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Effects of Mandatory Non-Financial Disclosure on non-financial performance in the EU

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Abstract

This research studies the effects of mandatory non-financial disclosure on the non-financial performance of firms in the EU. Existing literature showed mixed evidence regarding these non-financial disclosure mandates. This study provides new insights on non-financial disclosure mandates, especially the Non-Financial Reporting Directive by the European Commission. The sample consists of 747 unique firms based in EU-member states, as well as a control group consisting of 2,306 US firms. This study uses a Difference-in-differences approach to a regression model. The treatment effect of the NFRD is found to be significantly negative, and increasing over time. This negative treatment effect is strongest for the environmental pillar of non-financial performance.

Keywords: Non-financial disclosure (NFD); disclosure mandates; European Union (EU); non-financial reporting directive (NFRD); non-financial performance.

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1 Introduction

Corporate enterprises have an ever increasing impact on society as a whole nowadays. These enterprises are not just providing goods and services, creating jobs and other opportunities which one can consider as financial consequences, but are also concerned with human rights, health, innovation, education and the environment, which one can consider as non-financial consequences (European Commission, 2017). These impacts on society can either be positive or negative, but either way, a great variety of stakeholders wants to address the accountability of firms for this impact which typically lies beyond the traditional responsibility of maximizing shareholder value (Carroll & Shabana, 2010). This concept is more commonly known as Corporate Social Responsibility (CSR) (European Commission, 2017). To elaborate, one can define CSR as the economic, legal, ethical and philanthropic responsibilities of the firm (Carroll, 1991, p. 47). This definition is mainly concerned with the social responsibility of firms. However, this CSR definition is widely considered as an incomplete one (Omran & Ramdhony, 2015). Nowadays, CSR is typically expressed in terms of a “triple bottom line”¹, because the firm does not solely address social factors, but also governance and environmental factors in their annual statements (Elkington, 1999). Reporting on CSR practices can be used interchangeably with non-financial disclosure (NFD) (Hąbek & Wolniak, 2013). This study generally uses NFD, which is defined by Erkens et al. (2015) as disclosure provided to external users on dimensions of performance other than conventional, financial performance. This links with the development in accountability of firms over the past 30 years. Since the 1980s, there has been a modernized demand for information, as well as a demand for transparency and accountability, which is no longer solely based on financial information (Maas & Sampers, 2020). This is in line with the growing call for comparability in the CSR performance of firms as well (Wood, 2010). CSR performance can be used interchangeably with non-financial performance. This study uses the latter.

The European Commission (EC) took it upon itself to saturate the demand for transparency, accountability and comparability by the corporate world. To do so, the European

¹ The triple bottom line is also referred to as the 3Ps, being People, Planet, Profit.

Union's (EU) Non-Financial Reporting Directive of 2014 (NFRD 2014/95/EU²) was drafted and accepted. In this directive the EC was transparent in what non-financial reports should entail to a certain degree per the fiscal year 2017. This directive has become a benchmark for the disclosure on sustainability performance of certain firms³. This directive obligates public interest entities (PIEs) to prepare a non-financial statement (supplemental to the compulsory, annual financial statements), incorporating information, as well as a risk assessment and policies about environmental effects of their core business, social factors within the firm, human rights and bribery matters, among other non-financial factors. With this, the EU takes a significantly large step towards mandatory NFD. The EU imposed this directive because they consider disclosure of non-financial information as a critical factor to ensure change towards a sustainable global economy (Directive 2014/95/EU). With the enforcement of the NFRD, the EU shows its intent to adhere to the set Sustainability Development Goals (SDG) of the United Nations.

Before 2017, there were no official requirements for NFD of EU-based firms. However, NFD of PIEs had to be in accordance with the 'comply or explain' principle as of 2014. Up until this point, this means that the PIEs either had to comply to the rules of the NFRD or otherwise explain why they were not adhering to the set of rules (Krasodomska et al., 2020). Commencing in 2018 (thus, NFD on the fiscal year of 2017), article 2 of the NFRD, consisting the guidelines on non-financial reporting, is in effect. This article consists of a methodology for reporting non-financial information, which means that there are non-binding guidelines installed for PIEs. These guidelines are prepared to aid PIEs with providing high quality, value relevant, decision-useful information in a consistent and comparable manner (European Commission, 2017). Since the guidelines are considered to be non-binding, meaning there is no official legislation involved (thus, being voluntary to a certain extent), the PIEs have the freedom to use any other form of non-financial reporting guidelines (i.e. GRI or SASB⁴). However, the EC has the conviction that

² Generally referred to when NFRD is used.

³ This Directive affects firms that have over 500 employees and are based in one of the 27 EU member states. In this study, firms that fall under the NFRD are referred to as public interest entities (PIEs).

⁴ Examples of non-governmental organizations trying to set up NFD standards/guidelines. Global Reporting initiative and Sustainability Accounting Standards Board are trying to make CSR (or parts of CSR) performance more measurable and comparable between firms.

their guidelines are best to use, since these are built on the frameworks of 21 other, internationally operating organizations concerned with NFD.

Compared to financial disclosure (FD), non-financial disclosure is relatively less informative, as well as less helpful for the users of this information (Maas & Vermeulen, 2020)⁵. Moreover, users complain about the lack of comparability and verifiability of semi-voluntary reports, considering that the disclosing organization can choose what to report to some extent (Bernow et al., 2019). The lack of an unambiguous approach towards uniform regulation of NFD frustrates users, because this leads to opportunistic and unreliable NFD by management, trying to cover for other corporate misconduct (Muttakin, 2015). Mandatory NFD is one way to bridge the gap between the informativeness standards of financial and non-financial reports. Mandatory NFD has been developed into a mechanism central for policymakers concerned about this topic. Transparency is key here, since more disclosure of activities intuitively leads to more insights in the practice of the respective firms. Typically, this reduces information asymmetry between stakeholders and the firm (Hess, 2007). Transparency also allows firms to benchmark themselves against competitors, which could potentially lead to an expanding market share, by benefiting from stakeholder confidence. This is especially the case when the CSR performance of a firm is good, relative to when non-financial performance of a firm is considered to be below par (Fernandez-Feijoo et al., 2014; Shauki, 2011).

The goal of regulation by public administrations, being national and international governments, is to strengthen confidence and transparency for the users of non-financial information. Governments do so, assuming that users will 'punish' or 'reward' firms through market activities⁶ (Jackson et al., 2017). Considering the fact that the requirements and amendments of the NFRD have become quite extensive, the relationship between NFD and non-financial performance of firms has been a subject in existing literature (Fiechter et al., 2022; Downar et al., 2021; Grewal et al., 2018; Jackson et al., 2017).

To fill this gap within research, this study tries to answer the following research question: what is the effect of mandatory non-financial disclosure on the non-financial performance of

⁵ Users of non-financial information are generally considered to be business leaders, investors, consumers and regulators (Deloitte, 2021)

⁶ Purchasing or selling of stock, to decrease or increase value of this firm.

European firms? With answering this question, this study adds to existing literature. The study of Grewal et al. (2018) examines the effects of mandatory NFD on the equity market and its reaction to the introduction of the NFRD, while this study investigates the effects of mandatory NFD on firm-level non-financial performance. This study also builds upon the research of Downar et al. (2021), which considers a specific element within the aggregate concept of NFD, being the effects of mandatory carbon disclosure on emissions and firm financial operating performance. This study fills the gap by addressing the aggregate of mandatory NFD and its effects on non-financial performance of firms. Moreover, Fiechter et al. (2022) analyses the real effects of the NFRD in the EU, by mainly examining the years prior (2014-2018) to the mandate, to study if the obligation in the future drives firms to change their behaviour regarding social responsibility.

To answer the research question, a multivariate regression analysis is performed using a Difference-in-Differences (DID) approach. A panel dataset is compiled, using data originating from 2009 up until 2020. The raw sample consists of firms based in 37 countries, being the 27 EU member states and along with other countries. Here lies the difference between the treatment group and the control group. All firms in the treatment group can be considered as PIEs, meaning that the firm has 499+ employees. The control group consists of solely U.S. firms, also with 499+ employees, which is in line with Fiechter et al. (2021) and Downar et al. (2021). U.S. firms have not been subject to a NFD mandate up to 2020. This study compares pre -and post NFRD non-financial performance for PIEs and control group firms.

The main dependent variable in this study is the non-financial performance of firms, which is measured by the firm-year-specific ESG-score provided by Refinitiv Eikon. The main independent variable in this study is mandatory NFD. In line with Downar et al. (2021), a treatment variable is made to cover for the difference between mandatory and non-mandatory NFD. A combination of control variables is added to the regression model to control for firm-specific characteristics as well as country-specific characteristics. The same goes for an error term, firm fixed effects and year fixed effects, to control for firm and time effects.

This study indicates that the non-financial performance of firms is significantly improving over time, but that the NFRD has a negative effect on PIEs compared to firms that are not subject to the NFRD. The treatment effect is significantly negative at -1.562, meaning that compared to

control firms, the non-financial performance of PIEs were negatively affected by the introduction of the NFRD. The results show evidence that this negative effect is growing over time. Finally, evidence is provided to show that the results are robust, based on geographical location in Europe.

Furthermore, section 2 of this study consists of the review of the regulatory background of the NFRD, as well as the theoretical framework and the hypothesis development. Section 3 provides the research design. Section 4 presents the results of the regression analysis. Finally, in section 5, a conclusion is drawn.

2 Regulatory Background and Hypothesis Development

2.1 Regulatory background

The European Parliament and the European Council published and presented the Non-Financial Reporting Directive on the 22nd of October 2014. Its general purpose is the amendment of Directive 2013/34/EU on comparable and clear financial statements by certain large undertakings and groups, presented on the 26th of June 2013⁷ (Directive 2013/34/EU). Correspondingly, according to paragraph 6 of the NFRD, PIEs have the obligation to report non-financial information about “(at least) environmental matters, social and employee-related matters, respect for human rights, anti-corruption and bribery matters”. Firms are defined as PIEs when they have a yearly average of employees in excess of 500, according to paragraph 14 (Directive 2014/95/EU). The directive is applicable to all fiscal years from 2017 onward.

To elaborate, PIEs have to prepare a non-financial statement consisting of the following parts:

- Brief description of the group’s business model.
- Description of the policies used by the group, in relation to the environmental, social and employee-related matters, including the due diligence processes implemented.
- The results of the policies involved.

⁷ Directive 2013/34/EU aims to assure comparable financial statements, along with other related reports which are different from International Financial Reporting Standards (IFRS). The EC obliged EU-member states to have added this directive to national law by July 20th 2015.

- Primary risk assessment in relation to the mentioned matters, related to the operations of the PIE. Also and evaluation of the risk management system in place.
- Non-financial key performance indicators significant to the respective PIE.

To dissect the matters that are obligatory within the NFRD even more, each section (being environmental, social and employee-related matters and human rights issues) has certain detailed impacts to be reported on. For the environmental section, the PIE needs to report on health and safety, the use of (non)-renewable energy sources, greenhouse gas emissions, water use and air pollution. Considering the social and employee-related sections, actions regarding gender equality, working conditions, social dialogue, respect for trade union rights among other impacts need to be reported on. For the human rights section, especially the prevention of human rights abuses and corruption are central focus points, according to paragraph 7 (Directive 2014/95/EU).

In the financial reporting realm, there are certain rules and standards involved for financial statements and other related reports. The International Financial Reporting Standards (IFRS) are the set standards that publicly traded firms must adhere to, to provide comparable and clear financial information. However, for the non-financial reporting realm, there is no single mandatory reporting standard as of 2022. To ensure some kind of comparability and clarity the EC has set up certain (non-mandatory) guidelines when it comes to NFD (European Commission, 2020). Considering the parts that need to be incorporated into the non-financial statement, every PIE is free to report these in the way the PIE feels it as most appropriate, according to paragraph 9 of the NFRD (Directive 2014/95/EU).

By making PIEs compliant to the rules set in the directive, moreover by adhering to the set of guidelines, the European Parliament acknowledges the usefulness of firms uncovering their practices regarding CSR. This could potentially lead towards decreasing sustainability risks as well as increasing investor confidence and consumer trust (Choi & La, 2013). The next section elaborates on the theoretical framework used for the development of hypotheses for this study.

2.2 Theoretical framework

This study develops the hypotheses based on the targeted disclosure cycle theory (TDC)⁸ proposed by Fung et al. (2007). This theory is based on 'targeted transparency' by users of information (Fung et al., 2007). The claim here is made that a change in behavior of information users is induced by NFD and that this behavioral change affects the actions of disclosing parties, which is expected to affect the behavior of the user of information again. TDC thus indicates a cyclical approach where information users and disclosing parties are affecting each other. This cycle is depicted in Figure 1. The essentials of TDC are the disclosing parties and their targeted behavior, the users of NF information and their targeted behavior, as well the NFD regulation involved.

According to Downar et al. (2021), TDC has the assumption that NFD as well as financial disclosure affects the information users' behavior leading to positive changes in corporate output. One can assume that making NFD mandatory affects both information user and disclosing party behavior over time. This changing behavior includes a more positive approach of firms towards CSR.

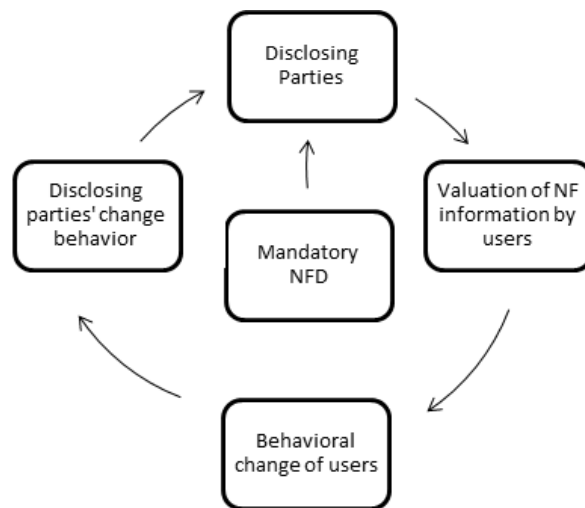


FIGURE 1. TARGETED DISCLOSURE CYCLE

Note: Based on figure from Gerged, A. M., Matthews, L., & Elheddad, M. (2021). Mandatory disclosure, greenhouse gas emissions and the cost of equity capital: UK evidence of a U-shaped relationship. *Business Strategy and the Environment*, 30(2), p. 912.

⁸ Sometimes referred to as Targeted Transparency Regulation in existing literature.

Related to NFD, TDC has been used as a theoretical framework in a recent study involving mandatory greenhouse gas emissions (GHG) disclosure⁹ (Downar et al., 2021). Key here is that a 2013 law obliges UK firms to disclose their GHG, with the goal to affect the corporate behaviour towards a sustainable economy. The NFRD includes goals that are the basis of this UK law, but has exceedingly more goals. Hombach and Sellhorn (2019) used a survey approach to examine whether the determinants for mandatory disclosure have real effects. The variables that are reported on provide the information users with additional information that can affect their decision-making, leading to market activities of those users of information, which in turn can affect the CSR investment and non-financial performance of firms, according to TDC (Friedman & Heinle, 2016). The next section elaborates on the hypothesis development.

2.3 Hypothesis development

In paragraph 3 of the NFRD, the European Commission pleads for mandatory NFD, where the continental administrative body claims that NFD is an integral part of managing change towards a global sustainable economy. It does so by contributing to the combination of long-term profitability on the one hand, and social justice and sustaining the environment on the other hand (Directive 2014/95/EU). Previous studies have shown that mandatory NFD has effects on several aspects on the corporate agenda, being the increase in quality of corporate financial and non-financial disclosure (Ioannou & Serafeim, 2017; Lock & Seele, 2016); an increase in the firm's market value (Ioannou & Serafeim, 2017; Rossi & Harjoto, 2020); an increase in assurance on NFD (Ioannou & Serafeim, 2017); and the increase in investment efficiency for the firm (Shroff et al., 2014).

Related to non-financial aspects on the corporate agenda, several studies have added evidence of real effects of mandatory NFD to existing literature. NFD mandates are the parallel variable in these studies, but samples were varying. Country-level research has been done by Chen et al. (2018), who found out that a Chinese mandate on NFD lead to lower profitability for the shareholders, but resulted in positive externalities for other stakeholders¹⁰. Likewise, Downar et

⁹ Greenhouse gas emissions disclosure fall under the non-binding guidelines set up by the European Commission, thus is a specific part of NFD.

¹⁰ Reduction in industrial wastewater and SO₂ emissions to be exact, which fall under the environmental pillar of CSR performance.

al. (2021) studied the effects of the UK mandate on GHG emissions¹¹ on a firm-level and found a significant negative effect (i.e. an implied increase in non-financial performance). An explanation for this is that this mandate increases transparency, making non-financial information easier accessible for stakeholders, which in turn affects firms' commitment towards CSR practices, which can be explained by TDC (Downar et al., 2021). Moreover, industry-level research performed by Christensen et al. (2015) lead to the conclusion that within the mining industry, NFD has a positive effect on mine-safety. Mine-safety information is valued by the market, rewarding the reporting firms, which in turn confirms TDC as well. Safety of employees is one of the category scores that fall under the social pillar of non-financial performance, explaining the previous drawn conclusion. Ioannou & Serafeim (2017) performed a DID-regression analysis regarding mandatory NFD in four countries and the effect of those mandates on the level of ESG disclosure scores, but use a very different sample and time period compared to this study¹². In all cases, both the treated group and the control group have an increase in non-financial performance after the introduction of the respective NFD mandate (Ioannou & Serafeim, 2017). Likewise, Fiechter et al. (2022) investigated the real effects of mandatory NFD on CSR transparency and CSR activities and did find significant results towards increasing non-financial performance of firms in Europe. The results showed that firms were responding to the NFRD, even before the directive was obligatory. This study differs from Fiechter et al. (2022) by looking at both the non-financial performance of EU firms, as well as the three pillars that compromise the non-financial performance. Moreover, the difference lies within the timeframe. The timeframe of Fiechter et al. (2022) is different, since they only consider the years 2011-2018, meaning that the NFRD was only in effect for one year when the sample was compromised. The effects of the NFD mandate were logically most apparent in 2018 as shown by the results of Fiechter et al. (2022), but this study tries to confirm a lagging effect by adding two more years of data for non-financial performance. Combining the evidence provided by the study of Fiechter et al. (2022) with the theoretical approach of TDC,

¹¹ Greenhouse gas emissions fall under the environmental pillar of CSR performance.

¹² Ioannou & Serafeim (2017) uses a sample based on China, Denmark, Malaysia and South Africa as treated firms, with a worldwide and U.S. sample for control group firms. Their timeframe is as early as 2005-2012.

leads to the conclusion that there could be a potential lagging effect. Existing literature confirms this predisposition (Cannon et al., 2020).

More in-depth, Jackson et al. (2020) examined the effects mandatory NFD on the social aspect of CSR activities, and made a distinction between government regulation and business self-regulation. Government regulation of NFD motivated firms towards an increase of 7 points of the social pillar of non-financial performance (on a scale of 0 to 100, where 0 means zero CSR-related activities and 100 means a full range of CSR-related activities). Business self-regulation of NFD presented even more promising results, with an increase of 12 points of non-financial performance. Doni et al. (2019) examined the effects of the social disclosure score of two different fiscal years (2013-2014) on several aspects of NFD. The study did find significant results, meaning that the social pillar score affected the setup of the description of the business model. However, with other aspects of NFD, there was no significant relationship found¹³. Concluding, existing literature has shown a variety of evidence that mandatory NFD could have positive and negative effects on the aggregate non-financial performance of firms, as well as the different pillars. Considering the existing literature, the following hypotheses are stated:

H1a: The introduction of the NFRD leads to an increase in non-financial performance of EU-Firms that fall under the NFRD.

H1b: The introduction of the NFRD leads to an increase in non-financial performance for firms that do not fall under the NFRD, like the firms that do fall under to the NFRD.

H2: Firms that fall under the NFRD obtain a larger increase in their non-financial performance than firms that do not fall under to the NFRD, since the introduction of the NFRD.

H3: The difference in the positive effect of the NFRD between firms that fall under the NFRD and firms that do not fall under is the strongest for the social pillar, followed by the positive effect on the environmental pillar and the positive effect on the governance pillar.

¹³ Doni et al. (2019) found no significant relationship found between the social pillar and positioning of non-financial information, the presence of reconciliation tables in the NFD and the model of organization and management.

The following section is used to explain the research design, and specifically the methodology used in this study.

3 Research Design

3.1 Methodology

To examine the impact of the NFRD (Directive 2014/95/EU), this study utilizes a Difference-in-Differences approach surrounding the implementation of this EU-directive. To illustrate, a DID approach makes use of two types of differences and makes comparisons using these differences. This study analyzes the differences between pre-NFRD and post-NFRD data for treatment group firms (i.e. PIEs) and control group firms. The time window involved in this study is 2009-2020, to get an even distribution between pre-NFRD and post-NFRD years. The DID-regression analysis is deemed most applicable for this study to track common trends between treatment group firms and control group firms (Downar et al., 2021). Figure 2 shows the geographical distribution of the treatment group. The next section elaborates on the regression models being used in this study.

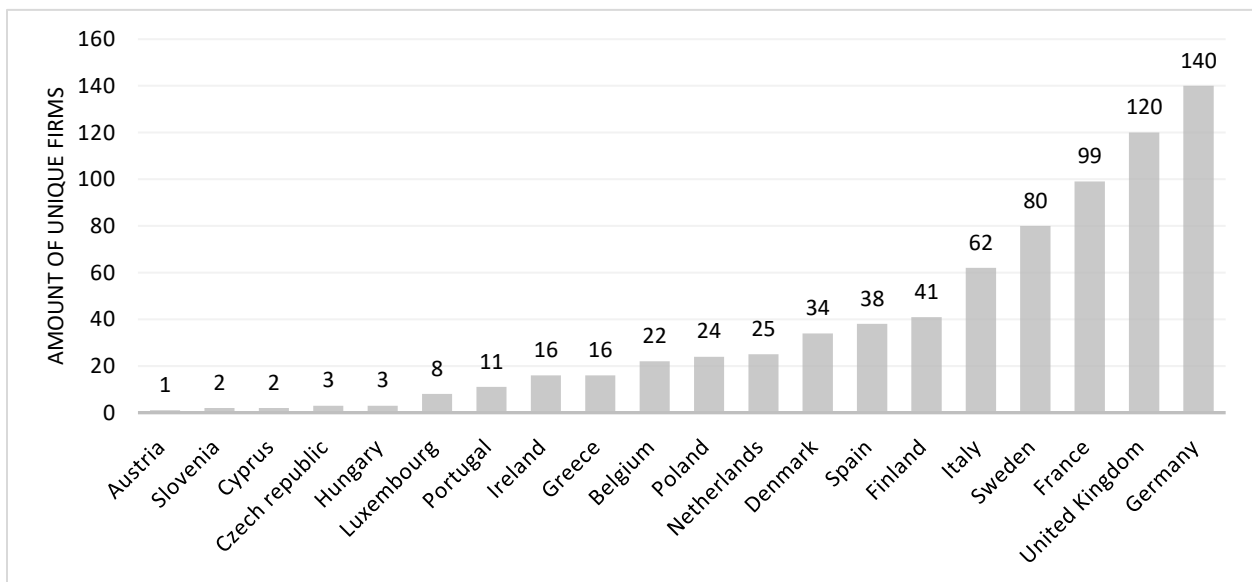


FIGURE 2. TREATMENT GROUP DISTRIBUTION BY COUNTRY

3.2 Regression models

To test hypothesis H1a, which entails that the introduction of the NFRD leads to an increase in non-financial performance of PIEs, the following fixed effects regression equation 1 is used:

H1a:

$$(1) \quad \begin{aligned} ESG_T_{it} = & \beta_0 + \beta_1 \cdot POST + \beta_2 \cdot FSIZE_{it} + \beta_3 \cdot FFIN_{it} + \beta_4 \cdot \\ & FDIS_{it} + \beta_5 \cdot F_AGE_{it} + \beta_6 \cdot BRD_C + \beta_7 \cdot GDP_{ct} + \beta_8 \cdot CPL_{ct} + \\ & \alpha_i + \lambda_t + \eta_{it} \end{aligned}$$

All variables used in this equation are explained in Table 3. To test this hypothesis, the sample solely consists of firms that are subject to the NFRD (i.e. PIEs). The dependent variable of interest ESG_T , consists of the non-financial performance score for a respective firm-year. $POST$ is a binary variable which indicates the difference in pre -and post NFRD periods involved in this study. The NFRD became mandatory for firms from the fiscal year 2017, so all years prior score a 0 for this binary variable. Starting from 2017 until 2020, all years score a 1 for this variable.

ESG_T is measured by the ESG-score, which is firm-year-specific, and is provided by Refinitiv ESG, once known as Thomson Reuters ASSET4 (Braam & Peeters, 2018). This database provides objective, verifiable and comparable ESG data on a global scale (Braam & Peeters, 2018). The ESG-scores are based on the relative performance of firms as compared to peer firms. This is deemed necessary, since different industries need different weighting for data points for it to be a fair measurement (Refinitiv, 2021). Each firm within the database gets a score, varying from 0 to 100, where a score of 0 depicts a situation of very low involvement with CSR activities, compared to peer firms and a score of 100 depicts the highest involvement with CSR activities compared to peer firms. The overall scores are categorized into four quartiles; 1 = (0-25), 2 = (> 25 – 50), 3 = (> 50 – 75) and 4 = (> 75 – 100). According to Refinitiv ESG standards, firms with the lowest scores, (i.e. firms belonging to quartile 1) have a relatively poor non-financial performance and their degree of transparency in reporting on CSR is insufficient. Second quartile firms have a satisfactory non-financial performance and their transparency degree in reporting on CSR as moderate. Firms that are placed within the third quartile, have a good non-financial performance and an above average degree of transparency in reporting. Firms with the highest scores, being

in the fourth quartile have an excellent non-financial performance and their transparency of CSR reporting is considered as high.

Regarding the other independent variables used in Equation 1, a combination of control variables is used to control for firm-specific as well as country-specific variation.

This study controls for firm size since recent literature claims that larger firms are more notable compared to smaller firms, therefore invite more attention from the media and other stakeholders, inducing them to look good to maximize shareholder value (Eunjung et al., 2016). Next to this, a study by Udayasankar (2008) claims there is a significant, U-shaped relationship between firm size and non-financial performance, meaning that both small and large firms are mostly motivated to engage in CSR activities. Considering the results of Udayasankar (2008), the decision is made to control for firm size in this study. This control variable is measured by the year-end value of total assets¹⁴ which is in line with Campbell & Mínguez-Vera (2008). Campbell & Mínguez-Vera (2008) uses the natural logarithm of total assets since their data is skewed. For this study there is no skewness in the firm size data, so there is no need to take the natural logarithm of total assets. However, to increase significance and detail to the coefficients, firm size is depicted in millions of euros. This variable is denoted by FSIZE.

Another control variable is added for firm financial performance, since firms that are more successful than market average could potentially show more commitment towards CSR practices than their rivalling firms (Eunjung et al., 2016). In this study, firm financial performance is measured by using Tobin's Q, which entails the ratio of market value to replacement cost (Tobin, 1969). Several studies have used Tobin's Q as proxy for firm financial performance (Wolfe & Sauaia, 2003; Hejazi et al., 2016; Jia, 2020). This variable is denoted by FFIN.

Furthermore, a control variable is added for firm financial distress, since firms that are under more financial distress have less funds available for CSR activities. Financial distress is generally measured by a firm's level of leverage. Literature has shown that there is a significant, negative relationship between leverage and non-financial performance (Barnea & Rubin, 2010). Leverage is the ratio of total debt to total assets. This variable is denoted by FDIS.

¹⁴ For this study, the results for Total Assets are divided by 1,000,000 to add significance and detail.

Moreover, a control variable is added for firm age, since firms that are existent over a longer period of time have more experience in dealing with shareholders and other stakeholders (Waluyo, 2017), have more social commitments over time (Mishra, 2015) and therefore are more committed to non-financial performance. This variable is measured by subtracting the reported incorporation year from the year in which the data is reported. The variable is denoted by *F_AGE*.

Next to this, a control variable is added for board composition measured by the ratio of independent board members to total board members. This control variable is added since literature shows that firms with more independent, non-executive board members generally have a better non-financial performance relative to firms with less independent, non-executive board members (Shaukat et al., 2016). This control variable is denoted by *BRD_C*.

Additionally, a control variable is added to control for the country-specific variance in GDP¹⁵. This is done to control for economic development in the respective years of enquiry and is in line with Mbanyele et al. (2022). To make the results for this control variable more detailed and significant, the choice is made to divide all observations regarding GDP by 1,000.

Finally, a country-specific control variable is added for the variance in the domestic price-level. An increase in the price-level might deduce firms to show commitment when it comes to CSR practices. This variable is denoted by *CPL*.

Furthermore, to test hypothesis H1b this study also uses a fixed effects regression model. This is depicted by regression equation 2:

H1b:

$$(2) \quad \begin{aligned} ESG_{T_{it}} = & \beta_0 + \beta_1 \cdot POST + \beta_2 \cdot FSIZE_{it} + \beta_3 \cdot FFIN_{it} + \beta_4 \cdot \\ & FDIS_{it} + \beta_5 \cdot F_AGE_{it} + \beta_6 \cdot BRD_C + \beta_7 \cdot GDP_{ct} + \beta_8 \cdot CPL_{ct} + \\ & \alpha_i + \lambda_t + \eta_{it} \end{aligned}$$

All definitions of variables are denoted in Table 2. For this hypothesis, the sample solely consists of firms that do not fall under the NFRD (i.e. control group firms). The control group for this study consists of U.S. firms, which is in line with Downar et al. (2021) and Fiechter et al. (2022).

¹⁵ All monetary variables in this study are denoted in EUR.

To test hypothesis H2, a DID-approach to a regression analysis is used. For this analysis the regression equation 3 is used:

H2:

$$(3) \quad \begin{aligned} ESG_{T_{it}} = & \beta_0 + \beta_1 \cdot POST + \beta_2 \cdot POST \cdot TREAT_{it} + \beta_3 \cdot FSIZE_{it} + \\ & \beta_4 \cdot FFIN_{it} + \beta_5 \cdot FDIS_{it} + \beta_6 \cdot F_AGE_{it} + \beta_7 \cdot BRD_C + \beta_8 \cdot \\ & GDP_{ct} + \beta_9 \cdot CPL_{ct} + \alpha_i + \lambda_t + \eta_{it} \end{aligned}$$

The main independent variable of interest is POST*TREAT, which indicates if there is a treatment effect for firms that are subject to the NFRD. If this variable indicates a positive coefficient, it would mean that PIEs are positively affected by the NFRD, compared to firms that are not subject to the NFRD. Illustratively, this means that PIEs have a larger increase in their non-financial performance since the introduction of the NFRD, compared to US firms that are not subject to the NFRD.

Moreover, to test hypothesis H3, three separate fixed effects regression analyses are run. The regression equations 4, 5 and 6 are used to observe the effects of the NFRD on the respective pillars of the non-financial performance of firms. To test regression equations 4, 5 and 6, a DID-regression analysis is used to examine the differences between the PIEs and the control group.

H3:

$$(4) \quad \begin{aligned} ESG_{E_{it}} = & \beta_0 + \beta_1 \cdot POST + \beta_2 \cdot FSIZE_{it} + \beta_3 \cdot FFIN_{it} + \beta_4 \cdot \\ & FDIS_{it} + \beta_5 \cdot F_AGE_{it} + \beta_6 \cdot BRD_C + \beta_7 \cdot GDP_{ct} + \beta_8 \cdot CPL_{ct} + \\ & \alpha_i + \lambda_t + \eta_{it} \end{aligned}$$

$$(5) \quad \begin{aligned} ESG_{S_{it}} = & \beta_0 + \beta_1 \cdot POST + \beta_2 \cdot FSIZE_{it} + \beta_3 \cdot FFIN_{it} + \beta_4 \cdot \\ & FDIS_{it} + \beta_5 \cdot F_AGE_{it} + \beta_6 \cdot BRD_C + \beta_7 \cdot GDP_{ct} + \beta_8 \cdot CPL_{ct} + \\ & \alpha_i + \lambda_t + \eta_{it} \end{aligned}$$

$$(6) \quad \begin{aligned} ESG_{G_{it}} = & \beta_0 + \beta_1 \cdot POST + \beta_2 \cdot FSIZE_{it} + \beta_3 \cdot FFIN_{it} + \beta_4 \cdot \\ & FDIS_{it} + \beta_5 \cdot F_AGE_{it} + \beta_6 \cdot BRD_C + \beta_7 \cdot GDP_{ct} + \beta_8 \cdot CPL_{ct} + \\ & \alpha_i + \lambda_t + \eta_{it} \end{aligned}$$

The difference between these equation lies in the dependent variables used. Equation 3 is used to estimate the effect of the NFRD on the environmental pillar of the non-financial performance of PIEs. Equation 4 is used to estimate the effect on the social pillar of the non-financial

performance of PIEs. Equation 5 is used to estimate the effect on the governance pillar of the non-financial performance of PIEs. The ESG data points of firms are subdivided into three pillars, being the Environmental, Social and Governance pillar. Each pillar is derived from a set of data points that are associated with several categories. To illustrate, the environmental pillar consists of three categories, consisting of 136 data points per firm-year. The environmental (E) score determines the score for the weighted average relative rating of a firm, based on their reported data concerning the environment and the resulting environmental category scores. This is denoted by the variable called ESG_E. The social (S) score is the part for the weighted average relative rating of firm, based on their reported data concerning social information and the resulting social categories. This is denoted by the variable called ESG_S. The governance (G) score is the part for the weighted average relative rating of the firm based on their reported corporate governance information and the resulting governance category scores (Refinitiv, 2021). This is denoted by the variable called ESG_G. This study is sure that this ESG score is a good proxy for non-financial performance of firms, as several other studies use these ESG scores as proxies (Tasnia et al., 2020; Shahbaz et al., 2020; Tarmuji et al., 2016). The next section elaborates on the data collection.

3.3 Data

The data collection process is delineated in **Error! Reference source not found.** The raw sample consisted of 5,689 firms, spreading across 23 countries across Europe and the US. The raw sample was first adjusted due to the fact that not all firms had ESG-data available in the Refinitiv Eikon database. This lead to a sample of 4,136 firms. Second, firms were deleted from the sample (for that year) if one of their firm-year observations on non-financial performance was missing after consulting each of the following databases; Refinitiv Eikon, BoardEx, Datastream, OECD.stat and Eurostat. Afterwards, to reduce the amount of missing observations within the sample, several steps were taken to fill these missing observations. For firm size, all missing observations were filled by using the company mean instead of the missing observations. The same goes for firm performance and firm financial distress. For board composition, the first value available is used

for all missing firm-year observations prior. The same goes for the amount of employees working for the firm.

TABLE 1. SAMPLE SELECTION PROCESS

Sample definition	Unique firms			Firm-Year observations		
	Treatment Group	Control Group	Total	Treatment Group	Control Group	Total
Firms in raw sample	2,115	3,574	5,689	25,380	42,888	68,268
Firms with ESG-data available	2,056	3,523	5,579	11,622	20,277	31,899
Firms without missing data	905	3,231	4,136	4,618	19,018	23,636
Firms with more than 499 employees	747	2,306	3,053	5,113	15,091	20,204
Final sample	747	2,306	3,053	5,113	15,091	20,204

This table depicts the data collection for an estimation of the effect of the NFRD on the non-financial performance of firms.

TABLE 2. SAMPLE DISTRIBUTION

	Unique Firms			Firm-Year observations		
	Treatment Group	Control Group	Total	Treatment Group	Control Group	Total
Austria	16	0		98	0	
Belgium	22	0		117	0	
Cyprus	2	0		7	0	
Czech republic	2	0		24	0	
Denmark	34	0		241	0	
Finland	41	0		250	0	
France	99	0		817	0	
Germany	140	0		704	0	
Greece	16	0		136	0	
Hungary	3	0		25	0	
Ireland	11	0		114	0	
Italy	62	0		420	0	
Luxembourg	3	0		23	0	
Netherlands	25	0		211	0	
Poland	24	0		220	0	
Portugal	8	0		62	0	
Slovenia	1	0		4	0	
Spain	38	0		313	0	
Sweden	80	0		351	0	
United Kingdom	120	0		916	0	
United States	0	2,306		0	15,091	
Final sample	747	2,306	3,053	5,113	15,091	20,204

This table shows the geographic sample distribution of both the treatment group and the control group. Treatment group firms are based in the EU, control group firms are solely based in the US.

Subsequently, to only include firms with more than 499 employees, firm-year observations with less than 500 employees were deleted. The aggregate of these steps lead to a final sample, consisting of 3,053 unique firms across Europe¹⁶ and the US, with a total of 20,204 firm-year observations. Table 2 shows the distribution of unique firms, as well as firm-year observations over the treatment group and the control group.

TABLE 3. OVERVIEW OF VARIABLES

VARIABLES	EXPLANATION	SOURCE
Dependent variables		
ESG_T	Overall firm score based on self-reported information in the environmental, social and governance pillars. The score varies from 0-100, with 100 being the highest non-financial performance score.	Refinitiv ESG by Thomson Reuters Eikon
ESG_E	Weighted average relative rating of a firm, based on reported environmental information. The score varies from 0-100.	Refinitiv ESG by Thomson Reuters Eikon
ESG_S	Weighted average relative rating of a firm, based on reported social information. The score varies from 0-100.	Refinitiv ESG by Thomson Reuters Eikon
ESG_G	Weighted average relative rating of a firm, based on reported governance information. The score varies from 0-100.	Refinitiv ESG by Thomson Reuters Eikon
Independent variables		
POST	Binary variable which makes a distinction between the pre-Directive years (2009-2016) and the post-Directive years (2017-2020). For the pre-Directive years, the binary variable indicates a 0, for the post-Directive years, the binary variable indicates a 1. This is done to detect differences for all dependent variables after the introduction of the NFRD.	
TREAT	Indicator variable which depicts whether or not a firm is within the 'treatment group' (variable indicates a 1) or within the 'control group' (variable indicates a 0). When a firm has +499 employees and is based in an EU-member state, TREAT is a 1. When a firm does not confirm one of these characteristics, TREAT is a 0.	Datastream

¹⁶ Firms from the United Kingdom were also included in the sample. The UK left the EU as of 01-02-2020, which leads to the conclusion that for the greater extend of the timeframe used in this study, UK firms were subject to the NFRD. This is in line with Breijer & Orjij (2022).

Control variables	Included are several firm-level control variables, as well as country-level control variables.	
FSIZE	Measured by the year-end total assets in Millions of Euros.	Datastream
FFIN	Measured by Tobin's Q. Tobin's Q is measured by the ratio of market value to replacement cost.	Datastream
FDIS	Measured by leverage; being total debt/total assets.	Datastream
F_AGE	Firm age in years	BoardEx
BRD_C	Board composition, measured by the independent board members, relative to the total amount of board members.	Refinitiv ESG by Thomson Reuters
GDP	Measured by GDP in Billions of Euros.	OECD.stat Eurostat
CPL	Measured by Producer Price index	Eurostat

This table explains all the used variables for this study.

4 Results

In this section the results of the regression analyses, as well as the results of the DID-regression analysis are presented. Prior to the presentation of those results, the results of a Hausman test¹⁷ are presented, as well as the results of a check for a possible multicollinearity problem. At the end of this section, a robustness test based on geographic location is performed and the results are presented.

4.1 Descriptive statistics

TABLE 4. DESCRIPTIVE STATISTICS

Panel A: Control Group					
Variables	Obs	Mean	Std. Dev.	Min	Max
Dependent variables					
ESG_T	15091	42.127	19.399	.45	95.15
ESG_E	15091	29.272	27.989	0	98.55
ESG_S	15091	44.327	21.138	.26	97.86
ESG_G	15091	49.798	22.68	.19	99.45
Control variables					

¹⁷ A Hausman test is performed to examine whether a fixed effects regression model or a random effects model is most suitable for this study.

F_SIZE	15091	30.23	162.464	.009	3972.802
FFIN	15091	2.311	7.338	.230	608.643
FDIS	15091	27.409	22.593	0	391.59
F_AGE	15091	31.618	30.793	0	228
BRD_C	15091	.211	.136	0	.923
GDP	15091	14704.017	938.455	12675.596	16121.727
CPL	15091	101.67	4.433	90.25	106.72

Panel B: Treatment Group

Dependent variables					
ESG_T	5113	55.695	19.744	2.9	94.52
ESG_E	5113	54.894	25.996	0	99.2
ESG_S	5113	59.051	22.885	.72	98.47
ESG_G	5113	52.166	22.452	1.01	98.3
Control variables					
FSIZE	5113	56.667	208.693	.048	2483.948
FFIN	5113	1.708	1.528	.402	58.866
FDIS	5113	26.002	18.632	0	253.79
F AGE	5113	63.062	54.333	0	370
BRD_C	5113	.195	.158	0	.857
GDP	5113	1513.691	1225.344	37.818	23009.9
CPL	5113	100.447	4.67	85.43	113.15

This table displays the descriptive statistics used in this study. In Panel A, the descriptive statistics for the control group (i.e. US firms and 500+ employees) are shown. In panel B, the descriptive statistics for the treatment group (EU-firms and 500+ employees) are shown. The variables are explained in Table 3.

depicts the descriptive statistics of all variables included in the regression analyses performed for this study, divided into the treatment and control group. Looking at the aggregate non-financial performance score, as well as the different pillars, one can conclude that there is a substantial difference between the highest scoring firm and the lowest scoring firm for both the control group and the treatment group. Comparing the mean of both groups shows that firms within the treatment group are scoring higher on their non-financial performance than firms within the control group (55.597 vs. 39.359). This means that PIEs are scoring relatively good compared to peer firms, while firms in the control group score relatively bad compared to peer firms. The same goes for each respective pillar of non-financial performance, but especially for the environmental pillar, where control group firms score 29.272 and the treatment group firms score 54.894. Illustratively, PIEs are relatively bigger (by total assets), have a lower level of firm success, but also a lower level of firm financial distress, are older and have relatively less independent directors, compared to control group firms.

The next section provides the summary statistics and results for preliminary tests as well as the results of the regression analyses performed in this study.

TABLE 4. DESCRIPTIVE STATISTICS

Panel A: Control Group

Variables	Obs	Mean	Std. Dev.	Min	Max
Dependent variables					
ESG_T	15091	42.127	19.399	.45	95.15
ESG_E	15091	29.272	27.989	0	98.55
ESG_S	15091	44.327	21.138	.26	97.86
ESG_G	15091	49.798	22.68	.19	99.45
Control variables					
FSIZE	15091	30.23	162.464	.009	3972.802
FFIN	15091	2.311	7.338	.230	608.643
FDIS	15091	27.409	22.593	0	391.59
F_AGE	15091	31.618	30.793	0	228
BRD_C	15091	.211	.136	0	.923
GDP	15091	14704.017	938.455	12675.596	16121.727
CPL	15091	101.67	4.433	90.25	106.72

Panel B: Treatment Group

Dependent variables					
ESG_T	5113	55.695	19.744	2.9	94.52
ESG_E	5113	54.894	25.996	0	99.2
ESG_S	5113	59.051	22.885	.72	98.47
ESG_G	5113	52.166	22.452	1.01	98.3
Control variables					
FSIZE	5113	56.667	208.693	.048	2483.948
FFIN	5113	1.708	1.528	.402	58.866
FDIS	5113	26.002	18.632	0	253.79
F AGE	5113	63.062	54.333	0	370
BRD_C	5113	.195	.158	0	.857
GDP	5113	1513.691	1225.344	37.818	23009.9
CPL	5113	100.447	4.67	85.43	113.15

This table displays the descriptive statistics used in this study. In Panel A, the descriptive statistics for the control group (i.e. US firms and 500+ employees) are shown. In panel B, the descriptive statistics for the treatment group (EU-firms and 500+ employees) are shown. The variables are explained in Table 3.

4.2 Preliminary tests

Firstly, a Hausman specification test is performed. Considering the resulting P-value of .000, which is lower than the predetermined 5% level for ESG_T, a fixed effects regression model is deemed most appropriate for this study. Therefore, year fixed effects are included in the regression models to cover for any variance in the economy of respective countries that possibly could affect the non-financial performance of firms. Additionally, firm fixed effects are also added to the regression models to exclude constant omitted variables.

Secondly, to check for a possible multicollinearity issue within the sample, a pairwise correlation test and a Variance Inflation (VIF) test are performed. Additionally, a VIF test is performed to check for any linear relations between independent variables. The results of this VIF test are shown in appendix A. According to Acock (2018) a multicollinearity problem could be existent in a model when the results of a VIF test would exceed 10. However, within this model the results are between 1.004 and 3.007.

Additionally, a pairwise correlation test is performed.

Table 5 shows the results for the pairwise correlation test with all independent variables involved in this study. The pairwise correlation test does not show any significantly strong

correlations, since all scores are between -.337 and .337. Combining the results of the VIF test with the results of the pairwise correlation test, one can conclude that there should be no problem of multicollinearity within this model.

TABLE 5. CORRELATION MATRIX

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) POST	1.000								
(2) TREAT	-0.077	1.000							
(3) FSIZE	-0.049	0.065	1.000						
(4) FFIN	0.030	-0.039	-0.028	1.000					
(5) FDIS	0.021	-0.028	0.001	-0.012	1.000				
(6) F_AGE	-0.052	0.337	0.016	-0.033	-0.051	1.000			
(7) BRD_C	0.019	-0.048	-0.045	0.002	-0.026	-0.085	1.000		
(8) GDP	0.149	-0.985	-0.061	0.042	0.032	-0.337	0.049	1.000	
(9) CPL	0.787	-0.117	-0.050	0.039	0.034	-0.061	0.004	0.202	1.000

This table depicts all pairwise correlations between the independent variables used in this study. Bold-faced correlations are strong correlations.

4.3 Hypotheses H1a and H1b

The respective results are presented in Table 6 **Error! Reference source not found.** This table shows the effect of the introduction of the NFRD (POST) on non-financial performance (ESG_T), but solely for PIEs. In the fixed effects regression model there is controlled for firm size (FSIZE), firm performance (FFIN), firm financial distress (FDIS), firm age (F_AGE), board composition (BRD_C), GDP (GDP) and the price level (CPL), as well as firm fixed effects (α) and time fixed effects (λ). For hypothesis H1a, the sample solely consists of PIEs, so only firms that are based in an EU-member state. Hypothesis H1a states that the introduction of the NFRD has a positive effect on the non-financial performance of PIEs. This is depicted by the coefficient linked to POST in Table 6. The conclusion can be drawn from the results that the introduction of the NFRD has a positive effect on the non-financial performance of PIEs, considering the fact that the regression coefficient is at 3.542. Illustratively, after the introduction of the NFRD, the non-financial performance of PIEs has increased with 3.542 points on a scale of 0-100. The results for this

relationship are significant since the p-value = .000, which is lower than the predetermined α of 5%. Accordingly, the conclusion can be drawn that this study fails to reject hypothesis H1a. The R-squared value of 0.394 means that 39.4% of all the variation in the non-financial performance is explained by the aggregate of the other variables in the model. One can conclude there is a strong goodness of fit for this model, since the R-squared value is higher than 0.3 (Acock, 2018, p.278). Observing the coefficients of the control variables used in the regression analysis, firm age and board composition actually have the expected, significant positive effect on the non-financial performance of PIEs. Firm financial performance has a significant, yet unexpected negative effect on non-financial performance (p-value = .001), where firm financial distress (p-value = .004) has a significant, yet unexpected positive effect on non-financial performance. Most noticeably is that, although there is evidence in existing literature, firm size and GDP and price level have no significant effect on non-financial performance.

TABLE 6. FIXED EFFECTS REGRESSION MODEL OF H1A

ESG_T	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
POST	3.542	.407	8.71	.000	2.744	4.339	***
FSIZE	.005	.003	1.45	.147	-.002	.012	
FFIN	-.7	.214	-3.27	.001	-1.12	-.28	***
FDIS	.039	.014	2.89	.004	.013	.066	***
F_AGE	1.461	.11	13.25	.000	1.245	1.677	***
BRD_C	8.378	2.101	3.99	.000	4.259	12.497	***
GDP	-.001	.001	-0.82	.411	-.002	.001	
CPL	-.019	.065	-0.29	.774	-.147	.109	
Constant	-36.985	4.244	-8.71	.000	-45.306	-28.665	***
Mean dependent var		55.695		SD dependent var		19.744	
R-squared		0.394		Number of obs		5,113	

*** p<.01, ** p<.05, * p<.1

This table shows the regression estimations provided for regression equation 1. The relation between the NFRD and the non-financial performance of PIEs is depicted by these coefficients. All variables are explained in Table 3. ESG_T is the dependent variable of interest, which denotes the non-financial performance of firms. Significance levels are depicted by either ***,** or *, indicating significance at .01, .05 and .1 levels.

The results for this regression analysis are presented in Table 7. The table shows the effect of the introduction of the NFRD on the non-financial performance of firms. However, for this hypothesis only firms that do not fall under the NFRD are in the sample. The same combination of control variables is used for H1b as for H1a. Hypothesis H1b states that the introduction of the NFRD has a positive effect on the non-financial performance of firms that do not fall under the NFRD. The relationship is depicted by the coefficient linked to POST in **Error! Reference source**

not found.. Considering the results of the regression analysis, one can conclude that the introduction of the NFRD has a positive effect on the non-financial performance of firms that do not fall under the NFRD, since the regression coefficient is 3.735, which is a positive number. Subsequently, after the introduction of the NFRD, the non-financial performance of firms that do not fall under the NFRD has increased with 3.735 points on a scale of 0-100.

TABLE 7. FIXED EFFECTS REGRESSION MODEL OF H1B

ESG_T	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
POST	3.735	.236	15.84	.000	3.273	4.197	***
FSIZE	.005	.002	2.11	.035	0	.009	**
FFIN	.037	.031	1.19	.234	-.024	.097	
FDIS	-.019	.007	-2.61	.009	-.034	-.005	***
F_AGE	1.222	.087	14.03	.000	1.052	1.393	***
BRD_C	-10.009	1.028	-9.73	.000	-12.025	-7.993	***
GDP	-.001	0	-10.22	.000	-.001	-.001	***
CPL	.403	.066	6.13	.000	.274	.532	***
Constant	-19.221	3.553	-5.41	.000	-26.186	-12.256	***
Mean dependent var	42.127		SD dependent var		19.399		
R-squared	0.374		Number of obs		15,091		

*** p<.01, ** p<.05, * p<.1

This table shows the regression estimations provided for regression equation 2. The relation between the NFRD and the non-financial performance of control group firms is depicted by these coefficients. All variables are explained in Table 3. ESG_T is the dependent variable of interest, which denotes the non-financial performance of firms. Significance levels are depicted by either ***,** or *, indicating significance at .01, .05 and .1 levels.

The results for this relationship can be considered as significant since the p-value is .000, which is lower than the predetermined α of 5%. Concluding, this research fails to reject hypothesis H1b. The R-squared value of .374 means that 37.4% of the variance in the non-financial performance of firms not falling under the NFRD is explained by the variables in the model. Likewise for H1a, the R-squared value exceeds 0.3 and therefore there is a strong goodness of fit for this model (Acock, 2018, p.278). Regarding the control variables used in this model, firm size, firm age and price level have the expected, significant positive relationship¹⁸. Firm financial distress has the expected, significant negative relationship with the non-financial performance of firms that do not fall under the NFRD. Both board composition and GDP have a significant, yet unexpected negative relationship with the non-financial performance of firms not falling under the NFRD. Firm financial performance has no significant relationship at all, which was not expected.

¹⁸ Firm size, firm age and price level have a p-value which is lower than the predetermined α of 5%.

4.4 Hypothesis H2

The results of DID-regression analysis are presented in

Table 8. The independent variable of interest is POST*TREAT, where the difference between the pre -and post Directive years is made, as well as the difference between PIEs and control group firms. Hypothesis 2 states that PIEs obtain a larger increase in their non-financial performance than control group firms, since the introduction of the NFRD. This is depicted by the coefficient linked to the independent variable POST*TREAT in

Table 8. According to the results, one can conclude that there is a negative treatment effect for PIEs, since the regression coefficient is at -1.562, which is negative. The results for the model developed are significant for POST*TREAT, since the p-value is 0.000, which is below the predetermined α of 5%. Considering the results in Table 8, one can conclude that this study has to reject H2. Economically, the results mean that since the introduction of the NFRD there has been an increase in the non-financial performance of firms in general, but the PIEs have had a lower increase than firms not subject to the NFRD. Observing the R-squared value of .374, one can imply that 37,4% of the variance in the non-financial performance of firms is explained by all independent variables within the regression model used. For H2, the goodness of fit is also to be considered as strong. (Acock, 2018, p.278). Observing the control variables used in this DID approach to a regression model, firm size (p-value = .005), firm age (p-value = .000) and the country price level (p-value = .000) have an expected, significant positive relationship with the non-financial performance of firms. Both board composition (p-value = .000) and GDP (p-value = .000) have a significant, yet unexpected, negative relationship with the non-financial performance of firms. Firm distress and firm financial performance have a negative, yet insignificant relationship with the non-financial performance of firms, although existing literature proves otherwise.

TABLE 8. DIFFERENCE-IN-DIFFERENCES REGRESSION MODEL OF H2

ESG_T	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
POST	4.02	.221	18.20	.000	3.587	4.453	***
POST*TREAT	-1.562	.324	-4.82	.000	-2.196	-.927	***
FSIZE	.005	.002	2.80	.005	.002	.009	***
FFIN	.025	.03	0.82	.410	-.035	.085	
FDIS	-.003	.006	-0.50	.618	-.016	.009	
F_AGE	1.401	.065	21.40	.000	1.272	1.529	***
BRD_C	-6.968	.923	-7.55	.000	-8.777	-5.158	***
GDP	-.001	0	-8.29	.000	-.001	-.001	***
CPL	.168	.046	3.65	.000	.078	.259	***
Constant	-17.757	2.36	-7.52	.000	-22.383	-13.131	***
Mean dependent var	45.560		SD dependent var		20.360		
R-squared	0.374		Number of obs		20,204		

*** $p < .01$, ** $p < .05$, * $p < .1$

This table shows the regression estimations provided for regression equation 3. All variables are explained in Table 3. ESG_T is the dependent variable of interest, which denotes the non-financial performance of firms. The independent variable of interest is the treatment effect of the NFRD on the non-financial performance of PIEs and control group firms, which is depicted by POST*TREAT. Significance levels are depicted by either ***, ** or *, indicating significance at .01, .05 and .1 levels.

To check if the treatment effect of the NFRD on the non-financial performance of firms has lagged, three separate DID-regression analyses are used. The results are shown in Table 9. For 2018 (model 1), where the NFRD was first in effect, the results show that the treatment effect is significantly negative, with a coefficient of -.929. This means that in 2018, PIEs had a non-financial performance which was weaker by .929 points compared than control group firms. This negative effect becomes more greater over time, since the regression coefficients for 2019 and 2020 are -1.462 and -2.390 respectively¹⁹. This means that for PIEs, the NFRD has a significant negative treatment effect on their non-financial performance compared to control group firms. This negative treatment effect has been increasing over time.

¹⁹ POST*TREAT has a p-value lower than the predetermined alpha of 5% for all three models used.

TABLE 9. LAGGING EFFECTS OF H2

	(1) 2018	(2) 2019	(3) 2020
POST	3.594*** (.215)	4.225*** (.257)	4.899*** (.254)
POST*TREAT	-.929** (.363)	-1.462*** (.417)	-2.390*** (.414)
Observations	14,678	14,916	14,966

Standard errors are in parentheses

**** p<.01, ** p<.05, * p<.1*

This table shows the regression estimations provided for regression equation 3, but for three separate years to check for lagging effects. All variables are explained in Table 3. ESG_T is the dependent variable of interest, which denotes the non-financial performance of firms. The independent variable of interest is the treatment effect of the NFRD on the non-financial performance of PIEs and control group firms, which is depicted by POST*TREAT. Significance levels are depicted by either ***,** or *, indicating significance at .01, .05 and .1 levels.

4.5 Hypothesis H3

The results for these analyses are shown in Table 10. Fixed Effects Regression model of H3. Hypothesis 3 states that the difference of the effect of the NFRD between the treatment group and the control group, the positive effect on the non-financial performance falling under the umbrella of the social pillar is strongest, the positive effect on the non-financial performance falling under the umbrella of the environmental pillar is second strongest and the positive effect on the non-financial performance falling under the umbrella of the governance pillar is weakest. The ordering of the dependent variables is denoted by the regression coefficients linked to POST*TREAT. Observing this regression coefficient of the three models leads to the conclusion that the positive effect on the social pillar of non-financial performance is strongest, but also the only positive coefficient. The effect on both the environmental pillar and the governance pillar is unexpectedly negative. All three coefficients are significant, but with these results one can conclude that H3 has to be rejected. The regression coefficient for POST*TREAT in model 1 means that since the introduction of the NFRD, the environmental pillar of non-financial performance of PIEs has had a treatment effect of -4.647 points on a scale of 0-100, which can be seen as a rather strong effect. This means that firms within the control group have had a larger increase on their environmental pillar than PIEs. Since the p-value is at .000, which is lower than the predetermined α of 5%, the results are deemed significant. The regression coefficient for POST*TREAT in model

2 means that since the introduction of the NFRD, the social pillar of non-financial performance of PIEs has had a treatment effect of 1.240 points on a scale of 0-100, which is a considerable increase. The p-value for this results is at .001, which is lower than the predetermined α of 5%, so the tested positive relationship can be considered as significant. The regression coefficient for POST*TREAT in model 3 means that since the introduction of the NFRD, the governance pillar of non-financial performance has had a treatment effect of -1.163 points on a scale of 0-100, meaning that the control group has had a larger increase on their governance pillar than PIEs. The p-value for this results is at .024, which is lower than the predetermined α of 5%, so the tested relationship can be considered as significant. Regarding the R-squared scores for all three models, there is some discrepancy. The independent variables included in model 2 explain the variance in the social pillar of non-financial performance better than for the other two pillars (.334 vs .195 and .165 respectively). One can conclude that the variance in the environmental and governance pillars of non-financial performance of firms depend on other economic or non-economic factors. The R-squared score for model 2 depicts a goodness of fit considered as strong, since it exceeds .3. For model 1 and 3, the goodness of fit is low, since they both exceed .1, but do not exceed .3.

TABLE 10. FIXED EFFECTS REGRESSION MODEL OF H3

	(1) ESG_E	(2) ESG_S	(3) ESG_G
POST	1.143*** (.318)	3.116*** (.261)	4.499*** (.352)
POST*TREAT	-4.647*** (.466)	1.24*** (.383)	-1.163** (.516)
FSIZE	-.002 (.003)	.003 (.002)	-.002 (.003)
FFIN	-.018 (.044)	.033 (.036)	-.014 (.048)
FDIS	.031*** (.009)	.013* (.008)	.008 (.01)
F_AGE	1.56*** (.094)	1.694*** (.077)	1.089*** (.104)
BRD_C	-3.201** (1.329)	-3.798*** (1.091)	-40.251*** (1.471)
GDP	-.001*** (0)	-.001*** (0)	-.001*** (0)
CPL	.255*** (.066)	.106* (.055)	-.053 (.074)
_cons	-44.861*** (3.398)	-20.045*** (2.79)	30.148*** (3.761)
Observations	20204	20204	20204
R-squared	.195	.334	.165

Standard errors are in parentheses

**** p<.01, ** p<.05, * p<.1*

This table shows the regression estimations provided for regression equation 4, 5 and 6. Model 1 consists of the regression estimations which are explained by regression equation 4. Model 2 consists of the regression estimations which are explained by regression equation 5. Model 3 consists of the regression estimations which are explained by regression equation 6. All variables are explained in Table 3. ESG_E, ESG_S and ESG_G are the dependent variables of interest, which denotes the respective pillar of the non-financial performance of firms. The independent variable of interest is the treatment effect of the NFRD on the non-financial performance of PIEs and control group firms, which is depicted by POST*TREAT. Significance levels are depicted by either ***,** or *, indicating significance at .01, .05 and .1 levels.

4.6 Robustness testing

In order to ensure structural validity for the models used in this study, a robustness test is performed. According to Leamer (1983) robustness tests are tools to solve validity problems and are essential for all quantitative studies. A division of the treatment group firms is made, based on geographical location, in order to check for the robustness of the results. For the robustness test, the treatment group is divided into the British Isles and Scandinavia. The British Isles consist

of PIEs based in the UK and Ireland, Scandinavia consists of data on PIEs from Denmark, Finland and Sweden.

Table 11 shows the results for the robustness test. For the British Isles, the results are considered as robust and thus may be the driver of the results. Using this sample, the regression coefficient of interest (being the coefficient of POST*TREAT) is significant, with the p-value being lower than the predetermined α of .05. With this, one can conclude that since the introduction of the NFRD, firms in did general had an increase in their non-financial performance, but the PIEs in the British Isles have had lower increase than firms that were not subject to the NFRD. This lower increase comes down to 4.578 points on a scale of 0-100. Comparing the R-squared score of model 1 in Table 11, with the R-squared score of Table 8, (.367 vs. .374), leads to the conclusion that for PIEs on the British Isles, the variation in ESG_T is explained less by all variables included in the model, than for the whole sample. However, this comes down to a difference of .7%, which is considerably small.

For Scandinavia, the results are also to be considered as robust, which means they can also be the driver of the results. Using this sample, the regression coefficient of interest (being the coefficient of POST*TREAT) is significant, with the p-value being lower than the predetermined α of .05. With this, one can conclude that since the introduction of the NFRD, firms in did general had an increase in their non-financial performance, but the PIEs in Scandinavia have had lower increase than firms that were not subject to the NFRD. This lower increase comes down to 2.507 points on a scale of 0-100. Comparing the R-squared score of model 2 in Table 11, with the R-squared score of Table 8, (.376 vs. .374), leads to the conclusion that for PIEs in Scandinavia, the variation in ESG_T is explained more by all variables included in the model, than for the whole sample. However, this comes down to a difference of .2%, which is considerably small.

With all this information, one can conclude that an indication of robustness is given by the results of these robustness tests.

TABLE 11. ROBUSTNESS TEST - BRITISH ISLES VS. SCANDINAVIA

	(1) British Isles – ESG_T	(2) Scandinavia – ESG_T
POST	3.911*** (.232)	3.770*** (.231)
POST*TREAT	-4.578*** (.609)	-2.507*** (.676)
FSIZE	.005*** (.002)	.005** (.002)
FFIN	.031 (.031)	.030 (.030)
FDIS	-.014** (.007)	-.015** (.007)
F_AGE	1.377*** (.078)	1.216*** (.083)
BRD_C	-9.970*** (1.006)	-9.699*** (1.006)
GDP	-.001*** (.000)	-.001*** (.000)
CPL	.212*** (.056)	.399*** (6.340)
_cons	-11.184*** (2.957)	-21.617*** (-6.500)
Observations	16,125	15,937
R-squared	.367	.376

Standard errors are in parentheses

*** $p < .01$, ** $p < .05$, * $p < .1$

This table shows the regression estimations provided for regression equation 3, with smaller samples divided into two groups. Model 1 shows the regression estimations for the British Isles, model 2 shows the regression estimations for Scandinavia. All variables are explained in Table 3. ESG_T is the dependent variable of interest, which denotes the non-financial performance of firms. The independent variable of interest is the treatment effect of the NFRD on the non-financial performance of PIEs and control group firms, which is depicted by POST*TREAT. Significance levels are depicted by either ***,** or *, indicating significance at .01, .05 and .1 levels.

5 Conclusion and Discussion

This study adds to the existing literature on the effects of mandatory non-financial disclosure. Existing literature is extensive when it comes to reporting mandates, with one common conclusion. In the end, mandating non-financial disclosure should lead to a better non-financial performance of firms. This study finds contradictory evidence. Using a Difference-in-Differences approach, there is evidence that firms subject to the NFRD do increase their non-financial performance, but there is a negative treatment effect of the NFRD. This means that firms that are subject to the NFRD actually have a lower increase in their non-financial performance, than firms

that are not subject to the NFRD. Intuitively, one explanation for this could be, that firms that were not performing well in their non-financial section before the introduction of the NFRD, are still not performing well, but now have to report on these 'bad practices'. The results also show evidence that this discrepancy in growth of non-financial performance between firms subject to the NFRD and firms not subject to the NFRD widens over time. This study also shows evidence that the results are robust based on varying geographical locations of firms subject to the NFRD.

This conclusion gives us one clear insight, which differs from previous research. Where Fiechter et al. (2022) found a significantly positive treatment effect, this study does quite the opposite. Especially tracking the results over time leads to contradictory results. The same goes for the results found in Downar et al. (2021), which showed a reduction of GHG emissions as a reaction to a similar non-financial disclosure mandate. Both these prior studies show consistency with the hypotheses posed in this study, but the results for this study prove otherwise.

Considering the theoretical foundations of TDC, one would expect that a reaction of information users would benefit 'good non-financial practice' and harm 'bad financial practice' on the equity market (Friedman & Heinle, 2016). Intuitively, a lagging effect of information user reaction is apparent here, since not all good practices could be benefited and all bad practices could be harmed immediately. However, results show evidence that this lagging effect either has to be longer than three years or there is no lagging effect at all.

As it comes to the limitations for this study, this study only elaborates on two levels of non-financial performance, being the total non-financial performance and the three pillars. Further research should focus more on those three pillars and their category scores, which could help understand, where mandatory non-financial disclosure could help to improve non-financial performance²⁰. Moreover, new research could focus more on the difference between smaller and larger firms (by employees) and make use of the DID-approach, to see whether mandatory NFD has an effect on the small firms as well. Likewise, the introduction of the Corporate Sustainability Reporting Directive by the EC, which amends the NFRD, could lead to the same or to different results, but in anyway would be interesting and an addition to existing literature. The EC stated

²⁰ Examples of category scores are; greenhouse gas emissions, nitrogen emissions, takeover defenses and data privacy.

that around 6,000 EU-based firms are subject to the CSRD in the future, which means that the sample for this study could be expanded, leading towards more generalizable results.

Lastly, the results for these tests are specific to this sample. An extension of the regression models using more control variables could potentially drive up the explanatory power of the variation in the non-financial performance of firms. Added to this, other economic and non-economic shocks are not included in the models, therefore one can see this as a limitation.

Discussing potential implications for policy makers leads to one sole conclusion. Due to the fact that this study finds a negative treatment effect, a question could be raised for those policy makers. Did the NFRD reach its intended goal? The introduction of the NFRD did lead to more accountability and transparency, but according to TDC, there should be a change in behavior (in this case, non-financial behavior) of firms as well. These results show that this change is not apparent, and not happening over time.

6 Bibliography

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7 Appendices

APPENDIX A: VARIANCE INFLATION TEST

	VIF	1/VIF
POST	3.007	.333
CPL	2.686	.372
SUBJ	2.303	.434
GDP	2.215	.452
F AGE	1.138	.879
BRD C	1.012	.989
F SIZE	1.008	.992
FDIS	1.005	.995
FFIN	1.004	.996
Mean VIF	1.709	.