



Stakeholders and regulatory pressure on ESG disclosure

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ABSTRACT

We focus on the impact of stakeholders' pressure on the levels of ESG transparency exhibited by companies operating under different regulatory frameworks – specifically, within voluntary or mandatory disclosure regimes – between 2012 and 2020. Our analysis encompasses European and US listed companies, each having taken distinct paths toward sustainability reporting. Europe underwent the transition to a mandatory disclosure regime with the implementation of the EU 2014 Non-Financial Reporting Directive, while the US adopted a market-based approach, often referring to disclosure frameworks established by non-governmental entities. Our findings reveal that, under the voluntary disclosure regime, higher pressure toward transparency is primarily driven by employee-oriented and environmentally sensitive companies. However, during the mandatory regime for European firms, regulatory pressure takes the place of the previously exerted pressure by stakeholders. US-listed firms are indirectly impacted by the European regulatory transition, exhibiting heightened levels of pressure on reporting demanded by stakeholders in environmentally sensitive industries, as well as by institutional investors.

1. Introduction

In the last decade, ESG disclosure has assumed fundamental importance for companies justified by an increasing interest of a multitude of stakeholders. On the one hand, governments and regulatory bodies are implementing or considering ESG-related regulations and reporting requirements. ESG disclosure helps companies comply with these regulations, ensuring they meet legal obligations and avoiding potential penalties or reputational damage. On the other hand, different groups of stakeholders, including customers, employees and investors, have increasingly high expectations for companies to address environmental and social challenges. ESG disclosure enables companies to demonstrate their commitment to responsible business practices, meet stakeholder expectations, and build trust with them.

Academic research has exhibited a growing interest on the impact of regulatory developments on the level of firms' disclosure and, in turn, on the influence of that transparency on companies, under different profiles. Jackson et al. (2020) examine the trade-off between government regulation and self-regulation. They claim that, on the one hand, government regulation may establish more stringent minimum standards at

the expense of a 'one size fits all' rigidity. On the other hand, business self-regulation, while possibly more flexible in supporting best practices, might fail to police firms' strategic non-compliance. Moreover, several studies provide evidence of the positive impact of the introduction of Integrated Reporting on firms' behavior (see Dumay et al. (2016) for a review). Hooghiemstra (2000) explores the motivations behind voluntary CSR reporting and the potential impact of mandatory reporting requirements on these motivations. Dhaliwal et al. (2011) show the positive impact of mandatory CSR reporting regulations on the cost of equity capital. Marquis and Qian (2014) investigate whether mandatory requirements lead to symbolic or substantive reporting practices. Baboukardos and Rimmel (2016) provide evidence of the positive impact of the introduction of the first mandatory adoption of corporate governance codes in South Africa on financial market valuations. Bernardi and Stark (2018) study the impact of the reporting regime change in South Africa (mandatory since February 2011) on analyst forecast accuracy.

More recently, a growing number of studies have focused on the impact of the Non-Financial Reporting Directive (2914/95/EU, hereafter, NFR Directive) on the level of transparency. This directive is a key

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regulatory step toward harmonising transparency across European member states and marks a shift in non-financial disclosure from a voluntary exercise to one that is mandatory (Kinderman, 2020; La Torre et al., 2018). Grewal et al. (2019) investigate the equity market reaction to the passage of this directive and provide evidence of negative returns of EU firms due to the expectations of higher costs associated with the disclosure, while also noting a less negative reaction for firms having higher pre-directive non-financial disclosure levels, and a positive returns for firms having strong pre-regulation disclosure. Fiechter et al. (2022) show a positive impact on the CSR activities after the NFR Directive. Furthermore, Chiamonte et al. (2021) demonstrate a positive impact of the NFR Directive on banks more engaged in CSR practices.

Another stream of research has focused on the role of stakeholders in regard to the level of transparency, showing a growing interest in this activity which is due to multiple reasons. The first is that ESG disclosure can provide companies with a competitive edge. Companies that effectively manage and disclose their ESG performance may attract socially responsible investors, gain customer loyalty, enhance their brand reputation and attract and retain talented employees (Albinger & Freeman, 2000; Khojastehpour & Johns, 2014; Unerman, 2008). Moreover, ESG transparency has a positive impact on a company's long-term financial performance. By considering and disclosing ESG practices, companies can identify opportunities for innovation, efficiency improvements, and cost savings, leading to long-term value creation for shareholders (see Malik, 2015 for a literature review). On this issue, Fernandez-Feijoo et al. (2014) distinguish four groups of stakeholders and demonstrate that each group positively affects the transparency of sustainability reporting.

This paper fits into these theoretical frameworks with the aim of investigating the sources of the pressure, toward transparency, coming from two opposite directions. The first is the perspective of regulators, employing a top-down approach, issuing guidelines for the harmonisation of non-financial reporting and setting long-term goals in support of sustainable economic development. The second is that of stakeholders, engaged in a bottom-up oversight of transparency, influencing the strategic choices of the company.

To investigate the impact of these complementary sources of pressure, we analyze and compare the dynamics of the level of ESG disclosure scores of listed companies in the two most important developed equity markets, US and European, two areas characterised by different regulatory frameworks. In fact, while in Europe, in the last decade, listed companies have been asked to follow a well-defined regulatory process on transparency, in the US the effort to improve disclosure has been entrusted to other stakeholders. European regulators have been more proactive on transparency; in US, ESG disclosure requirements are generally less prescriptive, with a greater emphasis on principles-based reporting.

We base our analysis on the scores provided by Bloomberg, between 2012 and 2020. Bloomberg's ESG disclosure scores are derived from consideration of the quantity and quality of firm's disclosures, and so are seen as reflecting firm's commitment to non-financial reporting. Our observation period permits to test the impact of the NFR Directive, identifying two balanced sub-periods. The first, from 2012 to 2015, has been characterised by a voluntary disclosure regime in both areas. During the second, from 2016 to 2020, European companies have been subject to new regulatory requirements on transparency due to the application of the NFR directive.

To the best of our knowledge, this is the first paper that investigates, contextually, the two sources of pressure, comparing the dynamics of the ESG disclosure level among a large sample of listed firms, observed during a period characterised by increasing public attention on issues related to ESG.

Our first contribution focuses on examining the role played by different stakeholder groups in influencing ESG transparency during voluntary disclosure regimes in both Europe and the US. The second

contribution explores the impact of the introduction of the NFR Directive on ESG transparency in both regions. Although the Directive is limited to European firms, we extend our analysis to US firms to determine whether it has also had an indirect effect on companies still operating under a voluntary regime. Our third contribution involves comparing stakeholder engagement in transparency before and after the implementation of the NFR Directive. This analysis allows us to assess the impact of two distinct sources of pressure on transparency over the entire observation period. We identify which categories of stakeholders have contributed the most to improvements in corporate disclosure, taking into account the contextual influence of the European directive.

Our findings underscore that within a voluntary disclosure regime, various stakeholder groups exhibit differing levels of engagement in ESG reporting. Specifically, we observe that employee-oriented and environmentally sensitive firms demonstrate an increased commitment to transparency. Conversely, firms with substantial institutional ownership are less inclined toward disclosure, suggesting a cost-benefit approach that may hinder transparency. Shifting our focus to the impact of the NFR Directive, we affirm the efficacy of the guidelines imposed by European authorities in fostering a more widespread inclination among firms to disclose their efforts on ESG issues. This trend is evident in higher levels of ESG disclosure, extending even to US firms operating within a voluntary regime. Lastly, we highlight a nuanced shift in stakeholder pressure on reporting. In Europe, during the mandatory regime, there appears to be a decrease in stakeholder pressure, potentially indicative of a perception that companies are adhering to the heightened disclosure standards. Conversely, in the US, stakeholders of environmental sensitive firms and institutional investors have intensified their pressure, likely in response to a growing demand for transparency spurred by European authorities.

Finally, we have conducted additional analyses and robustness tests to comprehensively explore the ESG transparency issue. Specifically, we revisited the categorization of firms into stakeholder groups, testing alternative variables to those suggested by Fernandez-Feijoo et al. (2014) to evaluate the robustness of our results. For instance, while retaining the original classification for institutional-oriented companies, we explored alternative proxies for other stakeholder categories. For customer proximity industries, we employed selling expenses as a proxy, reflecting consumer pressure by accounting for firms' investments in marketing and advertising activities. For environmentally sensitive industries, we shifted from a sector-based classification to firm-level data, using greenhouse gas (GHG) emissions intensity to provide a more precise measure of environmental impact relative to revenue. Lastly, for employee-oriented industries, we introduced 'workforce intensity,' a variable that scales the number of employees by the firm's size, offering a more accurate reflection of internal employee pressure on ESG disclosure. These adjustments were made to ensure the validity and reliability of our variables of interest. Our expanded analyses offer deeper insights, while the robustness checks confirm the credibility and consistency of our findings.

The article is organised as follows. Section 2 provides the background to formulate and discuss our hypotheses; Section 3 describes our sample; Section 4 presents our research methodology; Section 5 describes the empirical findings, additional and robustness analyses and Section 6 provides concluding remarks.

2. Background and hypotheses

2.1. Stakeholders engagement on ESG disclosure

The concept of stakeholder arises in the context of business management. In his seminal contribution, Freeman defines stakeholders as 'any group or individual who can affect or be affected by the decisions and the achievement of corporate objectives' (Freeman, 1984). While Freeman's definition represents the cornerstone, numerous attempts have been made over the years to more accurately identify such groups.

Without reaching a final point, the common aspect of these categorisations is to emphasise that there are different groups of stakeholders with different and sometimes conflicting expectations (Fernando & Lawrence, 2014). Each of these parties has an influence on the company. The consequences of such actions are the subject of a broad and current field of investigation promoted by Mitchell et al. (1997). An implication of the stakeholder theory is that an organisation must manage the relationship with these groups (Elijido-Ten et al., 2010) and meet multiple expectations beyond simple economic and financial performance as in traditional shareholder theories (Guthrie et al., 2006).

As CSR subsumes the responsibility of a company toward the public good, there are overlaps with CSR and stakeholder theory. Freeman and Dmytriyev (2017) postulate that CSR is part of corporate responsibility (corporate responsibility toward all stakeholders). Soliman and Ben-Amar (2022), consistent with stakeholder theory-based arguments, show that high CSR performance is positively related to more readable and less ambiguous narrative disclosure. Snider et al. (2003) adopt the stakeholder theory framework to examine which companies communicate and evaluate CSR. Hence, stakeholder theory provides a basis for the development of management strategies targeting the interests and expectations of all stakeholders (Herremans et al., 2016). According to Clarkson (1995), a company that manages relationships with its primary stakeholders and attempts to meet their expectations through CSR creates more value. The main pressure for ESG disclosure comes from various stakeholders who are increasingly interested in understanding a company's sustainability performance and its impact on society and on the environment.

Moreover, recent studies have demonstrated that strong ESG performance can positively affect financing conditions. For instance, Lian et al. (2023) find that high ESG performance is associated with narrower bond credit spreads, attributed to reduced information asymmetry and lower agency costs, thus lowering perceived risk among bond investors. Additionally, Su and Xue (2023) demonstrate that high ESG performance in Chinese companies improves labor investment efficiency, helping firms manage labor shortages and rising costs. These findings underscore ESG practices' potential not only to meet stakeholder expectations but also to enhance operational efficiency, particularly in human capital management.

Recent research highlights that ESG ratings can drive both transparency and innovation within companies. Wang et al. (2023) find that ESG ratings significantly increase green innovation by reducing information asymmetry between investors and managers, thereby strengthening monitoring capabilities. Other studies indicate that media coverage also plays a crucial role in influencing corporate ESG performance by serving as an external monitoring mechanism. For example, He et al. (2024) show that increased media attention correlates with improved ESG performance, as media coverage reduces information asymmetry and draws analyst attention, enhancing external oversight of firms. This effect is especially pronounced in non-state-owned firms and those that voluntarily disclose ESG information.

In this paper we follow the methodology introduced by Fernandez-Feijoo et al. (2014) which categorises industries from the institutional perspective of legitimacy and stakeholders, and identifies four groups: companies in industries well-known by consumers; industries with high-employee pressure; environmentally sensitive industries and industries with high-investor pressure. They demonstrate that these four groups of stakeholders positively affect the transparency of sustainability reporting. In more detail, the interest in these groups is motivated as follows: i) Conscious consumers are becoming more interested in the social and environmental practices of the companies they support. They are increasingly looking for products and services from companies that demonstrate responsible business practices. Customers are pressuring companies to provide transparency and ESG information to make informed purchasing decisions (Kang & Hustvedt, 2014); ii) Employees, particularly the younger generation, are increasingly concerned about working for companies that align with their values and contribute to

society. Moreover, companies that prioritize ESG and provide transparent disclosure can attract and retain top talent (Greening & Turban, 2000); iii) Environment can be recognized as a key stakeholder because business activities can have significant impacts on the natural environment. Companies acknowledge their responsibility to minimise negative environmental impacts, protect natural resources, and contribute to the preservation and restoration of the environment; iv) Institutional investors, asset managers, and pension funds are placing greater importance on ESG factors in their investment decisions. They recognise that ESG issues can have material impacts on a company's financial performance, risk profile, and long-term sustainability. Investors are demanding more transparency and ESG-related information from companies to make informed investment choices and assess the alignment of their portfolios with sustainability goals (Eccles et al., 2017).

Extending the research of Fernandez-Feijoo et al. (2014), we test the impact of the stakeholders' engagement on the level of the ESG disclosure of listed firms under a voluntary regime. Hence, we hypothesise:

H1. *Under a voluntary regime, ESG disclosure is driven by stakeholders' pressure.*

2.2. Regulatory pressure on ESG disclosure

Corporate ESG disclosure and its improvement in quality, comparability and consistency across and within global disclosure regimes continues to attract attention by governments and supranational institutions but with different objectives and timescales.

The definition and promotion of effective guidelines focused on environment sustainability accelerated in 2016, following the ratification of The Paris Agreement in December 2015. Since then, several steps have been outlined toward promoting sustainable business practices and more detailed social, environmental, and risk reporting standards (OECD, 2016).

We focus on the dynamics in the levels of ESG disclosure of companies listed in Europe and the United States. This comparison is of particular interest because Europe and the US have followed distinct approaches to ESG disclosure, driven by differences in regulatory frameworks, market dynamics, and stakeholders' expectations.

Europe can be considered a first mover in ESG disclosure. The European region has been at the forefront of developing regulations and frameworks that promote ESG disclosure and sustainability reporting. It is worth retracing the main steps of the regulatory process that involved European companies on this issue. As already mentioned, one of the main steps taken in Europe is the NFR Directive, approved in 2014. This Directive requires companies from 2018 onwards to include non-financial statements in their annual reports or in a separate filing. This includes information on environmental protection, social responsibility and treatment of employees, respect for human rights, anti-corruption and bribery, and diversity on company boards. It applies to public-interest companies with more than 500 employees, which constitutes approximately 6000 companies and groups. In June 2017, the European Commission (EC) provided *Guidelines on NFR* to help companies disclose relevant non-financial information in a more consistent and comparable manner. In June 2019, the EC published additional guidelines on reporting climate-related information which integrate recommendations by the Task Force on Climate-related Financial Disclosures. Moreover, in December 2019, the EC published *The European Green Deal* (European Commission, 2019). This Document reformulated the European commitment to tackle climate and environmental problems on a new basis, aiming at achieving the targets of the Energy and Climate Strategy, already established at the legislative level in the Clean Energy Package.

The European Green Deal presents a roadmap for making the EU's economy sustainable and aims to boost the efficient use of resources by moving to a clean, circular economy, toward averting climate change, biodiversity loss, and pollution. The European Green Deal covers all

sectors of the economy, notably transportation, energy, agriculture, building construction, and infrastructure industries such as steel, cement, ICT, textiles and chemicals. Furthermore, in 2020, the EU published the *Taxonomy Regulation* (EU 2020/852, 2020) which is a classification system that provides companies, investors, and policymakers with appropriate definitions for economic activities which can be considered environmentally sustainable. The Taxonomy Regulation was published in the *Official Journal of the European Union* on 22 June 2020 and came into force on 12 July 2020. This system should create security for investors, protect private investors from greenwashing, help companies to become more climate-friendly, mitigate market fragmentation, and help shift investments where they are most needed.

Moreover, the EU Sustainable Finance Disclosure Regulation (SFDR), came into effect in March 2021. This regulation requires asset managers to disclose detailed information about the sustainability characteristics of their investment products, including how ESG factors are integrated into investment decision-making processes, and how the products align with specific sustainability objectives. The SFDR applies to all financial market participants that offer financial products within the European Union, regardless of whether they are based in the EU or not. Thus, the SFDR aims to increase transparency and improve the comparability of ESG-related information provided by financial market participants, including asset managers, investment funds, and investment advisors.

Furthermore, on 5 January 2023, the Corporate Sustainability Reporting Directive (CSRD) entered into force. This new directive modernises and strengthens the rules concerning the social and environmental information that companies have to report. A broader set of large companies, as well as listed SMEs, are required to report on sustainability – approximately 50,000 companies in total. The aim of these new rules is to ensure that investors and other stakeholders have access to the information they need to assess investment risks arising from climate change and other sustainability issues.

In the US, the approach to ESG disclosure discipline has followed a market-based approach often referencing disclosure frameworks established by non-governmental entities to establish similar frameworks. Therefore, in the US, sustainable investing and disclosure has been guided by voluntary, private-sector-led processes, protocols, and guidelines. More specifically, there are no mandatory ESG disclosures at the federal level. The Securities and Exchange Commission (SEC) requires all public companies to disclose information regarding human capital resources and measures or objectives if it is material to the understanding of the business. For example, in 2010, the SEC issued guidance regarding how the US securities laws and regulations may require disclosures of climate-related information, depending on a company's circumstances.

However, although the direct impact of the European regulatory process on US firms is quite limited, we must consider the indirect effects on US firms operating within the EU or having subsidiaries or business relationships with EU-based companies. US firms that have significant operations or subsidiaries in EU member states may need to comply with stricter requirements if they meet the size and classification criteria outlined in the directive. These companies would be required to disclose non-financial information related to ESG matters in their annual reports in accordance with the NFRD requirements.

Furthermore, the NFRD's influence extends beyond its direct applicability. It has contributed to the broader global trend of increased attention to non-financial reporting and sustainability practices. Many multinational companies, including US-based firms, voluntarily adopt or align their reporting practices with international standards and frameworks, such as the Global Reporting Initiative (GRI) or the Sustainability Accounting Standards Board (SASB) guidelines, to meet investor and stakeholder expectations.

Recent research has also highlighted the interconnectedness of global equity markets and the influence of external shocks on ESG performance and transparency. Wan et al. (2024) examine the transmission of information and risk among global stock markets, finding that

extreme events, such as the COVID-19 pandemic, intensified the connections between these markets. Their analysis reveals that European and North American regions are key transmitters of spillover effects, while Asian and Indian markets primarily receive these spillovers. These findings suggest that regulatory and market-driven ESG practices in certain regions can have wide-reaching impacts, emphasizing the importance of harmonized standards and consistent disclosure practices globally.

Moreover, the EU's focus on ESG issues and sustainability has influenced global conversations and regulatory developments in this area. As sustainable finance and ESG considerations gain traction globally, US firms may face increasing pressure from investors, stakeholders, and regulators to disclose ESG information and align with international best practices.

Finally, it's worth noting that the regulatory landscape in the US regarding ESG reporting and disclosure is evolving. While there is currently no comprehensive federal framework for ESG disclosure in the US, there have been discussions and proposals for enhanced ESG reporting and standards at the federal level. Additionally, certain US states have implemented or proposed their own ESG reporting requirements for companies operating within their jurisdiction.

Thus, we assess the impact of the mandatory disclosure regime on ESG practices in both Europe and the United States. We designate 2016 as the dividing year between the voluntary and mandatory disclosure periods. This decision is informed by the timeline of the NFRD, which was proposed in 2014, enacted in 2016, and required companies to disclose their first reports for the financial year of 2018. Our choice is based on the observation that companies frequently begin adjusting their practices and preparing for new regulations well before the official compliance date. Such early adjustments allow firms to align with emerging best practices, address stakeholder expectations, and reduce the risk of non-compliance.

Supporting this approach, Grewal et al. (2019) examined market reactions to mandatory nonfinancial disclosure, finding that companies initiated compliance preparations following the enactment of the NFRD in 2016. Similarly, Fiechter et al. (2022) explored the real effects of the CSR reporting mandate in the European Union, noting that many firms began adapting their disclosure practices in anticipation of the new requirements. Jackson et al. (2020) discussed the influence of mandatory non-financial disclosure on corporate social responsibility (CSR), identifying 2016 as a pivotal year for the preparatory activities of companies responding to the directive. Furthermore, Chiramonte et al. (2021) analyzed the impact of ESG strategies on bank stability, using 2016 as the point when banks began aligning their ESG practices with the expected regulatory standards. This leads us to our second hypothesis:

H2. *Mandatory disclosure has had a positive impact on ESG disclosure levels and, to a lesser extent, in countries under a voluntary disclosure regime.*

2.3. Stakeholder pressure under a mandatory regime

With the implementation of the NFR Directive, companies are now required to adhere to specific disclosure standards regarding their ESG practices. This regulatory framework aims to harmonize non-financial reporting across firms, establishing a baseline level of transparency and accountability. Our analysis focuses on the period following the Directive's introduction to investigate how mandatory disclosure influences the dynamics of stakeholder pressure.

One potential outcome of this regulatory shift is a diminution of external stakeholder pressure. As regulatory bodies enforce compliance with clearly defined disclosure standards, stakeholders might perceive less need to push for additional transparency. This is because mandatory reporting may satisfy stakeholders' demand for sufficient information, providing them with a clearer view of corporate ESG practices. Once companies are seen as meeting these regulatory standards, stakeholders may feel that their demands for transparency have been met, reducing

their motivation to push for further disclosures.

However, there is also the possibility that mandatory disclosure could lead to greater scrutiny. As companies provide more comprehensive information in response to regulatory requirements, stakeholders may become aware of previously hidden or underreported issues. The increased visibility and availability of detailed ESG data may enable stakeholders to identify new concerns that were not apparent under voluntary reporting regimes. This could, in turn, lead to more targeted pressure for improvements in specific areas of ESG performance.

Furthermore, there is the potential for a trade-off between the quantity and quality of ESG disclosures. With the introduction of mandatory reporting, companies might focus on fulfilling regulatory requirements by increasing the volume of disclosures, without necessarily improving the depth and quality of the information provided. This could result in stakeholders being overwhelmed with data, while the substantive insights needed to assess corporate ESG performance are diluted. In such cases, stakeholders might increase their pressure on companies not only to comply with regulations but to enhance the meaningfulness of their disclosures, demanding higher-quality, actionable ESG data that goes beyond mere compliance. This trade-off could lead to a situation where the increased quantity of information does not correspond to an increase in clarity or transparency, prompting stakeholders to exert more pressure to ensure that the quality of ESG disclosure meets their expectations. This dynamic could be particularly relevant in industries with complex environmental impacts, where the depth of disclosure is crucial for understanding corporate performance.

In light of these considerations, we anticipate a shift in stakeholder attitudes toward disclosure following the introduction of the NFR Directive, expecting particularly lower pressure in Europe, justified by the heightened regulatory enforcement. Based on these considerations, our third hypothesis is as follows:

H3. *Under a mandatory regime, stakeholders' pressure on ESG disclosure is reduced.*

3. Data and methodology

3.1. Sample

We focus on samples of European and US firms. For Europe, we select firms included in the Bloomberg Europe Large, Mid, & Small Cap Index. This captures approximately 99 % of the investable European markets and includes 1651 firms. For the US, we select the Russell 3000 Index. This captures about 98 % of the investable US equity market and constitutes 3020 firms. Our period is 2012–2020. [Table 1](#) describes these two samples.

For ESG disclosure we use the score provided by Bloomberg. This score is on the annual base and ranges from 0.1 for companies that disclose a minimum amount of ESG data to 100 for those that disclose every data point collected by Bloomberg. Each data point is weighted in terms of importance. The overall score is also tailored to different industry sectors and measures the amount of ESG data a firm publicly reports.

Our models require the identification of several explanatory variables able to influence the level of ESG transparency. We focus on the variables identified in prior literature ([Aouadi & Marsat, 2018](#); [Baldini et al., 2018](#); [Drempetic et al., 2020](#); [Gao et al., 2016](#); [Ioannou & Serafeim, 2015](#); [Pavlopoulos et al., 2019](#); [Yu & Van Luu, 2021](#)). *Market Capitalisation* (SIZE) is total market value in logarithmic terms. As reported by [Clementino and Perkins \(2021\)](#), the availability of slack resources is identified as explaining the greater propensity of large companies to engage in multiple CSR practices ([Campbell, 2007](#)) and to disclose more information related to ESG factors ([Tamimi & Sebastianelli, 2017](#)). Recently, [Drempetic et al. \(2020\)](#) stress the importance of firm size on ESG scores. They argue that ESG scores are distorted in favor

Table 1
Sample constituents by Industry.

Panel A - EU Sample			
SECTOR	N. of firms	Percent	Freq.
Basic Materials	101	6.12	6.12 %
Communications	114	6.9	6.90 %
Consumer, Cyclical	218	13.2	13.20 %
Consumer, Non-cyclical	305	18.47	18.47 %
Energy	89	5.39	5.39 %
Financial	341	20.65	20.65 %
Industrial	298	18.05	18.05 %
Technology	1190	7.21	7.21 %
Utilities	66	4	4.00 %
Total	1651	100	100 %
Panel B - US Sample			
SECTOR	N. of firms	Percent	Freq.
Basic Materials	88	2.91	2.91 %
Communications	183	6.06	6.06 %
Consumer, Cyclical	365	12.09	12.09 %
Consumer, Non-cyclical	799	26.46	26.46 %
Energy	116	3.84	3.84 %
Financial	749	24.8	24.80 %
Industrial	378	12.52	12.52 %
Technology	269	8.91	8.91 %
Utilities	73	2.42	2.42 %
Total	3020	100	100 %

This table shows the composition of the two samples by industrial sector.

of larger companies because scores are dependent on resources for providing data. We also control for *Market Value/Book Value* (MV_BV), *Return-on-assets* (ROA), *Sales growth* (SALES_G) and *Leverage* (LVRG). Finally, we consider the visibility of the company in terms of *Analyst Coverage* (NANL): in this case, NANL is the number of firms' research reports released each year. [Table 2](#) presents the variable definitions.

3.2. Data on stakeholders' groups

There have been numerous attempts to identify stakeholders, with various classifications and taxonomies being proposed. Following [Fernandez-Feijoo et al. \(2014\)](#), we define four groups of stakeholders: customers, employees, environment and investors. For the latter category, as our sample is based on listed companies only, we focus on institutional investors. Thus, we focus on the following groups of stakeholders:

- Customers as reflected in *customer proximity industries* (CPI). It includes energy utilities, financial services, food and beverage products, healthcare, household and personal products, retailers, telecommunications, textiles and clothing, waste management and water utilities.
- Employees as reflected in *employee-oriented industries* (EOI). The greater the number of employees the greater the chance that they will organize themselves, with their pressure on management correspondingly increasing. As proxy of firms with the highest number of employees we rely on the top quartile of the market capitalisation distribution.
- Environment as reflected in *environmentally sensitive industries* (ESI). It includes firms in agriculture, automotive, aviation, chemical, construction, construction materials, energy, energy utilities, forest and paper products, logistics, metal products, mining, railroad, waste management and water utilities. As reported by [Cicchello et al. \(2021\)](#), companies operating in environmentally sensitive sectors are more inclined to elevate disclosure and implement sustainability reporting policies to improve their image and ability to

Table 2

Variable definitions

Variable	Description
ESG-score	ESG DISCLOSURE SCORE: Proprietary Bloomberg score based on the extent of a company's Environmental, Social and Governance data. The score ranges from 0.1 for companies that disclose a minimum amount of ESG data to 100 for those that disclose every data point collected by Bloomberg. Each data point is weighted in terms of importance. The score is also tailored to different industry sectors. The score measures the amount of ESG data a company reports publicly.
ROA	RETURN ON ASSET: Indicator of how profitable a company is relative to its total assets, in percentage. It gives an idea as to how efficient management is at using its assets to generate earnings. Calculated as: Net Income / Average total assets)*100 where Average total assets is the average of the beginning and ending balance. Modification: 1-year lag. Variable winsorised at the 1 st and 99 th percentiles.
LVRG	FINANCIAL LEVERAGE: Measures the average debt to average equity. Calculated as: Average Total Debt / Average Total Common Equity. Modification: 1-year lag. Variable winsorised at the 1 st and 99 th percentiles.
SALES_G	SALES GROWTH: A percentage increase or decrease of sales revenue by comparing current period with same period prior year. Calculated as: (Revenue from current period – Revenue from same period prior year)*100 / Revenue from same period prior year. Modification: 1-year lag. Variable winsorised at the 1 st and 99 th percentiles.
MV_BV	MARKET-TO-BOOK VALUE: Measure of the relative value of a company compared to its market value. Calculated as: Market Capitalization / Book Value. Modification: 1-year lag. Variable winsorised at the 1 st and 99 th percentiles.
SIZE	MARKET CAPITALIZATION: Total market value of all of a company's outstanding shares stated in USD. Modification: 1-year lag and natural logarithm.
NANL	ANALYST COVERAGE: it represents the analysts' focus on the company. It is the number of reports released by analysts about the company during the previous year.
CROSS	CROSS LISTING: Cross-listing is a binary variable coded 1 if the company is listed on US and European stock exchanges and 0 otherwise.
CPI	CUSTOMER PROXIMITY INDUSTRIES. This variable equals to 1 for companies operating in industries with high consumer closeness and 0 otherwise. It includes energy utilities, financial services, food and beverage products, healthcare, household and personal products, retailers, telecommunications, textiles and apparel, waste management and water utilities.
EOI	EMPLOYEE-ORIENTED INDUSTRIES. The greater the number of employees the greater the chance that they will organize themselves and their pressure increases. We defined the variable based on company size. This variable adopts a value of 1 if its size is in the top quartile of the market capitalization distribution.
ESI	ENVIRONMENTALLY SENSITIVE INDUSTRIES. This variable equals to 1 for companies operating in industries that have an important impact on the environment (i.e. extractive or high pollution activities) and 0 otherwise. It includes agriculture, automotive, aviation, chemical, construction, construction materials, energy, energy utilities, forest and paper products, logistics, metal products, mining, railroad, waste management and water utilities.
IOC	INSTITUTIONAL ORIENTED COMPANY. This variable is equal to 1 if the percentage of institutional investors belongs to the top quartile of the distribution, otherwise it is 0.
NFRD2015	NON-FINANCIAL REPORTING DIRECTIVE DUMMY VARIABLE. This variable equal to 1 for observations after 2015.
D_US	DUMMY US. This binary variable is coded 1 when the company is listed on the US financial market and 0 otherwise.

This table describes the variables used in our models.

cope with increased consumer pressure regarding sustainability concerns (Cho et al., 2014; Sellami et al., 2019).

- Investors, in our model we focus on institutional investors. *Institutional-oriented companies* (IOC) are firms in which institutional investors may play an important role in corporate CSR reporting policy. We define this variable with the percentage of shareholding held by institutional investors. We deviate from the original model as we focus on institutional rather than general investors. We consider that the greatest pressure may come from this type of investor as they

are subject to constraints in terms of eligibility of the securities to be included in their managed portfolios.

To evaluate the robustness of our findings, we regrouped companies into the four stakeholder categories, excluding the institutional investors group, using alternative parameters. We decided to maintain the original classification for the *institutional-oriented companies* (IOC) category, as the percentage of institutional investors' ownership in the capital structure of a company serves as a reliable proxy for the influence of institutional investors on ESG disclosure decisions.

For the other stakeholder groups, we tested alternative variables to assess the robustness of our model. Specifically, for *customer proximity industries*, we tested an alternative variable based on selling expenses. Bloomberg defines this variable as the “sum of all direct and indirect selling expenses (such as advertising expenses), general and administrative expenses.” This choice is motivated by the rationale that companies with high selling expenses are often more exposed to consumer scrutiny and market perception, given their substantial investment in advertising and marketing. Companies investing heavily in sales and marketing tend to face stronger pressure from consumers and the public to maintain a transparent and socially responsible profile, particularly in terms of ESG disclosure.

For *environmentally sensitive industries*, we moved the focus from an industry-based classification, to firm-level data, specifically on the greenhouse gas (GHG) emissions relative to revenue, a key indicator of the firm's environmental impact. GHG emissions are highly scrutinized in the context of climate change, and their importance in ESG reporting has increased due to regulatory pressures and stakeholder awareness. By using GHG emissions intensity (emissions per unit of revenue), we capture the environmental footprint of a company in a more granular way, which allows us to focus on individual firms' environmental performance rather than general industry trends.

Lastly, for the *employee-oriented* category, we replaced market capitalization with the a variable reflecting the workforce intensity. Specifically, we constructed this variable by dividing the number of employees by the size of the firm, as measured by market capitalization. This new variable allows us to better assess the impact of employee pressure on ESG disclosure. Firms with higher workforce intensity are likely to experience stronger pressure from their employees to engage in transparent and responsible business practices, as a larger proportion of their resources are tied to human capital.

4. Empirical analyses

To test our hypotheses, we follow a multivariate approach. We estimate the following regression model:

$$ESG\ score_{it} = \alpha + \beta X_{it-1} + \gamma Y_{it} + \delta CountryFE + \varepsilon_{it} \quad (1)$$

where ESG score is the *ESG Disclosure score*; X_{it-1} is a vector of lagged explanatory variables for firm i in year $t-1$ including *Return-on-assets* (ROA), *Leverage* (LVRG), *Sales growth* (SALES_G), *Market Value/Book Value* (MV_BV), *Market Capitalisation* (SIZE), *Analyst Coverage* (NANL) and *Cross Listing* (CROSS); Y_{it} is a vector of dummy variables that represent the identified group of stakeholders (*Customers*, CPI - Customer proximity industries; *Employees*, EOI - Employee-oriented industries; *Environment*, ESI - Environmentally sensitive industries; *Institutional Investors*, IOC - Institutional Oriented Company); *CountryFE* represents country-specific fixed effects. $\alpha, \beta, \gamma, \delta$ are the corresponding coefficient vectors, and ε_{it} is an error term.

To test our initial hypothesis, we calculate the coefficients with a focus on the first subperiod (from 2012 to 2015). This enables us to explore the relation between stakeholder pressure and ESG transparency within the context of a voluntary disclosure regime. To assess whether any distinctions exist between European and US firms, we introduce a dummy variable (D_US) into the model.

In testing our second hypothesis, which investigates the impact of the NFRD Directive on transparency, we split the sample into European and US firms, focusing on two distinct observation periods: 2012 to 2015 and 2016 to 2020. We use the regression model outlined in Eq. (1) and introduce the dummy variable NFRD2015. This variable takes the value 1 for the second period, representing the mandatory regime in Europe, and 0 otherwise. By incorporating this variable, we can evaluate both the direct effect (in the case of Europe) and the indirect effect (in the case of the US) of the NFR Directive's introduction on the level of ESG transparency.

Finally, for testing our third hypothesis, we expand our analyses by introducing the interaction term between the dummy variable associated with the introduction of the Directive (NFRD2015) and the dummy variables related to stakeholder groups (CPI, EOI, ESI, IOC). This interaction term enables us to explore whether the influence of the mandatory regime in Europe has varying effects on stakeholders' pressure concerning ESG transparency across different stakeholder groups.

This analysis offers valuable insights into the dynamics of ESG disclosure under diverse regulatory frameworks, illuminating the nuanced connections between stakeholder pressure, regulatory changes, and ESG disclosure practices.

5. Results

5.1. Descriptive statistics

Table 3 provides descriptive statistics for our samples. The European sample comprises a total of 8463 firm-year observations for the selected variables, and the US sample includes 17,496 observations. To address potential distortions caused by outliers, we applied winsorization to all variables, excluding ESG scores, at the 1st and 99th percentiles. Additionally, as part of further robustness checks, we have implemented supplementary treatments for outliers (refer to Section 5.4).

With ESG scores ranging from 0 to 100, the average scores in our samples reveal that European firms demonstrate higher standards of disclosure. In particular, the average ESG disclosure score is 39.50 for European firms compared to 21.10 for those in the US.

Table 4 shows the Pearson correlations between all the variables used in the empirical analysis, including the ESG Disclosure score (ESG_DISC), stakeholder pressure proxies (CPI, EOI, ESI, IOC), and control variables. The ESG_DISC variable is positively correlated with most stakeholder pressure proxies, particularly with employee-oriented industries (EOI, 0.469***) and environmentally sensitive industries (ESI, 0.224***), while showing a negative correlation with institutional-oriented companies (IOC, -0.101***). There is no significant correlation with CPI. This suggests that firms in employee-oriented and environmentally sensitive sectors tend to disclose more ESG information,

Table 3
Descriptive statistics for variables used in the analysis.

Panel A – Full Sample								
stats	N	Mean	SD	Min	p25	p50	p75	Max
ESG	25,959	27.097	15.355	0.826	14.876	20.096	39.256	79.339
ROA	25,955	2.580	12.413	-133.826	0.780	3.354	7.226	34.802
LVRG	25,959	4.229	4.738	1.053	1.795	2.522	4.355	43.309
SALES_G	25,959	10.010	35.510	-75.976	-1.614	5.221	13.761	387.227
MV_BV	25,959	3.145	2.888	0.371	1.269	2.135	3.824	16.817
SIZE	25,959	7.918	1.637	1.142	6.785	7.868	8.969	14.529
NANL	25,959	12.236	9.069	0	5	10	18	61
CROSS	25,959	0.109	0.312	0	0	0	0	1
NFRD2015	25,959	0.597	0.49	0	0	1	1	1
D_US	25,959	0.674	0.469	0	0	1	1	1
Panel B - Europe								
stats	N	Mean	SD	Min	p25	p50	p75	Max
ESG	8463	39.502	14.221	0.826	29.752	40.496	50.413	79.339
ROA	8463	4.584	8.399	-128.622	1.077	3.914	7.578	34.802
LVRG	8463	4.513	5.390	1.053	1.921	2.568	4.133	43.309
SALES_G	8463	6.087	28.051	-75.976	-2.906	3.706	10.681	387.227
MV_BV	8463	2.727	2.531	0.371	1.095	1.872	3.370	16.817
SIZE	8463	8.354	1.438	1.160	7.379	8.287	9.240	14.305
NANL	8463	15.415	8.936	0	8	14	21	44
CROSS	8463	0.09	0.286	0	0	0	0	1
NFRD2015	8463	0.593	0.491	0	0	1	1	1
Panel C- US								
stats	N	Mean	SD	Min	p25	p50	p75	Max
ESG	17,496	21.097	11.898	5.372	13.992	16.529	22.807	77.178
ROA	17,496	1.611	13.843	-133.826	0.675	3.009	7.057	34.802
LVRG	17,496	4.091	4.380	1.053	1.740	2.499	4.496	43.309
SALES_G	17,496	11.909	38.462	-75.976	-0.907	6.049	15.599	387.227
MV_BV	17,496	3.347	3.026	0.371	1.365	2.258	4.064	16.817
SIZE	17,496	7.705	1.685	1.142	6.495	7.616	8.776	14.529
NANL	17,496	10.694	8.725	0	4	8	15	61
CROSS	17,496	0.118	0.323	0	0	0	0	1
NFRD2015	17,496	0.599	0.49	0	0	1	1	1

This table provides summary statistics (number of observations, mean, standard deviation, minimum, 25th percentiles, median, 75th percentile and maximum) for the dependent and explanatory variables used in the econometric analysis.

Table 4
Pearson's correlation coefficients.

	ESG	ROA	LVRG	SALES_G	MV_BV	SIZE	NANL	CROSS	CPI	EOI	ESI	IOC	NFRD2015	D_US
ESG	1													
ROA	0.177***	1												
LVRG	0.056***	-0.021***	1											
SALES_G	-0.151***	-0.137***	0.072***	1										
MV_BV	-0.026***	-0.021***	0.083***	0.083***	1									
SIZE	0.546***	0.310***	0.049***	-0.082***	0.109***	1								
NANL	0.531***	0.166***	0.057***	-0.084***	0.061***	0.718***	1							
CROSS	0.251***	0.093***	0.045***	-0.038***	0.061***	0.439***	0.410***	1						
CPI	-0.007	0.143***	-0.059***	-0.053***	0.015***	0.031***	0.041***	0.013**	1					
EOI	0.469***	0.162***	-0.069***	-0.069***	0.080***	0.743***	0.614***	0.0542***	0.103***	1				
ESI	0.224***	0.063***	-0.056***	-0.061***	-0.043***	0.101***	0.065***	-0.004	0.046***	0.029***	1			
IOC	-0.101***	0.089***	-0.073***	-0.031***	0.043***	0.095***	0.0727***	-0.034***	0.108***	0.000	0.126***	1		
NFRD2015	0.154***	-0.038***	-0.014**	-0.001	0.054***	0.079***	-0.0523***	-0.000	0.089***	0.000	0.190***	0.190***	1	
D_US	-0.559***	-0.149***	-0.002	0.036***	0.044***	-0.071***	-0.0924***	0.063***	-0.018***	-0.106***	0.000	0.190***	0.190***	1

This table shows the correlation between the dependent and explanatory variables used in the econometric analysis. ***, **, * denote statistical significance at the 1 %, 5 %, and 10 % levels, respectively.

whereas companies with strong institutional investor presence are associated with lower ESG transparency. Among the control variables, firm size (SIZE, 0.546***) and analyst coverage (NANL, 0.531***) are strongly positively correlated with ESG scores. These findings indicate that larger companies and those receiving more analyst attention tend to provide more comprehensive ESG disclosures, consistent with existing academic literature. Lastly, the interaction term D_US, representing US-based companies, exhibits a negative correlation with ESG_DISC (-0.559***), underscoring the generally lower level of ESG transparency found in US firms compared to their European counterparts.

Building on the approach by Baldini et al. (2018), we utilize the Cuzick Test for Trend (Cuzick, 1985) and the Mann-Whitney U test. The Cuzick test is a non-parametric method designed for detecting trends across ordered groups, while the Mann-Whitney U test assesses differences in medians between two periods. Consequently, the latter is particularly useful for identifying the specific year in which potential trends manifest. Our objective is to discern statistically significant increasing or decreasing trends that differ from random behavior.

Fig. 1 visually represents the boxplot of ESG scores across different years. The median values exhibit an upward trend, accompanied by a reduction in the interquartile distance. Notably, distinctive dynamics are observed between the two sub-samples. In Europe, average disclosure scores consistently outpace those in the US each year, aligning with the findings of Stolyw and Paugam (2018). The trend toward increased transparency is evident and stable in Europe. The detailed results of these observations are outlined in Table 5, indicating a positive and significant trend in ESG scores for both Europe (Panel A) and the US (Panel B). Additionally, the Cuzick test highlights positive dynamics throughout each year of the observation period.

Fig. 1 and Table 5 show a consistent upward trend in median ESG disclosure over time, particularly after the introduction of the NFR Directive. To assess whether this increase is statistically significant, we performed a Mann-Whitney test comparing the pre- and post-NFRD

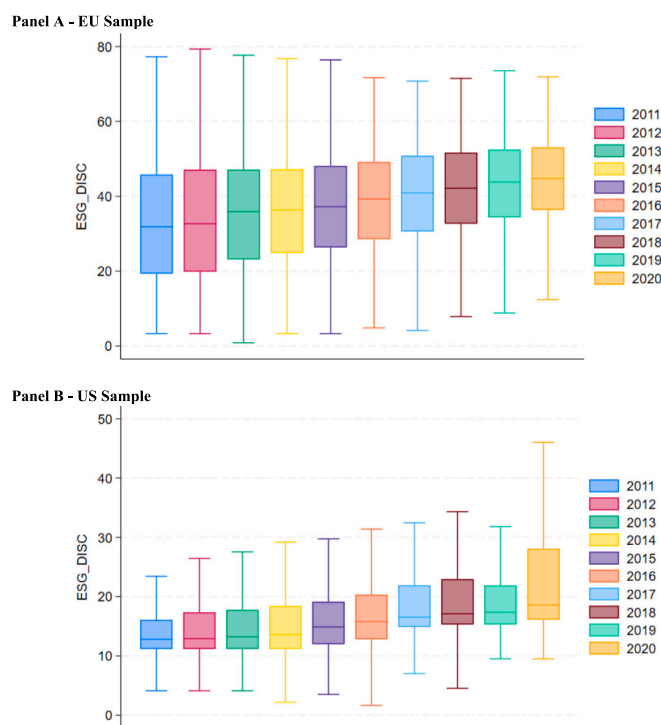


Fig. 1. Boxplot visualization of ESG disclosure score by year. The figure presents boxplots illustrating the distribution of ESG disclosure scores by year. These boxplots provide a visual representation of the median, quartiles, and potential outliers in ESG disclosure over time, allowing for the comparison of trends and variations across different years.

Table 5
Mann-Whitney and Cuzick Test for trends.

Panel A - EU Sample	Cuzick test for Trend			Mann-Whitney pre-NFRD – post-NFRD					
	24.77 (0.000)			-22.19 (0.000)					
Mann-Whitney	2011–2012 -2.321 (0.020)	2012–2013 -2.526 (0.012)	2013–2014 -1.434 (0.152)	2014–2015 -1.780 (0.075)	2015–2016 -2.604 (0.009)	2016–2017 -3.324 (0.001)	2017–2018 -2.111 (0.035)	2018–2019 -2.688 (0.007)	2019–2020 -2.786 (0.000)
Panel B - US Sample	Cuzick test for Trend			Mann-Whitney pre-NFRD – post-NFRD					
	49.07 (0.000)			-53.57 (0.000)					
Mann-Whitney	2011–2012 -2.321 (0.020)	2012–2013 -0.905 (0.3660)	2013–2014 -2.087 (0.037)	2014–2015 -6.779 (0.000)	2015–2016 -5.502 (0.000)	2016–2017 -10.540 (0.000)	2017–2018 -3.816 (0.000)	2018–2019 -7.995 (0.228)	2019–2020 -10.102 (0.000)

This table presents the results of the Mann-Whitney test, which examines the difference in means between groups and assesses the significance of these differences. Adjacent to the figure, the Cuzick test for trend is displayed, analyzing whether there is a significant trend across ordered groups.

***, **, * denote statistical significance at the 1 %, 5 %, and 10 % levels.

periods. The results indicate a significant rise in median ESG disclosure for both the EU and US samples. Specifically, for the EU, the Mann-Whitney test statistic is -22.19 (p -value = 0.000), while for the US, it is -53.57 (p -value = 0.000). These findings confirm that the increase in ESG disclosure following the NFR Directive is both sustained and statistically significant across both regions.

5.2. Baseline results

Our first hypothesis suggests that under a voluntary disclosure regime, transparency is influenced by stakeholder pressure. The results, outlined in Table 6, use ESG disclosure levels as the dependent variable and focus on the period (2012–2015). The table presents four distinct models (1–4), each focusing on a specific stakeholder group and testing the differences between the two geographical regions using a dummy variable (D_{US}). Additionally, we assess potential multicollinearity by calculating variance inflation factors (VIF) for each regression. The lack of significant VIF values indicates that multicollinearity is not a major concern.

Focusing first on the impact of stakeholder pressure on ESG disclosure, Model (1) examines the *customer proximity industries* (CPI) category. The results show a significant negative coefficient (-2.559^{***}), indicating that customer pressure on transparency is lower compared to other stakeholder groups. Notably, the coefficient of the interaction term ($D_{US} \times CPI$) is positive and significant (2.019^{***}), suggesting that US firms face higher pressure from consumers compared to their European counterparts. This implies that proximity to consumers may not have the same influence on ESG disclosure in Europe as it does in the US.

Model (2) investigates *employee-oriented industries* (EOI) and reveals a positive and highly significant coefficient (3.483^{***}) across the sample. This suggests that employees in both EU and US firms play a pivotal role in promoting ESG transparency, applying significant pressure on organizations to improve their disclosures.

Model (3), which focuses on “environmentally sensitive industries” (ESI), also shows a positive and highly significant coefficient (6.524^{***}). This result highlights that companies belonging to sectors with substantial environmental impacts are more inclined to engage in ESG reporting, likely to address and mitigate environmental risks. In this context, US firms exhibit slightly significantly lower pressure compared to their EU counterparts (-1.954^*) suggesting that this category of stakeholders in the US may be less proactive or effective in demanding ESG transparency from companies with large environmental footprints.

Model (4) examines *institutional-oriented companies* (IOC). Although the coefficient for this category is not significant (-0.162), the coefficient of the interaction term is negative and highly statistically significant (-2.841^{***}), indicating lower engagement from institutional

investors in promoting transparency, particularly in the US. This suggests that institutional investors may prioritize other considerations over ESG transparency, possibly due to the perceived costs or the limited immediate financial returns associated with extensive ESG disclosures. Notably, this result is more pronounced in US firms, whereas institutional investors in Europe appear to be more responsive to increasing regulatory requirements and stakeholder expectations regarding transparency.

In summary, our findings suggest that within a voluntary disclosure regime, ESG disclosure is primarily driven by *employee-oriented* and *environmentally sensitive* firms, while companies with closer consumer proximity show a notably lower tendency toward ESG transparency. When comparing US and European firms, we observe greater pressure from *customer-oriented* firms in the US. In contrast, *environmentally sensitive* firms and *institutional investors* exhibit stronger engagement in the European context.

Moreover, we observe significant relationships between ESG disclosure and several explanatory variables. Notably, companies with lower profitability (ROA) and slower sales growth (SALES_G) tend to disclose more ESG information, likely reflecting a strategic focus on transparency during weaker financial performance. Similarly, companies with lower market-to-book value (MV_BV) exhibit higher ESG transparency, possibly aiming to attract investor attention and enhance their sustainability profile. Consistent with previous research, larger firms (SIZE) show greater transparency, supported by their resources and organizational capacity to manage ESG reporting effectively. Analyst coverage (NANL) is also positively related with ESG disclosure, driven by the need to meet financial analysts expectations. Finally, firms listed on both US and European exchanges (CROSS) demonstrate higher transparency, aligning their practices with global standards like the GRI or TCFD, to enhance credibility and comparability.

Our second hypothesis focuses on the impact of the transition to mandatory disclosure throughout the entire observation period (2012–2020). To explore this, we introduce the dummy variable NFRD2015 into Eq. (1). The results of this analysis are presented in Table 7.

In Model (1), covering the entire sample, and Models (2) and (3), focusing on European and US firms, respectively, the coefficients of the dummy variable NFRD2015 are consistently positive and statistically significant. These results confirm the overall positive impact of the NFR Directive on listed firms. The findings highlight that transparency is higher within the European mandatory regime (2016–2020) compared to the preceding period of voluntary disclosure in both regions. The high negative coefficient of the dummy variable (D_{US}) in Model (1) (-13.80^{***}) suggests lower pressure on transparency for US firms only indirectly involved in this transition. Notably, the positive coefficient of

Table 6
Relationship between ESG Disclosure and Stakeholder Groups during Voluntary Disclosure Regime.

	(1)	(2)	(3)	(4)
ROA	-0.0528*** (0.00955)	-0.0487*** (0.00914)	-0.0525*** (0.00907)	-0.0521*** (0.00921)
LVRG	0.0240 (0.0295)	0.0254 (0.0291)	0.0639** (0.0288)	0.0190 (0.0293)
SALES_G	-0.0248*** (0.00258)	-0.0244*** (0.00252)	-0.0231*** (0.00255)	-0.0242*** (0.00253)
MV_BV	-0.218*** (0.0483)	-0.226*** (0.0473)	-0.200*** (0.0465)	-0.213*** (0.0471)
SIZE	3.271*** (0.179)	2.544*** (0.174)	3.146*** (0.175)	3.368*** (0.178)
NANL	0.237*** (0.0321)	0.205*** (0.0328)	0.244*** (0.0316)	0.243*** (0.0320)
CROSS	4.200*** (0.766)	3.333*** (0.782)	4.227*** (0.750)	3.640*** (0.756)
D_US	-10.97*** (2.906)	-12.18*** (2.876)	-9.924*** (2.742)	-10.11*** (2.922)
CPI	-2.559*** (0.860)			
D_US*CPI	2.019** (0.972)			
EOI		3.483*** (0.827)		
D_US*EOI		1.559 (0.957)		
ESI			6.524*** (0.932)	
D_US*ESI			-1.954* (1.182)	
IOC				-0.162 (0.784)
D_US*IOC				-2.841*** (0.873)
Country FE	yes	yes	yes	yes
Constant	3.352 (3.074)	9.095*** (3.049)	2.209 (2.918)	2.618 (3.089)
Observations	10,454	10,454	10,454	10,454
Adjusted R-squared	0.587	0.593	0.602	0.591

This table presents the results of our multivariate analysis examining the relationship between ESG disclosure and different stakeholder types during the voluntary disclosure regime (2012–2015). The dependent variable is the level of ESG disclosure, measured by the number of ESG-related disclosures made by a company. Models 1 to 4 control for a range of firm-specific characteristics, with each model including a distinct variable of interest (VoI), representing different stakeholder types: CPI (Customer Proximity Industries), EOI (Employee-Oriented Industries), ESI (Environmentally Sensitive Industries), IOC (Institutional-Oriented Companies). For each VoI, we also report the interaction coefficient between the stakeholder variable and D_US, a dummy variable that takes the value 1 for companies listed in the US and 0 for those listed in Europe. This interaction term captures whether the relationship between ESG disclosure and the respective stakeholder type differs significantly between US and European firms. The model employs country fixed effects and is estimated using robust standard errors clustered by company, following the methodologies of Gow et al. (2010) and Petersen (2009). Standard errors are reported in parentheses. *, **, and *** denote significance at the 10 %, 5 %, and 1 % levels, respectively.

the US sample in Model (3) is lower (3.547***) compared to the European sample's coefficient (6.405***) in Model (2). This difference underscores an indirect impact of the Directive on transparency in the US. Furthermore, this difference is statistically significant, as shown by the negative and highly significant coefficient (-2.373***) of the interaction term (D_US*NFRD2015).

The result aligns with Hypothesis 2, indicating that the European regulatory process has had a positive impact, though less pronounced, on listed firms operating under a voluntary regime. This impact is likely motivated by a growing demand for ESG reporting, driven by diverse stakeholders, with investors playing a pivotal role. The higher level of transparency can be attributed to the intense pressure exerted by a range of stakeholders, where investors, in particular, have taken a leading role. The active engagement of the Security Exchange Commission (SEC) with

Table 7
Effects of the Non-Financial Reporting Directive (NFRD) on Corporate ESG Disclosure.

	ALL	EU	US
	(1)	(2)	(3)
ROA	-0.0272*** (0.00719)	-0.0373 (0.0311)	-0.0220*** (0.00666)
LVRG	0.0442* (0.0243)	0.00644 (0.0434)	0.0578* (0.0300)
SALES_G	-0.0240*** (0.00177)	-0.0332*** (0.00497)	-0.0210*** (0.00173)
MV_BV	-0.221*** (0.0293)	-0.496*** (0.0758)	-0.162*** (0.0310)
SIZE	3.045*** (0.148)	2.560*** (0.295)	3.289*** (0.170)
NANL	0.267*** (0.0274)	0.354*** (0.0476)	0.211*** (0.0333)
CROSS	3.821*** (0.683)	3.581*** (1.133)	3.869*** (0.836)
D_US	-13.80*** (2.131)		
NFRD2015	6.020*** (0.288)	6.405*** (0.313)	3.547*** (0.150)
D_US*NFRD2015	-2.373*** (0.315)		
Country FE	yes	yes	yes
Constant	7.329*** (2.291)	10.51*** (2.749)	-8.004*** (0.967)
Observations	25,959	8463	17,496
Adjusted R-squared	0.604	0.407	0.438

This table presents the results of our multivariate analyses examining the impact of the Non-Financial Reporting Directive (NFRD) on corporate ESG disclosure. The dependent variable is the level of ESG disclosure. Models 1 to 3 control for a set of firm-specific characteristics and differ in their sample composition: Model 1 includes observations from all countries, Model 2 focuses on European companies and Model 3 on US companies. The dummy variable NFRD2015 takes the value of 1 for observations after the introduction of the NFRD regulation. The dummy variable D_US takes the value 1 for companies listed in the United States and 0 for companies listed in Europe. Model 1 includes the interaction between these two dummy variables to assess whether the NFRD's impact on ESG disclosure varies between European and US companies. We adopt country fixed effects. We estimate the regression with robust standard errors clustered by company (Gow et al. 2010; Petersen 2009). Standard errors are reported in parentheses. *, **, and *** denote significance at the 10 %, 5 %, and 1 % levels, respectively.

the topic of ESG disclosure and its acknowledgment of the potential impact on investors and markets further supports this trend.

To examine stakeholders' responses to the regulatory transition, Hypothesis 3 posits that under a mandatory regime, stakeholders' pressure on ESG disclosure diminishes. The results are presented in Table 8, where the models incorporate interactions between the dummy variables associated with stakeholders (CPI, EOI, ESI, and IOC) and NFRD2015. This allows us to capture any changes in the attitudes of various stakeholder groups toward disclosure under different regulatory regimes. Panel A reports the results for the European sample, while Panel B presents those for the US sample. The control variables exhibit consistent patterns across all models, indicating that their fundamental relationships are upheld.

Analyzing European firms (Panel A), the statistically significant coefficients for the interaction terms in the case of employee oriented firms (-1.852***) and firms mainly owned by institutional investors (-1.770***), suggest that the pressure on transparency from these categories of stakeholders, after the Directive, is lower, compared to the voluntary regime. This finding provides evidence that the increased transparency observed after the introduction of regulatory requirements is less influenced by stakeholders due to the overall regulatory pressure on each category of firms. In particular, the new regulatory requirements likely provided stakeholders, especially institutional investors, with a foundational level of ESG information. Consequently,

Table 8
Relationship between ESG Disclosure and Stakeholder Groups under the Non-Financial Reporting Directive (NFRD).

Panel A Europe	(1)	(2)	(3)	(4)	(5)
ROA	-0.0373 (0.0311)	-0.0288 (0.0313)	-0.0338 (0.0312)	-0.0292 (0.0299)	-0.0380 (0.0312)
LVRG	0.00644 (0.0434)	-0.00866 (0.0435)	0.00399 (0.0433)	0.0531 (0.0431)	0.00659 (0.0435)
SALES_G	-0.0332*** (0.00497)	-0.0333*** (0.00492)	-0.0332*** (0.00497)	-0.0308*** (0.00512)	-0.0329*** (0.00499)
MV_BV	-0.496*** (0.0758)	-0.470*** (0.0762)	-0.494*** (0.0754)	-0.435*** (0.0722)	-0.499*** (0.0758)
SIZE	2.560*** (0.295)	2.529*** (0.297)	2.314*** (0.320)	2.349*** (0.295)	2.554*** (0.297)
NANL	0.354*** (0.0476)	0.357*** (0.0479)	0.348*** (0.0481)	0.357*** (0.0467)	0.355*** (0.0477)
CROSS	3.581*** (1.133)	3.678*** (1.130)	3.564*** (1.137)	3.592*** (1.110)	3.566*** (1.134)
NFRD2015	6.405*** (0.313)	6.484*** (0.343)	7.127*** (0.396)	6.506*** (0.346)	6.641*** (0.349)
CPI		-2.065** (0.880)			
NFRD2015*CPI		-0.314 (0.696)			
EOI			2.112** (0.882)		
NFRD2015*EOI			-1.852*** (0.570)		
ESI				5.817*** (0.931)	
NFRD2015*ESI				0.0936 (0.679)	
IOC					0.980 (0.734)
NFRD2015*IOC					-1.770*** (0.669)
Country FE	yes	yes	yes	yes	yes
Constant	10.51*** (2.749)	10.73*** (2.746)	11.95*** (2.893)	10.20*** (2.597)	10.41*** (2.763)
Observations	8463	8463	8463	8463	8463
Adjusted R-squared	0.407	0.410	0.408	0.433	0.407

Panel B US	(1)	(2)	(3)	(4)	(5)
ROA	-0.0220*** (0.00666)	-0.0192*** (0.00680)	-0.0157** (0.00632)	-0.0254*** (0.00657)	-0.0180*** (0.00655)
LVRG	0.0578* (0.0300)	0.0550* (0.0301)	0.0512* (0.0294)	0.0749** (0.0291)	0.0412 (0.0296)
SALES_G	-0.0210*** (0.00173)	-0.0212*** (0.00175)	-0.0204*** (0.00169)	-0.0190*** (0.00166)	-0.0208*** (0.00171)
MV_BV	-0.162*** (0.0310)	-0.158*** (0.0311)	-0.165*** (0.0302)	-0.146*** (0.0301)	-0.151*** (0.0305)
SIZE	3.289*** (0.170)	3.277*** (0.170)	2.532*** (0.154)	3.195*** (0.168)	3.366*** (0.171)
NANL	0.211*** (0.0333)	0.213*** (0.0335)	0.165*** (0.0339)	0.221*** (0.0331)	0.222*** (0.0334)
CROSS	3.869*** (0.836)	3.834*** (0.835)	3.027*** (0.844)	3.793*** (0.810)	3.256*** (0.829)
NFRD2015	3.547*** (0.150)	3.512*** (0.168)	3.751*** (0.145)	3.433*** (0.152)	3.013*** (0.181)
CPI		-0.715 (0.464)			
NFRD2015*CPI		0.196 (0.351)			
EOI			5.513*** (0.658)		
NFRD2015*EOI			-0.637 (0.460)		
ESI				4.595*** (0.733)	
NFRD2015*ESI				1.818*** (0.511)	
IOC					-3.084*** (0.356)
NFRD2015*IOC					1.887*** (0.302)
Country FE	yes	yes	yes	yes	yes

(continued on next page)

Table 8 (continued)

Panel B US	(1)	(2)	(3)	(4)	(5)
Constant	-8.004*** (0.967)	-7.798*** (0.966)	-3.100*** (0.875)	-8.131*** (0.964)	-7.604*** (0.948)
Observations	17,496	17,496	17,496	17,496	17,496
Adjusted R-squared	0.438	0.438	0.452	0.461	0.445

This table presents the results of our multivariate analysis examining the influence of different types of stakeholders on ESG disclosure following the implementation of the Non-Financial Reporting Directive (NFRD). The dependent variable is the level of ESG disclosure. The estimates encompass the entire time period from 2012 to 2020. Panel A presents the findings for the European subsample, while Panel B presents the results for the US subsample. Models 1 to 5 control for a range of firm-specific characteristics: Model 1 showcases the control variables and the NFRD2015 dummy variable, which assumes a value of 1 for observations post-NFRD regulation. Models 2 to 5 differ in their inclusion of a distinct stakeholder dummy variable (VoI) representing various stakeholder groups: CPI (Customer Proximity Industries), EOI (Employee-Oriented Industries), ESI (Environmentally Sensitive Industries), IOC (Institutional-Oriented Companies). Beneath each VoI, the coefficient corresponding to the interaction between the stakeholder variable and the NFRD2015 dummy variable is reported. We adopt country fixed effects. We estimate the regression with robust standard errors clustered by company (Gow et al. 2010; Petersen 2009). Standard errors are reported in parentheses. *, **, and *** denote significance at the 10 %, 5 %, and 1 % levels, respectively.

some stakeholders may have felt a diminished need for additional pressure or advocacy, assuming that companies were compliant with the disclosure obligations imposed by the directive. Additionally, over time, companies have increasingly recognized the importance of ESG factors and the value of transparent reporting. Many European companies initiated substantial improvements in their ESG practices and reporting even before the directive was implemented. Stakeholders, witnessing this progress, might have perceived a reduced necessity for additional pressure, assuming that companies were already proactive in their ESG disclosure efforts. In essence, the regulatory framework seems to have played a crucial role in shaping ESG disclosure practices during the mandatory regime, with stakeholders potentially relying more on the regulatory requirements as a baseline for information, rather than actively pressuring companies for further disclosure.

Analyzing the US sample (Panel B), our results provide evidence that, whenever statistically significant, coefficients of the interaction terms are positive, specifically for environmentally sensitive industries (1.818***) and institutional investors oriented firms (1.887***). In contrast to our previous findings on European firms, these results suggest a higher engagement in transparency by these stakeholders in the US. The NFR Directive appears to have played a role in elevating the importance of ESG issues in the corporate reporting landscape. Consequently, stakeholders (in particular ESI e IOC) may have heightened their expectations and pressure on US listed companies. This pressure could be aimed at aligning with global reporting practices and standards, ensuring competitiveness in international markets. In more detail, European regulations often underscore the significance of materiality in ESG disclosure. Companies are encouraged to disclose ESG information that is considered material to their business and stakeholders. This emphasis is more stringent for environmentally sensitive industries, where ESG transparency is deemed more material due to the potential impact of these industries on the environment and society. Without standardized ESG reporting requirements similar to those in Europe, US companies have been slower to adopt comprehensive ESG reporting practices. As a result, institutional investors in the US have taken on a more active role in pushing for higher levels of ESG transparency to close the gap with global standards.

5.3. Additional analysis of ESG pillars

Although the overall ESG score is the most widely observed, some authors suggest analyzing individual pillars (E, S, G) due to factors such as the conditions of the country of origin, pressures from different stakeholders, and institutional contexts (Duque-Grisales & Aguilera-Caracuel, 2021; Humphrey et al., 2012). It is noteworthy that European regulators primarily focus on the disclosure of environmental and social issues, with comparatively less emphasis on governance. Our objective is to explore whether different stakeholders influence these distinct pillars of ESG reporting.

In these additional analyses, we focus on the entire observation

period (2012–2020). Table 9 presents our findings. Firstly, we confirm the positive impact of the NFR Directive on the disclosure of each ESG pillar. When focusing on European firms (Panel A), the differences we observe in the analysis of individual pillars compared to the overall ESG rating are as follows: i) the absence of significance in governance-related results for employee-oriented stakeholders. This suggests that the effort is primarily directed toward environmental and social disclosures, which are the focus of regulation and have historically been characterised by lower values compared to governance. ii) Environmentally sensitive firms (ESI) show the most significant effort in disclosing across all pillars compared to other stakeholders, with a particular focus on environmental and social aspects. iii) institutional investors (IOC) prioritize improvements in social and governance disclosure, rather than focusing on greater transparency in environmental reporting.

Moving to the US sample (Panel B), the most significant differences compared to the baseline model based on the overall ESG rating are as follows: i) Employee-oriented firms in the post-Directive period show a significant and opposite behavior across the pillars. Specifically, the results suggest a stronger commitment toward the Environmental (E) pillar, while exhibiting less interest in the Governance (G) pillar. ii) Environmentally sensitive firms, after the introduction of the European Directive, concentrate their efforts on the Environmental (E) pillar, showing a different and non-significant behavior for the other pillars.

5.4. Robustness tests

Robustness tests were conducted to assess the stability of our main findings. Several additional tests were performed to examine the impact of different factors on our results.

In testing the reliability of the stakeholder groups, we explored alternative variable definitions compared to Fernandez-Feijoo et al. (2014). As described in Section 3.2, the modifications for each stakeholder group are as follows: i) For Customer Proximity Industry (CPI), we examined selling and advertising expenses, specifically the percentage of “Selling, General and Administrative Expense” on total revenues. This was calculated as the sum of all direct and indirect selling expenses, general and administrative expenses divided by the total sales or revenues generated during the same period; ii) For *employee-oriented* (EOI), we focused on the number of employees rather than the company’s size. iii) For *environmentally sensitive* (ESI), we considered carbon-intensity firms identified by the parameter ‘Greenhouse gas emissions per million units of sales revenue’. The related dummy variables are coded 1 if the firm falls within the upper quartile of the sample distribution. No alternative variable was selected for *investor-oriented* companies (IOC), and the baseline definition was retained. These adjustments allow us to assess the robustness of our results and the consistency of stakeholder classifications in influencing ESG disclosure.

Table 10 presents the results of the robustness check for Hypothesis 1. The key findings generally confirm the baseline results, except for the case of environmentally sensitive firms. In fact, while the coefficient

Table 9
Impact of Stakeholder Groups on ESG Disclosure Pillars (Environment, Social, and Governance).

Panel A Europe	ENV	ENV	ENV	ENV	SOC	SOC	SOC	SOC	GOV	GOV	GOV	GOV	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	
ROA	-0.112*** (0.0406)	-0.118*** (0.0405)	-0.107*** (0.0398)	-0.120*** (0.0405)	-0.00218 (0.0340)	-0.00388 (0.0340)	-0.000779 (0.0334)	-0.00997 (0.0337)	0.00947 (0.0298)	0.00442 (0.0297)	0.00546 (0.0294)	0.000972 (0.0297)	
LVRG	-0.139** (0.0542)	-0.123** (0.0539)	-0.0661 (0.0537)	-0.119** (0.0542)	0.0136 (0.0548)	0.0199 (0.0543)	0.0624 (0.0542)	0.0232 (0.0545)	0.0891** (0.0438)	0.101** (0.0436)	0.125*** (0.0438)	0.103** (0.0439)	
SALES_G	-0.0347*** (0.00760)	-0.0347*** (0.00769)	-0.0318*** (0.00799)	-0.0347*** (0.00774)	-0.0303*** (0.00644)	-0.0305*** (0.00650)	-0.0281*** (0.00659)	-0.0298*** (0.00648)	-0.0159*** (0.00371)	-0.0159*** (0.00373)	-0.0145*** (0.00377)	-0.0153*** (0.00374)	
MV_BV	-0.443*** (0.0981)	-0.477*** (0.0970)	-0.418*** (0.0930)	-0.479*** (0.0984)	-0.361*** (0.0730)	-0.378*** (0.0731)	-0.329*** (0.0718)	-0.378*** (0.0731)	-0.261*** (0.0560)	-0.285*** (0.0560)	-0.253*** (0.0548)	-0.288*** (0.0555)	
SIZE	3.028*** (0.345)	2.764*** (0.376)	2.820*** (0.345)	3.028*** (0.344)	1.923*** (0.335)	1.616*** (0.354)	1.778*** (0.334)	1.975*** (0.335)	1.417*** (0.238)	1.285*** (0.237)	1.340*** (0.237)	1.441*** (0.238)	
NANL	0.335*** (0.0552)	0.324*** (0.0551)	0.339*** (0.0541)	0.332*** (0.0550)	0.332*** (0.0540)	0.322*** (0.0544)	0.332*** (0.0533)	0.331*** (0.0539)	0.209*** (0.0363)	0.203*** (0.0364)	0.209*** (0.0360)	0.209*** (0.0363)	
CROSS	5.177*** (1.358)	5.066*** (1.357)	5.112*** (1.332)	5.051*** (1.355)	3.167** (1.304)	3.096** (1.312)	3.095** (1.303)	3.100** (1.311)	2.511*** (0.879)	2.408*** (0.879)	2.416*** (0.867)	2.400*** (0.878)	
NFRD2015	4.642*** (0.433)	5.128*** (0.500)	4.472*** (0.421)	4.523*** (0.428)	5.364*** (0.412)	5.803*** (0.467)	5.403*** (0.420)	5.451*** (0.419)	4.436*** (0.312)	4.592*** (0.351)	4.353*** (0.315)	4.874*** (0.306)	
CPI	-2.664** (1.060)				-1.118 (1.086)				-2.250*** (0.668)				
NFRD2015*CPI	-0.367 (0.780)				-0.631 (0.831)				0.446 (0.628)				
EOI		2.132** (1.037)								0.784 (0.696)			
NFRD2015*EOI		-1.431** (0.718)								-0.177 (0.537)			
ESI			5.824*** (1.127)					5.058*** (1.096)				2.352*** (0.769)	
NFRD2015*ESI			1.323 (0.853)					-0.220 (0.786)				0.997 (0.622)	
IOC				-1.618* (0.980)					2.303** (0.938)				1.783*** (0.571)
NFRD2015*IOC				0.425 (0.874)					-1.885** (0.859)				-2.810*** (0.567)
Country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	
Constant	1.245 (3.198)	2.908 (3.396)	0.707 (3.033)	1.314 (3.212)	21.29*** (3.556)	23.30*** (3.610)	20.77*** (3.424)	20.78*** (3.569)	36.11*** (2.124)	36.97*** (2.331)	35.81*** (2.108)	35.63*** (2.140)	
Observations	7983	7983	7983	7983	8269	8269	8269	8269	8517	8517	8517	8517	
Adjusted R-squared	0.338	0.335	0.360	0.334	0.288	0.288	0.304	0.288	0.387	0.383	0.392	0.384	

Panel B US	ENV	ENV	ENV	ENV	SOC	SOC	SOC	SOC	GOV	GOV	GOV	GOV
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
ROA	-0.0388* (0.0232)	-0.0405* (0.0231)	-0.0467** (0.0224)	-0.0401* (0.0229)	-0.0299*** (0.00938)	-0.0250*** (0.00904)	-0.0336*** (0.00915)	-0.0287*** (0.00924)	-0.00990** (0.00387)	-0.0103*** (0.00370)	-0.0142*** (0.00381)	-0.0111*** (0.00378)
LVRG	0.0675 (0.0596)	0.0674 (0.0591)	0.0876 (0.0579)	0.0557 (0.0593)	-0.0271 (0.0376)	-0.0284 (0.0375)	-0.0114 (0.0363)	-0.0300 (0.0374)	0.0393* (0.0228)	0.0395* (0.0227)	0.0486** (0.0226)	0.0349 (0.0227)
SALES_G	-0.0613*** (0.00719)	-0.0598*** (0.00710)	-0.0534*** (0.00663)	-0.0605*** (0.00707)	-0.0225*** (0.00237)	-0.0219*** (0.00233)	-0.0197*** (0.00230)	-0.0224*** (0.00236)	-0.0106*** (0.000986)	-0.0101*** (0.000966)	-0.0096*** (0.000961)	-0.0103*** (0.000974)
MV_BV	-0.144** (0.0630)	-0.161*** (0.0622)	-0.130** (0.0611)	-0.139** (0.0620)	-0.0717** (0.0354)	-0.0807** (0.0350)	-0.0552 (0.0343)	-0.0688* (0.0353)	-0.0709*** (0.0183)	-0.0748*** (0.0179)	-0.0689*** (0.0180)	-0.0698*** (0.0180)
SIZE	5.129*** (0.320)	4.350*** (0.328)	5.010*** (0.317)	5.125*** (0.316)	3.490*** (0.209)	2.792*** (0.200)	3.361*** (0.205)	3.487*** (0.210)	1.572*** (0.0913)	1.277*** (0.0842)	1.550*** (0.0922)	1.622*** (0.0921)

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Table 9 (continued)

Panel B US	ENV	ENV	ENV	ENV	SOC	SOC	SOC	SOC	GOV	GOV	GOV	GOV
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
NANL	0.186*** (0.0555)	0.157*** (0.0558)	0.215*** (0.0547)	0.198*** (0.0548)	0.156*** (0.0404)	0.124*** (0.0407)	0.176*** (0.0397)	0.161*** (0.0404)	0.0618*** (0.0178)	0.0406** (0.0183)	0.0631*** (0.0179)	0.0642*** (0.0179)
CROSS	2.584** (1.258)	2.565** (1.268)	2.559** (1.226)	1.995 (1.269)	2.141** (0.922)	1.642* (0.933)	2.054** (0.882)	1.937** (0.934)	1.923*** (0.440)	1.593*** (0.446)	1.932*** (0.432)	1.674*** (0.440)
NFRD2015	0.226 (0.483)	-0.715 (0.600)	0.416 (0.479)	-0.306 (0.530)	3.801*** (0.278)	3.882*** (0.264)	4.361*** (0.253)	3.151*** (0.308)	2.214*** (0.0947)	2.350*** (0.0824)	2.150*** (0.0862)	2.069*** (0.106)
CPI	-1.109 (1.355)				-0.941 (0.728)				-0.472* (0.248)			
NFRD2015*CPI	0.326 (1.101)				1.068* (0.588)				-0.296 (0.197)			
EOI		2.401** (1.122)				3.821*** (0.786)				2.522*** (0.339)		
NFRD2015*EOI		2.187** (0.918)				0.612 (0.587)				-0.712*** (0.249)		
ESI			6.431*** (1.390)				7.617*** (0.999)				1.896*** (0.433)	
NFRD2015*ESI			2.062* (1.126)				-0.834 (0.797)				0.332 (0.290)	
IOC				-3.588*** (0.924)				-2.496*** (0.550)				-1.106*** (0.183)
NFRD2015*IOC				2.130** (0.832)				2.511*** (0.477)				0.397** (0.164)
Country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Constant	-28.17*** (2.035)	-22.27*** (2.215)	-29.29*** (1.999)	-27.18*** (1.994)	-11.58*** (1.213)	-7.028*** (1.202)	-12.25*** (1.206)	-10.92*** (1.201)	39.73*** (0.565)	41.49*** (0.525)	39.49*** (0.568)	39.63*** (0.561)
Observations	9243	9243	9243	9243	14,506	14,506	14,506	14,506	17,510	17,510	17,510	17,510
Adjusted R-squared	0.371	0.376	0.398	0.374	0.299	0.307	0.329	0.301	0.332	0.339	0.342	0.335

This table presents the results of our multivariate analysis investigating the influence of different stakeholder types on the specific pillars of ESG disclosure: Environment, Social, and Governance (ENV, SOC, GOV). Panel A focuses on European-listed companies, while Panel B addresses US-listed companies. All models control for a set of firm-specific variables and incorporate the NFRD2015 dummy variable, which indicates post-NFRD regulation observations. The estimates span the entire timeframe from 2012 to 2020. Models 1–4 analyze environmental disclosure as the dependent variable, models 5–10 examine social disclosure, and models 11–12 explore governance disclosure. Within each group corresponding to the specific pillar, the relationship between the pillar and the dummy variable representing the stakeholder group is examined. CPI (Customer Proximity Industries), EOI (Employee-Oriented Industries), ESI (Environmentally Sensitive Industries), IOC (Institutional-Oriented Companies). We adopt country fixed effects. We estimate the regression with robust standard errors clustered by company (Gow et al. 2010; Petersen 2009). Standard errors are reported in parentheses. *, **, and *** denote significance at the 10 %, 5 %, and 1 % levels, respectively.

Table 10
Exploring the Relationship between ESG Disclosure and Stakeholder Types under the Voluntary Disclosure Regime - Robustness Analysis.

	(1)	(2)	(3)	(4)
ROA	-0.0493*** (0.0101)	-0.0353*** (0.00919)	-0.0368*** (0.00907)	-0.0449*** (0.00945)
LVRG	0.170*** (0.0323)	0.114*** (0.0326)	0.166*** (0.0313)	0.166*** (0.0318)
SALES_G	-0.0209*** (0.00245)	-0.0188*** (0.00230)	-0.0186*** (0.00224)	-0.0206*** (0.00241)
MV_BV	-0.226*** (0.0475)	-0.161*** (0.0448)	-0.200*** (0.0448)	-0.225*** (0.0460)
SIZE	3.016*** (0.172)	2.512*** (0.167)	2.692*** (0.165)	3.136*** (0.172)
NANL	0.258*** (0.0314)	0.202*** (0.0310)	0.258*** (0.0305)	0.261*** (0.0313)
CROSS	4.498*** (0.736)	3.563*** (0.722)	4.030*** (0.700)	3.951*** (0.727)
D_US	-9.351*** (2.597)	-8.150*** (2.709)	-10.22*** (2.586)	-8.464*** (2.624)
CPI	-2.364** (1.015)			
D_US*CPI	1.949* (1.127)			
EOI		5.616*** (0.732)		
D_US*EOI		1.035 (0.979)		
ESI			7.668*** (0.842)	
D_US*ESI			8.526*** (1.297)	
IOC				0.674 (0.777)
D_US*IOC				-3.478*** (0.858)
Country FE	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes
Constant	11.14*** (2.949)	13.46*** (3.034)	10.42*** (2.880)	10.26*** (2.974)
Observations	10,454	10,454	10,454	10,454
Adjusted R-squared	0.620	0.637	0.654	0.624

This table presents the results of our multivariate analysis using alternative definitions of stakeholder variables to further explore the relationship between ESG disclosure and various stakeholder groups during the voluntary disclosure regime (2012–2015). The dependent variable in all models is the level of ESG disclosure. Models 1 to 4 control for a set of firm-specific characteristics and are distinguished by the inclusion of distinct dummy variables of interest (VoI) representing different stakeholder types. This robustness analysis tests alternative variables for identifying the VoI: CPI (Customer Proximity Industries), EOI (Employee-Oriented Industries), ESI (Environmentally Sensitive Industries), and IOC (Institutional-Oriented Companies). We adopt country and industry fixed effects. We estimate the regression with robust standard errors clustered by company (Gow et al. 2010; Petersen 2009). Standard errors are reported in parentheses. *, **, and *** denote significance at the 10 %, 5 %, and 1 % levels, respectively.

remains positive and even higher than in the baseline model for the overall sample (7.668***), indicating that companies with higher GHG emissions are more actively engaged in ESG reporting, the interaction term (D_US*ESI) shows a positive and highly significant coefficient (8.526***), a shift from the baseline model where it was negative and only marginally significant. This suggests that carbon-intensive firms in the US face greater pressure for transparency. This finding underscores the difference between evaluating companies based on their inclusion in environmentally sensitive sectors versus their individual carbon emissions profiles. The high variability in carbon intensity within the same sector explains these divergent outcomes. Consequently, US companies in environmentally sensitive sectors experience less pressure to disclose ESG information compared to their European counterparts. However, when focusing on specific emissions levels, the most carbon-intensive companies are under the greatest pressure to disclose, regardless of sector classification.

Table 11 presents the robustness check results for Hypothesis 2. In the case of European firms (Panel A), the baseline findings are largely confirmed, reinforcing the view of an overall improvement in ESG transparency following the 2015 NFR Directive. However, the updated model highlights a few key differences: i) the consumer proximity variable, identified by selling expenses, loses its significance compared to the baseline model, suggesting that stakeholders in firms with higher advertising expenditures do not exert differing levels of pressure on ESG disclosure compared to other firms; ii) the interaction term (NFRD2015*ESI) is negative and significant (-2.773), indicating that, post-Directive, the most carbon-intensive firms face less pressure to disclose, possibly due to increased standardization in reporting; and iii) institutional investor-oriented firms show a positive and significant coefficient (1.894***), indicating ongoing pressure for transparency, albeit reduced in the mandatory disclosure period.

The baseline results are also generally confirmed for US firms (Panel B). Notably, the interaction terms (NFRD2015*CPI) and (NFRD2015*ESI) both show negative and significant coefficients (-1.470*** and -4.054***, respectively), suggesting that these stakeholder groups exerted less pressure on firms for ESG disclosure after the Directive. A possible explanation for environmental sensitive firms, similar to what we observe for European firms in the same category, is a slowdown in disclosure efforts following substantial improvements in the period leading up to the Directive.

As a second robustness check, in line with [Awaysheh et al. \(2020\)](#), we excluded financial and utility stocks from the sample due to their high regulatory ESG disclosure standards. The results from this check align with and confirm our baseline findings.

In our final set of robustness tests, we applied different outlier handling techniques. The following approaches were employed: i) Original database with all observations (including outliers); ii) Winsorization procedure at the 5th and 95th percentiles. In both cases, the results confirmed the robustness of our findings.

In our main analysis, the EU sample includes firms from European Union countries, including the UK. However, considering the UK's Companies Act 2006 (Strategic Report and Directors' Report - Regulations 2013), which mandates carbon emissions reporting for UK firms starting in 2013, we conducted an additional robustness check by excluding UK firms from the EU sample. This adjustment was made to ensure that the specific regulatory framework in the UK did not influence or bias the results. The exclusion of UK firms did not materially alter the findings, as no significant changes were observed in the relationships between the variables. Detailed results of this robustness check are available upon request.

Additionally, to further validate the robustness of our findings, we reassessed the impact of the NFRD by adjusting the dividing year between voluntary and mandatory disclosure periods. While the primary analysis uses 2016 as the dividing year, aligned with the NFRD's enactment and existing literature, we conducted an additional robustness test using 2018, the first year in which companies were required to report under the NFRD framework, as the dividing year. The results remained consistent across this alternative specification, with no significant changes in our key findings.

6. Concluding remarks

ESG reporting engenders comparability, consistency, and assurance of non-financial reporting ([Slack & Tsalavoutas, 2018](#)). Various stakeholders committed to sustainability, including customers, employees and investors, are increasingly interested in understanding a company's ESG practices. In fact, ESG reporting helps companies build trust, demonstrate their commitment to sustainability, and respond to stakeholder concerns.

Europe and the US are taking different paths toward sustainability reporting. This is largely the result of differences in governance, regulatory culture and the balancing of domestic interests. The European

Table 11
 Relationship between ESG Disclosure and Stakeholder Groups under the Non-Financial Reporting Directive (NFRD) - Robustness Analysis.

Panel A Europe	(1)	(2)	(3)	(4)	(5)
ROA	-0.00301 (0.0316)	-0.00507 (0.0310)	0.0180 (0.0314)	0.00528 (0.0292)	-0.00422 (0.0316)
LVRG	0.200*** (0.0482)	0.195*** (0.0480)	0.141*** (0.0508)	0.207*** (0.0480)	0.200*** (0.0482)
SALES_G	-0.0293*** (0.00475)	-0.0291*** (0.00474)	-0.0276*** (0.00463)	-0.0270*** (0.00469)	-0.0289*** (0.00478)
MV_BV	-0.463*** (0.0742)	-0.454*** (0.0733)	-0.409*** (0.0713)	-0.446*** (0.0724)	-0.465*** (0.0739)
SIZE	2.520*** (0.289)	2.502*** (0.289)	2.121*** (0.289)	2.373*** (0.286)	2.529*** (0.291)
NANL	0.321*** (0.0471)	0.325*** (0.0470)	0.273*** (0.0466)	0.319*** (0.0470)	0.322*** (0.0472)
CROSS	4.072*** (1.055)	4.103*** (1.056)	3.383*** (1.049)	4.165*** (1.053)	4.067*** (1.054)
NFRD2015	6.577*** (0.308)	6.625*** (0.322)	7.270*** (0.388)	6.868*** (0.337)	6.863*** (0.341)
CPI		-0.986 (1.036)			
NFRD2015*CPI		-0.359 (0.859)			
EOI			5.189*** (0.791)		
NFRD2015*EOI			-2.023*** (0.560)		
ESI				6.534*** (0.874)	
NFRD2015*ESI				-2.773*** (0.674)	
IOC = 1					1.894*** (0.718)
NFRD2015*IOC					-2.289*** (0.658)
Country FE	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes
Constant	18.02*** (2.699)	18.05*** (2.700)	19.63*** (2.751)	16.55*** (2.653)	17.81*** (2.705)
Observations	8463	8463	8463	8463	8463
Adjusted R-squared	0.471	0.471	0.483	0.481	0.471

Panel B US	(1)	(2)	(3)	(4)	(5)
ROA	-0.0213*** (0.00714)	-0.0317*** (0.00746)	-0.0179*** (0.00676)	-0.0122* (0.00677)	-0.0176** (0.00709)
LVRG	0.160*** (0.0312)	0.149*** (0.0313)	0.112*** (0.0294)	0.138*** (0.0293)	0.151*** (0.0304)
SALES_G	-0.0166*** (0.00161)	-0.0155*** (0.00162)	-0.0146*** (0.00153)	-0.0157*** (0.00150)	-0.0164*** (0.00159)
MV_BV	-0.170*** (0.0296)	-0.156*** (0.0296)	-0.120*** (0.0281)	-0.139*** (0.0283)	-0.166*** (0.0290)
SIZE	3.124*** (0.164)	3.078*** (0.164)	2.682*** (0.154)	2.788*** (0.155)	3.226*** (0.165)
NANL	0.222*** (0.0328)	0.228*** (0.0329)	0.183*** (0.0321)	0.221*** (0.0313)	0.230*** (0.0327)
CROSS	4.043*** (0.797)	4.008*** (0.796)	3.150*** (0.778)	3.607*** (0.741)	3.399*** (0.791)
NFRD2015	3.749*** (0.146)	4.005*** (0.162)	3.897*** (0.145)	3.706*** (0.137)	3.306*** (0.175)
CPI		-0.369 (0.496)			
NFRD2015*CPI		-1.470*** (0.359)			
EOI			6.516*** (0.764)		
NFRD2015*EOI			-0.898* (0.533)		
ESI				16.55*** (1.091)	
NFRD2015*ESI				-4.054*** (0.946)	
IOC = 1					-2.977*** (0.347)
NFRD2015*IOC					1.624*** (0.293)

(continued on next page)

Table 11 (continued)

Panel B US	(1)	(2)	(3)	(4)	(5)
Country FE	yes	yes	yes	yes	yes
Industry FE	yes	yes	yes	yes	yes
Constant	2.169 (1.698)	2.393 (1.699)	5.376*** (1.657)	-0.310 (1.431)	2.294 (1.697)
Observations	17,496	17,496	17,496	17,496	17,496
Adjusted R-squared	0.484	0.486	0.507	0.543	0.491

This table presents the results of our multivariate analysis examining the influence of various types of stakeholders on corporate ESG disclosure following the implementation of the Non-Financial Reporting Directive (NFRD). In this robustness analysis, we test alternative definitions of stakeholder groups: CPI (Customer Proximity Industries), EOI (Employee-Oriented Industries), ESI (Environmentally Sensitive Industries), and IOC (Institutional-Oriented Companies). The dependent variable is ESG disclosure, and the estimates cover the full time period from 2012 to 2020. Model 1 includes only control variables, while Models 2 to 5 each incorporate a distinct stakeholder dummy variable (VoI). For each VoI, the table reports the coefficient corresponding to the interaction between the stakeholder variable and NFRD2015, which reflects the influence of the NFRD on the relationship between stakeholder type and ESG disclosure. We adopt country and industry fixed effects. We estimate the regression with robust standard errors clustered by company (Gow et al. 2010; Petersen 2009). Standard errors are reported in parentheses. *, **, and *** denote significance at the 10 %, 5 %, and 1 % levels, respectively.

Union has been one of the first movers on this issue, following a well-defined regulatory process on disclosure. In the United States, ESG disclosure discipline has followed a market-based approach, with disclosure being guided by voluntary, private-sector-led processes. Regulatory frameworks, and in particular the EU Non-Financial Reporting Directive and the Securities and Exchange Commission's (SEC), increased attention to climate and ESG disclosures are pushing companies to disclose material ESG information. Compliance with these regulations is essential for companies operating in these jurisdictions to avoid legal and reputational risks.

This paper aims to investigate the source of the disclosure pressure on European and US listed firms distinguishing between regulatory requirements and stakeholders' proactivity. As awareness grows, stakeholders are becoming more proactive in advocating for transparency, accountability, and ESG integration in corporate practices. We have split the observation period into two subsamples, whose watershed is the NFR Directive, to identify a first period of voluntary disclosure in both areas and a second period where the ESG disclosure has been mandatory only for European companies.

Our first finding indicates that, in voluntary disclosure regimes, ESG reporting is primarily driven by specific stakeholder groups, with the most active being those linked to employee-oriented and environmentally sensitive industries. The second result highlights an increase in reporting activity following the introduction of the NFR Directive, and this trend is not limited to European firms: US companies also improved their transparency, likely due to a growing awareness of ESG issues. The third finding concerns stakeholders' reporting behavior under the European mandatory regime. We observe a decrease in stakeholder engagement, particularly from employee-oriented groups and institutional investors, in European firms. This can be explained by a reduced need for additional pressure, as companies are assumed to comply with disclosure obligations. Conversely, in the US, stakeholders in environmentally sensitive industries and institutional investors oriented firms exhibit higher engagement in ESG reporting.

Our results highlight the impactful role of regulators and stakeholders in ESG reporting. The quality and quantity of ESG transparency is increasingly important, especially for investors more and more aware of the potential of sustainable finance. By addressing the sources of pressure on ESG disclosure, policymakers can foster a sustainable and responsible business environment, facilitate informed decision-making by investors and stakeholders, and drive positive change toward a more sustainable future.

Data availability

Data will be made available on request.

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