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Have you heard the news?
**An Event Study on the Market Impact of CSRD Announcements
on Firm Stock Prices**

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ABSTRACT

This study investigates how the EU's Corporate Sustainability Reporting Directive (CSRD), which for the first time mandates corporate sustainability disclosures for all (listed) firms, including mid- and small-caps, has impacted stock valuations around three pivotal announcement dates of the directive. Grounded in the Efficient Market Hypothesis (EMH) and viewed through a signaling-theory lens, an event study is conducted on 596 EU-listed firms, using daily returns from 2019 to 2023 to calculate cumulative abnormal returns (CARs) over 11-day, 5-day, and 3-day windows around each event. Cross-sectional regression results reveal a marginally significant negative average CAR (-0.45% , $p = .053$) for the 3-day window. However, hypothesized moderators tied to an industry's environmental, social, and governance (ESG) exposure, firm size, and ESG governance strength did not significantly affect immediate reactions. Conversely, higher return on assets (ROA) and greater trade openness explain most variation in CARs, suggesting that more profitable firms with are better able to manage the anticipated compliance costs 'in the eyes of the beholder', whereas greater trade openness is associated with more pronounced negative reactions, implying that firms in open economies face international exposure and likely supply-chain complexities that heighten the perceived cost of compliance with the CSRD.

Keywords: *corporate sustainability reporting directive (CSRD), mandatory disclosure, ESG, CSR, firm value, Event-Study, signaling theory, EMH*

TABLE OF CONTENTS

1	INTRODUCTION	4
2	LITERATURE REVIEW	7
3	HYPOTHESIS DEVELOPMENT	12
4	METHODOLOGY	14
5	RESULTS	25
6	DISCUSSION	32
7	CONCLUSION	35
	REFERENCES	36

1 | INTRODUCTION

In recent decades, corporate social responsibility (CSR) has evolved from a contested voluntary, reputation-driven business practice into an increasingly regulated and even mandated obligation for firms worldwide, particularly within the European Union (EU). CSR is defined as “actions that appear to further some social good, beyond the interests of the firm and that which is required by law” (McWilliams & Siegel, 2001, p. 117). Traditionally, firms voluntarily engaged in CSR initiatives largely driven by moral appeals, sustainability imperatives, reputational considerations, and maintaining their "license to operate" (Porter & Kramer, 2006). However, firms' voluntary reporting on environmental, social, and governance (ESG) practices generated considerable variability in disclosure quality and comparability across firms due to a lack of standardized frameworks (Habek & Wolniak, 2015; Christensen et al., 2021). Also, selective ESG reporting led, in the worst cases, to “green-washing”, the practice of foregrounding favorable impacts while downplaying negative ones, thereby deepening information asymmetries and eroding trust (Boiral et al., 2017; Marquis et al., 2016).

Given these limitations of voluntary disclosure, external pressure mounted for more robust and comparable mandatory ESG reporting standards (Ioannou & Serafeim, 2019). The EU responded with the Corporate Sustainability Reporting Directive (CSRD), proposed by the European Commission (EC) in 2021 and adopted in 2022, which requires all EU-listed companies, including small and medium-sized enterprises (SMEs), to disclose and obtain assurance on a comprehensive set of ESG metrics (Directive 2022/2464/EU), fundamentally shifting sustainability reporting from voluntary goodwill to a regulated compliance obligation (EY, 2025). Thus, the CSRD's announcement transforms sustainability reporting from voluntary to mandatory audited disclosure, anchored in its double-materiality principle that obliges firms to report both how sustainability issues affect their finances and how their activities impact society and the environment (Baumüller & Sopp, 2021). In theory, compulsory, standardized reporting should reduce information asymmetry and lower firms' cost of capital by providing investors with more reliable data (Christensen et al., 2021). The authors state that, in practice, however, it may also impose fixed compliance costs

While Christensen et al. (2021) provide a rigorous economic analysis of mandatory sustainability reporting, their work is largely theoretical. This study complements their framework by empirically examining the market-based reactions to the announcement of the

CSRD, thereby translating theoretical predictions into observable outcomes. According to the Efficient Market Hypothesis (EMH), share prices incorporate regulatory shocks almost instantaneously (Fama, 1991); however, EMH alone cannot predict how investors interpret this news. This study draws on signaling theory (Spence, 1973) to understand this reaction: investors likely interpret the CSRD through observable cues that distinguish firms likely to adopt substantive sustainability practices from those likely to engage in symbolic compliance. First, an industry's ESG exposure may indicate where the directive matters most, as carbon-intensive or controversy-prone sectors face greater legitimacy pressures and higher transition risks (Perego & Kolk, 2012; Bolton & Kacperczyk, 2021). Second, firm size can reveal whether a company possesses sufficient slack resources to absorb compliance costs and invest in genuine ESG integration, signaling organizational capacity and dynamic capabilities (Bromley & Powell, 2012; Kılıç et al., 2022). Third, robust internal ESG governance structures can signal to investors that a firm can translate reporting obligations into substantial practice improvements (Grewal et al., 2019; Al-Shaer & Zaman, 2018). Whether these cues ultimately reassure investors or heighten their concerns, thus driving systematically different market reactions to a uniform supranational mandate such as the CSRD across firms, remains an open empirical question. Because the directive has not yet taken effect, direct evidence on the real effects of the CSRD is unavailable. In such settings, equity-market reactions provide an indirect but powerful window into investors' forward-looking expectations regarding the directive's costs and benefits (Grewal et al., 2019). Therefore, this study's research question is as follows:

RQ: *How does the announcement of mandated corporate sustainability-reporting requirements influence firms' stock price performance, and how is this effect moderated by industry ESG exposure, firm size, and the strength of ESG governance practices?*

To answer this question, this study employs an event-study methodology. Daily share price data for 596 EU-listed firms from 2019 to 2023 are used to calculate cumulative abnormal returns (CARs) for the three pivotal CSRD announcement dates (11 December 2019, 21 April 2021, and 21 June 2022), thereby capturing investors' forward-looking assessments of the directive. CARs are preferred over accounting metrics because they reflect market expectations immediately and are less susceptible to managerial discretion or reporting lags (Fama, 1991; Grewal et al., 2019). Cross-sectional regressions link these announcement-day CARs with industry ESG exposure, firm size, and a composite index of ESG governance strength.

An event study of the CSRD's three key announcements reveals a marginally significant negative three-day CAR (-0.45% , $p = .053$), with cross-sectional variation explained almost entirely by return on assets (ROA) and trade openness (Trade as % of GDP) rather than by industry ESG exposure, firm size, or ESG governance strength. First, this finding refines signaling theory by identifying a boundary condition: when a uniform supranational mandate overwhelms firm-level ESG cues, investors revert to established financial and macroeconomic metrics until audited sustainability disclosures materialize in the long run. Second, it challenges the academic debate of legitimacy theory in mandatory-reporting contexts, demonstrating that costly, hard-to-replicate governance structures lose their short-run salience under a sweeping policy shock. Finally, by empirically assessing the CSRD's unprecedented, universal scope rather than voluntary regimes, this study extends the literature on ESG reporting to a comprehensive corporate sustainability disclosure framework.

The remainder of this study is structured as follows. Chapter two provides an extensive literature review. Chapter three outlines the hypothesis development. Chapter four describes the research methodology, detailing the sample selection, data sources, and empirical design. Chapter five presents the empirical findings and robustness checks. Chapter six offers a discussion of results, theoretical and practical implications, limitations, and recommendations for future research. Lastly, Chapter 7 contains the conclusion of this study.

2 | LITERATURE REVIEW

2.1 | Rationales for and challenges to firms' engagement in voluntary ESG disclosure

CSR, which is rooted in Freeman's (1984) stakeholder theory, expands firms' responsibilities beyond profit maximization to encompass the interests of various stakeholders, including employees, customers, suppliers, communities, and the environment. Over the past few decades, the concept of CSR has experienced significant growth, with heightened interest in ESG matters in the EU and worldwide (Carroll & Shabana, 2010). The EMH, proposed by Fama (1991), asserts that financial markets quickly and accurately incorporate all new publicly available information into security prices. Consequently, in an efficient market, stock prices fully reflect all information, including not only traditional financial data but also material non-financial information on ESG practices.

However, in the absence of comprehensive and clear regulatory frameworks imposed by governments and regulatory authorities regarding mandatory corporate sustainability reporting, firms have traditionally adopted voluntary ESG reporting practices to secure their 'license to operate' (Suchman, 1995), thereby satisfying stakeholder expectations. From an investor's perspective, under EMH, voluntary ESG reporting serves as a crucial signaling mechanism. The rationale behind this voluntary disclosure is threefold. First, firms aim to cultivate long-term legitimacy and improve their corporate image, strengthening brand equity and fostering positive internal morale (Porter & Kramer, 2006). This proactive approach to reputation management is expected to foster greater stakeholder trust and market credibility (Du et al., 2010). Second, corporate sustainability reports serve as a means for firms to articulate their broader societal responsibilities and outline their contributions to sustainable development (Herzig & Kuhn, 2017), and event-study evidence by Yu et al. (2018) indicates positive stock market reactions around ESG disclosures. Finally, and crucially, the signaling perspective posits that transparent ESG reporting can enhance firm value by attracting socially conscious investors, and potentially lower their cost of capital (Dhaliwal et al. 2014; Xu et al., 2023). In an efficient market, substantive and credible signals that involves genuine integration of CSR principles into a firm's operations, strategy, governance, and daily decision-making, leading to measurable improvements in ESG outcomes (Perego & Kolk, 2012; Christensen et al., 2021), are quickly incorporated into asset prices, reflecting the reduced risk perception and increased attractiveness of these firms, influencing investment decisions and firm valuation.

Yet, a primary concern from an investor's perspective in firms voluntarily reporting on ESG matters is the variability in disclosure quality and consistency, which severely limits stakeholders' and particularly investors' ability to effectively compare ESG performance across firms and sectors (Christensen et al., 2021). This lack of comparability stems from the absence of a single, universally recognized reporting standard (Habek & Wolniak, 2015). For instance, firms may independently select different reporting time periods, indicators, formats, and metrics (Eccles & Krzus, 2010). Additionally, because standalone CSR reports were subject to minimal regulatory guidance and oversight (Chen et al. 2016), this lack of enforcement mechanisms can allow firms substantial discretion over what information is disclosed, leading to selective reporting practices and challenges regarding transparency and accountability (Marquis et al., 2016). This selective disclosure directly leads to the risk of "greenwashing" which occurs when firms emphasize favorable ESG practices while downplaying or omitting negative impacts (Boiral et al., 2017). Such "cherry-picking" of information creates significant informational asymmetries, making it difficult for investors to discern genuine sustainability performance from mere symbolic gestures. This practice is entirely consistent with decoupling (Meyer & Rowan, 1977) which describe how public statements can be adopted for legitimacy while being disconnected from actual organizational practices. In other words, "greenwashing" occurs when a firm publicly communicates CSR, primarily to enhance legitimacy or reputation, without fundamentally altering underlying business practices (Bromley & Powell, 2012). It could even lead to increased compliance costs, bureaucratic burdens, and only superficial engagement (Grewal et al., 2019), highlighting that the costs of CSR implementation and reporting may outweigh perceived financial benefits, at least in the short term (Barnett & Salomon, 2012). From an EMH perspective, this implies the market might be processing signals that are symbolic rather than substantive, hindering accurate valuation based on true ESG performance.

2.2 | The shift to mandatory ESG reporting

Over time, voluntary ESG reporting often prompts discussions about the necessity and effectiveness of regulatory intervention to ensure robust and comparable corporate sustainability reporting practices (Ioannou & Serafeim, 2019). Ilhan et al. (2023) point out that investors frequently complain that the availability and quality of firm-level ESG disclosures are insufficient for making informed investment decisions. In response to the gap between stakeholder demand for ESG reporting and the information supplied by firms, several countries

and regions have introduced mandatory sustainability disclosure regulations to compel firms to deliver high-quality ESG communication, either alongside traditional financial disclosures or in specialized standalone reports (Krueger et al., 2024). The EU has led this shift from voluntary to mandatory corporate sustainability reporting requirements. On April 21, 2021, the EU published its draft for a new directive on sustainability reporting: The CSRD which transformed sustainability reporting in Europe from a ‘nice to have’ to a mandatory requirement, making it compulsory for firms in the EU to report on the impact of corporate activities on the environment and society, as well as how these impacts influence the financial position of the firm (GRI, n.d.). The CSRD “extends reporting requirements to a broader spectrum of firms, aiming to enhance data quality to match financial data standards, standardize sustainability disclosures for transparency, and increase the accountability of the board of directors by providing investors and stakeholders with insights into firms’ social, environmental and governance impacts” (EY, 2025). Preliminary research by Christensen et al. (2021) suggests that mandatory corporate sustainability reporting could yield significant capital market benefits.

On the one hand, theoretically, mandatory corporate sustainability reporting could change the previously explored voluntary CSR-firm performance relationship because the mandatory nature reduces information asymmetry, lowers the cost of capital, increases investor confidence, and lowers perceived risks, potentially strengthening firm performance (Christensen et al., 2021), potentially leveling the playing field between insiders and investors, leading to more efficient markets (Alves et al., 2015). Investors gain access to comparable data that was previously private or inconsistently reported, which improves the information environment and can boost market confidence when substantive CSR performance is reported (Christensen et al., 2021; Krueger et al., 2024), via mandated corporate sustainability reporting requirements.

On the other hand, regulating reporting practices does not always enhance the communication process or the quality of disclosed information, and while it may raise minimum standards, it can initially impose front-loaded compliance costs on firms, leaving investors uncertain about the substantive quality of disclosures (Habek & Wolniak, 2015). Additionally, it hinges on the materiality of the reported content concerning ESG matters. In sustainability reporting, materiality acts as a filter to determine which non-financial information is significant for stakeholders; however, its interpretation remains ambiguous. This ambiguity has led to a division between "financial" materiality, aimed primarily at investors, and "impact" materiality,

focused on broader stakeholder groups (De Cristofaro & Gulluscio, 2023). This division is exemplified by one of the most notable changes made to the European sustainability reporting regime with the introduction of the new “double materiality” approach under the new CSRD (Baumüller & Sopp, 2021), which requires a dual perspective encompassing both “financial” materiality, how the firms’ activities impact society and the environment, and “impact materiality”, how sustainability issues affect the firm’s financial position. The dual approach mandates firms to consider impact materiality (inside-out), indicating that a matter is material from an impact perspective if the firm’s activities have a significant positive or negative effect on stakeholders, even if those effects do not (yet) reflect in financial results (Nielsen, 2023). Illustratively, Reimsbach et al. (2019) emphasize that materiality is not an inherent attribute of non-financial disclosures; rather, its relevance resides in the “eyes of the beholder,” defined by the interpretations and information needs of the users who assess it. Here, the “beholders” are equity investors, whose views are swiftly reflected in share prices (Fama, 1991).

2.3 | Key factors driving heterogeneous firm reactions to mandatory ESG reporting

Drawing on signaling theory, the announcement of mandatory sustainability-reporting requirements typically prompts an immediate share-price reaction as investors rationally revise expectations to reflect both the benefits of these disclosures versus the possibility of generating additional compliance costs they impose (Grewal et al., 2019). Investors utilize firm signals to assess how new regulations might affect firm value (Spence, 1973). This market response is characterized by significant heterogeneity, influenced by several firm-specific factors. First, a prominent signal is the industry's ESG exposure, where sector-specific expectations and legitimacy pressures mean highly visible or environmentally sensitive industries face increased scrutiny from investors and may amplify the impact of for example greenwashing (Torelli et al., 2019). In sensitive sectors, ESG reporting acts as a potent signal of genuine corporate citizenship, distinguishing firms from those engaged in mere “greenwashing” (Torelli et al., 2019). Similarly, Mahoney et al. (2013) show that only firms with genuinely stronger CSR performance produce standalone CSR reports, while weaker firms tend to remain silent; this selective self-reporting creates an information gap whereby stakeholders observe only “best” practices and lack visibility into underperformers or greenwashers (Mahoney et al., 2012). Fiechter et al. (2022) show that high exposure firms ramp up CSR activities after the directive and moreover, industry ESG exposure signals both the materiality of mandated metrics and the intensity of stakeholder scrutiny: membership in carbon-intensive or highly visible sectors

implies that CSRD disclosures will be more decision-useful and that reputational stakes are higher, thereby amplifying the perceived upside of credible reporting (DiMaggio & Powell, 1983; Bansal & Clelland, 2004). In these same environmentally sensitive industries, legitimacy pressures are further magnified by industry bodies circulating “best-practice” templates to their members, driving firms to converge on similar ESG structures and practices in order to reduce the likelihood of adverse environmental incidents (Bansal & Clelland, 2004).

Second, firms under double materiality are compelled to invest more extensively in ESG factors that may not deliver immediate financial benefits, potentially increasing short-term compliance and implementation costs, but enhancing stakeholder trust, reputation, or legitimacy over time (Ioannou & Serafeim, 2019). Such rising reporting costs and expenses associated with addressing previously ignored external impacts might adversely affect short-term firm performance (Christensen et al., 2021). Firm size acts as a costly signal of resource slack and dynamic capabilities (Barney, 1991). Large balance sheets indicate that fixed reporting and assurance costs can be absorbed and that data systems are already in place, diminishing expected cash-flow drag and alleviating negative price pressure (Kılıç et al., 2022). Relatively smaller firms may encounter resource constraints that impede their capacity to comply effectively with reporting requirements, as demonstrated by Kılıç et al. (2022), who show that firm size moderates the relationship between sustainability performance and financial outcomes, with larger firms typically exhibiting stronger positive associations (Kılıç et al., 2022).

Lastly, ESG governance strength, particularly through internal structures like sustainability committees and executive compensation linked to CSR targets (Berrone & Gómez-Mejía, 2009), reflects a firm's ability to commit to sustainability through substantive, rather than merely symbolic, compliance, which investors perceive as a critical signal of genuine engagement (Eberhardt-Toth, 2017). Investors increasingly scrutinize whether a firm's "green talk" (symbolic actions, such as emphasizing nonmaterial ESG factors) is genuinely supported by "green walk" (substantive actions like pollution prevention or environmental innovation) (Berrone & Gómez-Mejía, 2009). Effective sustainability committees enhance integrated reporting quality and play a role in mitigating ESG controversies, thereby bolstering a firm's legitimacy and reputation (Al-Shaer & Zaman, 2018; Qaderi et al., 2022)

3 | HYPOTHESIS DEVELOPMENT

First, as explained in the theoretical background, in an efficient market (Fama, 1991), the European Commission's announcement of the CSRD is reflected in share prices almost instantaneously. What the EMH does not predict is the direction of that revaluation. Here, signaling theory (Spence, 1973) and legitimacy theory (Suchman, 1995) clarify why investors may view the same mandate as value-creating for some firms or value-destroying for others. Second, the CSRD operates as a public, yet noisy, signal: it notifies investors that all covered firms must disclose double-materiality sustainability metrics and obtain external assurance, but it gives no indication of whether any particular firm will convert the mandate into substantive, value-enhancing ESG practices or simply absorb the front-loaded fixed costs of symbolic compliance (Habek & Wolniak, 2015). Third, while the long-run benefits of improved information quality and legitimacy may eventually outweigh those costs (Christensen et al., 2021), investors cannot observe ex ante whether a given firm will achieve substantive integration or opt for symbolic compliance. In this high-uncertainty setting, initial market expectations skew toward the cost side of the ledger. Therefore, this paper hypothesizes that,

H₁: *The announcement of mandated corporate sustainability reporting requirements has a negative effect on firms' stock-price performance.*

However, investors cannot observe in advance whether a particular firm will transform the mandate into value-creating sustainability practices or merely incur compliance costs, they rely on firm-level signals to interpret the news. Three such signals are especially salient with industry-level ESG exposure as the most prominent one. First, industry ESG exposure acts as a prominent legitimacy signal: in environmentally sensitive or high-visibility sectors, stakeholder and investor scrutiny are intensified, and ESG reporting becomes a key means of demonstrating genuine corporate citizenship and distancing oneself from "greenwashing" (Torelli et al., 2019; DiMaggio & Powell, 1983). Second, voluntary CSR disclosure is endogenous to true CSR performance, only firms with genuinely strong CSR track records issue standalone reports, while weaker performers remain silent, creating an information gap that underscores the importance and materiality of mandatory, standardized CSRD in these sectors (Mahoney et al., 2013). Third, signaling theory implies that credible, the announcement of standardized disclosure can differentiate firms that walk the talk from those that merely "greenwash," thereby increasing the expected informational benefit of CSRD compliance (Mahoney et al., 2013). Therefore, this paper hypothesizes that,

H₂: *The relationship between the announcement of mandated corporate sustainability reporting and a firm's stock-price performance is positively moderated by ESG-exposure of the firm's industry.*

While sector-level legitimacy pressures set the stage, investors next turn to a firm's resource base to judge whether the fixed costs of CSRD compliance can be readily absorbed. First, size proxies for slack financial and organizational resources (Barney, 1991) and thus for the ability to fund the data systems, assurance engagements and cross-functional coordination that the CSRD requires (Kılıç et al., 2022). Second, by shouldering these front-loaded fixed costs, large firms reveal that they can move beyond box-ticking and internalize the broader ESG investments implied by the directive's double-materiality principle (Ioannou & Serafeim, 2019; Christensen et al., 2021). Third, because such outlays are prohibitively expensive for weaker firms to imitate, firm size functions as a costly, credibility-enhancing signal: investors interpret it as evidence that the issuer will deliver substantive, decision-useful disclosures rather than symbolic compliance. Therefore, this paper hypothesizes that;

H₃: *The relationship between the announcement of mandated corporate sustainability reporting requirements and a firm's stock-price performance is negatively moderated by the size of the firm.*

First, ESG governance strength provides investors with clear, observable evidence in for example of a firm's substantive commitment to sustainability, rather than mere symbolic rhetoric (Berrone & Gómez-Mejía, 2009; Eberhardt-Toth, 2017). Second, establishing and maintaining these governance mechanisms requires considerable investments in expertise, oversight processes, and incentive alignment, making them prohibitively costly for firms that seek only superficial legitimacy to replicate (Al-Shaer & Zaman, 2018; Qaderi et al., 2022). Third, signaling theory suggests that investors interpret such costly, transparent arrangements as credible "green walk" signals, distinguishing genuinely engaged firms from those engaging in "green talk," thereby lowering perceived greenwashing risk and enhancing the informational value of forthcoming standardized CSRD disclosures (Berrone & Gómez-Mejía, 2009; Eberhardt-Toth, 2017). Therefore, this paper hypothesizes that;

H₄: *The relationship between the announcement of mandated corporate sustainability reporting requirements and a firm's stock-price performance is negatively moderated by the internal ESG-governance practices.*

4 | METHODOLOGY

4.1 | Research context

This study examines the relationship between encompassing mandated corporate sustainability reporting requirements and firm performance as reflected by stock market valuations. Since the mandated corporate sustainability regulation requirements in the EU have not yet been enforced, direct observations of consumer and stakeholder responses are unavailable, making it infeasible to study actual behavioral changes (Grewal et al., 2019). The authors state that, however, examining equity market reactions offers an indirect yet insightful measure, reflecting investors' forward-looking expectations regarding the anticipated costs and benefits of the mandated corporate sustainability reporting requirements.

This study specifically focuses on publicly listed firms within the European Union that will all become subject to the CSRD disclosure requirements. Under the CSRD, all publicly traded firms, including SMEs listed on regulated markets, are required to disclose standardized sustainability information (Directive 2022/2464/EU).¹ Publicly listed firms provide a clear and measurable setting to investigate how mandated corporate sustainability disclosure affects firm performance measured by stock prices, as stock prices rapidly incorporate publicly available information, consistent with the EMH (Fama, 1991). As stated before, given that the CSRD of the EU represents an unprecedented act of supra-national disclosure regulation, affecting many firms across different industries with divergent characteristics (Fiechter et al., 2022), the European Union provides a unique setting for investigating how equity markets respond to widespread mandated corporate sustainability reporting, given its diverse population of listed firms, varying in industry, size, and ESG governance practices. The CSRD represents an ideal research context for examining this study's research question due to its extensive scale and broad applicability for approximately 50,000 firms across the European Union, significantly

¹ Although the CSRD was initially announced as extending mandatory sustainability reporting to all EU-listed firms, the subsequent Omnibus-package announced in February 2025 legislative package delayed its application for smaller issuers (European Parliament, n.d.). This adjustment in the implementation timeline does not undermine this study's analysis, however, because the event-study focuses on investor reactions to the formal legislative milestones presented the independent variables, which firmly signaled a binding directive and scope expansion. Even though the Omnibus delay shifts actual compliance dates, it does not alter the information content of the CSRD announcements themselves at that time, nor the market's immediate reassessment of firm value in light of the expected regulatory costs and benefits. Consequently, the research retains its relevance and validity despite the postponed roll-out for certain categories of listed companies.

expanding coverage beyond the roughly 11,000 firms previously subject to the NFRD (Social Economische Raad, n.d.). The diverse range of firm characteristics encompassed in the CSRD, such as industry, size, ESG governance structures, enables a robust analysis of how mandated corporate sustainability reporting influences firm performance. However, since equity market data are publicly available primarily for listed firms, the empirical analysis in this study is necessarily constrained to publicly traded companies in the EU. The research period covers five years from 2019 to 2023, which encompasses the entire evolution of the CSRD regulatory event. According to prior research (Baumüller & Sopp, 2021), these five years are strategically selected to capture key phases: Initial market anticipation (2019-2020), regulatory clarification and announcement (2021-2022), and firm-level preparation for compliance (2023). This approach ensures the timeline accurately reflects equity market reactions to these key regulatory events throughout the regulatory transition to mandated corporate sustainability reporting for all listed firms within the European Union.

4.2 | Sample and data collection

This study used various data sources to create the sample: first, Datastream's LSEG Workspace was used to retrieve the daily stock price and market return data for all publicly listed European firms. Datastream is a robust and widely recognized database for financial market data used extensively in empirical research (Yu et al., 2018; Christensen et al., 2021). Specifically, the stock data was retrieved over the period July 1, 2018, through December 31, 2023. Second, firm-level financials (ROA, Total Assets, Leverage, Interest Expense, Stock Liquidity) were retrieved from LSEG Workspace. Third, ISIN codes of the treatment firms were converted to ISO codes, and with these ISO codes, country-level financial and regulatory data were retrieved from the World Bank Group (GDP, Regulatory Quality, and Trade as % of GDP). Fourth, five ESG-related variables (ESG committee presence, the occurrence of regular internal CSR audits assessing ESG performance, the occurrence of external CSR sustainability audit, sustainability compensation incentives for senior executives, and ESG-score) were retrieved from the Refinitiv Eikon ESG database via LSEG Workspace for the full population of 2,493 firms listed on regulated stock exchanges across Europe as of 2023. Consistent with the regulatory scope of the CSRD, the focus was on firms incorporated within the 27 European Union (EU) member states. Therefore, firms domiciled in Switzerland, the United Kingdom, Iceland, Liechtenstein, Norway, Russia, and Türkiye were excluded as these countries fall outside the EU legislative framework and are not subject to the CSRD. ESG data from Croatia, Estonia, Latvia, and

Lithuania are missing in the Refinitiv Eikon database, and these countries were therefore not included in the sample selection. After applying this jurisdictional filter, 1,403 listed firms were left. Next, this study dropped firms with any missing (control) variable in the relevant year, in accordance with standard regression practice of using a listwise-complete sample when imputation is not performed to avoid distortions. After all merges, filters, and outlier screens, this research retained 596 unique ISINs, each contributing three event observations (1,788 total rows). After construction, this sample size allows for robust statistical analysis and sufficient coverage of the European listed firms' landscape impacted by CSRD. Table 1 presents the breakdown of the 596 firms by country, and Figure 1 shows a graphical representation of the distribution of EU-listed firms per country in the final sample, which clearly shows that the Western European firms have notably more publicly available (ESG) data.

TABLE 1 | Sample firms by country

Country	Count	% of Sample
Germany	112	18.8 %
France	95	15.9 %
Netherlands	80	13.4 %
Sweden	75	12.6 %
Italy	60	10.1 %
Spain	48	8.1 %
Finland	40	6.7 %
Belgium	36	6.0 %
Denmark	25	4.2 %
Austria	25	4.2 %
Total	596	100.0 %

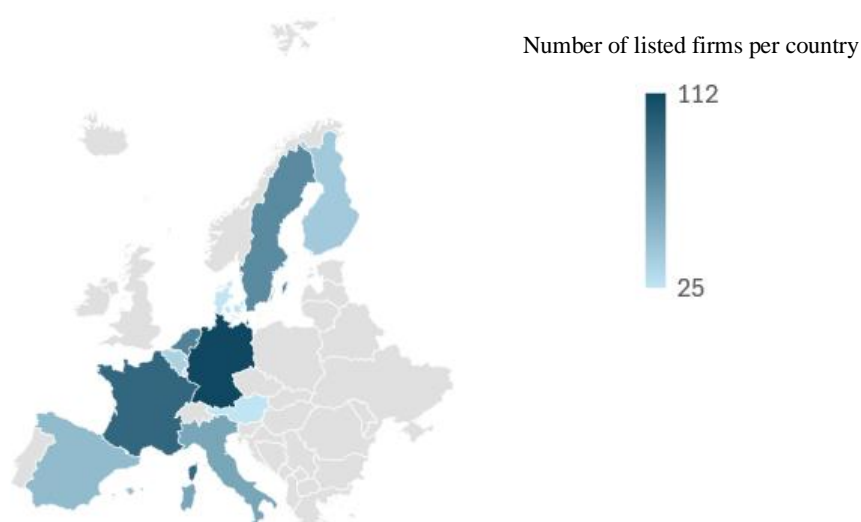


FIGURE 1 | Geographic distribution of EU-listed sample firms by member state

4.3 | Variables and measures

4.3.1 | Dependent variable

The theoretical concept of this study is firm performance, which will be measured through the market-based measure of CARs of the particular firm. As already mentioned, direct measures of real effect changes are unavailable, since the CSRD's reporting requirements have yet to take effect (Grewal et al., 2019). Consequently, equity market reactions provide a forward-looking proxy for investors' expectations of the costs and benefits of mandated sustainability reporting. Unlike accounting-based metrics (e.g. ROA or net income), market-based measures immediately reflect value-relevant information, are less prone to managerial manipulation, and avoid the delayed recognition inherent in financial statements (Fama, 1991; MacKinlay, 1997). For the calculation of CARs, adjusted stock prices and index returns are retrieved. Adjusted stock prices account for dividends, stock splits, and corporate actions, ensuring accurate reflection of firm valuation and investor reactions. Adjusted prices are essential for analyzing long-term financial performance and are a standard methodological choice in event studies and financial research (MacKinlay, 1997). Index returns corresponding to each firm's primary stock exchange (e.g., AEX for ASML listed in the Netherlands) will also be collected. This approach allows for controlling for market-wide movements and isolating firm-specific impacts from the CSRD policy shock. Subsequently, the CARs will be calculated as follows, as in Krüger's (2015) study; First, each firm's expected returns ($ER_{i,t}$) during the event period of each different event are calculated

$$ER_{i,t} = \alpha_i + \beta_i R_{M,t} + \varepsilon_{i,t},$$

where $ER_{i,t}$ is the expected return of firm i on day t during the event period, $R_{M,t}$ is the market, or index return on day t during the event period, α_i is the intercept, β_i is the systematic risk of stock i , and $\varepsilon_{i,t}$ is the daily risk-adjusted residual for firm i .

Second, $ER_{i,t}$ is used to calculate the abnormal returns during the event period

$$AR_{i,t} = R_{i,t} - ER_{i,t},$$

where $AR_{i,t}$ is the abnormal return of firm i on day t during the event period, $R_{i,t}$ is the actual return of firm i on day t during the event period. Then, abnormal returns $AR_{i,t}$ are used to calculate the subsequent CARs, these calculations will all be made in Stata and the do-file can be found in appendix A,

$$CAR_{i,t} = AR_{i,t1} + \dots + AR_{i,t2} = \sum_{t=t1}^{t2} AR_{i,t}.$$

4.3.2 | Independent variable

The independent variable of this study is the announcement of the mandated corporate sustainability reporting in the CSRD, operationalized as a regulatory "policy shock" (Grewal et al., 2019; Christensen et al., 2021). As stated above, a policy shock refers to a sudden, external regulatory event that changes firms' mandatory disclosure requirements, thereby significantly altering the information environment and corporate disclosure behaviors. It thus serves as an ideal independent variable to study the effects of mandatory corporate sustainability reporting requirements on firm performance. Seven key announcement dates were identified between 2019 and 2023 as having a major effect, using sources of the 'Legislative Train Schedule' (European Parliament, n.d.) and the Directive (Directive 2022/2464/EU) the European Parliament and European Commission (European Commission, n.d.) that are also cited in the table.

TABLE 2 | Identified events surrounding the announcement of CSRD

Event Date	Description
11 December 2019 Event #1	The European Commission announced its intention to review the NFRD and identified several shortcomings that need to be addressed (European Parliament, n.d.; Directive 2022/2464/EU, p 15)
17 December 2020 Event #2	The European Parliament set out its expectations and called for a legislative framework to include mandatory standards (Directive 2022/2464/EU, p 17)
21 April 2021 Event #3	The European Commission presented and proposed the directive to replace the NFRD (European Parliament, n.d.; European Commission, n.d.; Directive 2022/2464/EU, p 19)
24 February 2022 Event #4	The EU member states unanimously agreed on the Council's position on the directive proposal (European Parliament, n.d.)
21 June 2022 Event #5	The European Parliament and the Council reached a provisional agreement on the directive (European Parliament, n.d)
10 November 2022 Event #6	The European Parliament adopted the agreed text (European Parliament, n.d.)
28 November 2022 Event #7	The Council adopted the directive and gives green light to directive (European Parliament, n.d.)

Not all seven CSRD-related announcements carried the same informational weight. This study, therefore, concentrates on three core events (stated in bold), each introducing genuinely new regulatory commitments after textual analysis. First, on 11 December 2019, the European Commission's Communication on the European Green Deal announced a review of the 2014 Non-Financial Reporting Directive, explicitly citing persistent shortcomings and the calling of a new regulatory approach to non-financial reporting (European Parliament, n.d.; Directive 2022/2464/EU, p 15). This was the first time the Commission signaled a full NFRD overhaul, marking a clear agenda-setting moment. Second, on 21 April 2021, the Commission published its CSRD proposal, which for the first time laid out binding sustainability-reporting requirements for nearly 50,000 firms, mandated the double-materiality approach, and introduced limited third-party assurance of ESG information (European Parliament, n.d.; European Commission, n.d.; Directive 2022/2464/EU, p 19). Unlike prior political endorsements, this proposal provided the concrete legislative text and vastly expanded the scope of affected companies. Third, on 21 June 2022, Parliament and Council reached a provisional trilogue agreement that finalized the directive's content: definitive deadlines, SME phase-in arrangements, and assurance rules (European Parliament, n.d.). By focusing the event study on these three dates, the true changes in the regulatory environment external "information shocks" are believed to be captured best, consistent with event study methodology's emphasis on unanticipated regulatory news (MacKinlay, 1997).

4.3.3 | Moderator Variables

The binary variable *High_ESG_Industry* captures whether a firm operates in a sector characterised by elevated ESG risk, using a three-step procedure. First, industry-level ESG scores were calculated by averaging each firm's pre-event ESG Score within its primary SIC code (WC07021), both retrieved from Datastream, yielding a single "industry ESG score" that reflects the typical risk profile of that sector. Second, these industry scores were rank-ordered and split at the sample median: industries with mean ESG scores above the median were designated as "high-exposure," while those at or below the median were labelled "low-exposure." Third, each firm was assigned its industry's exposure status by merging the median-split indicator back onto the firm-level data via the WC07021 code (1 = high exposure, 0 = low exposure). This median-split method follows Bolton and Kacperczyk (2021) and analogous climate-finance studies that distinguish "brown" versus "green" sectors based on whether their industry-level ESG or carbon-intensity metrics exceed the cross-industry median. This yields the following classification.

TABLE 3 | Industry ESG Exposure Classification

Industry ESG Exposure	Count	% of Sample
High ESG Exposure	308	51.68 %
Low ESG Exposure	288	48.32 %

Note: $n = 596$

Firm Size (*Size*) is measured by the natural logarithm of Total Assets of the firm, to reduce right-skew, and allow interpretation of size effects (and its interaction) in percentage terms in line with previous research by Fiechter et al. (2022). Total assets capture the full stock of resources under management, both tangible and intangible, making it a comprehensive indicator of firm scale. The variable is directly sourced from Datastream.

The strength of existing internal ESG Governance Practices (*ESG Strength*) will be measured as a count variable based on firm-specific CSR governance and operational indicators. The components include the presence of a Sustainability Committee at the board level (1 = Yes, 0 = No) the occurrence of regular internal CSR audits assessing ESG performance (1 = Yes, 0 = No) and the occurrence of external CSR sustainability audit of its CSR/sustainability report (1 = Yes, 0 = No) and the Sustainability Compensation Incentives link of compensation of senior executives to CSR/sustainability targets (1 = Yes, 0 = No). ESG governance strength is thus measured as a formative index (Diamantopoulos & Winklhofer, 2001) that sums four binary governance practices, because each captures a distinct dimension of credible ESG oversight. Aggregating these practices into a single count variable thus yields a multidimensional proxy for overall ESG governance strength.

$$\text{ESGStrength}_i = \sum_{j=1}^4 x_{ij}, \quad x_{ij} \in \{0, 1\}$$

where the four x_{ij} are:

1. COM = Presence of Sustainability Committee
2. REP = Regular Internal CSR Audit
3. EXTCSR = External Assurance on ESG
4. CSRCOMP = Exec-Compensation Linked to CSR targets

4.3.4 | Control variables

This study controls for a comprehensive set of firm-level and country-level characteristics to isolate the effect of mandated sustainability-reporting announcements on stock-price performance. At the firm level, first, Return on Assets (*ROA*) is defined as net income divided by total assets, measuring a firm's profitability and directly retrieved from LSEG Workspace's Datastream database. Prior research often includes *ROA* to account for the notion that better-performing firms may be more resilient in the face of regulatory changes (Krueger et al., 2024; Kim, 2024), and thus this study controls for *ROA* to separate the impact of ESG-disclosure news from underlying financial performance. Furthermore, financial risk and solvency are addressed through two related measures. Namely, Leverage (*Leverage*) and Interest Expenses (*Interest Expense*). Leverage is measured as the ratio of total debt to total assets (from Datastream), capturing the firm's capital structure and financial risk, also used in Krueger et al. (2024) research as control variable. Interest Expenses, measured as total interest payments in the year (scaled by assets) from Datastream is also included, to proxy for the firm's debt servicing burden and cost of debt. These controls account for financial risk and solvency, which are important because highly leveraged or interest-burdened firms might react differently to new ESG disclosure mandates. In previous research, Kim (2024) includes a leverage control in the CAR regression for the climate disclosure event, and Lins et al. (2017) similarly control for leverage when examining CSR-related stock performance. Also, market liquidity is controlled for via Stock Trading Liquidity (*Stock Liquidity*). Liquidity is measured as the average daily trading volume divided by shares outstanding (share turnover) over the year before the event, obtained from Datastream. This captures how easily investors can trade the stock. In the context of disclosure events, Christensen et al. (2021) note that market liquidity is an important outcome of transparency initiatives, and it can also moderate the immediate price impact of news. Including a liquidity measure is consistent with prior event-study research to ensure that differences in CARs are not simply due to liquidity frictions (Ioannou & Serafeim, 2017; Grewal et al. 2020). Finally, for the firm-level controls, pre-event ESG performance (*ESG Score*) is measured using the Bloomberg ESG Disclosure Score (0–100) from Refinitiv Asset4 extracted via LSEG Workspace. This composite score reflects the breadth and quality of a firm's voluntary ESG disclosures prior to the announcement. Christensen et al. (2021) find that the positive market effects of mandatory sustainability reporting are muted for firms that had already adopted high-quality ESG disclosures, showing the need to control for baseline ESG standing in CAR regressions. At the country level, economic and institutional contexts are

accounted for through three macroeconomic indicators drawn from the World Bank's databases. First, economic development is proxied by GDP (*GDP*) (constant USD). Ioannou and Serafeim (2017) document that national income levels influence the efficacy of sustainability reporting policies. Second, regulatory quality (*Regulatory Quality*), measured by the World Bank's Worldwide Governance Indicators, captures the strength of institutional frameworks, including regulatory effectiveness and rule of law, which can shape investor confidence in disclosure regimes. Third, trade openness, Trade (as % of GDP), proxies a country's integration into the global economy.

All continuous controls exhibiting pronounced right-skew, namely Interest Expense, Stock Liquidity, GDP, Trade (as % of GDP) were transformed using the natural logarithm to reduce skewness, mitigate heteroskedasticity, and allow their coefficients to be interpreted as approximate percentage-change effects. This log-transformation ensures a more symmetric distribution for these variables and improves the reliability of the OLS estimates.

4.4 | Estimation procedure and empirical model

To examine how the announcement of mandatory sustainability reporting under the CSRD affects firms' stock price performance, this study adopts a quantitative, event study methodology, examining stock market reactions (captured through cumulative abnormal returns, CARs) around key regulatory announcements related to the CSRD from 2019 to 2023. Furthermore, the quantitative approach allows for statistically valid comparisons across firms and event windows, and supports the inclusion of moderating firm characteristics, such as Industry ESG Exposure, Size, and ESG Strength, that may influence the direction or magnitude of the observed stock price responses. The CSRD's multi-year rollout involved a sequence of public announcements, each building on the information revealed by its predecessors. Following Grewal et al. (2019), this study therefore aggregates cumulative abnormal returns across all three event dates rather than analyzing each announcement in isolation. By summing abnormal returns across events, idiosyncratic noise from any single date is attenuated, and the progressive incorporation of information, where investors interpret later announcements in light of earlier ones, is more accurately captured.

For the event study with CAR as the dependent variable, the event date, event window, and estimation window are determined beforehand. As mentioned above, key announcement dates for introducing mandated corporate sustainability reporting requirements were identified beforehand and can be found in Table 1. The event dates represent the date of the announcements. The announcement day is labelled as ($t=0$). The event window encompasses the time surrounding the event, and this study follows previous research by selecting the event window consisting of 11 days, from $t-5$ to $t+5$ days Krüger et al. (2015). Also, to capture both the immediate and more gradual market reactions, this study examines the 5-day window $CAR(-2,+2)$ as in Grewal et al. (2019) and the 3-day window $CAR(-1,1)$, covering two trading days on either side of $t=0$ as in work by Flammer (2013).

Earlier research by Krüger et al. (2015) used estimation periods of 250 trading days ending 50 days before the event date ($-250, -50$), and this study will follow up on that approach. The schematic diagram and the variables used for this event study are as follows;

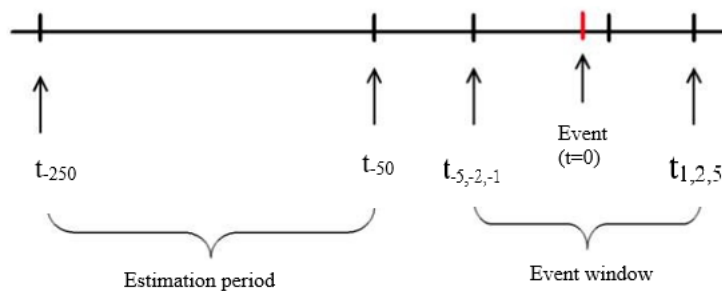


FIGURE 2 | Schematic diagram of this study's event study

The full model, including controls, of this study is the following;

$$CAR = \beta_0 + \beta_1 ROA + \beta_2 Leverage + \beta_3 Interest\ Expense + \beta_4 Stock\ Liquidity + \beta_5 Regulatory\ Quality + \beta_6 GDP + \beta_7 Trade\ (as\ \% \ of\ GDP) + \beta_8 ESG\ Score + \beta_9 High_ESG_Industry + \beta_{10} Size + \beta_{11} ESG\ Strength + \varepsilon.$$

Note: All continuous variables (ROA, LEV, Size, etc.) were mean-centered prior to estimation, and observations are indexed by firm (i), which are omitted here for clarity.

4.5 | Research ethics

This study uses only publicly available, aggregated data from LSEG Workspace (Refinitiv Eikon), the World Bank and SIC codes via Thomson Reuters Worldscope. Because these datasets contain no information on identified or identifiable individuals, they fall outside the scope of the EU GDPR as implemented in the Netherlands by the AVG. No personal data are processed, so neither informed consent nor formal ethical approval is required. All data handling still follows GDPR principles (lawfulness, transparency, data minimization) as well as Radboud University's Research Data Management Guidelines, ensuring academic integrity.

5 | RESULTS

5.1 | Descriptive statistics

This section presents the descriptive statistics. Table 4 reports the mean, standard deviation, minimum, maximum, and quartile values for all continuous variables, including the three aggregated CARs, over the different event windows, firm controls (ROA, Leverage, Interest Expense, Stock Liquidity, Regulatory Quality, GDP, Trade (as % of GDP), and ESG Score), and moderators (High_ESG_Industry, Size, ESG Strength). Variables that exhibited skewness (Interest Expense, Stock Liquidity, GDP, Trade (as % of GDP), and Size) underwent natural-log transformation prior to analysis, as mentioned in the Variables section.

The three CAR measures have means close to zero (−0.45 to −0.55) but exhibit substantial dispersion, indicating heterogeneity in market reactions. Moderators immediately follow: around 51.7% of firms are in high-exposure industries; firm size ($\ln(\text{Size})$) averages 16.23 (SD = 1.89); and internal ESG governance strength averages 2.61 (SD = 0.64). The control variables show typical cross-sectional variation in profitability (mean ROA = 5.49%, SD = 16.88%), leverage (mean = 45.14%, SD = 28.26%), and country-level factors.

TABLE 4 | Descriptive statistics

Variable	Mean	SD	Min	Median	Max
CAR (−5,+5)	−0.518	9.053	−109.20	−0.320	49.012
CAR (−2,+2)	−0.545	8.137	−104.26	−0.383	36.048
CAR (−1,+1)	−0.452	5.685	−55.29	−0.529	22.675
High_ESG_Industry ^a	0.517	0.500	0	1	1
Size ^b	16.230	1.888	11.735	16.074	23.724
ESG Strength	2.612	0.637	0	3	3
ROA	5.490	16.876	−47.830	4.165	358.880
Leverage	45.136	28.260	−22.660	44.135	495.410
Interest Expense ^b	0.792	0.821	−3.912	0.857	6.705
Stock Liquidity ^b	3.194	0.277	2.391	3.196	4.204
Regulatory Quality	1.265	0.434	0.407	1.283	1.843
GDP ^b	27.866	0.937	25.126	28.000	29.057
Trade (as % of GDP) ^b	22.991	0.293	22.698	22.910	24.383
ESG Score	63.376	16.151	17.650	65.190	95.270

Note: $n = 596$, ^aDummy, ^bLogarithmic value

To avoid artificial multicollinearity between main effects and interaction terms, all continuous predictors (ROA, Leverage, Interest Expense, Stock Liquidity, Regulatory Quality, GDP, Trade a (as % of GDP), ESG Score, Size, and ESG Strength) were mean-centered prior to analysis.

5.2 | Pearson correlations

Pearson correlations among the same set of variables show that the three CAR windows are positively correlated (0.588–0.863), while ROA is negatively correlated with CAR(−5,+5) and CAR(−2,+2) (−0.46, −0.47). Moderators (Size, ESG Strength) exhibit small negative correlations with CARs (≈ -0.07 to -0.10), indicating potential moderating effects worth testing in subsequent regressions.

TABLE 5 | Pearson correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
CAR (5,5)	1.000													
CAR (2,2)	0.863	1.000												
CAR (1,1)	0.588	0.720	1.000											
High_ESG_Industry	-0.071	-0.089	-0.055	1.000										
Size	-0.074	-0.096	-0.008	0.357	1.000									
ESG Strength	-0.076	-0.070	-0.106	0.192	0.127	1.000								
ROA	-0.463	-0.472	-0.060	0.049	-0.026	-0.054	1.000							
Leverage	0.014	-0.054	-0.045	0.122	0.141	0.140	-0.150	1.000						
Interest Expense	-0.048	0.009	-0.031	-0.106	-0.200	-0.134	0.061	-0.131	1.000					
Stock Liquidity	0.016	-0.031	0.069	-0.043	-0.249	-0.082	0.052	0.100	0.165	1.000				
Regulatory Quality	0.015	0.041	0.037	-0.116	0.097	-0.014	0.056	-0.169	0.150	0.019	1.000			
GDP	-0.007	0.025	-0.049	0.033	-0.136	0.217	-0.066	0.058	-0.025	0.010	-0.181	1.000		
Trade (as % GDP)	-0.039	-0.061	-0.026	-0.034	0.143	-0.112	0.036	-0.103	0.103	-0.008	0.446	-0.595	1.000	
ESG Score	-0.126	-0.113	-0.109	0.497	0.486	0.401	-0.018	0.109	-0.093	-0.177	-0.038	0.084	-0.054	1.000

Note: n = 596, bold indicates significance at 5%

5.3 | Regression models

Prior to multivariate regressions, Table 6 (Univariate CAR Test) presents the one-sample t-test for the aggregated different event-windows tested separately. None of the three aggregated CAR windows exhibits a statistically significant mean different from zero at the conventional 5% level. The 3-day window approaches marginal significance ($t=-1.94$, $p=.053$), suggesting a weak immediate market reaction, but the 5-day and 11-day tests remain non-significant. These findings underscore the need for multivariate cross-sectional regressions, where firm

characteristics and moderators may explain heterogeneity in abnormal returns, rather than relying on univariate tests alone.

TABLE 6 | Univariate CAR Tests

Variable	Mean	Std Dev	Std Err	t-Statistic	p-Value
CAR (-5,+5)	-0.5178	9.0534	0.3708	-1.396	.163
CAR (-2,+2)	-0.5445	8.1368	0.3333	-1.634	.103
CAR (-1,+1)	-0.4519	5.6852	0.2329	-1.941	.053*
Control variables					
ROA	0.0834	0.0552			
Leverage	0.4561	0.2153			
Interest Expense	2.3456	1.1234			
Stock Liquidity	1.9872	0.8745			
Regulatory Quality	0.8125	0.1543			
GDP	13.4820	0.2105			
Trade (as % of GDP)	5.6789	0.4567			
ESG Score	45.1230	15.2340			

Note: $n = 596$, significance levels: $*p < .10$; $**p < .05$; $***p < .01$.

This study then turns to a series of cross-sectional OLS regressions, one for each aggregation window, to isolate how firm-level characteristics relate to the strength of the stock-price reaction around our transition announcements. The results are shown in table 7. Specifically, the 11-day aggregated CAR (-5,+5), the 5-day aggregated CAR (-2,+2), and the 3-day aggregated CAR (-1,+1) are each regressed on the same set of pre-event controls measured at fiscal-year-end 2021 (ROA, Leverage, Interest Expense, Stock Liquidity, Regulatory Quality, GDP, Trade (as % of GDP)). Robust (White) standard errors are used throughout to correct for heteroskedasticity and are reported in parentheses, following the methodological convention MacKinlay (1997).

In all three windows, a higher ROA is associated with significantly less negative abnormal returns (e.g., $b = -0.246$, $p < .001$ in the 5-day model), suggesting that more profitable firms absorb CSRD compliance costs more easily. Leverage is also significantly negative in the 5-day window ($b = -0.032$, $p < .001$), indicating that indebted firms incur larger negative reactions. Regulatory Quality (RQ) exhibits a positive effect in the 5-day window ($b = 2.059$, $p < .05$), implying that stronger institutions attenuate the market's cost concerns. The Trade

(as % of GDP) ratio is negatively related across all windows, and firm ESG score yields a robust negative coefficient (e.g., 11-day: $b=-0.074$, $p<.01$), indicating that firms with higher ESG performance experience smaller negative adjustments. The baseline models explain between 3.7% (3-day) and 27.4% (5-day) of cross-sectional variation in aggregated CARs, underscoring the importance of these firm and country characteristics even before introducing moderators.

TABLE 7 | Baseline Cross-Sectional OLS Results

Predictor	CAR (-5,+5)		CAR (-2,+2)		CAR (-1,+1)	
	b	SE	b	SE	b	SE
Intercept	98.927*	(39.283)	111.446**	(36.800)	73.395*	(29.942)
ROA	-0.262***	(0.044)	-0.246***	(0.044)	-0.026**	(0.009)
Leverage	-0.016	(0.011)	-0.032***	(0.008)	-0.012	(0.007)
Interest Expense	-0.473	(0.451)	0.161	(0.387)	-0.391	(0.259)
Stock Liquidity	0.934	(1.824)	-0.520	(2.187)	1.429	(1.771)
Regulatory Quality	1.789†	(0.926)	2.059*	(0.958)	1.144	(0.793)
GDP	-0.814†	(0.455)	-0.539	(0.479)	-0.684†	(0.393)
Trade (as % Of GDP)	-3.256*	(1.342)	-3.977**	(1.274)	-2.512*	(1.047)
ESG Score	-0.074**	(0.023)	-0.061**	(0.022)	-0.034†	(0.018)
R²	0.254		0.274		0.037	

Note: $n = 596$, significance levels: † $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$

The primary cross-sectional Ordinary Least Squares (OLS) analysis was conducted for the 3-day event window (-1,+1), as this period demonstrated the strongest baseline effects and the highest R². Consistent with established econometric practices, continuous predictors were centered prior to analysis, and robust (White) standard errors were employed to address heteroskedasticity (Kothari & Warner, 2007). Within this framework, five models are estimated, incorporating all control variables, moderators High_ESG_Industry, Size, ESG Strength, and both interaction terms as predictors. Table 8 shows the results.

TABLE 8 | Cross-Sectional OLS Results (3-Day Window)

Predictor	Control Model	Model 1	Model 2	Model 3	Full Model
Intercept	-0.497* (0.232)	-0.569 (0.369)	-0.509* (0.233)	-0.494* (0.232)	-0.510 (0.373)
ROA	-0.026** (0.009)	-0.027** (0.009)	-0.027** (0.010)	-0.027** (0.009)	-0.028** (0.009)
Leverage	-0.011† (0.007)	-0.012† (0.007)	-0.014† (0.007)	-0.010 (0.007)	-0.013† (0.007)
Interest Expense	-0.391 (0.259)	-0.386 (0.258)	-0.330 (0.257)	-0.440† (0.261)	-0.378 (0.257)
Stock Liquidity	1.429 (1.771)	1.418 (1.773)	1.653 (1.850)	1.417 (1.772)	1.624 (1.852)
Regulatory Quality	1.144 (0.793)	1.162 (0.793)	1.083 (0.834)	1.174 (0.764)	1.088 (0.799)
GDP	-0.684† (0.393)	-0.684† (0.393)	-0.630† (0.390)	-0.605† (0.379)	-0.563† (0.379)
Trade (as % of GDP)	-2.512* (1.047)	-2.525* (1.048)	-2.679** (1.032)	-2.458* (1.036)	-2.602* (1.021)
ESG Score	-0.034† (0.018)	-0.036 (0.021)	-0.045* (0.020)	-0.027 (0.023)	-0.039† (0.023)
High_ESG_Industry (H ₂)		0.148 (0.546)			0.140 (0.555)
Size (H ₃)			0.115 (0.159)		0.123 (0.160)
ESG_Strength (H ₄)				-0.409 (0.450)	-0.415 (0.452)
R ²	0.037	0.037	0.041	0.042	0.044

Note: $n = 596$, significance levels: † $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

Model 1 (H₂) incorporates the industry ESG-exposure dummy (High_ESG_Industry) alongside the baseline controls. The estimated coefficient on High_ESG_Industry is positive ($b = 0.148$) but fails to attain statistical significance ($p = .546$). Consequently, H₂ is not supported in the immediate $(-1,+1)$ window. The second specification, Model 2 (H₃), tests the firm size term (Size). The coefficient is positive ($b = 0.115$) but non-significant ($p = .159$), indicating the absence of any systematic size-based moderation of CARs.. Thus, H₃ is also rejected. Model 3 (H₄) focuses on internal ESG governance strength (ESG Strength). The ESG Strength interaction is estimated negatively ($b = -0.409$) yet remains statistically indistinguishable from zero ($p = .450$). Accordingly, H₄ is not supported. The full specification simultaneously includes both interaction terms along with all baseline controls. Neither High_ESG_Industry, Size, and ESG Strength attains significance in this comprehensive model, and only core controls and standard firm- and country-level controls (ROA, Trade (as % of GDP)) continue to significantly predict CARs at $p < .01$. Across all moderation tests for the three-day window, no evidence emerges that high industry ESG exposure, firm size, or internal ESG strength significantly moderates the immediate stock-price reaction to the CSRD announcements. These results suggest that, in the short run, cross-sectional heterogeneity in abnormal returns is driven primarily by fundamental financial health ROA and trade (as a % of GDP) rather than by differentiated industry or ESG governance signals.

5.4 | Robustness check

In an additional robustness check, the 3-day aggregated CAR was winsorized at the 1st and 99th percentiles to limit the influence of extreme returns. None of the interaction terms retains statistical significance after winsorization. These results confirm that null results' failure to support H₂–H₄ in the 3-day event window is not driven by a small number of outlier observations.

TABLE 9 | Winsorized 3-Day Window Interaction Effects

Model	Moderator	b	SE	p-Value
1	High_ESG_Industry (H ₂)	0.148	0.546	0.786
2	Size (H ₃)	0.115	0.159	0.470
3	ESG Strength (H ₄)	-0.409	0.450	0.363

*Note: Each model includes baseline controls (ROA, Leverage, Interest Expense, Stock Liquidity, Regulatory Quality, GDP, Trade (as % of GDP), and ESG Score); robust SEs in parentheses; significance levels * $p < .05$; ** $p < .01$.*

Following Grewal et al. (2019), as a robustness check, this study excludes firms from any country-code group (first two characters of the ISIN) with more than 50 observations (US in the case of Grewal et al.), then re-estimates the same three models on this reduced sample. The sample size falls from 580 to 428 firms. The interactions remain non-significant, indicating the null moderation results are robust to country-level clustering.

TABLE 10 | Split-Sample Direct Effects by Country Concentration

Model	Moderator	b	SE	p-Value
1	High_ESG_Industry (H ₂)	0.460	0.797	0.564
2	Size (H ₃)	0.286	0.164	0.777
3	ESG_Strength (H ₄)	-0.897	0.663	0.176

*Note: Each model includes baseline controls (ROA, Leverage, Interest Expense, Stock Liquidity, Regulatory Quality, GDP, Trade (as % of GDP), and ESG Score); robust SEs in parentheses; significance levels *p<.05; *p<.01.*

As a further check, the CARs are replaced with two standard firm-value proxies: log market value and log revenue (fiscal end year 2021), merged by ISIN. Model 1–3 are re-estimated, controlling for ROA, Leverage, Interest Expense, Stock Liquidity, Regulatory Quality, GDP, Trade (as % of GDP), and ESG Score. The sample drops to 560 after merging and no focal term reaches significance, demonstrating that the three moderators remain non-significant, indicating the direct effects do not generalize to these broader firm-value measures.

TABLE 11 | Alternative DV Regressions

DV	Model	Moderator	b	SE	p-Value
ln(Market Value)	1	High_ESG_Industry (H ₂)	0.042	0.058	0.468
	2	Size (H ₃)	0.015	0.159	0.470
	3	ESG Strength (H ₄)	-0.409	0.450	0.363
ln(Revenue)	1	High_ESG_Industry (H ₂)	0.031	0.052	0.552
	2	Size (H ₃)	0.115	0.158	0.470
	3	ESG_Strength (H ₄)	-0.409	0.450	0.363

*Note: Each model includes baseline controls (ROA, Leverage, Interest Expense, Stock Liquidity, Regulatory Quality, GDP, Trade (as % of GDP), and ESG Score); robust SEs in parentheses; significance levels *p<.05; *p<.01.*

6 | DISCUSSION

6.1 | Summary

This study examined how the announcement of the EU's CSRD influenced stock price reactions and how these effects vary systematically across high and low ESG exposure, firm sizes, and internal ESG governance strength. Overall, key CSRD announcements averaged slightly negative CARs but did not differ significantly from zero in univariate tests for affected firms, suggesting only a muted market reaction. However, the three-day CAR was slightly negative (-0.45%) and marginally significant ($p = .053$), which indicates that investors, on balance, factored in net compliance costs and/or heightened disclosure risks in the short term. In the full cross-sectional regressions, none of the hypothesized moderators (High ESG Exposure industry, firm size, or internal ESG Strength) significantly influenced immediate cumulative abnormal returns. Instead, traditional predictors of financial resilience and market context drove the variation: higher ROA consistently attenuated negative CARs ($b \approx -0.026$, $p < .01$), suggesting that more profitable firms with likely stronger cashflows and financial buffers, are better able to handle the anticipated compliance costs 'in the eyes of the beholder'. Also, greater trade openness (Trade as % of GDP) was associated with more pronounced negative reactions ($b \approx -2.458$, $p < .05$), suggesting that firms in highly open economies likely face greater international exposure and therefore also supply-chain complexities that heighten the perceived cost of compliance with the CSRD. However, this marginal finding did not hold in the full sample. Overall, investors clearly expected some burden from the CSRD, evidenced by the slightly negative average CAR, but they did not punish or reward firms differently based on their industry's ESG risk exposure, their size, or their existing ESG governance structures in the immediate aftermath. In other words, when the directive became "news," the market fell back on hard, familiar metrics, rather than on ESG-related signals whose value remains untested until actual reports are filed.

6.2 | Theoretical Implications

This study extends current literature by focusing on the context of CSRD, which significantly expands the scope of corporate mandatory sustainability reporting, in combination with classic signaling and legitimacy frameworks. Signaling theory and legitimacy theory both predict that firm attributes should enable investors to distinguish between companies likely to internalize a new regulation and those inclined toward symbolic compliance. Under voluntary disclosure, such signals carry immediate informational value, if substantive. However, when a

supranational mandate such as the CSRD subjects all listed firms, including many SMEs, to the same requirements, the policy shock itself becomes the primary signal, and ESG governance proxies lose their short-run importance. Instead, heterogeneous market reactions are driven by established fundamentals, underscoring that at least in the short term in mandatory-reporting settings, investors fall back on hard financial and macroeconomic cues and proven track records rather than on governance structures alone. Therefore, this study empirically engages with Christensen et al.'s (2021) theoretical framework, which outlines both the potential benefits and frictions of mandatory CSR disclosure under double materiality. While their model anticipates implementation challenges and heterogeneous firm responses, the event-study evidence presented here suggests that market reactions, though modest, are shaped more by macroeconomic and financial fundamentals than ESG-specific firm signals. These findings extend signaling and legitimacy (at least in the short term) theories by identifying a boundary condition: firm-level (ESG) signals will regain market power only once investors can observe concrete (disclosure) outputs under a broad mandatory regime in the long run. While the EMH implies that prices should adjust to all available information, the sheer magnitude and complexity (think of double-materiality requirements) of the CSRD appear to overwhelm the market's ability to parse firm-level nuances, at least with the hypothesized relationships in this study.

6.3 | Practical implications

For corporate managers and policymakers, these results imply that, in the short run, market participants prioritize observable financial health, in this case ROA, over firm-level ESG governance or sector-level ESG exposure when reacting to sustainability reporting mandates. In a way, it is plausible say firms anticipating adverse market reactions may therefore benefit more from strengthening core financial fundamentals than from emphasizing board-level ESG committees or governance audits in their investor communications in the short run. At the policy level, regulators should recognize that the mere announcement of disclosure requirements should align with other measures allowing companies to gradually develop the internal ESG systems, data collection processes, and expertise required for comprehensive sustainability reporting. This helps avoid overwhelming businesses and encourages a more robust and accurate reporting over time and without it, the disclosed information might lack the necessary credibility to truly influence market perceptions and valuations over the long term, instead of investors only focusing on other signals.

6.4 | Limitations and future directions

Several limitations of this deserve mentioning, although steps were taken to mitigate their potential impact. First, the reliance on short-window CARs captures only investors' immediate repricing under the EMH. To address this, three event windows ($-5,+5$; $-2,+2$; $-1,+1$) were analyzed. Nonetheless, longer-term effects on accounting outcomes and cost of capital remain outside the present scope and therefore, future research could track real effects in market-based and accounting-based outcomes over multi-year periods as the new laws/requirements are implemented. Second, the sample is limited to publicly listed EU firms because the CSRD applies uniformly within the jurisdiction. While this ensures a clean regulatory experiment, it excludes private companies and firms in non-EU regimes, to which the CSRD is also going to be subject. The focus on EU listings was mitigated by comprehensive country-level controls and split-sample tests for country concentration, yet comparative insights could also be a future directions of studies in this field. Third, the proxies employed, firm size as an indicator of compliance capacity and the four-item ESG-Strength index as a gauge of signaling readiness, may not fully capture the multifaceted nature of firms' ESG integration or the quality of their disclosures. Fourth, the focus on three headline announcement dates was grounded in a rigorous textual analysis to isolate genuine information shocks and minimize misclassification. Nonetheless, this approach may overlook subtler regulatory signals that also shape investor expectations. Lastly, this study did not account for the potential impact of the COVID-19 pandemic on stock price behavior during the 2019–2023 period. The significant market volatility caused by the pandemic may have influenced some abnormal returns, introducing noise unrelated to CSRD announcements. This oversight limits the precision of the findings..

7 | CONCLUSION

This study has examined the market's immediate response to the European Union's Corporate Sustainability Reporting Directive (CSRD), a uniform expansion of mandatory corporate sustainability reporting from a narrow set of "large public-interest entities" to all listed firms, including SMEs. Event-study analyses across three aggregation windows revealed a modest negative average CAR, which indicates that investors, on balance, factored in net compliance costs and/or heightened disclosure risks in the short term, with cross-sectional variation driven mainly by fundamental financial indicators, particularly ROA, and by macroeconomic context such as trade openness, rather than by pre-existing ESG governance structures or industry-level ESG risk. These findings offer two key contributions. First, by integrating classic signaling and legitimacy frameworks within the unprecedented context of the CSRD, this study shows that a uniform, supranational policy shock results in directing investors to rely initially on well-established financial and institutional metrics until concrete, audited sustainability reports become available. Second, through a large-scale event-study of a uniform all-encompassing corporate sustainability reporting mandate, it extends the literature beyond voluntary disclosure, showing how the CSRD's double-materiality requirement is capitalized by markets in practise. In sum, successful navigation of mandatory corporate sustainability reporting depends on firms observable financial resilience in the short run, until concrete and measurable sustainability outcomes can be signaled through material corporate sustainability reports.

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