Erasmus University Rotterdam

Master Thesis

Market reaction to mandatory non-financial disclosure -

A review of the EU Directive 2022-2464.

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Abstract

This study investigates the stock market's reaction to the introduction of the Corporate Sustainability Reporting Directive (CSRD) by the European Union (EU). The introduction of the CSRD creates a natural experimental setting within the EU by imposing mandatory disclosure of non-financial information and requiring assurance over these disclosures. This research utilizes event study methodology to analyze market reactions for the initial event and a pooled sample of the three significant events associated with the introduction of the directive. The empirical findings demonstrate a negative market reaction during the initial event, while the subsequent events and the pooled sample show a positive market reaction. Regression analyses further reveal that firms subject to the Non-Financial Reporting Directive (NFRD) result in a more favorable stock market reaction than firms not under the NFRD. Furthermore, the results give empirical evidence to suggest that firms mandated to assure their non-financial information prior to the CSRD show a more favorable stock market reaction than firms without assurance requirements. In conclusion, this thesis suggests that the stock market responded positively to the introduction of the CSRD, particularly when firms had prior experience with either the NFRD or mandated assurance requirements.

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Introduction

1.1. Increased interest in CSR

The importance of corporate social responsibility (CSR) is steadily growing. Consumers expect companies to actively engage in social issues and develop CSR programs aligned with their values (Hartmann et al., 2023). CSR encompasses a company's efforts to contribute to social and environmental goals, such as reducing its ecological footprint or taking action on issues like equality, diversity, human rights, and education. According to Hartmann et al., effective promotion of CSR engagement can enhance customer and stakeholder responses toward the company.

The global concern surrounding climate change has further heightened the significance of CSR information and disclosure. Companies face external pressure to disclose non-financial information from government regulations, stakeholders, and social activists, who influence individual firms. Such firms often serve as industry examples, leading to spillover effects where other companies in the same sector follow in these footsteps by issuing non-financial disclosures (Reid & Toffel, 2009). Iounna and Serafeim (2018) note a substantial increase in the number of companies issuing CSR disclosures, from less than 50 in 1995 to over 6,000 in 2015.

Furthermore, Ioannou and Serafeim (2017) state that there has been a significant rise in companies that create governance systems to monitor, assess, guide, and communicate sustainability initiatives. The proportion of S&P 500 companies with board-level sustainability committees rose from 5% in 2012 to 24% in 2017. During the same period, the percentage of companies publishing sustainability reports grew from 20% to 80%. It is important to note that these trends extend beyond US companies and are observed globally. While voluntary actions drive some of these changes, legislative measures have also significantly shaped these developments.

1.2. European Union reacts to increasing CSR demands

Proof of the growing importance of CSR can be seen in a recent directive by the European Union (EU). The EU published directive 2022-2464 on December 14th, 2022. The premise of this directive is that all large (500+ employees)- and listed companies are required to disclose information about risks and opportunities they perceive to be associated with social and environmental issues as well as the effects of their operations on both people and the environment, which is part of The European Green Deal (European Union, n.d.).

Directive 2022-2464, from now on referred to as the Corporate Sustainability Reporting Directive (CSRD), will replace the Non-Financial Reporting Directive (NFRD), a directive that was introduced in 2014 and companies had to oblige by in 2017. The NFRD applied to roughly 11,700 large companies and groups across the EU. The CSRD will apply to approximately 50,000 companies. The directive aims to help investors, consumers, and other stakeholders assess companies' sustainability performance. It does so by making it possible to evaluate the investment risks arising from climate change and other sustainability issues. Finally, by

harmonizing the information that must be provided more, reporting costs for companies over the medium to long term should decrease. These new rules must apply over the fiscal year 2024, when the related non-financial reports will be published in 2025 (European Union, n.d.).

1.3. Summary

The introduction of the CSRD serves as an external shock to the regulatory landscape concerning the disclosure of non-financial information. This provides an ideal setting for this paper to shed light on the expectations of investors and stakeholders regarding the CSRD.

Within this study, three hypotheses are proposed to explore the stock market's response to the introduction of the CSRD. The first hypothesis anticipates a negative market reaction based on the assumption that firms not previously reporting non-financial information would incur net costs due to the CSRD's imposition of reporting obligations. The second hypothesis suggests that firms not subject to the NFRD before the CSRD would experience a relatively greater change in terms of CSR reporting, and thus corresponding costs, leading to a more negative reaction from investors and stakeholders. The final hypothesis proposes that firms without prior experience in mandated assurance would also experience relatively greater change under the new regulation, resulting in worse performance on the stock market than firms already subjected to mandated assurance.

The event study identifies three significant events that form the basis for the empirical investigation. The sample for the initial event consists of 842 firms, while the pooled sample includes 2,526 observations across all three events. Hypothesis 1 is examined using a t-test, while the remaining hypotheses are tested through regression analysis employing a dummy variable to represent firms' compliance with the NFRD regulation and mandated assurance for non-financial information.

The findings indicate a negative stock market reaction during the initial event. However, both events in 2022 and the pooled events collectively provide substantial statistical evidence to reject hypothesis 1 and conclude that the stock market reacted positively to the introduction of the CSRD. Although the second and third hypotheses yield non-significant results for the initial event in 2019, the combined events offer sufficient statistical evidence to support both hypotheses. Overall, it can be concluded that the stock market responded positively to the introduction of the CSRD, particularly when firms had prior experience with either the NFRD or mandated assurance requirements.

1.4. Contribution

This thesis aims to make a valuable contribution to the current body of literature by examining the stock market's response to the introduction of the CSRD. As of writing this paper, no previous studies or working papers have explored this particular topic. Therefore, this study will fill this gap by investigating how the stock market reacts to the introduction of the CSRD. This analysis will provide insights into the expectations of investors and stakeholders regarding the anticipated costs and benefits associated with the regulatory framework.

The findings of this study hold significance for various key stakeholders, including investors, stakeholders of the companies subject to the CSRD, and regulators responsible for formulating legislation about CSRD or other non-financial information disclosures. Additionally, the outcomes of this research can provide valuable insights to policymakers in other regions of the world who are considering implementing regulations related to non-financial information disclosure.

1.5. Layout

The remainder of this study is organized as follows. Chapter 2 elaborates on the regulatory background, discusses existing literature, and develops hypotheses. In chapter 3, the research design and methodology are outlined. Chapter 4 presents and discusses the empirical findings. Chapter 5 concludes the paper.

Theory

2.1. Background

Eccles et al. (2011) conclude in their research that there is a large and growing market interest in companies' CSR information, particularly in Environmental, Social, and Governance (ESG) information. This suggests that investors use ESG disclosure quality as a proxy for management quality. They further note that investors seem to care more about Environmental and Governance information than Social information. This can be attributed to the ease of quantifying and evaluating environmental information and the extensive literature linking governance to performance and risk. Clarkson et al. (2008) support this conclusion by providing evidence of a positive relationship between corporate environmental performance and the level of environmental disclosures. Turban and Greening (1997) find evidence that companies with better ESG scores are more attractive to work for as an employee, indicating that firms with higher ratings may have a competitive advantage over firms with lower ratings because they attract more applicants. Cheng et al. (2014) contribute further evidence by stating that firms with better ESG performance have improved access to finance, indicating lower capital constraints. They further emphasize that the most important dimensions are social and environmental, while the governmental dimension does not significantly influence the results. Finally, Dhaliwal et al. (2011) find that firms initiating ESG face lower capital constraints if they have a strong ESG performance. Collectively, these studies offer evidence that more and more stakeholders are basing their decisions on ESG data.

2.2. Mandatory CSR disclosure

Chen et al. (2018) researched the effect of mandatory CSR disclosure in China because disclosing CSR activities in China has been mandatory since 2008. They conclude that mandatory disclosure decreases profitability. However, there was a decrease in the industrial wastewater and SO_2 emission levels of these companies. Thus, mandatory CSR disclosures change firm behavior and generate positive externalities for the environment at the expense of shareholders. Hong et al. (2020) conclude that the mandatory reporting of CSR information results in an increase in green innovation. Fiechter et al. (2022) support this statement. They provide evidence that companies subject to the NFRD respond by increasing their CSR efforts, even before the directive goes into effect, especially firms with prior low levels of CSR reporting and CSR activities. Mittelbach-Hörmanseder et al. (2021) found that after the NFRD, there was a negative relation between CSR disclosures and stock price, meaning that the directive caused the company's stakeholders to lose value. Cuomo et al. (2022) found that the NFRD has increased CSR transparency and performance. They state that the association between the directive and CSR transparency is stronger for smaller firms. Lastly, they found that the directive reduced systematic risk and cost of equity for the companies included in the scope of the NFRD. Moreover, Grewal et al. (2019) cite multiple sources that conclude that mandatory disclosure programs have compelled companies to improve their performance related to the environment, food and water safety, surgical outcomes, and patient health outcomes.

A critical term to consider is "materiality," which lacks a universally agreed-upon definition (Beske et al., 2020). In this study, the concept of materiality is defined as the significance of information within a company's financial statements. Suppose a transaction or business decision is of sufficient importance to cause reporting to investors or other users of the financial statements. In that case, the information is considered "material" to the business and cannot be omitted. In this paper, it is crucial to acknowledge that non-financial information can hold material significance in both the financial and environmental dimensions. From a financial perspective, such information can have material implications for the company's financial performance. On the other hand, in ESG considerations, the environmental dimension assesses whether non-financial information holds material relevance at an ESG level for the company.

2.3. From NFRD to CSRD

However, there is a significant difference between the discussed literature and this thesis. The discussed literature primarily focuses on voluntary disclosures or the mandate of the NFRD. The subject of this study is the CSRD. The CSRD will replace the NFRD. The EU started working on the NFRD in its communication titled "Single Market Act — Twelve levers to boost growth and strengthen confidence — 'Working together to create new growth'," adopted on April 13, 2011. In this communication, the European Commission recognized the need for consistent and high transparency regarding the social and environmental information disclosed by companies across all member states. Finally, the NFRD was published on October 22, 2014. The directive applied to all companies that met all three of the following criteria: "[i] Large undertakings [ii] which are public-interest entities [iii] exceeding on their balance sheet dates the criterion of the average number of 500 employees during the financial year". Roughly 11,700 companies met all three of the criteria. These companies had to disclose their non-financial information starting from 1 January 2017. The NFRD furthermore introduced a new concept; 'double materiality'. This means that companies must evaluate all issues that affect their financial performance in the short, medium, and long term, as well as the effects of their business actions on these issues, in order to determine which sustainability issues need to be reported on. Thus, a sustainability issue must be reported if it is material in financial, environmental, or both aspects (European Union, 2014).

The European Commission has committed to assessing the non-financial reporting regulations outlined in the NFRD of the European Parliament and Council. This commitment was expressed in a document titled "The European Green Deal" published on December 11, 2019. The European Green Deal describes how the European Commission sets a goal for the EU to have no net emissions of greenhouse gasses by 2050. Furthermore, they aspire to preserve and improve the EU's natural resources and ensure its residents' health and well-being by mitigating environmental risks and negative effects. It seeks to create an economy that prioritizes people's well-being, enhances the EU's social market economy, ensures preparedness for future challenges, and fosters stability, employment, and growth (European Union, 2022).

The CSRD brought with it some major changes compared to the NFRD. First and foremost, the directive's scope has been significantly broadened due to the growth of users' needs for sustainability information. Under the CSRD, the following categories of European businesses will be required to create sustainability reports: (i) All publicly traded companies that operate under the legal form of a limited liability company, except for micro-sized entities. (ii) All large companies operating under the legal form of a limited liability company, even if they are not publicly traded. (iii) All large insurance companies and banks, irrespective of the legal form they employ. Thus, the directive will oblige all listed small, medium, and large-sized companies to disclose their sustainability information. Finally, the CSRD will also apply to companies established outside the EU with a direct stock exchange listing on an EU-regulated stock exchange or carrying out EU activities through listed subsidiaries, large non-listed subsidiaries, or branches. This will increase the scope to approximately 50,000 companies. Large companies will have to disclose their sustainability information starting from the year 2024, publishing their disclosures in 2025. Small and medium-sized companies will have to report their information starting from the year 2025, publishing their disclosures in 2026 (European Union, 2022).

Furthermore, an important change is that the CSRD will introduce mandatory assurance of published sustainability reports. Specifically, the directive emphasizes three areas to concentrate the assurance work on: (i) The compliance of the sustainability reporting with the European Sustainability Reporting Standards developed by the EFRAG[1], (ii) the suitability of the materiality process undertaken, (iii) the compliance with the reporting requirements of Article 8 of the Taxonomy. This assurance does not necessarily have to be given by the company's auditor. As specified by the CSRD, other assurance providers can also perform these assessments. The assessment must be based on the "limited assurance" level for the first three years. Finally, there will be penalties when a company violates the reporting obligations (European Union, 2022).

In contrast to earlier studies that focus on the actual effects of non-financial disclosure regulation, this paper will examine investors' perceptions of the expected costs and benefits regarding regulations mandating non-financial disclosures. Moreover, this paper will analyze a much broader non-financial disclosure, unlike the more targeted and industry-specific disclosures studied previously. This implies that the generalizability of this thesis is increased by the broader applicability of the rule under study.

2.4. Hypothesis development

The mandated disclosure of non-financial information can have numerous effects on the equity market. From an equity investor's perspective, the required disclosure might have a mixed effect in terms of costs and benefits. Grewal et al. (2019) present three major benefits. Firstly, mandatory disclosures, such as informational benefits, can increase relevant

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[1] The European Financial Reporting Advisory Group (EFRAG) is a non-profit association that serves the public interest by providing advice to the European Commission on the endorsement of international financial reporting standards

information for evaluating the company. This can enhance the forecasting of the company's performance while also providing more clarity regarding the firms' inherent risks, which reduces companies' cost of capital through lower information risk (Easley & O'Hara, 2004). Secondly, mandatory disclosures may improve the efficiency of monitoring, such as the evaluation of environmental performance. Thirdly, companies may become more operationally efficient when attracting investors by reducing energy consumption, increasing product quality, or improving personnel recruitment. Christensen et al. (2021) add that mandatory CSR standards can enhance harmonization in reporting, particularly within industries. This harmonization can enable users to compare CSR information across companies operating within the same industry more effectively. The benefits of improved comparability would be advantageous for firms currently exhibiting low levels of CSR disclosure and facilitate more accurate comparisons for industry-leading companies. Furthermore, the authors suggest that standardized CSR reports can potentially serve as an initial reference for consumers who, compared to investors, often possess lower levels of information and expertise when evaluating a company's CSR performance.

In introducing the CSRD, there are additional benefits to consider. Ioannou and Serafeim (2017) conducted a comparative analysis of firms operating in four countries (China, Denmark, Malaysia, and South Africa) that had implemented CSR disclosure mandates before 2011. The treated firms, subject to the mandates, demonstrated a significant increase in both the quantity and quality of their CSR disclosures following the regulatory requirements. These firms were also more inclined to seek assurance for their disclosures and adopt reporting guidelines voluntarily. Notably, these increases in CSR disclosures persisted despite the presence of "comply or explain" clauses within the mandates, which theoretically allowed firms to opt out of additional disclosures at a relatively low cost. The authors interpreted these results as indicative of a "race to the top" phenomenon, where firms strive to outperform each other.

Moreover, the mandatory assurance of CSR information has yielded market capital benefits, as highlighted in the study by Ballou et al. (2018). Kuo et al. (2017) support this by stating that mandatory assurance of CSR disclosures reduces the cost of debt capital. Lastly, according to Stuart et al. (2021), assurance of CSR information contributes to protecting the company from negative events.

However, according to Christensen et al. (2021), it is essential to acknowledge that CSR reporting entails significant costs. One primary concern is the potential disclosure of proprietary information to competitors, customers, and suppliers, which may diminish incentives for firms to engage in innovative CSR initiatives. Moreover, the increased transparency and scrutiny surrounding firms' CSR practices could expose them to regulatory actions and litigation from shareholders and other stakeholders. The introduction of CSR reporting for internal purposes also brings challenges related to data availability, the reliability of estimates, and potential resistance from managers and employees. Furthermore, Manchiraju and Rajgopal (2017) find that the mandatory expenditure of 2% of income on CSR activities in India leads to a decline in companies' share prices, indicating a perceived devaluation by investors. The introduction of the CSRD entails the mandated assurance of non-financial

disclosures, which means that every company will incur expenses related to the engagement of independent third-party assurance providers to validate the accuracy of the CSR report. This requirement represents a significant financial commitment (Simnett et al., 2009).

In their study, Hitz and Müller-Bloch (2015) state that the situation prior to governmental regulation is one that is in equilibrium, meaning that market participants have weighed the costs and benefits of engaging in the activity that the regulation now obliges the company to participate in. Grewal et al. (2019) used this knowledge to hypothesize that when the benefits of disclosing non-financial information outweigh the costs, a company decides to disclose the information. Therefore, if investors assume that companies are making the best CSR disclosure and performance decisions before the mandate, legislation obliging companies that did not disclose non-financial information before the regulation would lead investors to predict that the costs of the disclosure will outweigh the benefits.

Based on the insights mentioned above, the first hypothesis goes as follows:

H1: *There is a negative stock price reaction to the introduction of the Corporate Sustainability Reporting Directive.*

As mentioned earlier, the CSRD directive will broaden the scope of mandatory disclosures. This implies that many companies will be required to produce a non-financial disclosure report for the first time, while those already voluntarily disclosing will need to provide additional information (Ioannou & Serafeim, 2017).

Grewal et al. (2019) argue that governmental influences via regulation raise awareness about a firm's CSR performance, which affects consumers' decision to buy products from companies with relatively good CSR performance and employees' decision to seek employment at firms with relatively good CSR performance. Investors may place more weight on CSR data if the regulation is passed because they anticipate increased enforcement of CSR-related regulations and may also expect increased future regulations. Companies with a strong CSR performance score are expected to gain a competitive advantage in product and labor markets. In contrast, those with weaker CSR performance may face penalties, decreased consumer/employee attraction, or higher costs associated with transitioning to stronger CSR performance. Consequently, stock prices of firms with robust CSR performance stock prices are anticipated to respond positively, reflecting the investors' assessment of these expected competitive consequences. Cicchiello et al. (2022) and Aluchna et al. (2022) provide empirical evidence that the NFRD significantly improves a firm's CSR performance. Thus, the second hypothesis can be formulated as follows:

H2a: *There is a negative relation between stock price reaction to the Corporate Sustainability Reporting Directive and whether the firm was unaffected by the Non-Financial Reporting Directive prior to the Corporate Sustainability Reporting Directive.*

The mandated assurance of non-financial information will be new for several EU countries, but not all countries. For instance, Spain has had mandatory assurance over non-

financial information since 2018. Sierra Garcia et al. (2022) conducted a study revealing that companies are more likely to report their non-financial information when their sustainability report is assured. Furthermore, companies that hire a Big Four accounting firm as an assurance provider are more likely to report their non-financial information than those that hire non-accounting firms. Ackers and Eccles (2015) provide evidence that the mandatory assurance of CSR reports, exemplified by the King III mandate in South Africa, has improved the quality of the CSR information and the quality of the assurance itself. They argue that voluntary CSR assurance practices have resulted in inconsistent application, thereby hindering stakeholders' comprehension of the nature and scope of CSR assurance engagements. A mandatory CSR assurance regime is proposed as a potential solution to overcome this deficiency. This leads to the following hypothesis:

H2b: *There is a negative relation between stock price reaction to the Corporate Sustainability Reporting Directive and whether firms did not fall under mandated assurance prior to the Corporate Sustainability Reporting Directive.*

Methodology

3.1. Research design

This thesis will follow Grewal et al. (2019)'s research design. Meaning an event study will be done. Event studies are empirical investigations that use financial market data to assess the influence of a particular event on specific variables of interest. The value of conducting an event study stems from the expectation that, in an efficient market, the consequences of an event will be swiftly incorporated into security prices. Consequently, examining security prices within a relatively short time frame makes it possible to construct a measure of the event's economic impact (MacKinlay, 1997). Relevant events about non-financial reporting will be identified through a comprehensive analysis of multiple news sources. These events can be found in Appendix A. There are multiple rationales for excluding an event. Rationale (A) refers to a confounding event that pertains to both non-financial disclosures and other nondisclosure matters related to CSR; Rationale (B) signifies events that are deemed not significant enough to have a substantial impact on the likelihood of mandated non-financial reporting in the EU; Rationale (C) indicates events that are correlated with preceding events, with the preceding event specified in parentheses. Finally, following related prior literature (Hitz & Müller-Bloch, 2015), this study will have an event window of three days.

Press releases from the EU and multiple news outlets were examined to identify potential events. Three of the 16 identified events that could impact mandated non-financial reporting have been determined to significantly affect the likelihood of mandated non-financial reporting in the EU. The initial significant event was the adoption of 'The European Green Deal' on December 11, 2019. This event marked a significant milestone in the EU's commitment to addressing climate change and achieving environmental sustainability. The European Green Deal is a comprehensive set of policy initiatives and measures aimed at transforming the EU into a climate-neutral and resource-efficient economy. The second event occurred on November 28, 2022, when the European Council reached an agreement on the proposal of the CSRD. This agreement indicated a broad consensus among EU member states regarding updating and strengthening sustainability reporting standards. The agreement outlined key provisions and requirements of the CSRD, which would be implemented once the directive becomes law. Lastly, on December 14, 2022, the president of the European Parliament signed the proposal, officially enacting the CSRD as legislation. This marked the final stage in the legislative process, solidifying the CSRD as a binding regulation for companies operating in EU member states.

This study will utilize Bloomberg's database, Refinitiv, renowned for its extensive coverage of CSR disclosures (Grewal et al., 2019).

3.1.1. Hypothesis 1

This study will conduct a t-test to determine whether the market-adjusted abnormal returns (MAR) mean is statistically different from zero. This will provide insight into the overall average abnormal returns across the event period, allowing for a comprehensive evaluation of the impact of the events on the stock prices. The S&P 500 is the benchmark for

this study's expected returns. It is a widely recognized stock market index that provides a suitable comparison to the companies in the dataset. Notably, the S&P 500 is selected as a benchmark because it is not directly influenced by the event under investigation. Suppose the MARs are negative and statistically significant at the 5% level. In that case, H1 will be deemed valid, indicating a negative association between stock price reaction and the introduction of the CSRD.

3.1.2. Hypothesis 2a

For H2a, the following regression model will be used:

$$\text{Market-Adjusted Returns (MARs)}_i = \alpha_1 + \beta_1\text{Non-NFRD\_dummy}_i + \beta_2\text{MarketCapitalizationScaled}_i + \beta_3\text{Big4}_i + \beta_4\text{Industry}_i$$

This regression model utilizes a binary dummy variable to indicate whether a company was unaffected by the NFRD prior to the CSRD. A regression analysis will be conducted with the stock price reaction as the dependent variable and the non-NFRD dummy variable as the independent variable. Suppose the dummy variable's coefficient is negative and statistically significant at the 5% level. In that case, H2a will be deemed valid, indicating a negative association between stock price reaction and not being subject to the NFRD prior to the CSRD.

3.1.3. Hypothesis 2b

For H2b, the following regression model will be used:

$$\text{Market-Adjusted Returns (MARs)}_i = \alpha_1 + \beta_1\text{Non-MandatoryAssurance\_dummy}_i + \beta_2\text{MarketCapitalizationScaled}_i + \beta_3\text{Big4}_i + \beta_4\text{Industry}_i$$

Regarding H2b, this study will create a binary dummy variable to indicate whether a company was subject to mandatory assurance regulation prior to the CSRD. A regression analysis will be conducted with the stock price reaction as the dependent variable and the mandatory assurance dummy variable as the independent variable. Suppose the dummy variable's coefficient is negative and statistically significant at the 5% level. In that case, H2b will be considered valid, indicating a negative association between stock price reaction and not having mandatory assurance prior to the CSRD.

3.2. Variables

3.2.1. Market-adjusted abnormal returns

In order to test H1, this study will be computing MARs for the event day and a predefined event window spanning one day before and one day after the event day. By incorporating this window, the study allows the equity markets to reflect the anticipated effects of the events in stock prices. The estimation of MARs will involve calculating the expected returns (ER) during the specified event window. The ERs will be calculated using the S&P 500. The S&P 500 is a widely recognized stock market index that provides a suitable comparison to the companies in the dataset. Most importantly, the S&P 500 is well fit as a benchmark because it is not directly influenced by the introduction of the CSRD.

$$ER_{it} = (R_t - R_{t-1})/R_{t-1}$$

Where ER_{it} represents the expected returns for firm i at time t, which is the day in the event window that is being calculated. R_t represents the return of the S&P 500 at time t. R_{t-1} represents the return of the S&P 500 stock market at time $t-1$, which corresponds to the day before t.

The determination of actual returns (ACR) will involve calculating the percentage difference between the closing prices of the first and last day within the event window. This computation measures the realized price movements during the specified period.

$$ACR_{it} = (CP_{it} - CP_{it-1})/CP_{it-1}$$

Where ACR_{it} represents the actual returns of firm i at time t, which is the day in the event window that is being calculated. CP_{it} denotes the closing price of firm i's stock at time t, while CP_{it-1} represents the closing price of firm i's stock at time $t-1$, which corresponds to the day before t.

The MARs are calculated as the actual returns minus the expected returns.

$$MAR_{it} = ACR_{it} - ER_{it}$$

Where MAR_{it} represents the abnormal returns of firm i at time t. ACR_{it} represents the actual returns of firm i at time t. ER_{it} represents the expected returns for firm i at time t.

3.2.2. Main interest variables

The main interest variables for H2a and H2b are non-NFRD_dummy and non-MandatoryAssurance_dummy, respectively. The regression used for H2a introduces a binary dummy variable to indicate whether a company was unaffected by the NFRD prior to the CSRD. A value of 1 represents companies unaffected by the NFRD, while 0 denotes companies that did get affected.

Regarding H2b, this study will create a binary dummy variable to indicate whether a company was subject to mandatory assurance regulation prior to the CSRD. A value of 1 represents firms that did not have mandatory assurance regulation, while 0 represents firms that did have a form of prior mandatory regulation. The classification of the dummy variable will be based on the headquarters location of the companies. Specifically, companies from Spain and France, where mandatory assurance regulation was in place before the CSRD (Sierra Garcia et al., 2022; Martinez et al., 2021), will be assigned a value of 0 in the dummy variable, while companies from all other countries will obtain a value of 1.

3.2.3. Control variables

The control variables used in all three tests outlined earlier are the following: (i) Big4 auditor dummy variable: This binary variable indicates whether a company has engaged a Big4 auditor for its financial reporting and assurance requirements. By including this control

variable, the study aims to account for the potential influence of auditor size, reputation, and expertise on the observed association. The Big4 auditors are Deloitte, EY, KPMG, and PWC. (ii) Market capitalization: This variable serves as a control for the size of the company. By incorporating market capitalization as a control variable, the study seeks to mitigate the potential effects of firm size. The variable market capitalization used in the regression has been logarithmically scaled to be more comparable. (iii) Industry classification: This variable captures the industry in which the company operates. By considering industry classification as a control variable, the study seeks to control for any specific industry characteristics or dynamics that may impact the observed association.

3.3. Sample selection

Table 1 presents the sample selection. The Bloomberg database provided 12,270 observations. After excluding all companies with missing values for one or more relevant variables, the sample size was reduced to 1,334 observations. Additionally, the dataset was refined based on the geographical locations of the companies. So finally, excluding countries in Europe that are not part of the EU, a treatment group of 842 observations remained for each individual event, resulting in a total of 2,526 firms observed when the events were pooled together.

Table 1. Sample Selection

Sample selection	Initial event	Pooled events
	No. of firms	No. of firms
Bloomberg population	12,270	36,820
Less: missing required information	10,900	32,700
Less: non-EU countries	528	1,584
Treatment group	842	2,526

Notes. This table reports the sample selection process.

Table 2 presents the distribution of countries across the two distinct samples. Columns 2 and 3 provide the count and respective percentages of observations from each country in the sample used to analyze the initial event. Columns 4 and 5 present the same information for the sample used to analyze the pooled data from the three events.

Table 2. Distribution of observations

Sample:	Initial event		Pooled events	
	Unique firms	**%**	**Unique firms**	**%**
Austria	31	3.81	93	3.81
Belgium	33	3.92	99	3.92
Cyprus	2	0.24	6	0.24
Czech Republic	3	0.36	9	0.36
Denmark	38	4.51	114	4.51
Finland	29	3.44	87	3.44
France	129	15.32	387	15.32
Germany	151	17.93	453	17.93
Greece	21	2.49	63	2.49
Hungary	4	0.48	12	0.48
Republic of Ireland	41	4.87	143	4.87
Italy	79	9.38	237	9.38
Luxembourg	12	1.43	36	1.43
Malta	3	0.36	9	0.36
Netherlands	50	5.94	150	5.94
Poland	31	3.68	93	3.68
Portugal	12	1.43	36	1.43
Romania	2	0.24	6	0.24
Slovenia	1	0.12	3	0.12
Spain	61	7.24	183	7.24
Sweden	109	12.95	327	12.95
Total	842	100	2,526	100

Notes: This table presents the frequency distribution of observations by country. Two samples are presented. The first one being the initial event in 2019. The second sample is the sample used in the analysis of all three events pooled together.

Results

4.1. Summary statistics

Table 3 presents the descriptive statistics of the dataset. The variable market capitalization has been logarithmically scaled to make the data more comparable. All continuous variables are winsorized on the 1% and 99% levels.

Table 3. Descriptive statistics

Panel A: Descriptives for the initial event

Variable	N	Mean	SD	Min	Median	Max
Market capitalization	842	21.77	1.6	17.65	21.78	25.36
Actual returns	842	0.0084	0.027	-0.0672	0.0073	0.1033
Expected returns	842	0.0104	0	-0.0104	-0.0104	-0.0104
Market-adjusted abnormal returns	842	-0.0020	0.027	-0.0776	–0.0031	0.0929
Non-Mandated assurance (dummy)	842	0.7743	0.42	0	1	1
Non-NFRD (dummy)	842	0.1081	0.31	0	0	1
Big4 auditor (dummy)	842	0.8872	0.32	0	1	1

Panel B: Descriptives for the pooled sample

Variables	N	Mean	SD	Min	Median	Max
Market capitalization	2,526	21.77	1.6	17.71	21.72	25.54
Actual returns	2,526	-0.0163	0.051	-0.1654	-0.0134	0.1291
Expected returns	2,526	-0.0306	0	-0.0306	-0.0306	-0.0306
Market-adjusted abnormal returns	2,526	0.0143	0.051	-0.1349	0.0172	0.1597
Non-Mandated assurance (dummy)	2,526	0.7743	0.42	0	1	1
Non-NFRD (dummy)	2,526	0.1116	0.31	0	0	1

Big4 auditor (dummy)	2,526	0.8872	0.32	0	1	1

Notes: Table 2 provides the descriptive statistics of the variables used in H1 and H2b, rounded to four decimal places. All continuous variables are winsorized at the 1% and 99% levels. The variable market capitalization has been logarithmically scaled. Detailed definitions of the variables can be found in Appendix B. The initial event concerns introducing the European Green Deal on December 11, 2019. The pooled event represents the three events pooled together.

Table 4 presents the Pearson correlation table, with significant values on a 5% significance level highlighted in bold. Panel A presents the correlation table for the sample used to analyze the initial event. Panel B presents the correlation table for the combined sample of all events, which will be used in the subsequent analyses.

Table 4. Pearson-correlation table

Panel A: Pearson-correlation for the initial event

Variables		(1)	(2)	(3)	(4)	(5)
Market capitalization	(1)	1.0000				
Market-adjusted abnormal returns	(2)	**-0.0823**	1.0000			
Non-NFRD (dummy)	(3)	**0.2076**	**0.0851**	1.0000		
Non-Mandated assurance (dummy)	(4)	**0.1130**	-0.0418	**0.0598**	1.0000	
Big4 auditor (dummy)	(5)	**0.2368**	-0.0387	**0.0693**	**-0.1667**	1.0000

Panel B: Pearson-correlation for the pooled sample

Variables		(1)	(2)	(3)	(4)	(5)
Market capitalization	(1)	1.0000				
Market-adjusted abnormal returns	(2)	**0.0066**	1.0000			
Non-NFRD (dummy)	(3)	**0.2251**	0.0644	1.0000		
Non-Mandated assurance (dummy)	(4)	**0.0838**	**0.0883**	**0.0312**	1.0000	

Big4 auditor (dummy)	(5)	**0.2359**	-0.0478	**0.0711**	**-0.1667**	1.0000

Notes: Bold values indicate significance at the 5% level.

4.2. Descriptive results

Table 5 presents the findings of H1, which suggested a negative stock price reaction to the introduction of the CSRD. The results indicate that this hypothesis holds for the initial event, namely the publication of the European Green Deal in 2019. The MARs exhibit a negative coefficient, with the t-statistic reaching significance at the 5% level. This statistical evidence confirms H1 for the first event.

However, for the subsequent events in 2022 and when considering all events together, both display significant and positive MAR values at the 1% level. These results indicate that H1 is not supported for the events in 2022 and the pooled events analysis. In fact, statistical evidence suggests that the market reacted positively to introducing the CSRD for these events.

The results show that investors initially reacted negatively in 2019, but their perception changed to a positive outlook about the introduction of the CSRD for both events in 2022. This paper suggests two possible reasons for this. Firstly, it could be that the regulation regarding the CSRD seemed strict and impractical when it first got announced in 2019. However, revisions and modifications to the regulation could have made the legislation more feasible, hence the positive reaction from investors in 2022. The second reason could be that the benchmark for the expected returns, the S&P 500, is not the best fit for the dataset. Despite the CSRD not applying to firms in the United States, there could be significant differences in characteristics between the firms in the S&P 500 and those in the dataset.

Table 5. Market reactions around each event

Event No.	Date (dd-mm-yy)	Impact on likelihood/ scope	Actual return	Expected return	Market-adjusted return	t-statistic (vs. 0)	N
1	11-12-2019	+	0.0084	0.0104	-0.0020	-2.17**	842
2	28-11-2022	+	-0.0117	-0.0173	0.0056	6.15***	842
3	14-12-2024	+	-0.0133	-0.0237	0.0104	10.54***	842
Mean MAR					0.0143		
t-statistic (vs. 0)					8.05***		

Notes: This table reports the mean three-day MARs on the respective event dates using the S&P 500 as the market index. Variables are reported in Appendix B. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

4.3. Regression results

Table 6 presents the results for H2a, which proposed a negative association between the introduction of the CSRD and whether a firm was unaffected by NFRD obligations prior to the CSRD. Columns 2 and 3 present the findings for the 2019 sample, revealing insufficient statistical evidence to support H2a for the initial event. Although the coefficient of the non-NFRD dummy is negative, suggesting a negative relation, the t-statistic does not reach significance at the 5% level, preventing the acceptance of H2a.

The regression reveals that the coefficient of the non-NFRD dummy is -0.0053, which suggests that firms unaffected by the NFRD experienced a decrease in MARs of 0.53% compared to firms affected by the NFRD, ceteris paribus. However, the t-statistic must be more significant to make definitive conclusions.

The results for the pooled events analysis show a negative coefficient, with the t-statistic being significant at the 1% significance level, as can be seen in columns 4 and 5 in Table 6. These results provide sufficient statistical evidence to support H2a when considering all events together. Thus, there is a negative association between introducing the CSRD and whether a firm was unaffected by NFRD obligations prior to the CSRD for the pooled events.

The regression reveals that the coefficient of the non-NFRD dummy is -0.0151, which suggests that firms unaffected by the NFRD experienced a decrease in MARs of 1.51% compared to firms affected by the NFRD, ceteris paribus. In this case, the t-statistic is significant at the 1% significance level. Comparing this decrease of 1.51% to the unconditional mean MAR of 1.43%, it is worth noting that the MARs of non-NFRD firms are slightly negative (-0.08%).

This is not in line with the mean MAR of non-NFRD firms, as seen in Appendix C. However, it is essential to note that the mean MAR of non-NFRD firms is slightly positive and has a small t-statistic, which means the result is statistically insignificant. Therefore, the observed difference between the expected -0.08% and the actual 0.03% can be attributed to the insignificant mean and the control variables used in the regression.

Table 6. Results for H2a

Sample:	2019		Pooled	
Variable	**Coefficient**	**T-statistic**	**Coefficient**	**T-statistic**
Intercept	0.0282	2.165**	0.0302	2.067**
Non-NFRD (dummy)	-0.0053	-1.590	-0.0151	-4.131***
Market Capitalization	-0.0014	-2.362**	-0.0010	-1.458
Big4 auditor (dummy)	-0.0015	-0.498	-0.0073	-2.223**
Industry fixed effects	Included		Included	

N	842		2,526
Adjusted R²	0.0544		0.0517

Notes: This table presents the results of the regression examining how the stock market reacted to predetermined events regarding the passage of the CSRD, rounded to four decimal places. The variable Market Capitalization has been logarithmically scaled for comparability. Industry fixed effects are included. Results are presented for two different samples. Columns 2 and 3 cover the event of the introduction of the European Green Deal on December 11, 2019. Columns 4 and 5 cover the three events pooled together. Across all regressions, the dependent variable is market-adjusted abnormal returns. All continuous variables are winsorized at the 1% and 99% levels. All variables are defined in Appendix B. *, **, and *** represent significance for the indicated test at 10%, 5%, and 1% levels, respectively.

Table 7 presents the results for H2b, which proposed a negative association between the introduction of the CSRD and whether a firm was not subject to mandatory assurance. Columns 2 and 3 present the findings for the 2019 sample, revealing insufficient statistical evidence to support H2b for the initial event. Furthermore, the coefficient for whether a company did not fall under the mandatory assurance of non-financial information prior to the CSRD is positive, suggesting a positive relation. The t-statistic does not reach significance at the 5% level, meaning there is insufficient statistical evidence to support this statement.

The regression reveals that the coefficient of the non-mandated assurance dummy is 0.0021, which indicates that firms unaffected by the mandated assurance experienced an increase in MARs of 0.21% compared to firms affected by mandated assurance, ceteris paribus. However, the t-statistic needs to be more significant to make definitive conclusions.

The results for the pooled events analysis show a negative coefficient, with the t-statistic being significant at the 1% significance level, as can be seen in columns 4 and 5 in Table 7. These results provide sufficient statistical evidence to support H2b when considering all events together. Thus, there is a negative relation between introducing the CSRD and whether a firm was not subject to mandatory assurance obligations prior to the CSRD for the pooled events.

The regression reveals that the coefficient of the non-NFRD dummy is -0.0109, which indicates that firms that were not subject to mandated assurance prior to the CSRD experienced a decrease in MARs of 1.09% compared to firms that did get affected by mandated assurance, ceteris paribus. In this case, the t-statistic is significant at the 1% significance level. Comparing this decrease of 1.09% to the unconditional mean MAR of 1.43%, it is worth noting that the MARs of non-mandated assurance firms are still positive (0.34%).

This is in line with the mean MAR of non-mandated assurance firms, as both mean MARs are negative and significant, which can be seen in Appendix D. The difference between the expected 0.34% and the actual 1.15% can be attributed to the control variables used in the regression

Table 7. Results for H2b

Sample:	2019		Pooled	
Variable	**Coefficient**	**T-statistic**	**Coefficient**	**T-statistic**
Intercept	0.0274	2.092**	0.0363	2.478**
Non-Mandated Assurance (dummy)	0.0021	0.938	-0.0109	-4.433***
Market Capitalization	-0.0011	-1.871*	-0.0008	-1.200
Big4 auditor (dummy)	-0.0018	-0.610	-0.0038	-1.147
Industry fixed effects	Included		Included	
N	842		2,526	
Adjusted R²	0.0526		0.0527	

Notes: This table presents the results of the regression examining how the stock market reacted to predetermined events regarding the passage of the CSRD, rounded to four decimal places. The variable Market Capitalization has been logarithmically scaled for comparability. Industry fixed effects are included. Results are presented for two different samples. Columns 2 and 3 cover the initial event of the introduction of the European Green Deal on December 11, 2019. Columns 4 and 5 cover the three events pooled together. Across all regressions, the dependent variable is market-adjusted abnormal returns. All continuous variables are winsorized at the 1% and 99% levels. All variables are defined in Appendix B. *, **, and *** represent significance for the indicated test at 10%, 5%, and 1% levels, respectively.

Conclusion

This study examines the stock market's response to the introduction of the Corporate Sustainability Reporting Directive (CSRD) in the European Union (EU). The analysis focuses on three significant events: the publication of the European Green Deal in 2019, the legislative approval by the European Parliament in 2022, and the actual publication of the CSRD in the same year.

The first findings provide statistical evidence supporting a negative stock price reaction to the initial event in 2019. However, the results for the subsequent events in 2022 show a positive and significant stock price reaction. This is also observed when analyzing the pooled events. Thus, overall, there is sufficient statistical evidence to conclude that the stock market exhibits a positive reaction to the publication of the CSRD. This implies that investors and stakeholders anticipate a net benefit from the new regulation.

The regression results indicate no significant effect of the Non-Financial Reporting Directive (NFRD) effect during the initial event. However, when considering the pooled events, significant evidence supports a negative association between the introduction of the CSRD and firms not being subject to the NFRD prior to the CSRD, suggesting that investors and stakeholders reacted more positively to firms that were subject to the NFRD before the CSRD.

Similarly, the study finds no significant effect of mandated assurance during the initial event. However, when analyzing the pooled events, significant evidence supports a negative association between the introduction of the CSRD and firms that were not subject to mandatory assurance before the CSRD, proposing that investors and stakeholders reacted more positively to firms with mandatory assurance in place before the CSRD.

Overall, this study provides empirical evidence demonstrating the stock market's positive reaction to the introduction of the CSRD. Additionally, it establishes positive relations between the introduction of the CSRD and whether a firm was affected by either the NFRD or mandated assurance over non-financial information prior to the CSRD. These findings contribute to a better understanding of the implications and expectations surrounding the CSRD's introduction.

This study has several limitations that should be acknowledged. Firstly, it is essential to note that the analysis focuses exclusively on listed firms, while the CSRD applies to both listed and private companies. Therefore, the findings may only partially capture the impact of the CSRD on the broader business landscape. Additionally, the limitations of the dataset used in this study should be acknowledged. The data quality was a concern as it contained many missing values. Out of the approximately 50,000 affected companies, the initial dataset contained 12,700 observations, which was reduced to 842 observations in the treatment sample. This reduction in sample size introduces potential bias and may limit the generalizability of the findings. Moreover, it is worth noting that due to the data limitations, the dataset is skewed towards larger-sized firms, while medium and small-sized firms are relatively underrepresented. Finally, although the S&P 500 appears to be an acceptable benchmark for

calculating the expected returns, the results suggest that it might not be the best fit for the used dataset.

Future research should aim to address these limitations by including a broader range of companies and employing robust data collection methods to enhance the reliability and representativeness of the findings. Finally, future research should avoid using the S&P 500 as a benchmark in order to mitigate the risk of incorrectly calculating the expected returns.

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Appendix A. Events Regarding the Publication of EU Directive 2022-2464

Event	Date	Description	Include/exclude	Rationale
1	June 26, 2013	Introduction of Directive 2013/34/EU	Exclude	A
2	April 15, 2014	Publication of Directive 2014/95/EU	Exclude	B
3	September 25, 2015	Transforming our world: the 2030 Agenda for Sustainable Development	Exclude	A
4	March 8, 2018	Action Plan: Financing Sustainable Growth	Exclude	A
5	May 29, 2018	European Parliament called for the further development of non-financial reporting requirements in the framework of Directive 2013/34/EU	Exclude	B
6	June 17, 2019	Guidelines on non-financial reporting: Supplement on reporting climate-related information	Exclude	A, B
7	December 5, 2019	Deepening of the Capital Markets Union	Exclude	A
8	December 11, 2019	The European Green Deal	Include	
9	May 20, 2020	EU Biodiversity Strategy for 2030: Bringing nature back into our life	Exclude	B
10	April 22, 2021	Adoption by European Commission	Exclude	C (8)
11	September 7, 2021	Central Bank gives opinion	Exclude	B
12	September 22, 2021	European Economic and Social Committee's opinion	Exclude	B
13	November 28, 2022	Approval by the Council of the European Union of the European Parliament position at 1st reading	Include	

Appendix A. (Continued)

Event	Date	Description	Include/exclude	Rationale
14	December 14, 2022	Publication of Directive 2022-2464 (CSRD)	Include	
15	December 20, 2022	News article stating that CSRD regulation seems fine, but is going to be difficult to implement	Exclude	B, C (14)
16	March 8, 2023	News article stating that many large and medium-sized companies are not ready for the CSRD regulations	Exclude	B, C (14)

Appendix B. Variable Definitions

Variable	Definition
	Variables used in the main analysis
Expected Returns$_{it}$	The expected returns for firm i at time t, which is the day of interest within the event window.
Actual Returns$_{it}$	The actual returns of firm i at time t, which is the day of interest within the event window.
Market-adjusted Abnormal Returns$_{it}$	The abnormal returns of firm i at time t, which is the day of interest within the event window.
Industry$_i$	The industry that firm i operates in.
Market capitalization$_i$	The market capitalization of firm i. This variable has been logarithmically scaled to make it comparable with the other variables.
Big4 dummy$_i$	A dummy variable that represents whether firm i has a Big4 auditor.
Non-NFRD dummy$_i$	A dummy variable that represents whether firm i fell under the NFRD prior to the CSRD.
Non-MandatoryAssurance dummy$_i$	A dummy variable that represents whether firm i had mandatory assurance on its CSR reports prior to the CSRD.

Appendix C. Non-NFRD firms' market reactions around each event

Event No.	Date (dd-mm-yy)	Impact on likelihood/ scope	Actual return	Expected return	Market-adjusted return	t-statistic (vs. 0)	N
1	11-12-2019	+	0.0019	0.0104	-0.0085	-2.62**	91
2	28-11-2022	+	-0.0212	-0.0173	-0.0039	-1.02	76
3	14-12-2024	+	-0.0083	-0.0237	0.0154	4.19***	76
Mean MAR					0.0030		
t-statistic (vs. 0)					0.37		

Notes: This table reports the mean three-day MARs on the respective event dates using the S&P 500 as the market index. Variables are reported in Appendix B. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Appendix D. Non-Mandated Assurance firms' market reactions around each event

Event No.	Date (dd-mm-yy)	Impact on likelihood/ scope	Actual return	Expected return	Market-adjusted return	t-statistic (vs. 0)	N
1	11-12-2019	+	0.0090	0.0104	-0.0014	-1.31	652
2	28-11-2022	+	-0.0131	-0.0173	0.0042	3.97***	652
3	14-12-2024	+	-0.0150	-0.0237	0.0087	7.50***	652
Mean MAR					0.0115		
t-statistic (vs. 0)					5.68***		

Notes: This table reports the mean three-day MARs on the respective event dates using the S&P 500 as the market index. Variables are reported in Appendix B. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.