

The effect of ESG disclosure on firm value in the European context

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Atif Mahmood

Department of Economics, University of Perugia, Perugia, Italy

Asad Mehmood

*Department of Management and Business Administration,
Gabriele d'Annunzio University of Chieti and Pescara, Chieti, Italy*

Simone Terzani

Department of Economics, University of Perugia, Perugia, Italy

Francesco De Luca

*Department of Management and Business Administration,
Gabriele d'Annunzio University of Chieti and Pescara, Chieti, Italy, and*

Hadrian Geri Djajadikerta

*Faculty of Business and Law, School of Accounting, Economics and Finance,
Curtin University, Perth, Australia*

Abstract

Purpose – The environmental, social and governance (ESG) topic has recently received increasing attention from scholars due to increasing regulations for firms' non-financial disclosure with respect to environmental and social issues. For instance, the European Union (EU) recently issued the Corporate Sustainability Reporting Directive (CSRD) in December 2022 and implemented it starting in 2024 in member states. Non-financial disclosure is relevant for various stakeholders and could affect firm value. Therefore, this study aims to examine the effect of ESG disclosure on firm value in the EU context.

Design/methodology/approach – This study uses panel data on listed EU firms extracted from the Bloomberg database from 2014 to 2024. The final sample comprises 11,003 firm-year observations. The ordinary least squares method is used as a baseline regression. This study addresses the endogeneity issues by applying instrumental variable and two-step system dynamic panel generalised method of moments approaches.

Findings – The results of the univariate tests, including the mean-difference comparison test based on pre-CSRD and CSRD issuance periods, reveal a significant decrease in the average ESG disclosure score in the CSRD issuance period. These results are similar for individual ESG pillars. Further, the results show a significant reduction in average firm value in the CSRD issuance period. The regression results report a significant and positive effect of ESG disclosure on firm value.

Practical implications – This study provides practical implications for policymakers, firms and stakeholders. Based on the findings and the contexts of signalling and institutional theories, regulatory requirements for non-financial reporting on environmental and social issues affect a firm's sustainable behaviour. This directly impacts various stakeholders, including market participants, and eventually affects market value.

Originality/value – This study contributes to the literature on the relationship between ESG disclosure and firm value in the context of the transition from the non-financial reporting directive to CSRD.

Keywords ESG disclosure, Corporate sustainability, Firm value, EU directives, CSRD

Paper type Research paper

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1. Introduction

The term environmental, social and governance (ESG) appeared in a 2004 United Nations (UN) report; however, since its revolution from the 2010s to 2020s, it has emerged as a proactive movement instead of a reactive one. ESG serves as a framework for evaluating how a business handles opportunities and risks brought forth by changing non-market and market environments. These changes affect the entire environment in which an organisation functions, including the social, economic and environmental systems (Eskantar *et al.*, 2024). The recent developments regarding ESG issues increased the demand for more transparent and relevant information from firms to assess their impact on sustainable activities (Cohen and Simnett, 2015). The significant increase in voluntary disclosure regarding ESG issues in different countries encourages mandatory disclosures in various regions (KPMG & UNEP, 2016; KPMG, 2020). The recent development by the International Sustainability Standard Board (ISSB), the Security and Exchange Commission (SEC) of the USA and the European Financial Reporting Advisory Group (EFRAG) for enhanced sustainability development for all stakeholders provides promising evidence (de Villiers *et al.*, 2024a).

Focusing on the sustainability debate within the European Union (EU), the Green Paper (issued by the Commission of EU Communities, 2001) to foster the ESG framework serves as guidelines for measuring corporate performance regarding ESG activities (de Villiers *et al.*, 2024a). The emergence of standard settings focused on getting more ESG information from corporations has promoted sustainability development (Bebbington and Larrinaga, 2014). Earlier, the EU introduced the non-financial reporting directive (NFRD) in 2014, Directive 95/2014/EU, that mandated those firms (1) listed and operating within the EU; (2) having more than 500 employees; and (3) qualified as large public-interest entities to disclose their non-financial information related to environmental factors, social factors and governance factors (European Union, 2014; Tettamanzi *et al.*, 2022). The development and initiation of such measures have raised awareness of ESG issues among different stakeholders, leading to a gradual increase in demand for more transparent and material information (Hummel and Jobst, 2024). Recently, the EU issued and implemented the Corporate Sustainability Reporting Directive (CSRD) in December 2022, replacing NFRD to ensure greater business transparency and accountability with respect to environmental and social matters.

The UN's Principle for Responsible Investment has raised the assets under management to \$121 trillion with 5,300 signatories with the motive to use the ESG lens for their investment and decision-making processes (An *et al.*, 2025). The European Security and Market Authority (ESMA) found that in Europe, the percentage of sustainable funds increased by more than four times, from 3% of assets under management in 2013 to 14% in 2023 (Bloomberg, 2024). This increase in sustainable investment activities and interest reflects Europe's strong commitment to fostering a sustainable region (Von der Leyen, 2019).

The mandatory sustainability disclosures are vital for both firms and their stakeholders, including the investors, and can potentially affect business outcomes, including firm value. Due to the emergence of ESG, enterprises' exposure to diverse and complex risks has increased, and conventional reports lack demonstration of numerous enterprise activities (Cuadrado-Ballesteros *et al.*, 2017). For instance, outside investors may face difficulties regarding the managers' interest in the case of less transparent corporate disclosures (Ross, 1973). Theoretical arguments provide reasons for firms' engagement in ESG disclosure to mitigate information asymmetry and benefit stakeholders, particularly investors, to get financial resources (Cormier and Magnan, 2015; Yuan *et al.*, 2022; Alatawi *et al.*, 2023). ESG information reduces investors' insecurity in harmonising the financial data (Verrecchia, 2001). Firms' commitment towards ESG issues acts as a signal for outside stakeholders that the firm is a responsible corporate citizen and considers environmental, social and governance matters. However, such stakeholders and investors find it difficult to ascertain and distinguish the good and bad firms in the absence of mandatory disclosures due to a lack of access to the specific information related to ESG (Gugerty, 2009; Belal and Cooper, 2011). Firms engaged in voluntary disclosures by issuing dedicated CSR reports provide signals to diverse stakeholders

that their corporate actions are sustainable and not harmful. These actions provide a strong ground for signalling theory, which posits that issuing dedicated CSR reports helps firms reduce information asymmetry by distinguishing actions from their counterparts to gain the benefits associated with such responsible actions (Mahoney *et al.*, 2013). Therefore, ESG disclosure brings transparency and transmits signals to the market (Yuan *et al.*, 2022). In addition, non-financial disclosures encourage investors to make investment decisions with lower financing costs (Dhaliwal *et al.*, 2011). Hence, theoretically, high ESG disclosures are linked with the lower cost of debt, reducing information asymmetry and bringing investors' confidence, which ultimately contributes towards corporate value enhancement.

According to the perspective of institutional theory, it explains the critical role of regulators and societal pressures on firms to derive non-linear results (Khan *et al.*, 2016). The external pressures, particularly from regulators on firms, may lead them to proactively avoid resulting consequences and thus provide ESG disclosure and enhance their firm value. Arguably, coercive and normative pressures influence firms' behaviour concerning sustainability disclosure since formal laws in isolation cannot establish a norm, as informal laws allow normativity of practice once society legitimates them (Nicolò *et al.*, 2024). Considering these perspectives of institutional and signalling theories, this study investigates how ESG disclosure impacts firm value in the EU context. Particularly, this study highlights how the issuance of CSRD impacts the behaviour of firms with respect to their sustainability reporting. The EU provides a standardised regulatory framework for sustainability reporting, such as NFRD and the new CSRD, for firms in scope in its member countries that are required to comply with these regulatory requirements.

In the literature, several studies have examined the potential impact of ESG elements on a firm's value and financial performance; however, they lack unanimous findings (Chininga *et al.*, 2024; Fatemi *et al.*, 2018). Additionally, those studies were conducted under different regions, settings and regulatory frameworks; thus, the established relationship differs in terms of region and time (Baughn *et al.*, 2007; Christensen *et al.*, 2021; Pizzi *et al.*, 2022). For instance, most empirical evidence on the ESG-firm value relationship comes from developed countries primarily supporting mandatory disclosure (Aydoğmuş *et al.*, 2022; Chen *et al.*, 2024; Li *et al.*, 2018), and their corporate culture has introduced mechanisms to embed sustainability initiatives within their corporate strategy. Fatemi *et al.* (2018) and Plumlee *et al.* (2015) considered the US companies and reported the influential impact of ESG on firm value. Accordingly, scholars Da Fermo *et al.* (2024), Dkhili (2024) and Tahmid *et al.* (2022) conducted their studies in the EU region and reported that firms, through ESG practices, gain an influential impact on their firm value. In contrast, other studies reported mixed and inconclusive results (Nollet *et al.*, 2016; Landi and Sciarelli, 2019; Garcia and Orsato, 2020; Buallay *et al.*, 2021; Duque-Grisales and Aguilera-Caracuel, 2021). Despite robust research, factors including the sample period and nature of performance measures applied in these studies contributed to the inconclusive and mixed results. Hence, the literature lacks unanimity regarding the ESG–firm value relationship. The regulatory framework and country heterogeneity shape a firm's policy decisions and strategic actions. Recent research under the institutional theory and the institutional difference hypothesis highlights that a particular territory's institutional and economic development level influences a firm strategic decisions for ESG initiatives (Julian and Ofori-dankwa 2013; Tilt, 2016).

This study aims to examine the impact of ESG disclosure on firm value in the context of CSRD using the sample of listed EU firms based on 11,003 firm-year observations from 2014 to 2024. Since the EU issued CSRD in December 2022, our dataset includes the period of CSRD issuance, i.e. 2024, which refers to the reporting period 2023. We use Bloomberg to extract the data, including ESG scores. These scores are, for the most part, based on the Global Reporting Initiative (GRI) reporting framework under NFRD. Arguably, GRI has a more significant impact than existing frameworks (Boiral *et al.*, 2019; Venturelli *et al.*, 2019; Doni *et al.*, 2020). The 2020 KPMG Survey of Sustainability Reporting [1] presents that GRI is used by 96% of the largest 250 firms (the G250) of the world for their sustainability reporting (Papa *et al.*, 2022).

The existing literature also provides evidence with respect to firms growing adherence to GRI standards resulting from mandatory NFRD (Papa *et al.*, 2022). Bloomberg collects the company-reported ESG data from sustainability reports, among others, mainly based on the GRI framework. Then, Bloomberg assigns scores to that ESG data. CSRD, on the other hand, is based on the European Sustainability Reporting Standards (ESRS) reporting framework and has been implemented in EU member states since January 2024. Companies have to publish reports in the context of CSRD using the ESRS framework during 2025 for the reporting period 2024. Based on data availability until the last reporting period, our dataset includes reports publication period till 2024 that mainly uses the GRI reporting framework but includes the CSRD issuance period. The GRI reporting framework, predominantly adopted under NFRD, represents a strong connection with the ESRS reporting framework, as CSRD drew inspiration from it to draft the ESRS. For instance, EFRAG recently issued the “GRI-ESRS Interoperability Index”, which presents guidelines for interoperability between GRI and the newly issued ESRS [2] (EFRAG, 2023). This interoperability index shows a specific correspondence with ESRS contents for several GRI contents [3]. Hence, the ESG scores provided by Bloomberg used for the analysis in our study could be a good approximation of what we would expect under ESRS.

This study performs univariate tests on study variables based on pre-CSRD and CSRD issuance periods, including a mean-difference comparison test. Interestingly, we find a significant decrease in the average ESG disclosure score in the CSRD issuance period. Similarly, there is a significant decrease in the average scores of individual ESG pillars. Moreover, there is a significant decrease in average firm value in the CSRD issuance period. Further, this study employs the ordinary least squares (OLS) method as a baseline regression for hypothesis testing. In addition, this study addresses the endogeneity issue by using alternative techniques, including the instrumental variable (IV) analysis and the two-step system dynamic panel generalised method of moments (GMM). The results show that ESG disclosure positively impacts firm value, indicating that firms’ contribution to ESG is favourable for firms as it increases firm value.

This study provides several theoretical contributions. Firstly, this study contributes to the literature regarding ESG disclosure in the context of CSRD issuance and its relationship with firm value. Secondly, this study contributes to theory by considering the signalling and institutional theories framework for establishing the nexus between ESG disclosure and firm value. Thirdly, this study provides empirical evidence concerning how CSRD issuance impacts ESG disclosure and the firm value of EU firms. Fourthly, this study further provides empirical evidence with respect to the effect of ESG disclosure on firm value.

The following sections of the paper are structured as follows: Section 2 provides the theoretical framework and hypothesis development. Section 3 presents the research methodology and Section 4 provides the empirical analysis and discussion. Lastly, Section 5 discusses the conclusions, including study implications, limitations and directions for further research.

2. Theoretical framework and hypothesis development

2.1 Background of EU’s Corporate Sustainability Reporting Directive

Focusing on the sustainability debate within the EU, to foster the ESG framework, the Green Paper [4] served as guidelines for measuring corporate performance regarding ESG activities (de Villiers *et al.*, 2024a). The EU’s 2003/51 Accounting Modernisation Directive (by amending the Accounting Directive) required EU companies to disclose key performance indicators related to non-financial matters. Later, the EU introduced the obligation to prepare a Corporate Governance statement as part of the annual reports of listed firms by amendment to the Accounting Directive [5] (Camilleri, 2015). The Europe 2020 [6] strategy aiming for “smart, sustainable and inclusive” growth introduced three key drivers: “1) knowledge and innovation; 2) a greener and more efficient use of resources; and 3) higher employment in conjunction with social and territorial cohesion” (European Commission, 2010). To ensure and enhance the quality and transparency of a firm’s disclosed non-financial performance, the EU Commission introduced a communication titled “Single Market Act; Twelve levers to

boost growth and strengthen confidence - Working together to create new growth” (European Commission, 2011).

Further, to prevent the stakeholder’s concerns related to environmental and social disclosure, the EU embraced the directive 2013/50/EU of Disclosure of Transparency, amending the earlier Transparency Directive 2004/109/EC to include ESG disclosure in the annual reports in addition to the compliance of financial reporting. Firms adopted voluntary disclosures to some extent. However, these disclosures often lack uniformity, and the motives behind voluntary disclosures create obstacles to the credibility and usefulness of such information. Consequently, they remain fragmented from sustainability reporting, as they do not comprehensively address ESG factors.

To address these issues, in 2014, the EU adopted the NFRD by amending the existing EU Accounting Directives 34/2013 to emerge sustainability reporting in Europe, which mandates certain large firms to issue non-financial reports as part of their annual reports. The European Commission issued the non-mandatory guidelines to report non-financial information, while the directive provides flexibility for adopting the reporting framework. However, existing standards proposed by GRI and Integrated Reporting provide flexibility in communicating and disclosing ESG information due to the absence of a mandatory framework, which raises questions on the transparency and completeness of the sustainability reporting; hence, the transparency gaps remain (Vigneau and Adams, 2023). The focus of the directive emphasises the perspective of “double materiality” and firms required to disclose sustainability information (about environmental, social, employees, human rights, bribery and corruption issues) along with their corporate policy, outcomes, risk assessment and risk management and essential business performance indicators (Guterman, 2021; Mio *et al.*, 2021). The directive aims to “increase the relevance, consistency and comparability of information disclosed by certain large companies and groups across the Union on non-financial and diversity topics; and to stimulate change toward a sustainable global economy”. However, the scope and reach of double materiality recommendations, including financial materiality proposed by SDGs, is much broader and covers the global achievements of firms’ SDGs, including firms’ contribution towards value creation for both investors and society. Meanwhile, the NFRD proposed by the EU responds only to the firm’s external impacts (Abhayawansa, 2022).

In Europe, the emphasis and development on sustainability awareness have shown an unprecedented improvement, starting from the NFRD that significantly helps to increase the awareness of ESG, such as the quality, quantity and coverage of ESG information in annual reports has increased and contributes to bringing positive image and repute of the firms with favourable financial outcomes (Turzo and Terzani, 2024). In addition, the formation of sustainability committee(s) by respective firms and the potential role of gender diversity through the inclusion of female directors in the boardroom contributed significantly to shaping the governance structure embedded by variety of skills, large pool of various opinions, aspects, field experience and good relationship with outside actors and help firms to foster their decision making mechanisms and to facilitate the interest of large groups of stakeholders regarding ESG and achievement of SDGs (Nicolò *et al.*, 2022; Zampone *et al.*, 2024).

The current development towards sustainability disseminates the abundance of non-financial reporting regulations across the world. EU’s CSRD, which superseded the previous NFRD, covers large and small enterprises to disclose information pertaining to climate change and relevant ESG matters under a framework with the obligation to follow the ESRS reporting framework in providing sustainability information, along with mandatory external assurance (Camilleri, 2015; Giner and Luque-Vílchez, 2022; Tettamanzi *et al.*, 2022; Baboukardos *et al.*, 2023; Hummel and Jobst, 2024; Krasodomska *et al.*, 2024). Accordingly, the *consultation paper on sustainability reporting* (CPSR) by the International Financial Reporting Standards (IFRS) mandates the formulation of sustainability reporting standards with the help of the

Foundation to help investors in decision-making. In contrast, EFRAG, along with CSRD, has composed the ESRS draft that covers the biodiversity, climate change, workforce and circular economy issues to facilitate the interests of a broader set of stakeholders. Further, the scope of CSRD and IFRS differs in terms of scope, audience, materiality and reporting boundary (Giner and Luque-Vílchez, 2022). Further, the initiation of the ISSB enhances the importance of a regulatory framework for sustainability information. However, its scope and expansion to different regions, the legitimacy issue in framing the sustainability reporting agenda and its investor-oriented approach are major challenges that receive a critical backlash from different groups of stakeholders (de Villiers *et al.*, 2024b).

2.2 Theoretical framework

This study adopts signalling and institutional theories as a relevant primary framework for examining the ESG disclosure and firm value relationship. Signalling theory articulates that firms with greater emphasis on ESG activities tend to explicitly report their CSR initiatives and provide strong signals to the stakeholders about their sustainable corporate actions and such reporting positively enhances firm valuation in many aspects (Mahoney *et al.*, 2013; Uyar *et al.*, 2020). Through voluntary disclosures, managers reduce information asymmetry among firms' stakeholders and signal their efforts through various means (Spence, 1973; Connelly *et al.*, 2011). Further, stakeholders significantly punish corporate's irresponsible behaviour (Mahoney *et al.*, 2013). Voluntary disclosures by firms not only translate into a competitive advantage but also distinguish them as "good" firms having superior sustainable corporate efforts than those with inferior initiatives (Clarkson *et al.*, 2008; Maas *et al.*, 2014; Wang *et al.*, 2018). Information on environmental issues contributes to firm value by meeting the needs of stakeholders and making this information available to them (Hahn and Kühnen, 2013; Nirino *et al.*, 2021; Tsang *et al.*, 2023). Non-financial information bridges the stakeholder's concerns, originates reasonable communication and fosters business support. These transparent initiatives and responses to stakeholders' concerns translate into firm connection and ample support from pivotal stakeholders. Firms' engagement in ESG practices attracts other stakeholders, including customers, employees and the community, to evaluate the firm's actions, thereby significantly impacting firm value. Thus, ESG disclosures increase firm value by strengthening the firm's association with diverse stakeholders.

The institutional theory contends that a particular country's institutional settings shape a firm's decision-making procedure, efficacy and legitimation of its strategies (Delmas and Toffel, 2008; Sreepriya *et al.*, 2023). It further explains how pressure from society and regulators plays an essential part in deriving non-linear results (Khan *et al.*, 2016). Institutional environments pressurise firms to comply with mainly acceptable normative initiatives (Aksom and Tymchenko, 2020; Eng *et al.*, 2022). Institutional theory explains how different enterprises in the same sector share similarities (Azmi *et al.*, 2021; Nirino *et al.*, 2021). A particular territory's institutional and economic development level influences a firm's strategic decisions for ESG initiatives (Dobers and Halme, 2009; Julian and Ofori-dankwa 2013; Tilt, 2016). Institutional theory highlights that a firm's involvement in ESG disclosures as a means of significant non-financial data is grounded on diverse social factors in addition to instrumental decisions. Hence, the ESG disclosure strategy is reflected as a response to broader institutional obligations (Li *et al.*, 2024). Institutional theory emphasises external pressures; therefore, this can lead to a proactive approach for firms to increase firm value and mitigate relevant consequences by reporting ESG information. Institutional isomorphism explains that firms change their actions to remain active and survive in a competitive condition. Coercive and normative pressures shape firms' sustainability disclosure behaviour because formal laws in isolation cannot establish a norm, as informal laws provide normativity of practice once legitimated by society (Nicolò *et al.*, 2024). If they fail to do so, their exposure to various risks will increase, and they might be excluded from the market or rely on

2.3 Hypothesis development

This study reviews the prior literature on the relationship between ESG disclosure and firm value and develops the hypothesis statement.

Existing literature presents CSR as a mechanism framed on multiple aspects to satisfy the interests of broader stakeholders, from environmental preservation to social welfare and shareholder value (Flammer, 2013; Erhemjamts and Huang, 2019). To concisely capture the key aspects of CSR, it progresses to ESG elements (Gillan *et al.*, 2021; Tsang *et al.*, 2023). Arguably, ESG disclosure reduces information asymmetry and enhances stock price informativeness and short-term market value, and thus, ESG disclosure reflects broader business impacts (Cho *et al.*, 2013; Fatemi *et al.*, 2018; Dai *et al.*, 2021). Investors rely on firms that disclose ESG information as disclosing ESG information boosts investors' confidence and helps enhance firm value (Tang *et al.*, 2024). ESG investments, though resource-intensive, are recognised as strategies that enhance firm value through competitive advantage and improve corporate reputation, particularly for companies with higher ESG disclosure (Bualay, 2019a; Murè *et al.*, 2021).

Firms that engage in ESG activities can potentially improve operational efficiency and reduce the cost of capital. These high-ranked firms face lower financial risks, enabling them to prevent systemic risks, reduce the information asymmetry between managers and shareholders and bring investor confidence. These incentives are ultimately beneficial for enhancing firm value (Bachoo *et al.*, 2013; Albuquerque *et al.*, 2019; Dai *et al.*, 2021; Duque-Grisales and Aguilera-Caracuel, 2021; Wong *et al.*, 2021; Tahmid *et al.*, 2022; Chen *et al.*, 2024; Dkhili, 2024; Priem and Gabellone, 2024; An *et al.*, 2025). In line with these arguments, the existing literature shows the relevance with respect to the significant impact of ESG disclosure on firm value (An *et al.*, 2025; Buchanan *et al.*, 2018; Chen *et al.*, 2018; Fatemi *et al.*, 2018). Table 1 provides a summary of previous studies with an overview of the possible ESG disclosure–firm value relationship that has been investigated in the literature, mainly

Table 1. Summary of previous studies

Study	Sample	Period	Findings
An <i>et al.</i> (2025)	China	2013–2023	Positive and significant relationship between ESG disclosure scores and FV
Chen <i>et al.</i> (2024)	Japan	2016–2021	ESG has a significant impact on FV
de Villiers <i>et al.</i> (2024c)	Europe	2007–2013	Unexpected CSR disclosure level positively linked with share prices
Tang <i>et al.</i> (2024)	China	2009–2022	ESG performance enhances investor confidence and thereby enhances FV
Dkhili (2024)	Europe	2007–2018	ESG positively impacts FV
Tahmid <i>et al.</i> (2022)	Europe	2008–2020	ESG initiatives positively impact FV
Wong <i>et al.</i> (2021)	Global	2012–2018	ESG certification lowers a firm's cost of capital while FV increases significantly
Fatemi <i>et al.</i> (2018)	US	2006–2011	ESG strengths increase FV and concerns decrease it ESG disclosure plays an impacting moderator role
Plumlee <i>et al.</i> (2015)	US	2000–2005	ESG disclosure type is essential for FV
Bachoo <i>et al.</i> (2013)	Australia	2003–2005	Quality ESG reporting reduces the cost of equity capital

Source(s): Table created by authors based on previous studies

reporting a positive relationship. Based on this, the present study proposes the following hypothesis:

- H1.* ESG disclosure (and the individual pillars, i.e. environmental, social and governance disclosures) significantly and positively impact firm value.

3. Research methodology

3.1 Data and sample

This study examines the impact of ESG disclosure on firm value. For this purpose, this study considers a sample of listed firms in EU member states. The sample selection of EU-listed firms is aligned with the literature (Ioannou and Serafeim, 2018; Grewal *et al.*, 2019; Cicchiello *et al.*, 2023; Da Fermo *et al.*, 2024). The panel data are extracted from the Bloomberg database from 2014 to 2024 as the years of report publication and refer to the previous year's reporting period. For instance, 2024 represents the reporting period 2023. The EU has issued the CSRD on 14th December 2022. Hence, 2024 (based on the reporting period 2023) represents the CSRD issuance period. Bloomberg provides broader and more comprehensive coverage of ESG data (Ioannou and Serafeim, 2018), as its ESG score covers 900 data points across various ESG factors, including energy, air quality, water, intellectual capital, waste conservation, diversity, compensation and shareholders' rights. Hence, because of its comprehensive coverage and structure of the data, Bloomberg's ESG disclosure scores present a more robust proxy for non-financial information than others, such as manually constructed indices or standalone CSR reports. In addition, segregating ESG into an individual pillar of environment, social and governance apprehends the requirements of various stakeholders interested in sustainability information for a specific pillar. Scholars have often used Bloomberg ESG scores in the literature as a proxy of non-financial information, thereby validating its reliability and acceptance as a credible measure (Han *et al.*, 2016; Nollet *et al.*, 2016; Wang and Sarkis, 2017; Buchanan *et al.*, 2018; Eng *et al.*, 2022).

The initial extraction of panel data from the Bloomberg database provided data for 10,428 listed companies from 27 EU countries. The data cleaning is performed in which (a) missing firm-year observations are excluded and (b) firms with duplicate data are excluded. These steps led to a final sample of 1,862 firms with 11,003 firm-year observations, classified under the Global Industry Classification Standard (GICS). Tables 2 and 3 provide complete sample information regarding firms and respective observations according to their countries and industries. The final sample firms belong to 23 EU countries and 11 industry sectors under GICS. The outliers are removed by winsorising all study variables at the 1st and 99th percentiles (Matsumura *et al.*, 2017; Deb *et al.*, 2019).

3.2 Study variables

This study measures firm value using Tobin's Q, computed as the market value of equity plus total assets minus the book value of equity divided by total assets. Investors, markets and stakeholders often assess a company's value through firm value, usually based on market capitalisation and stock price. This assessment estimates the firm's potential growth, future cash flows and risk factors (Chang *et al.*, 2024). However, its determinants, including market conditions, economic performance, quality of corporate governance and reporting non-financial information, influence firm value.

The variable of interest is ESG disclosure, measured through the ESG disclosure score. The ESG disclosure score data are extracted from the Bloomberg database (Eng *et al.*, 2022). ESG disclosure score is a "Proprietary Bloomberg score based on the extent of a company's Environmental, Social and Governance (ESG) data disclosure. The score ranges from 0 for companies that do not disclose any of the Environmental, Social and Governance data included in the score, to 100 for those that disclose every data point. This score measures the

Table 2. Sample firms with respect to countries

	Country	Firms	Percentage	<i>N</i>	Percentage
1	Austria	50	2.69	357	3.24
2	Belgium	47	2.52	47	0.43
3	Bulgaria	16	0.86	59	0.54
4	Croatia	11	0.59	55	0.50
5	Cyprus	16	0.86	62	0.56
6	Denmark	72	3.87	523	4.75
7	Estonia	11	0.59	70	0.64
8	Finland	73	3.92	358	3.25
9	France	283	15.20	1,856	16.87
10	Germany	245	13.16	1,244	11.31
11	Greece	69	3.71	433	3.94
12	Hungary	15	0.81	94	0.85
13	Ireland	46	2.47	368	3.34
14	Italy	189	10.15	1,094	9.94
15	Lithuania	19	1.02	93	0.85
16	Luxembourg	31	1.66	213	1.94
17	Malta	20	1.07	114	1.04
18	Netherlands	78	4.19	555	5.04
19	Poland	107	5.75	516	4.69
20	Romania	34	1.83	173	1.57
21	Slovenia	13	0.70	69	0.63
22	Spain	123	6.61	859	7.81
23	Sweden	294	15.79	1,791	16.28
	Total	1,862	100	11,003	100

Note(s): *N* is the number of observations**Source(s):** Table created by authors**Table 3.** Sample firms with respect to industry sector

	GICS	Firms	Percentage	<i>N</i>	Percentage
1	Communication Services	124	6.66	735	6.68
2	Consumer Discretionary	260	13.97	1,510	13.72
3	Consumer Staples	124	6.66	702	6.38
4	Energy	49	2.63	327	2.97
5	Financials	191	10.26	1,262	11.47
6	Health Care	164	8.81	965	8.77
7	Industrials	435	23.37	2,558	23.25
8	Information Technology	206	11.07	1,014	9.22
9	Materials	128	6.88	797	7.24
10	Real Estate	111	5.96	663	6.03
11	Utilities	69	3.71	470	4.27
	Total	1,861	100	11,003	100

Note(s): GICS is the Global Industry Classification Standard. *N* is the number of observations**Source(s):** Table created by authors

amount of Environmental, Social and Governance (ESG) data a company reports publicly, and does not measure the company's performance on any data point" (Bloomberg, 2017). Bloomberg uses several sources to collect the company-reported ESG data, including "corporate social responsibility (CSR) or sustainability reports, annual reports and websites, other public sources, as well as through company direct contact" (Coluccia *et al.*, 2020).

Following the implementation of NFRD in the EU, companies mostly prepare sustainability reports using the GRI reporting framework. For instance, it is reported that EU firms progressively adhere to GRI standards due to mandatory NFRD (Papa *et al.*, 2022). Hence, as discussed earlier, Bloomberg collects company-reported ESG data from sustainability reports, among others, mainly based on the GRI framework and assigns scores to that ESG data. On the contrary, CSRD uses the reporting framework of ESRS, which was issued in July 2023 and starting in 2025, EU companies that are in the scope of CSRD need to publish sustainability reporting using the ESRS. Recently, EFRAG issued the “GRI-ESRS Interoperability Index” (EFRAG, 2023), showing a strong connection between GRI and ESRS contents. Thus, ESG disclosure scores provided by Bloomberg could better align with the ESRS framework through the GRI-ESRS interoperability index. Additionally, this study also uses each component of ESG, such as environmental disclosure score (EDS), social disclosure score (SDS) and governance disclosure score (GDS) as a measure of ESG disclosure.

This study uses several control variables, including corporate governance variables (board size, women on the board and board independence) and firm characteristics (return on assets, cash reserves, firm leverage and firm size). Table 4 presents the definitions of the study variables.

Table 4. Variables definitions

Variable	Notation	Measure	Source
<i>Firm Value</i>	<i>FV</i>		
Tobin's Q	TQ	Market value of equity plus total assets minus the book value of equity, entire divided by total assets	Giannopoulos <i>et al.</i> (2022), Tahmid <i>et al.</i> (2022), Wu and Chang (2022)
<i>ESG disclosure</i>	<i>ESGD</i>		
ESG disclosure score	ESGDS	Environmental, social and governance disclosure score (0–100)	Aydoğmuş <i>et al.</i> (2022)
Environmental disclosure score	EDS	Environmental disclosure score (0–100)	Aydoğmuş <i>et al.</i> (2022), Wu and Chang (2022)
Social disclosure score	SDS	Social disclosure score (0–100)	
Governance disclosure score	GDS	Governance disclosure score (0–100)	
<i>Corporate Governance</i>	<i>CG</i>		
Board size	BS	The total number of directors on the board	Cooper and Uzun (2022)
Women on the board	WOB	The number of women directors on the board as a percentage of board size	
Board independence	BI	The number of independent directors on the board as a percentage of board size	Atif <i>et al.</i> (2021)
<i>Firm Characteristics</i>	<i>FC</i>		
Return on assets	ROA	Net income as a percentage of total assets	Cooper and Uzun (2022), Fatemi <i>et al.</i> (2018), Tahmid <i>et al.</i> (2022)
Cash reserves	CR	Cash and cash equivalents divided by net assets	Atif <i>et al.</i> (2021)
Firm leverage	LEV	Total debt divided by total assets	Aydoğmuş <i>et al.</i> (2022), Cooper and Uzun (2022), Tahmid <i>et al.</i> (2022)
Firm size	SIZE	Natural log of total assets	Fatemi <i>et al.</i> (2018), Tahmid <i>et al.</i> (2022)

Source(s): Table created by authors

3.3 Regression equations and techniques

This study employs the OLS as a baseline regression method to estimate the empirical models. The country, industry and year-fixed effects are incorporated since this study uses panel data of firms from different countries and industries. The inclusion of year-fixed effects also controls for the COVID-19 effect and the introduction of the EU's CSRD. The heteroscedasticity and within-firm correlation in the residuals are controlled by correcting the standard errors for clustering at the firm level (Petersen, 2009). This study further checks for multicollinearity issues between the explanatory variables through the multicollinearity diagnostic test.

This study uses the following regression equations to investigate the impact of ESG disclosure on firm value:

$$TQ_{i,t} = \beta_0 + \beta_1(ESGDS)_{i,t} + \beta_2(Control\ Variables)_{i,t} + country + industry + year + \varepsilon_{i,t} \quad (1)$$

$$TQ_{i,t} = \beta_0 + \beta_1(EDS)_{i,t} + \beta_2(Control\ Variables)_{i,t} + country + industry + year + \varepsilon_{i,t} \quad (2)$$

$$TQ_{i,t} = \beta_0 + \beta_1(SDS)_{i,t} + \beta_2(Control\ Variables)_{i,t} + country + industry + year + \varepsilon_{i,t} \quad (3)$$

$$TQ_{i,t} = \beta_0 + \beta_1(GDS)_{i,t} + \beta_2(Control\ Variables)_{i,t} + country + industry + year + \varepsilon_{i,t} \quad (4)$$

where TQ measures firm value, $ESGDS$, EDS , SDS and GDS are proxies of ESG disclosure, $country$ includes country fixed effects based on the sampling countries, $industry$ represents industry fixed effects using the sampling industry sectors as per GICS, $year$ includes year fixed effects based on the data sample period, β_0 is a constant, ε is the error term, i is firm and t is the year.

In addition to the OLS approach, this study uses alternative techniques to address the endogeneity issues and to check the robustness of the main study findings. The alternative techniques include IV analysis and a two-step system dynamic panel generalised method of moments (GMM).

4. Empirical analysis and discussion

4.1 Average ESG disclosure trend

Figure 1 shows the average ESG disclosure scores, including each pillar with respect to listed EU firms from 2014 to 2024. The same data are also displayed in Table 5. We observe an increasing trend for average ESG disclosure scores from 2015, the year of NFRD issuance in 2014 by the EU, as 2015 refers to the reporting period 2014, until 2018, the first reporting year after NFRD implementation in 2017 in EU member states as 2018 refers to the reporting period 2017. Interestingly, this increasing trend in average disclosure scores from 2015 until 2018 is a result of policy introduction where EU-listed firms with more than 500 employees along with other criteria, among others, were required to pay attention to environmental and social considerations to address sustainability issues and to report such considerations in their non-financial disclosures. It shows that EU firms started taking sustainability issues into consideration mainly from the issuance of NFRD, with significant growth in subsequent years, including the implementation year. Surprisingly, we see a substantial decrease in average ESG disclosure scores in 2019, the second reporting year after NFRD implementation, as 2019 refers to the reporting period 2018. This significant decrease in average ESG disclosure scores could represent that firms after 2018 felt comfortable with the efforts they made before to meet the NFRD requirements and devoted less effort right in the following years, probably due to not-so-strict regulatory requirements that featured the NFRD. Furthermore, we note a slight increase in the average scores in 2020 and 2021, followed by a slight decrease in 2022 and a notable increase in 2023. These average scores are almost constant from 2019 to 2023, presenting increasing and decreasing trends. Interestingly, we do not observe any major

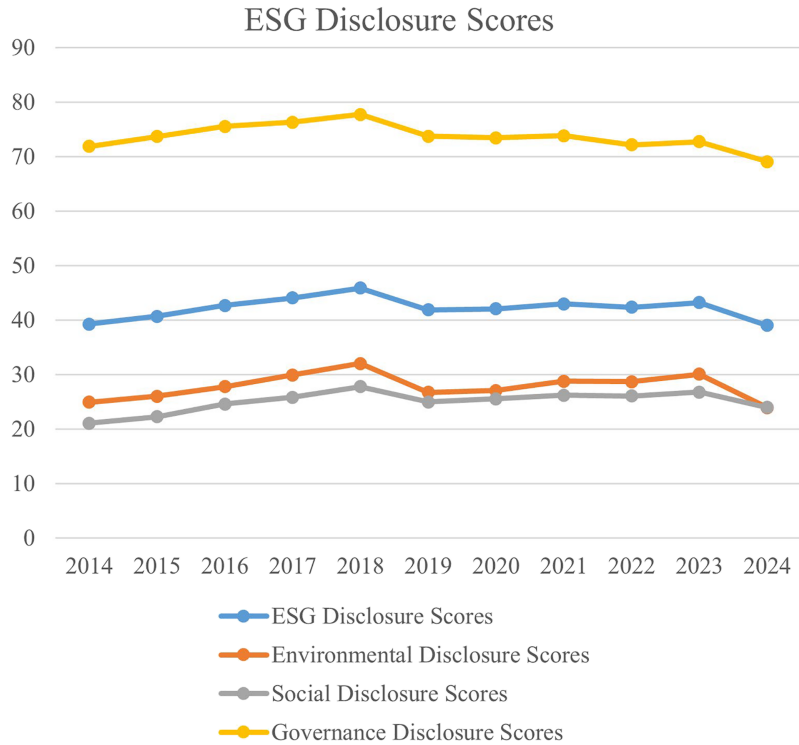


Figure 1. Average ESG and individual pillars, E, S and G, disclosure scores of EU firms. **Source(s):** Figure created by authors

Table 5. Average ESG and individual pillars, E, S and G, disclosure scores of EU firms

Year	ESG	Environmental	Social	Governance
2014	39.28	24.92	21.09	71.89
2015	40.71	26.03	22.25	73.70
2016	42.71	27.81	24.60	75.56
2017	44.08	29.91	25.86	76.32
2018	45.90	32.05	27.80	77.74
2019	41.87	26.74	25.00	73.75
2020	42.08	27.09	25.54	73.47
2021	42.99	28.79	26.24	73.82
2022	42.37	28.72	26.08	72.19
2023	43.23	30.06	26.79	72.72
2024	39.02	23.92	23.97	69.07

Source(s): Table created by authors

increase in average ESG scores in the observation period, like in 2018, which also remains the highest in the observation period. This trend hence indicates that NFRD became less effective in the years following its implementation. Probably, these results also made European regulators aware of the limits of NFRD and pushed them toward readdressing the sustainability reporting regulations.

Interestingly, [Figure 1](#) further presents a major decrease in average ESG disclosure scores in 2024 (the reporting year 2023). In particular, this decrease in average ESG scores in 2024 is the highest-ever decrease in the observation period, and earlier it was in 2019. We observe similar trends for individual pillars' such as environmental and social disclosure scores. With respect to governance scores, this decrease is the second-highest in 2024, and the highest was in 2019. Among the three pillars, in 2024, the highest decrease is in environmental disclosure scores, followed by governance and social scores. Probably, the main factor behind this highest decrease in average disclosure scores in 2024 after 2019 is the introduction of CSRD by the EU. The year 2024 refers to the reporting year 2023 and thus represents the CSRD issuance period since the EU issued CSRD on 14th December 2022. The CSRD comes with improved and stricter regulatory requirements, which makes it mandatory for companies in scope to disclose their environmental and social considerations in sustainability reports. Although CSRD was issued in December 2022, and its implementation was due in EU member states from January 2024, and companies have to publish sustainability reports in 2025 according to the CSRD using the ESRS reporting framework, the decrease in average disclosure scores in 2024 could be evidence of a changed behaviour of firms that are approaching the new CSRD enforcement. For instance, companies had almost only 1 year to start following the CSRD from its issuance in December 2022, and the ESRS reporting standards were introduced in July 2023, with a short time to understand and implement the new requirements under CSRD and ESRS. This short transition period to implement changes and follow the new rules has resulted in possible pressure on firms, making them uncomfortable with adequate compliance and affecting their sustainable behaviour since it would probably take more time to understand and implement the new rules.

The shift in the focus of companies to understanding the new rules under CSRD and ESRS standards probably compromised their existing practices since they devoted more attention to understanding them, which resulted in the highest decrease in ESG disclosure scores in the observed period. This explanation could find support, especially from the recently announced Omnibus Package [7] by the [European Commission \(2025\)](#), which introduced significant changes with respect to sustainability reporting. For instance, CSRD currently applies to large public-interest entities, and to large firms (meeting two of the following criteria: above 250 employees, above €50 million net turnover and above €25 million balance sheet total). However, considering the challenges posed by the CSRD for companies concerning strict and excessive regulatory requirements and time constraints, the European Commission in the Omnibus Package proposed reducing the scope of reporting companies. In particular, the reporting requirements under CSRD now would only apply to large firms (firms with more than 1,000 employees and either turnover higher than €50 million or balance sheet total higher than €25 million). Moreover, the Omnibus Package also addresses the need to revise and simplify the ESRS by significantly reducing the number of data points. These proposals by the European Commission in the Omnibus Package highlight the tense situation for firms and accurately represent the highest decrease in ESG disclosure scores in 2024 (reporting period 2023). Companies might be influenced by complex requirements and time constraints, which resulted in a major decrease in their average ESG disclosure scores even in the last year before the CSRD became effective. Hence, the Omnibus Package could be seen as a major relief for firms by reducing the scope of companies and allowing them further time to streamline their sustainability disclosure practices as per the new CSRD. This relief from the European Commission also highlights that CSRD could be influential in comparison to NFRD because of improved requirements that make firms liable to consider environmental and social issues in a serious manner.

4.2 Univariate tests

Next, for univariate tests, [Table 6](#) presents the descriptive statistics for the full sample and subsamples. The subsamples include the pre-CSRD issuance period, 2014 to 2023 and the

Table 6. Univariate tests (descriptive statistics)

Variable	Full sample N = 11,003		Pre-CSR issuance period (2014–2023) (CSR issued on 14th December 2022) N = 9,777		CSR issuance period (2024 – as the publication year of 2023 financial reports) N = 1,226		Mean-difference comparison test	
	Mean	SD	Mean	SD	Mean	SD	Mean diff	SE
TQ	1.670	1.392	1.692	1.411	1.489	1.214	–0.204***	0.042
ESGDS	42.237	13.879	42.641	13.925	39.019	13.076	–3.621***	0.419
EDS	27.949	20.280	28.454	20.419	23.921	18.660	–4.533***	0.613
SDS	25.417	13.063	25.599	13.146	23.970	12.288	–1.628***	0.395
GDS	73.227	15.561	73.748	15.407	69.070	16.155	–4.678***	0.469
BS	9.048	3.632	9.214	3.666	7.726	3.037	–1.488***	0.109
WOB	27.642	15.416	27.423	15.351	29.387	15.821	1.964***	0.467
BI	58.698	24.037	58.913	23.964	56.979	24.558	–1.934***	0.728
ROA	0.027	0.089	0.030	0.085	0.008	0.116	–0.0221***	0.003
CR	0.346	0.453	0.347	0.451	0.344	0.466	–0.00242	0.014
LEV	0.265	0.171	0.264	0.169	0.266	0.187	0.00109	0.005
SIZE	21.891	2.232	22.008	2.229	20.956	2.024	–1.052***	0.067

Note(s): The years refer to reports publication based on the previous year's reporting period. For instance, 2024 represents the reporting period 2023. *N* is the number of observations. SD is the standard deviation. *** represents a significance level of 1%. Variables definitions are presented in [Table 4](#)

Source(s): Table created by authors

CSR issuance period, 2024. These periods are the report publication years and refer to the previous year's reporting period. In addition, mean differences between the subsample groups are examined statistically using the mean-difference comparison test ([Mehmood and De Luca, 2023](#); [Mehmood et al., 2023a](#)). The average value of ESGDS for the full sample is 42.24, which indicates that, on average, EU firms disclose almost 43% of data related to ESG. With respect to the pre-CSR issuance period, the mean value of ESGDS is 42.64, which decreases to 39.02 in the CSR issuance period with a statistically significant mean difference. This decrease could result from increasing pressures of stricter requirements under CSR, the adoption of ESRS and time constraints. Compliance with these new rules requires a better understanding and proper implementation. However, a shorter transition period resulted in increasing challenges for firms to adhere to these new rules, which has probably compromised their existing sustainability reporting practices. Hence, these results indicate that the issuance of CSR impacted firms' attitudes regarding their sustainability disclosure. This still occurs in the context of NFRD enforcement, where companies predominantly use the GRI framework for non-financial disclosure. For instance, it is reported that following the NFRD implementation, the EU firms have shown growing adherence to GRI standards ([Papa et al., 2022](#)). However, EFRAG recently issued interoperability guidelines between GRI and the newly issued ESRS [2] ([EFRAG, 2023](#)). This document also provides an index showing a specific correspondence with ESRS contents for several GRI contents. As there is no evidence yet of CSR mandatory implementation (the first reporting year is 2024, with the publication of data in 2025), it is possible to consider that the disclosure scores (mainly according to the GRI framework) that we provided with the analysis could be a good approximation of what we would expect under ESRS. In addition, the ESG disclosure scores provided by Bloomberg are based on the company-reported ESG data, mainly under the GRI framework. Therefore, Bloomberg ESG disclosure scores could better align with the ESRS framework through the GRI–ESRS interoperability index.

Recently, the European Commission realised the difficulty for firms discussed above and announced the Omnibus Package (European Commission, 2025), which proposed reducing the scope of companies that are required to report as per CSRD using the ESRS. The European Commission, with this package, is also committed to revising and simplifying the ESRS. These results support the perspective of institutional theory. For instance, scholars consider institutional theory and argue that the ESG disclosure strategy of firms responds to institutional obligations (Li *et al.*, 2024). These results are consistent with respect to the coercive dimension of institutional theory, which argues that coercive pressures shape the sustainability reporting behaviour of firms (Nicolò *et al.*, 2024) since the coercive pressures on EU firms resulting from CSRD regulation impacted the behaviour of EU firms with respect to their sustainability reporting. In addition, scholars argue that firms' strategic decision-making for ESG initiatives is shaped by a region or territory's institutional and economic development level (Dobers and Halme, 2009; Julian and Ofori-dankwa 2013; Tilt, 2016). Our results represent a similar trend since the issuance of CSRD reflected a change in firms' ESG disclosure strategy that resulted in lower average ESG disclosure scores in the CSRD issuance period.

With respect to each component of ESG for the full sample, Table 6 shows that the EU firms, on average, disclose higher Governance (73.23) related data than environmental (27.95) and social (25.42) data. Regarding subsamples, the average EDS decreases from 28.45 to 23.92 in the CSRD issuance period, with a significant mean difference. Similarly, the mean SDS decreases from 25.60 to 23.97 in the CSRD issuance period, with a significant mean difference. Consistently with the institutional theory, these significant decreases in environmental and social disclosure scores further support the effect of CSRD issuance on EU firms even before formal CSRD enforcement. Moreover, the mean GDS decreases from 73.75 to 69.07 in the CSRD issuance period, with a significant mean difference.

Table 6 further presents the mean value of TQ, 1.67 for the full sample, indicating that, on average, EU firms have better firm value, representing that their stock is overvalued. Regarding subsamples, the average TQ decreases from 1.69 to 1.49 in the CSRD issuance period with a significant mean difference. This significant decrease in market value after the introduction of CSRD appears to have negatively impacted TQ. Consistently to the signalling theory, this decrease is probably due to stricter CSRD regulatory requirements that have signalled to stakeholders, including market participants, that firms are required to implement potentially challenging policies with respect to non-financial disclosures. This is true since NFRD did not have strict regulatory requirements as CSRD has now. Hence, this situation influenced both firms' confidence because of the introduction of this new directive in a short period after NFRD and the perception of market participants because of information asymmetry where they possibly had no or less information on how firms are going to act on CSRD, leading to a significant decrease in market value. In addition, market participants could also be concerned about the increasing risk of greenwashing as a consequence of the stricter and more extensive content provided under the CSRD framework. These results indicate that it seems challenging for firms to comply with all the regulatory requirements of CSRD, which is why their market value has decreased. It is evident from the recently announced Omnibus Package that provides relief to firms with respect to sustainability reporting under CSRD (European Commission, 2025) and is also helpful for firm stakeholders, including market participants, for their interests. These results further highlight that firms need to address CSRD requirements for their effective contribution to sustainability issues and protect stakeholders' interests by improving non-financial disclosure, which could help firms gain market participants' trust and enhance the market value in the long run. These results align with the view of signalling theory. According to signalling theory, firms provide signals to stakeholders about their sustainable behaviour through ESG disclosure in their non-financial reports, which increases firm value (Mahoney *et al.*, 2013; Uyar *et al.*, 2020). The opposite is true when firms fail to adopt sustainable behaviour, reducing firm value. Moreover, considering the potential reliability of sustainability information, the EU is also aware of the increasing risk of greenwashing in the CSRD context and to reduce this risk, it has recently issued a new

directive, Directive (EU) 825/2024, that will enter into force in 2026 aimed at reducing and sanctioning greenwashing practices (European Union, 2024).

Regarding the control variables, Table 6 shows that the average board size of EU firms for the full sample is 9.05. The average board size significantly decreases from 9.21 to 7.73 in the CSRD issuance period. The average representation of females on boards for the full sample is 27.64%, significantly increasing from 27.42% to 29.39% in the CSRD issuance period. The board independence of EU firms is, on average, 58.70%, with a significant decrease from 58.91% to 56.98% in the CSRD issuance period. Further, the mean return on assets for the full sample is 2.74%, significantly decreasing from 2.99% to 0.78% in the CSRD issuance period. The mean cash reserves for the full sample are 34.65%, and the average firm leverage is 0.27. The average firm size for the full sample is 21.89, significantly decreasing from 22.01 to 20.96 in the CSRD issuance period. All the study variables are winsorised at the 1st and 99th percentile to mitigate the issue of outliers (Matsumura *et al.*, 2017; Deb *et al.*, 2019).

Table 7 shows the correlation matrix, and the results indicate a statistically significant relationship between firm value and ESG disclosure measures along with control variables. Table 7 further presents the multicollinearity diagnostic test, and the results show no issue of multicollinearity between the explanatory variables as the variance inflation factor (VIF) values are <5.

4.3 Causal effect of ESG disclosure on firm value

Table 8 presents the OLS regression results for the impact of ESG disclosure on firm value. Column (1) indicates the effect of the ESG disclosure score on firm value. Columns (2)–(4) show the impact of each component, E, S and G on firm value, respectively. The country, industry and year-fixed effects are incorporated in all models. The year-fixed effects include the period of CSRD issuance. The regression results in Table 8 indicate that the ESG disclosure score positively and significantly impacts Tobin's Q, suggesting that a higher ESG disclosure score leads to higher firm value. These results support hypothesis 1 of the study. Similarly, in the case of the disclosure score of each component of ESG, such as EDS, SDS and GDS, the results depict a positive and significant impact on Tobin's Q. These results indicate that the disclosure score of each ESG component also leads to higher firm value, thus supporting hypothesis 1 of the study.

These findings represent that ESG disclosure is quite relevant for firms as it increases firm value. Particularly, stakeholders require firms to consider non-financial aspects by using resources sustainably (De Luca *et al.*, 2022; Mehmood *et al.*, 2023b), and firms' consideration of environmental and social issues gives them a competitive advantage. Stakeholders prioritise firms that meet their expectations and address their concerns, which helps firms build stakeholders' trust. This allows firms easier access to critical resources. For instance, the recently issued CSRD by the EU requires firms to disclose non-financial information, particularly for environmental and social issues, with stricter requirements than the NFRD. In response, firms need to comply with the CSRD requirements that also require firms to build market participants' trust. Our analysis, which includes the period of CSRD issuance, indicates that ESG disclosure has a role in influencing the behaviour of market participants and their investment decisions since they pay attention to how firms would respond to CSRD. Our findings confirm that ESG disclosure significantly affects market value, with higher non-financial disclosure contributing to improving firm market value. Hence, these results show that investors prefer investing in firms that consider sustainability issues. In addition, the creditors would be willing to lend money to such firms. Firms' access to these critical resources because of higher ESG disclosure helps them achieve goals efficiently and increases firm value. These results with respect to the impact of ESG disclosure on firm value, are in line with the perspectives of institutional and signalling theories. In addition, these results are consistent with the earlier literature (see (Jo and Harjoto, 2012; Buallay, 2019b; Dkhili, 2024; An *et al.*, 2025)).

Table 7. Correlation matrix and multicollinearity diagnostic test

Variables	1	2	3	4	5	6	7	8	9	10	11	12
1. TQ	1.000											
2. ESGDS	-0.096***	1.000										
3. EDS	-0.109***	0.909***	1.000									
4. SDS	-0.115***	0.869***	0.770***	1.000								
5. GDS	-0.020**	0.763***	0.486***	0.487***	1.000							
6. BS	-0.132***	0.517***	0.449***	0.411***	0.454***	1.000						
7. WOB	-0.005	0.346***	0.249***	0.239***	0.402***	0.212***	1.000					
8. BI	0.105***	0.050***	-0.015	0.005	0.150***	-0.199***	0.071***	1.000				
9. ROA	0.135***	0.118***	0.126***	0.112***	0.059***	0.029***	0.050***	-0.047***	1.000			
10. CR	0.036***	0.016*	-0.017*	0.035***	0.036***	0.067***	0.027***	0.026***	-0.140***	1.000		
11. LEV	-0.151***	0.099***	0.095***	0.081***	0.073***	0.047***	0.014	-0.041***	-0.192***	-0.028***	1.000	
12. SIZE	-0.148***	0.519***	0.440***	0.428***	0.456***	0.518***	0.237***	0.087***	0.129***	0.049***	0.012	1.000
VIF (1)		2.44				2.35	1.68	1.51	1.15	1.16	1.24	3.61
VIF (2)			2.06			2.32	1.66	1.49	1.15	1.16	1.24	3.39
VIF (3)				1.82		2.29	1.66	1.49	1.15	1.16	1.24	3.29
VIF (4)					2.05	2.35	1.68	1.53	1.15	1.16	1.24	3.07
N	11,003	11,003	11,003	11,003	11,003	11,003	11,003	11,003	11,003	11,003	11,003	11,003

Note(s): VIF is the variance inflation factor. VIF (1) includes the ESGDS and VIF (2)–(4) includes individual components, EDS, SDS and GDS, respectively. N is the number of observations. ***, ** and * represent significance levels of 1%, 5% and 10%, respectively. Variables definitions are presented in [Table 4](#)

Source(s): Table created by authors

Table 8. OLS regression results

Variables	(1) TQ	(2) TQ	(3) TQ	(4) TQ
ESGDS	0.00707*** (0.00238)			
EDS		0.00328** (0.00147)		
SDS			0.00361* (0.00187)	
GDS				0.00542** (0.00215)
BS	0.00774 (0.00961)	0.00979 (0.00967)	0.0112 (0.00948)	0.00799 (0.00965)
WOB	-0.00203 (0.00193)	-0.00160 (0.00191)	-0.00148 (0.00192)	-0.00198 (0.00193)
BI	0.00255* (0.00150)	0.00284* (0.00148)	0.00282* (0.00148)	0.00241 (0.00152)
ROA	2.721*** (0.615)	2.739*** (0.617)	2.742*** (0.616)	2.746*** (0.614)
CR	0.259*** (0.0561)	0.260*** (0.0561)	0.259*** (0.0562)	0.257*** (0.0560)
LEV	-0.415** (0.186)	-0.414** (0.186)	-0.416** (0.187)	-0.421** (0.186)
SIZE	-0.154*** (0.0248)	-0.144*** (0.0235)	-0.139*** (0.0231)	-0.143*** (0.0231)
Constant	4.036*** (0.509)	3.973*** (0.504)	3.851*** (0.486)	3.725*** (0.466)
Country effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
R-squared	0.265	0.264	0.264	0.265
F-statistic	13.45	13.43	13.42	13.47
p-value	0.000	0.000	0.000	0.000
Mean VIF	2.74	2.72	2.71	2.70
N	11,003	11,003	11,003	11,003

Note(s): Table 8 presents the OLS regression results. Column (1) shows the impact of ESG disclosure score (ESGDS) on firm value (TQ). Columns (2)–(4) present the influence of individual pillars disclosure scores, EDS, SDS and GDS, on firm value (TQ). Country-fixed effects, industry-fixed effects and year-fixed effects are included in all regressions. *N* is the number of observations. ***, ** and * represent significance levels of 1%, 5% and 10%, respectively. Variables definitions are presented in Table 4

Source(s): Table created by authors

Table 8 further shows the results with respect to control variables. The findings indicate that board independence has a positive and significant impact on firm value, representing that independent directors on boards are vital for firms with respect to their market value since higher board independence leads to higher firm value. The board size has positive coefficients, and board gender diversity has negative coefficients, but their impact is statistically insignificant. With respect to firm characteristics, return on assets positively and significantly influences firm value. It indicates that higher firm profitability leads to higher firm value. Further, cash reserves positively and significantly impact firm value, indicating that firms that keep an adequate portion of cash to meet short-term obligations tend to have higher firm value. Firm leverage has a negative and significant impact on firm value, representing that firms that rely more on financing assets using debt experience a reduction in their firm value. Lastly, firm size negatively influences firm value, showing that smaller firms have higher firm value than larger firms.

4.4 Robustness tests

This study further applies alternative techniques to mitigate the endogeneity issues in econometric analysis, which could result in biased estimates. Firstly, this study applies the IV analysis method. The IV method helps deal with omitted variable bias, reverse causality and simultaneity. Simultaneity is when the independent variable is jointly determined with the dependent variable simultaneously (Wintoki *et al.*, 2012) in any given period. The IV method requires exogenous instruments closely related to the independent variable and have no impact on the dependent variable. Following Aouadi and Marsat (2018) and Wu *et al.* (2023), this study uses the industry-year average of ESG disclosure score and Shakil (2021) for taking one-year lagged ESG disclosure score as instruments for ESG disclosure score. The same procedure is followed for each pillar, E, S and G, where each pillar is instrumented with respective industry-year averages and one-year lagged values.

Table 9 presents the IV regression results. Column (1) shows results with respect to the impact of ESG disclosure score on firm value. Columns (2)–(4) indicate the effect of the disclosure score of each component of ESG on firm value, respectively. The results for the model fit confirm the strength of instruments used as the Cragg–Donald Wald F-statistic is higher than Stock–Yogo weak identification test critical values at 10% IV size (Cragg and Donald, 1993; Stock and Yogo, 2005). Further, the overidentification test of the instruments used confirms their validity, as the Hansen test fails to reject the null hypothesis. Regarding the main results, the IV regression indicates a positive and significant impact of the ESG disclosure score and its pillars, EDS, SDS and GDS, on firm value. These results, hence, show consistency with the main findings, indicating the robustness of the analysis.

Next, this study applies the two-step system dynamic panel GMM method, which addresses the endogeneity issues, including dynamic endogeneity (Wintoki *et al.*, 2012). In dynamic endogeneity, the current values of the independent variable are influenced by the past values of the dependent variable (Wintoki *et al.*, 2012). Arguably, the system GMM technique is the major estimator for addressing the dynamic endogeneity problem (Wintoki *et al.*, 2012). Table 10 presents the two-step system dynamic panel GMM regression results. Column (1) indicates the impact of ESG disclosure score on the firm value. Columns (2)–(4) show the effects of individual components, EDS, SDS and GDS on firm value, respectively. The post-estimation tests, such as the Arellano–Bond test for the second-order autocorrelation (AR(2)), fail to reject the null hypothesis, indicating no issue of autocorrelation. The Hansen test of overidentifying restrictions fails to reject the null hypothesis, showing that the instruments used are valid. The GMM results indicate that the ESG disclosure score and individual pillars disclosure scores, EDS, SDS and GDS, positively and significantly impact firm value. Thus, the GMM analysis results are consistent with the main findings, showing the robustness of the analysis.

5. Conclusion

Sustainability is currently an ongoing phenomenon around the globe due to the adverse effects of climate change, and companies have a significant role to play in it. In particular, there is increasing debate with respect to making firms environmentally and socially responsible. In this respect, different regulations have been adopted, such as NFRD by the EU in 2014, and recently, the EU issued CSRD in December 2022. CSRD replaces NFRD, which was in force until the end of 2023 in EU member states. EU makes this replacement to improve business transparency and accountability with respect to environmental and social issues. Earlier, NFRD was not as effective as expected due to flexible regulatory requirements. Therefore, the EU has drastically improved the regulations in the new CSRD with respect to firms' non-financial disclosure, with increasing relevance for firms and their stakeholders than ever before. This study considers this development and investigates how non-financial disclosure, the ESG disclosure, affects the firm value of EU-listed firms using the institutional and signalling theories framework. The univariate tests show a significant decrease in the ESG

Table 9. IV regression results – robustness test

Variables	(1) TQ	(2) TQ	(3) TQ	(4) TQ
ESGDS	0.00574*** (0.00147)			
EDS		0.00218** (0.00091)		
SDS			0.00306** (0.00119)	
GDS				0.00541*** (0.00139)
BS	0.00753 (0.00498)	0.00954* (0.00501)	0.01028** (0.00493)	0.00687 (0.00500)
WOB	-0.00180 (0.00113)	-0.00141 (0.00112)	-0.00137 (0.00112)	-0.00191* (0.00114)
BI	0.00223*** (0.00077)	0.00247*** (0.00076)	0.00243*** (0.00076)	0.00200** (0.00079)
ROA	3.149*** (0.317)	3.167*** (0.317)	3.166*** (0.317)	3.170*** (0.317)
CR	0.235*** (0.032)	0.236*** (0.032)	0.235*** (0.032)	0.232*** (0.032)
LEV	-0.372*** (0.097)	-0.371*** (0.097)	-0.372*** (0.097)	-0.377*** (0.096)
SIZE	-0.143*** (0.013)	-0.133*** (0.013)	-0.132*** (0.012)	-0.136*** (0.012)
Constant	4.067*** (0.251)	3.969*** (0.254)	3.916*** (0.242)	3.792*** (0.225)
Country effects	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes
R-squared	0.276	0.275	0.275	0.276
F-statistic	43.67	43.56	43.50	43.72
p-value	0.000	0.000	0.000	0.000
Hansen J-statistic	0.647	0.114	0.215	1.240
p-value	0.421	0.735	0.643	0.266
Cragg-Donald Wald F-statistic	24,665	18,140	17,643	18,836
Stock-Yogo weak ID test critical values at 10% IV size	19.93	19.93	19.93	19.93
N	9,055	9,055	9,055	9,055

Note(s): Table 9 displays the IV regression results. Column (1) represents the effect of ESG disclosure score (ESGDS) on firm value (TQ). Columns (2)–(4) indicate the effect of individual pillars disclosure score, EDS, SDS and GDS on firm value (TQ). Industry-year average and one-year lagged ESG disclosure are used as instruments for ESG disclosure scores. Individual pillars disclosure scores, EDS, SDS and GDS, are instrumented using respective industry-year averages and one-year lagged disclosure scores. Country-fixed effects, industry-fixed effects and year-fixed effects are included in all regressions. *N* is the number of observations. ***, ** and * represent significance levels of 1%, 5% and 10%, respectively. Variables definitions are presented in Table 4

Source(s): Table created by authors

disclosure scores and in the firm value in the CSRD issuance period. Additionally, this study finds that higher ESG disclosure enhances firm value, which is consistent with the views of signalling and institutional theories. These findings are consistent with respect to individual components, E, S and G disclosures. The robustness tests show consistency with the main findings.

Table 10. System GMM regression results – robustness test

Variables	(1) TQ	(2) TQ	(3) TQ	(4) TQ
TQ _(t-1)	0.625*** (0.057)	0.626*** (0.057)	0.623*** (0.057)	0.627*** (0.057)
ESGDS	0.00299*** (0.00108)			
EDS		0.00218*** (0.00079)		
SDS			0.00346*** (0.00126)	
GDS				0.00391*** (0.00141)
BS	0.00554 (0.00421)	0.00572 (0.00421)	0.00636 (0.00424)	0.00429 (0.00425)
WOB	-0.00110 (0.00085)	-0.00103 (0.00085)	-0.00102 (0.00086)	-0.00131 (0.00086)
BI	0.00066 (0.00067)	0.00075 (0.00067)	0.00071 (0.00068)	0.00043 (0.00069)
ROA	1.289*** (0.327)	1.286*** (0.326)	1.298*** (0.330)	1.286*** (0.325)
CR	0.085*** (0.028)	0.086*** (0.028)	0.085*** (0.028)	0.083*** (0.027)
LEV	-0.089 (0.080)	-0.087 (0.080)	-0.088 (0.081)	-0.092 (0.080)
SIZE	-0.056*** (0.013)	-0.057*** (0.013)	-0.057*** (0.013)	-0.056*** (0.013)
Constant	1.484*** (0.290)	1.541*** (0.300)	1.513*** (0.297)	1.352*** (0.272)
Country dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
AR(1)	-6.775	-6.781	-6.751	-6.793
p-value	0.000	0.000	0.000	0.000
AR(2)	-0.536	-0.529	-0.561	-0.521
p-value	0.592	0.597	0.575	0.602
Hansen test	4.330	4.302	4.339	4.373
p-value	0.363	0.367	0.362	0.358
N	9,055	9,055	9,055	9,055

Note(s): Table 10 presents the GMM regression results. Column (1) displays the effect of ESG disclosure score (ESGDS) on firm value (TQ). Columns (2)–(4) show the impact of individual pillars disclosure score, EDS, SDS and GDS on firm value (TQ). Country-fixed effects, industry-fixed effects and year-fixed effects are included in all regressions. *N* is the number of observations. ***, ** and * represent significance levels of 1%, 5% and 10%, respectively. Variables definitions are presented in Table 4

Source(s): Table created by authors

5.1 Theoretical contributions

This study provides several theoretical contributions along with practical implications. For theoretical contributions, firstly, this study contributes to the literature with respect to ESG disclosure in the context of CSRD issuance and its effect on firm value. Secondly, this study theoretically contributes using the institutional and signalling theories framework and explains the relationship between ESG disclosure and firm value. Thirdly, this study provides empirical evidence regarding how the issuance of CSRD impacts sustainable behaviour, i.e. ESG disclosure of EU firms and firm value of EU firms. In the context of CSRD issuance, this study contributes to the body of knowledge that CSRD issuance did impact the sustainable behaviour

of EU firms. Another contribution is with respect to the significant decrease in firm value in the CSRD issuance period. Fourthly, regarding the effect of ESG disclosure on firm value, this study also adds to the body of knowledge that firms' sustainable behaviour impacts firm value since stakeholders prioritise firms that create a sustainable business environment. Hence, firms that consider sustainability issues and report environmental and social information in their non-financial reports experience an increase in their firm value, consistent with the earlier literature (Dkhili, 2024; An *et al.*, 2025).

5.2 Practical implications

This study provides practical implications for policymakers, firms and stakeholders. Our findings suggest that non-financial information is critical for firms and their stakeholders. CSRD is a regulatory framework in EU member states, and it requires EU firms to adopt sustainable behaviour and consider environmental and social issues to improve transparency and accountability. Based on our findings, the issuance of CSRD negatively impacted firms' behaviour toward environmental and social reporting, reflecting that regulatory requirements are necessary to make firms accountable for their operations and consider non-financial aspects. Particularly, the enhanced regulatory requirements for sustainability reporting under CSRD based on ESRS made EU companies in scope uncomfortable with their sustainability disclosures, probably due to the short transition period in accurately understanding and following the new rules. In evidence of this, the European Commission recently announced the Omnibus Package [7] (European Commission, 2025), introducing major changes for sustainability reporting and providing significant relief to almost 80% of companies in scope under CSRD with further time for appropriate implementation of CSRD. In particular, with respect to CSRD, the Omnibus Package proposes to reduce the scope of reporting companies as the reporting requirements would now only apply to large firms. Moreover, it further focuses on revising and simplifying the ESRS to reduce the number of data points. European Commission with Omnibus Package aims to foster a favourable business environment in the EU to boost the competitiveness of EU companies by cutting administrative burdens (European Commission, 2025).

In the context of NFRD, firms adopted the opposite behaviour during NFRD issuance and until its implementation period with a continuous increase in their ESG disclosures. In the following years, there was a decline in firms' sustainable behaviour, probably due to the not-so-strict requirements under NFRD. However, the recently introduced CSRD by the EU features relatively stricter requirements that are somewhat challenging for firms due to disclosure of non-financial contents that were not required under NFRD. As the findings suggest, EU firms became aware of the increasing and strict regulations regarding non-financial information due to CSRD issuance in December 2022, which negatively affected their sustainable behaviour and resulted in the lowest-ever decrease in ESG disclosures in 2024 (reporting period 2023) than in previous years. The second lowest disclosure scores were in 2019, the second report publication year under NFRD. If the EU adopts the proposal of the Omnibus Package, it is expected that the relief under this proposal will provide EU firms with the opportunity to appropriately implement the CSRD. This will allow EU firms to improve their sustainable behaviour to address stakeholders' concerns at a broader level regarding environmental and social matters. Surely, this will be evident during the following years of CSRD implementation.

In the context of the role of ESG disclosure in firm value, ESG disclosure helps firms improve market value since stakeholders prioritise firms' complying with regulatory requirements regarding disclosure of non-financial information. The disclosure of non-financial information allows firms to survive and maintain competition in the market since stakeholders, including market participants, prefer to consider and invest in firms meeting regulatory requirements for environmental and social issues. It further helps firms to improve firm value, which allows firms to attract more potential investors and represents a win-win

situation for firms. On the other hand, firms that are reluctant to disclose non-financial information are at potential risk of losing investors and, hence, critical resources and could eventually face a failure in the market. Thus, non-financial disclosure is vital for firms with respect to their survival in the market and to maintain and improve firm value.

Firms need to act consistently with the CSRD requirements to address the concerns of various stakeholders, including market participants, so as not to compromise their firm value. Based on our findings, the disclosure of non-financial information, i.e. ESG, is vital for market participants since firms' sustainable behaviour directly affects firm outcomes and failure of successful integration of CSRD requirements with firm strategies increases the risk of affecting market participants' investment decisions with the consequence of a decrease of firms' market value. Due to stricter regulatory requirements under CSRD, firms can be involved in an information asymmetry problem that could result in firms having more information than the market participants regarding firms' progress through the CSRD implementation. This behaviour of firms could affect both firms and market participants in the long run. Hence, with respect to signalling theory and as our findings suggest, firms are required to make stakeholders, including market participants, aware of their course of action to comply with CSRD requirements and remain competitive in the market. For this purpose, firms need to disclose non-financial information with respect to environmental and social issues. This will help reduce information asymmetry, improve market participants' trust and help them feel confident while making investment decisions. This behaviour of market participants will allow firms to experience an improvement in their market value. Notably, the announcement of the Omnibus Package (European Commission, 2025) is critical for both firms and their stakeholders, including market participants, for their trust and interests in firms. This proposal will allow firms to perform business operations by cutting administrative burdens and provide further time to adequately adopt the sustainability practices under CSRD. Thus, this package protects the interests of both firms and their stakeholders, including market participants.

5.3 Limitations and future recommendations

Although this study provides a broader analysis considering the sample of listed EU firms in the context of issuance of CSRD by the EU for ESG disclosure and firm value, further studies are required to investigate how the implementation of CSRD in EU member states impacts the sustainable behaviour of firms. In fact, as 2024 is the first reporting year under CSRD, further evidence could be available only in the next years. In particular, is there a significant increase in firms, sustainable behaviour following the implementation of CSRD? Are EU firms disclosing different non-financial information compared to the pre-CSRD implementation period? Future studies are also required to investigate the effect of firms' sustainable behaviour, particularly the ESG disclosure, on firm market value. Further studies should also be conducted on specific CSRD/ESRS-related aspects, such as climate change, pollution or biodiversity, in a way to establish a clearer link between ESG disclosure and the CSRD/ESRS framework. Moreover, as this study focuses on listed firms, further studies could also examine the sustainable behaviour of non-listed EU firms as well as its impact on firm value. Future studies could further conduct a comparative analysis between regions to deepen the understanding of the investigated relationship. Future research could also use alternative proxies for main study variables, including ESG disclosure and firm value, to further validate and explain this relationship.

Notes

1. KPMG (2020). The time has come, the KPMG survey of sustainability reporting.
2. This document is available here: <https://www.efrag.org/system/files/sites/webpublishing/Meeting%20Documents/2305101050307353/04-02%20draft%20ESRS-GRI%20Interoperability%20Index%20SR%20TEG%20meeting%205%20December.pdf>

3. “The GRI-ESRS Interoperability Index provides a helping hand to companies by outlining how GRI disclosure requirements relate to the ESRS, reiterating the high degree of alignment achieved between the two sets of standards and preventing the need for double reporting” (source: GRI website, <https://www.globalreporting.org/news/news-center/advancing-collaboration-progress-in-the-gri-and-efrag-partnership/>, accessed on December 20th, 2024).
4. Green paper issued by the Commission of EU Communities, 2001
5. Directive 2006/46/EC of the European Parliament and of the Council of 14 June 2006
6. A European strategy for smart, sustainable and inclusive growth issued by EC
7. The European Commission announced the Omnibus Package on 26th February 2025, which is available at https://commission.europa.eu/publications/omnibus-i_en

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About the authors

Atif Mahmood, Ph.D., has recently earned his PhD from the University of Perugia, Italy, and his research focused on ESG particularly, how European firm's ESG disclosure and their ESG controversies impact firm's economic and financial performance. In addition, he has been a Research Associate at the School of Accounting, Economics and Finance, Curtin University, Australia from April 2024 to October 2024. His research interests include Corporate Governance, Corporate Finance and Corporate Social Responsibility. He has presented papers at several international conferences.

Asad Mehmood, Ph.D., is Postdoctoral Fellow at the University of Chieti-Pescara, Italy, where he also earned his doctorate in Accounting. He has been a Visiting Researcher at the University of Lincoln, United Kingdom, during the academic years 2021/2022 and 2022/2023. He has research and teaching experience at both undergraduate and graduate levels. He is currently a member of the European Academy of Management and has previously been a member of the European Accounting Association and the European Finance Association. He has (co)authored papers in peer-reviewed academic journals and book chapters. He has also participated in several international conferences. His research interests include Corporate Governance, Corporate Finance and Corporate Sustainability. In 2021, he was honoured with the Conference Best Discussant Award at the 14th Annual Conference of the EuroMed Academy of Business (EMAB). Asad Mehmood is the corresponding author and can be contacted at: asad.mehmood@unich.it

Simone Terzani, Ph.D., is Associate Professor of Accounting and Business Administration at the Department of Economics – University of Perugia, where he teaches Financial Reporting and Advanced Financial Accounting. His main research interests are financial and non-financial reporting. He published books and articles in important journals such as *Journal of Business Ethics*, *Journal of Accounting and Public Policy* and *Small Business Economics*.

Francesco De Luca, Ph.D., is Full Professor of International Accounting and Financial Reporting at the University "G. d'Annunzio" of Chieti-Pescara, Department of Business Administration and Management, where he has been also Department Chair. He has been a visiting scholar at the University of

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Alabama at Birmingham (USA), School of Business, in 2012, 2014 and 2017. He is currently member of the Editorial Board of the Springer Book Series "SIDREA Accounting and Business Administration". He has (co)authored various articles and books about international accounting standards convergence, non-financial information, sustainability and ESG reporting, venturing and start-up finance, financial distress analysis and troubled debt restructuring.

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Professor Hadrian Geri Djajadikerta is the Accounting Lead in the Faculty of Business and Law at Curtin University in Australia. He is an award-winning academic and HDR supervisor with sustainability and corporate governance as his key research areas. Hadrian is active in quality publications and has received and been an investigator in multiple research grants. He has supervised more than thirty PhD students to completion and examined numerous PhD theses. He has also received various accolades, including the Vice-Chancellor's Excellence in Research Supervision Award, the Vice-Chancellor's Award for Excellence in Teaching and Wiley's citation for Top Cited Papers.

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