UNIVERSITY OF TURKU
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IMPACT OF ESG RATING AND EU REGULATORY POLICIES ON FIRM VALUE

An empirical study on influence of ESG Rating and EU disclosure legislation on corporate financial performance and value in Europe.

Department of Economics
Master's thesis

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The aim of this thesis to examine the relationship between firm's ESG rating and financial performance in Europe during changes in EU disclosure regulation. Sustainability reporting provides investors, companies and legislators transparency and reliability. Non-financial reporting has experienced vast growth in recent years for voluntary and mandatory reasons. Still, the quality of non-financial reporting has been actively questioned of its impact in creating transparency and contributing to more sustainable business environment. To make reports and sustainability scores more reliable, EU has implemented it's Non-Financial Reporting Directive, among other legislations and sustainability frameworks.

NFRD mandates large companies to publish non-financial information and impact they have on society. This thesis aims to fill the gap on impact of mandated reporting and give insight to relationship between ESG rating and financial performance. Empirical part of this thesis examines ESG rating's relationship on accounting-based and market-based financial performance and how Directive 2014/95/EU impacts this relationship in Europe.

Empirical work uses different pooled ordinary least squares models and fixed effects models with unbalanced panel data acquired from LSEG database. Sample consists of 1972 companies in 32 different countries during years 2011-2022. Regression models give support to stakeholder and legitimacy theory as results indicate that ESG rating has positive influence on financial performance. Providing support that ESG rating can be a tool for company to reduce information asymmetry and risk. Results also indicate that this effect is enhanced for large companies subject to NFRD after 2018 when first reports were mandated.

Various robustness tests are used on the results as well as comparing the impacts on two data subsets that contained differing number of countries that are part of European Union. This thesis examines the role of sustainability legislations and offers evidence of the effects during its first years. It provides insight for companies to invest in sustainability and legislators to create more standardized framework for transparency.

Key words: ESG, NFRD, Sustainability, Non-financial reporting.

Pro gradu -tutkielma

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Tämän Pro gradun tavoite on tutkia yrityksen ESG-pisteytyksen ja yrityksen taloudellisen suoriutumisen välistä suhdetta Euroopassa, EU:n raportointimääräysten muutosten aikana. Kestävyysraportointi luo sijoittajille, yrityksille ja lainsäätäjille läpinäkyvyyttä ja luotettavuutta. Muiden kuin taloudellisten tietojen raportointi on kasvanut viime vuosina, sekä vapaaehtoisista että pakollisista syistä. Silti raportoinnin laatua on kyseenalaistettu sen vaikutuksesta läpinäkyvyyden luomiseen ja kestävän liiketoimintaympäristön kehittämiseen. Raportoinnin ja kestävyyspisteytyksen luotettavuuden parantamiseksi EU on asettanut Non-Financial Reporting Directive -direktiivin, sekä muita lainsäädäntöjä ja kestävyyskehyksiä.

NFRD velvoittaa suuria yritykset julkaisemaan ei-taloudellisia tietojaan ja omia vaikutuksia yhteiskuntaan. Tämä Pro gradu pyrkii täyttämään aukon pakollisen raportoinnin vaikutuksista ja lisäämään ymmärrystä ESG-luokituksen ja yrityksen arvon välisestä suhteesta. Empiirinen osio tutkii ESG-luokituksen suhdetta tilinpäätösperusteiseen ja markkinaperusteiseen taloudelliseen suorituskykyyn ja sitä, miten Direktiivi 2014/95/EU vaikuttaa tähän suhteeseen Euroopassa.

Empiirinen työ käyttää erilaisia yhdistetyn vaikutuksen regressioita ja kiinteän vaikutuksen regressioita epätasapainoisella paneelidatalla, joka on hankittu LSEG-tietokannasta. Otokseen kuuluu 1972 yritystä, 32 eri maasta, vuosilta 2011–2022. Regressiomallit tukevat sidosryhmä- ja legitimiteettiteorioita, tulokset osoittavat, että ESG-pisteytyksellä on positiivinen vaikutus yrityksen taloudelliseen suoriutumiseen. Tulokset viittaavat siihen, että ESG-investoinnit voivat olla yritykselle väline vähentää epäsymmetristä informaatiota ja riskiä. Tulokset osoittavat myös, että tämä vaikutus on voimakkaampi suurilla yrityksillä, jotka ovat NFRD:n alaisia vuoden 2018 jälkeen, jolloin ensimmäiset raportointimääräysten mukaiset raportit julkaistiin.

Tulosten robustisuuteen käytetään erilaisia testejä, sekä verrataan vaikutuksia kahdella osittaisotoksella, jotka sisältävät eriävät määrät Euroopan unioniin kuuluvia maita. Tämä Pro gradu tarkastelee kestävyyslainsäädännön roolia, ja tarjoaa tärkeää näyttöä sen vaikutuksista direktiivin ensimmäisinä vuosina. Tulokset lisäävät tärkeää näkemystä yritysten kannustimista investoida kestävyyteen ja luo lainsäätäjille kannustimia luoda standardoidumpi kehys kestävälle yritystoiminnalle.

Avainsanat: ESG, NFRD, 2014/95/EU.

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1 INTRODUCTION

1.1 Backround

During recent years, terms such as Environmental, Social and Governance (ESG), Corporate Sustainability (CS) and Corporate Social Responsibility (CSR) have become increasingly important attributes for companies. Previous three terms are often mixed and used in conjunction with each other (Sherwood & Pollard 2018). ESG investing lacks exact definition, it is more of an umbrella term for responsible investing. ESG investing can be defined as taking environmental, social and governance factors into consideration in investment decision-making along the side of financial factors (Schanzenbach & Sitkoff 2020; MSCI 2023).

ESG rating is used to evaluate company's commitment to ESG issues, and how the company handles issues that are relevant to its business. ESG rating is an important metric because it makes it easier for investors to take ESG factors in consideration. It capsulizes a large array of different variables to one. ESG ratings are often given by different ESG rating agencies, such as MSCI ESG Research, Refinitiv, ECP or Vigeo EIRIS. Rating agencies have different rating methods and parameters when it comes to evaluating ESG criteria. The accuracy and reliability of ESG rating has been a contemporary topic in ESG debate (Escrig-Olmedo et al. 2019).

The incorporation of ESG data in portfolio management has been one of the most important trends during the last decade. In 2020 $35.3 trillion was managed through different forms of socially responsible investment. 15% growth in two years amounting to 36% of all professionally managed assets according to Global Sustainable Investment 2020 report. The growth is largely supported by institutional investors, although retail investors are also increasingly moving towards socially responsible investing (Verheyden et al. 2016; Sustainable Investment Alliance 2020).

EU is already mandating large companies to report non-financial information annually with the Non-financial Reporting Directive (NFRD), which started from fiscal year 2017. July 2020 EU Taxonomy Regulation was set in force. It establishes core requirements that corporations have to meet to be considered as environmentally sustainable. Its goal is to clarify the criteria of corporate responsibility. It aims to support green transition and covers expenditure linked to transition plans, attract Taxonomy-aligned investors, and

enables lower interest rate for investments that are aligned with EU Taxomony (Directive 2022/2464 2022; European Commission 2023). Common terminology and definitions for sustainability are needed to allocate funds more efficiently. Which is the reason EU Taxonomy and its legislation Corporate Sustainability Reporting Directive (CSRD) will be applied (Lykkesfeld & Kjaergaard 2022, 9).

Countries under The Paris Agreement have common aim towards the goal of reducing carbon footprint and combatting climate change. In effort to reach these goals, authorities must create incentives and enforce a more environmental approach to business reporting with economic incentives and mandating disclosures of ESG data. Díaz-Peña et al. (2022) found that companies in countries that have net zero legislations had lower adjusted risk and fared better in downturn. Companies acknowledge importance of sustainability and the benefits its carries, but the change is slowed down by short-termism of financial markets (Clark et al. 2015).

As ESG is becoming increasingly important metric for investment decisions, investors are criticizing the quality and availability of ESG disclosure data (Krueger et al. 2021). Ilhan et al. (2023) found that mandatory ESG disclosure regulation can fix this problem. Stronger development of ESG data quality and quantity needs to be required to match the rise of ESG investing. CSR disclosures can offer this important information to market participants. Mandatory CSR reporting may enhance quality and quantity of data that matters, for investors and other stakeholders (Christensen et al. 2021).

Increased CSR information can have a positive effect on firms by increasing liquidity, decreasing cost of capital, and providing better capital allocation. Reasons for mandating larger ESG disclosure is based on the increasing influence of ESG in capital markets. There is growing importance in creating accuracy and efficient standardization. Alternative is the current or former expensive and uncertain self-regulated ESG system. When self-regulated voluntary disclosures create the foundation for ratings and metrics, it can lead to confusion and unreliability of data that misleads investors. Self-regulation cannot lead to sustainability in the long run (El-Hage 2021).

Krueger et al. (2021) found significant positive and robust impact between mandatory ESG disclosure and stock liquidity. Effects were more coherent if the disclosure requirements were given by government institutions. Information needs to be enforced and not made with comply-or-explain basis. Aghamolla & Byeong-Je (2021) model shows that with voluntary disclosure, managers have incentives to keep out bad signals and release only positive information. Mandatory disclosure may also create other

unintended negative effects, such as costs and reduced innovation. Nevertheless, under correct conditions, transfer to mandatory disclosure brings positive effects for markets and firms.

Mandatory reporting's primary effects are larger array of firms disclosing non-financial information and disclosed information becoming more comprehensive as it prevents firms from picking what information they want to disclose. However, there are contradictory results whether mandatory reporting influences actual reporting quality (Hoffman et al. 2018).

It is a common assumption that strong ESG performance increases financial performance by reducing cost of capital and increasing cash flows. The impact on shareholder value depends on the weight of risk on cost of capital. Integrating ESG factors to decision making is important for management (Sassen et al. 2016). In Eccles et al. (2014) 18-year period study of high sustainability companies, firms with high ESG ratings outperformed their equals when it comes to stock market and accounting measures.

Many academics have investigated the value relevancy of non-financial information and its closure. Some studies have shown that voluntarily disclosed ESG information has impact on firm value and other studies have found only minor or non-existing effect of disclosure. ESG rating and its relationship with corporate financial performance has been researched from varying angles with varying results. Schanzenbach & Sitkoff (2020) define juridical reasoning of ESG investing by Trustees as measure to control financial risk and gain excess profits. Ilhan et al. (2023) studied institutional investors ownership increases firm's climate risk disclosures and Verheyden et al. (2016) found positive correlation between usage of ESG data on investment decisions and fund performance. Outside of institutional investing, there exists different results. that range from which ESG metric has impact on value or if there is value relevant effect at all.

1.2 Motivation and contribution

The purpose of this thesis is examining the ESG ratings connection to financial performance in European listed companies and does EU Non-Financial Reporting Directive have positive impact on the connection. Financial performance is measured in accounting-based and market-based measurements. Impact of NFRD is estimated by the

possible change in connection between ESG and financial variables, for the group of companies that fall under reporting mandate in reporting years. Preliminary hypothesis is that investments in ESG activities have positive correlation with firm value and, NFRD causes transparency and enhances ESG rating which increases the possible positive correlation. Hypothesis is based on choice of stakeholder theory over shareholder theory in firm value creation. According to stakeholder theory, companies should take sustainability matters into consideration, in order to elevate profits.

This thesis contributes to existing ESG and sustainability literature by researching the impact of external legislation. CSR literature grows fast, as sustainability is becoming more and more important subject in our everyday lives. Studies revolving around impact of legislations are scarce as the legislations around sustainability reporting have only recently surfaced around the world. This thesis expands literature around NFRD and what impacts mandatory reporting has on firm value. It is important question for managers who face or will face mandatory reporting in the future, or just contemplate if investing in ESG is profitable. It is also important for policymakers and legislators to understand what are the large-scale effects of their decisions. This thesis gives insight to if legislations increase incentives for ESG investing and increase profitability of ESG-policies in Europe. Thesis contributes to expanding the literature on stakeholder theory as value creating effect of ESG rating.

Previous research of ESG and financial performance are often focused on certain countries, sectors, or other external effects. This thesis aims to study the effect of ESG on European market and examine effect that EU directive has on entire European market. Time period studied in this thesis is 12-year time span from 2011 to 2022. It covers different market conditions and the Covid-crisis. Results contribute to economic sustainability theory and provide better understanding of the effects of mandatory reporting and investor behaviour. Europe is an interesting setting for this study for its status as frontier of sustainability. Even if Europe has high quality sustainability norms and policies, ESG has its doubters, when it comes to value creation. It is important to know if NFRD can create transparency and standardize ESG reporting.

Much of the existing corporate social responsibility research focuses on different impacts of CSR activities, instead of effects of CSR reporting. Separating the impact of reporting from CSR activities is difficult task. Cordazzo et al. (2020) studied impact of NFRD on Italian firms. Their results showed no relevant effect of mandatory disclosure on stock value. It must be concluded that their study had small sample size and companies were

only analysed on two different years. Aluchna et al. (2022) studied NFRD influence on ESG performance in companies listed in Poland. They achieved robust results of increased ESG performance following NFRD.

1.3 Focus and structure

This thesis starts by delving deeper into ESG framework, EU legislations and NFRD, giving them some theoretical background and explaining their evolution. Section 3 contains theoretical overview of how ESG can affect firm value. Subsection 3.1. presents theoretical framework for stakeholder theory and other theoretical avenues of impact. 3.2 contains prior empirical works and results of this subject. It covers different estimations of impact and different methods that have been used. It contains varying results from different aspects of sustainable investing. Subsection 3.3 explains how NFRD can possibly impact this relationship. Hypothesis for empirical part is presented at the end of section 3. Section 4 covers details of the panel data, methods, variables, and different tools used in panel regression models. Results of regression models are presented at section 5, along with descriptive statistics, summaries of the results robustness tests. Last section, section 6 contains conclusions of results, discussion of findings and their limitations.

2 ESG FRAMEWORK

2.1 Brief history of ESG

ESG related terminology is currently scattered, and official definitions remain unestablished. The field of sustainable finance became more mainstream in 1970s when awareness of social responsibility and social justice started to arise. In 1990s the rising problem of climate change gave birth to renewable energy funds and use of the term "sustainable development" began growing rapidly. Environmental problems were added to the previous framework of social responsibility and justice. First ESG investment strategies began in the early 2000s. By 2010 ESG became common metric in world in finance. Currently ESG is advancing outside of financial world as 2020s will likely be remembered as period that implemented regulatory framework for ESG and made ESG data more standardized and harmonized. (Lykkesfeld & Kjaergaard 2022, 246-247)

Socially responsible screenings can be considered as analyses, in which, investor incorporates CSR metrics with economic performance in financial decision making. Socially responsible investing (SRI) binds finance and society together. Different SRI practices developed concurrently when various authorities, and legislations change corporate and financial social conduct. Legislations guide financial consideration which stem from differing institutional frameworks. Thus, economic settings and cultural habits increase the cultural dependence of ESG (Puaschunder 2019).

Europe has refined history of using sustainability metrics in institutional investments. The legislation in Europe promotes stakeholder participation in corporate governance, which for instance has led to European corporate boards regularly including employee representatives. Europe also hosts a variety of cultural difference toward SRI. France and Germany generally allow more liberal interpretation of legislation permitting institutional investors to engage in socially beneficial activities as UK permits SRI only if it aligns with greater interest of shareholders. SRI and ESG investing has grown especially in Northern and Central Europe but its evolution has been lacking in Southern Europe (Puaschunder 2019). Currently different regions of financial world are experiencing shift in culture. It is more and more common for corporations to consider ESG and CSR as crucial factors that impact a business's bottom line. Sustainability and its distinct components are no longer considered only as term referring to environmental topics, it

has evolved to term that addresses to business resiliency and business's capability to create long-term value (Johnson et al. 2020).

2.2 Review of EU corporate sustainability laws

Culture plays a significant role in shaping the law, resulting in varying legal frameworks, laws, across European countries. Majority of these countries are part of the EU, leading to significant legal commonalities. This is particularly true in the realm of financial markets legislation. (Lykkesfeld & Kjaergaard 2022. 101)

2.2.1 Non-Financial Reporting Directive

NFRD 2014/95/EU came to effect in EU countries in 2014. It forces large public-interest entities that are classified as large undertakings, financial institutions, and listed companies with over 500 employees to disclose specific non-financial information about economic, social and environmental matters. Annual reports include information about their policies, risks, and performance in social, environmental, human rights, and anti-corruption matters. It aims to standardize and improve economic, social, and environmental reporting by setting legal requirements for reporting and changing it compulsory (Directive 2014/95/EU 2014; La Torre et al. 2020).

Directive was passed in 2014 and first reports were set for 2017 fiscal year. Reports can be released with management reporting in the annual report or within its own separate release. Non-financial reporting strengthens stakeholder communication, enabling organizations to disclose advancements in ESG matters. It is anticipated to enhance sustainability transition within companies. Despite increase in the amount of non-financial reports disclosed annually, concerns have come up about quality of the reports, and its impacts in ESG performance. (European Parliament 2021; Aluchna et al. 2022)

Implementation led to a rise in use of non-financial reporting frameworks towards investors. Companies adopting it voluntarily used NFR frameworks with stakeholder-oriented reporting frameworks when creating non-financial reports. It aimed to increase standardization in non-financial information among voluntary reporters and resisters. Disclosure increased information asymmetry for resisters and decreased for voluntary adopters. It indicates that resisters tried to avoid revealing subpar non-financial performance and decrease the costs required for implementation (Breijer & Orij 2022). NFRD increases the number of companies that publish sustainability reports. It enhances

moderating influence of CSR reporting adoption by creating transparency in ESG and promoting sustainability (Cuomo et al. 2022).

2.2.2 Other EU legislations

On 5.1.2023, Corporate Sustainability Reporting Directive (CSRD) came into action. CSRD is an amendment to the older reporting requirements in NFRD. Firms must report by the new rules for 2024 financial year, for reports published in 2025. Companies under CSRD are required to disclose information aligned with European Sustainability Reporting Standards. NFRD reporting laws remain until companies have to align with CSRD. CSRD has much wider scope, multiplying the number of companies that must comply and requiring audit assurance of reported information. Beginning from 2025 all companies that meet at least two of the following criteria have to comply with reporting requirements: over 250 employees, 2 million euros annual revenue and 40 million euros turnover. List of reporting companies expands yearly until 2028 (KPMG 2021; European Commission 2022; Directive 2022/2464).

In 2018 European Commission revealed its plan to increase sustainable financing, which was accompanied by several sustainable finance regulations. One of them was EU Taxonomy. It channels investments towards economic activities important for the transition, aligning with goals of the European Green Deal. The taxonomy is a categorization framework, which establishes standards for economic activities that align to a net-zero aim by 2050 and taking into account larger environmental targets beyond only climate considerations. EU Taxonomy enables financial and non-financial companies to have a similar definitions of economic activities that are accepted as environmentally sustainable. It instils confidence in investors, reduces greenwashing and encourages companies to increase environmentally friendly practices (European commission 2018; European commission 2020A; European commission 2020C).

EU Taxonomy came into effect on July 12, 2020. By outlining four requirements that economic activity must meet to qualify as sustainable and appointing six environmental and climate objectives around climate change, sustainable use of water, circular economy, pollution, biodiversity and ecosystems. The conditions to qualify as sustainable economic activity are:

1. Making a substantial contribution to at least one environmental objective
2. Doing no significant harm to any of the other five environmental objectives
3. Complying with minimum safeguards; and,

4. Complying with the technical screening criteria set out in the Taxonomy delegated acts.

To ensure that an economic activity has positive impact on one of these objectives and causes no significant harm to the other five, the EU set up performance criteria, known as technical screening criteria, through delegated acts. These criteria have been set up for economic activities that can substantially contribute to climate change mitigation and climate change adaptation (European Commission 2020A; European Commission 2020B).

SFDR mandates that financial market participants must inform investors of sustainability risks of their investments that may influence their performance and inform of the negative impacts these investments can cause on environment and society. Regulation does not force these firms to prioritize green criteria in investments. It sets out rules that forces them to justify any green investment claims they make regarding their financial products. (European Commission 2018) SFDR focuses on the disclosure of how financial products align with ESG objectives, including the EU Taxonomy criteria. For example, Finland's Financial Supervisory authority requires funds to align with SFDR act article 8 or 9 to be allowed to use key words such as sustainable, ESG or responsible in the name of the funds (European Commission 2021; Finanssivalvonta. 2023).

2.3 Incentives for transparency

Representing investors is an obligation of board members, which aims to create transparency in both financial and non-financial performance. As listed and unlisted companies face pressure from stakeholders, their approach to reporting and integration of ESG into business strategy and operations determines their possible success. Demand for transparency is high in financial market participants. If companies want to provide investors information about important ESG policies, goals, and results, they must communicate by non-financial disclosure (Lykkesfeld & Kjaergaard 2022, 9). Stakeholder theory considers the interests of stakeholders alongside cash flow considerations. Stakeholder approach to value creation acknowledges that value is created in collaboration with stakeholders in the long-term, creating it an economic theory that enforces ESG considerations (Lykkesfeld & Kjaergaard 2022, 30).

Implementation of an ESG strategy without a clear purpose could be seen as insincere effort to appear environmentally conscious. It is particularly significant when considering incentive structures of ESG factors that don't inherently benefit the company. Lykkesfeld

& Kjaergaard believe providing transparent information with specific objectives and a specified incentive system, may significantly enhance trust in ESG practices of a company and its value generation. Financial market participants that provide financial services and are aligned with legislations represent vital aspect in decreasing transaction costs and information asymmetries for participants. As soon as more market participants commence to the regulatory guidelines, this transformation becomes more valued (Lucarelli et al. 2020).

Managements face a growing need to address stakeholder demands by adopting new approach to strategic planning, performance evaluation, and reporting. In order to maintain their license to operate, companies have to align their strategy with their stakeholders. Companies are expected to meet the expectations of large array of stakeholders and they are expected to share important information with them, leading to transparency and engagement (Linciano et al. 2022). Mandatory disclosures eventually may standardize reporting and reduce its costs for companies currently practising voluntary disclosures. They may also increase the stakes and costs for companies that have not added ESG information in their disclosure analysis. Outcome of standardization will probably be more reliable ESG information (El-Hage 2021). If exposure to risk correlates positively with disclosure, reputation is not damaged when disclosing negative information. Even when market has only minimal regulation and costs for borrowing are low, bond issuers may use disclosure to reduce capital costs. Threshold for using disclosure to decrease information asymmetry instead may decrease when markets are regulated, resulting in more transparent and efficient markets (Cuny 2016).

3 ESG RATINGS IMPACT ON FIRM VALUE

Schanzenbach & Sitkoff refer to ESG investing motivated by ethical, moral and third-party benefit as collateral benefits ESG. and risk adjusted returns motivated ESG investing as risk-return ESG. Collateral benefits ESG investor avoids investments that fall below a certain ESG threshold. For example, choosing not to invest in arms manufacturing companies due to the collateral harm. Risk-return ESG investing aims to impose ESG factors as metrics for estimating expected risk and returns. Common risk-return ESG strategy utilizes ESG factors in stock picking, while leaning on theory that the factors can identify market mispricing and find profit. Risk-return ESG strategy might not invest in arms company because the company's possible litigation and regulatory risks are underestimated (Schanzenbach & Sitkoff 2020).

Governance factor has probably the most straightforward theoretical impact on firm performance. Management, executive incentives, and existence of controlling shareholders are measures that are frequently under the magnifying glass of investors. Optimal corporate governance is often contextual. Optimal way of governance for one firm might not suite for another firm. Popular corporate law academic view presents that context-based governance should be considered, which can create disturbance on ESG rating if not considered subjectively. Environmental and social factors can identify more distinct risks within firms, such as weak internal controls and lacking compliance records, which can lead to political, regulatory and litigation risks. Environmental and social factors may work as intermediary for quality of management, which is important factor for investment decisions and challenging to observe directly. High quality firms often have good compliance programs and quality managers are often attracted to firms that have socially responsible policies and operate in sustainable way (Schanzenbach & Sitkoff 2020).

ESG rating can contribute to reduced default risk for companies in various ways. Sustainability has connection to value of company brand and satisfaction of customers, which leads to better sales turnover and profitability. It stabilizes company's financial performance by improving its corporate image and creating better relationships to government entities and financial markets. Previous results support theory that socially responsible investors have smaller sensitivity to adverse events compared to conventional fund providers. ESG disclosure helps in lowering agency costs and reducing information asymmetry. Information across the market serves to mitigate various risks, including

regulatory, controversy, managerial, and reputational risks. Investors assess companies based on the availability of non-financial information when determining the likelihood of default (Atif & Ali 2021).

3.1 Review of theory and prior literature

3.1.1 Stakeholder theory and legitimacy theory

Legitimacy and stakeholder theories create basis for the connection between the disclosure of ESG information and financial impact. ESG transparency demonstrates a proactive approach towards sustainability, successively reinforcing firms' status with consumers and investors. It can enable them lower capital costs, while also strengthening their competitiveness. Stakeholder theory underlines that market valuation of a company is heavily reliant on its capacity to fulfil the demands of its stakeholders. According to stakeholder theory, companies should aim to create value for all its stakeholders instead of only shareholders (Eccles et al. 2014; Clark et al. 2015; Chen & Xie 2022). Companies should distinguish the relevance of different groups that are affected by its business activities, directly or indirectly. Companies should disclose information to serve interests of their stakeholders and legitimatize their operations (Dhaliwal et al. 2014; Freeman et al. 2014).

Rational investors, limited by their risk profiles and budgets, make investment choises to maximize returns. Investors with specific preferences can alter their utility function and exhibit elevated risk tolerance and more lenient budget limitations towards companies that disclose ESG data (Chen & Xie 2022). Company must pursuit stakeholder approval and align their activities with it, which is creates the theoretical basis for disclosure incentives (Omran & El-Galfy 2014). Legitimacy theory emphasizes the importance for organizational legitimacy, which comes from the restrictions of societal norms and values, as well as the responses caused by these constraints. Legitimacy theory provides a tool for analyzing how organizations conduct their actions concerning the environment. Legitimacy theory states that firms use sustainability disclosure to polish their image with sustainability to attain legitimacy. This theory can also serve as a basis for CSR for it offers intel into why firms disclose voluntarily and give assurances of non-financial information (Omran & El-Galfy, 2014; Hummel & Schlick, 2016).

Firms disclose non-financial information by legitimacy theory with the aim of seeming legitimate to their stakeholders, as stakeholder theory presents how businesses are

responsible to multiple stakeholders (Omran & El-Galfy, 2014). Legitimacy theory and stakeholder theory shouldn't be viewed as opposing, but more as supporting viewpoints that overlap. Legitimacy theory aims at the wider array of societal intentions, stakeholder theory handles how firms tackle with individual groups in society Legitimacy is grounded in the basis that firms operate within a social contract with society and company itself. Firms require societal approval and legitimacy to establish long term success (Frynas & Yamahaki 2016). While firm aims at maximization of profits, they have to prioritize various concerns of stakeholders, and shareholders, who have tendency to prioritize profits. Firms have incentives to disclose CSR and ESG information as a signal, since high quality ESG disclosure can enhance stakeholder communication and legitimacy. From a stakeholder and legitimacy theory perspective the quality and quantity of ESG reporting is important (Chen et al. 2023A).

3.1.2 Risk and assurance

ESG performance lowers risk by decreasing investment risks as it is a signal of corporate governance practices, adherence to laws and regulations, decreased operational risk, and increased commitment to societal responsibility. Companies also gain more media attention and their management face stronger outside monitoring, which can decrease agency costs. Social reputation acts as a strong asset for business value in organizations. Companies with good reputation possess advantages in competitiveness, reducing financial constraints and cost of capital, leading to reduced business risk (Chen et al. 2023B). Stronger relationships between firms and stakeholders are strengthened through trust and cooperation which can be achieved with disclosure and transparency. Firms with good sustainable performances usually disclose their ESG-related information in annual reports or third-party reports, leading to more assured reporting. This clears asymmetric information and possibly reduces cost of capital even more (Banerjee et al. 2020).

Atif & Ali (2021) studied the effect of ESG disclosure on default risk. ESG disclosure reduces the risk of default through increased profitability and decreased variance in performance. Verheyden et al. (2016) examined the impact of ESG screening with data on global stocks from 2010 - 2015. They discovered that ESG screening increases risk-adjusted returns. The expected monthly return in the worst 5% of months and standard deviation of monthly returns, is smaller when compared to unscreened companies. Individual daily return distributions show that ESG screening diminishes tail risks by reducing likelihood of abnormally negative return.

ESG performance can decrease information asymmetry as assurance has a strong role in moderating connection between ESG performance and information asymmetry. Negative correlation with ESG performance and information asymmetry is stronger in firms that have screened ESG performance compared to unscreened (Kim & Park 2023). Del Giudice & Rigamonti (2020) studied changes in ESG rating after revelation of corporate misconduct. Impact on ESG rating was significantly negative only for unaudited firms. Externally audited and screened companies did not suffer from remarkable decrease in ESG rating. Implying that rating agencies can provide precise reports and assurance. Third-party assurance seems valuable for investors and stakeholders that require and rely on ESG ratings in decision-making. Firms with low ESG ratings may have problems attracting capital, resulting to increased financial costs. They can also face problems in supply chains or operational challenges as, for example subcontractors affect ESG rating. Assurance can help reveal weaknesses in a company's ESG performance. Companies with assured ESG scores pose competitive advantage compared to peers with unassured ESG scores. Assurance can result to higher investor confidence in company's ESG efforts, possibly reducing the cost of capital.

3.1.3 Different estimations of impact

The connection between financial and sustainability performance is uncertain as there is no standard methods of measurement. Different ways that studies measure these factors can influence their results. In a meta-study Lopez-Arceiz et al. (2018) examined the relationship between economic and social performance. They found that interaction between the two varies with the used measurement criteria. Performance was divided to accounting-based and market-based measurements, size-based criteria, and survey-based measurement. Size-based criteria showed the highest correlation at 0.828, while accounting criteria had a correlation of 0.167, and market criteria had a correlation of 0.082. Another study by Wang et al. (2016) examined 119 effect sizes from 42 different research. They discovered that the overall effect of CSR on corporate financial performance (CFP) is not only positive but also statistically significant. CSR had a stronger effect on accounting-based corporate financial performance (0.04898) when compared to to market-based CFP (0.0378). Results indicated that the impact is stronger with firms in developed economies compared to firms in developing economies (Wang et al. 2016).

Meta-study by Lu & Taylor (2016) involving 198 studies made similar findings with the other meta-studies. CSR increases firm's CFP particularly in long term. Environmental aspect seems to have largest impact on CFP, and the relationship is stronger for accounting-based measures than for market-based measurements. These findings are similar with the results of Lopez-Arceiz et al. (2018) and Wang et al. (2016). Clark et al. (2015) researched the effects these impacts have on firm level and found three major effects. In 90% of cost of capital studies, ESG standards related to reduced capital costs. In 88% of the cases strong ESG practises related to better operational performance. And in 80% of the research, sustainability practices had notable positive effect on stock price performance. They also noticed a momentum effect with ESG ratings. Investing strategies where larger weights are given to companies with increasing ESG ratings surpassed the ones that focused only on static ESG criteria (Clark et al. 2015).

3.2 Empirical evidence of the effects

3.2.1 ESG and value

Determining the effect of ESG rating and firm value is difficult because it is complex and evolving field of study. Many researchers have mixed results from different areas because of lack of standardization, time lag, causation vs. correlation, data and reporting quality, industry-specific variations and external factors.This section covers studies about different results and the explanations for those effects.

Different factors must be taken to account to examine the effects of ESG disclosure and firm value. The first concern revolves around the efficient identification of ESG information disclosure. Previously works have often utilized ESG ratings provided by reputable institutions to measure the ESG performance of companies. This approach has its limitations as there is no standardized rating criteria or consistent regulatory mandates. Rating agencies give differing ESG scores to the same company because of variations in ESG indicators and their weights, which can result in biased inferences. Managers might also attempt to influence rating agencies by suppressing data and using greenwashing to boost ESG scores (Pedersen et al. 2021; Chen & Xie 2022).

The second large problem is endogeneity of reverse causality in ESG disclosure and CFP. Better companies are better equipped to embrace environmental and social tasks, leading them more inclined to disclose ESG information. The third issue is distinguishing investors who simply prefer ESG and those who adopt a more general investment

approach. Chen & Xie (2022) addressed these problems by matching data from Chinese listed companies from period 2000 to 2020, using the initial disclosure of companies' ESG ratings as a natural experiment. To deal with the endogeneity issue they used a staggered difference-in-differences model. The results imply that ESG disclosure significantly enhances financial performance of companies. Companies with large shareholding ratios or high market values possessed by ESG investors experience bigger impact of ESG disclosure to financial performance.

Negative and nonsignificant impacts on valuation have also risen from research Fatemi. et al. (2018) found that ESG strengths boost value and ESG weak points decrease value, however when ESG disclosure is isolated it can decrease firm value. When firm has good ESG rating, strong ESG disclosure negatively impacts the positive impact of the already good ESG rating. Reason for this result is perhaps that the market can interpret improved disclosure as an overinvestments to ESG activities. Boyle et al. (1997) found negative impact on one of the earlier studies of the subject. Stock market's reaction to ethical initiative of defence industry disclosure was negative and the effect was stronger for firms that signed the ethical initiative. Atan et al. (2018) also found no significant relationship in their study of Malaysian companies. ESG scores and ESG individual scores had no significant impact on ROE or Tobin's Q.

Friede et al. (2015) combined results and data of 2200 individual studies They discovered, clear evidence for ESG investing. Their findings contrast the common perception among investors which could be biased because of results of portfolio research, which show more neutral and mixed ESG–CFP relationship. (Clark. et al. 2015) found that high-sustainability rating portfolios consistently win a low-sustainability portfolios by 4.8% annually. Suggesting that companies with high ESG quality tend to exhibit strong financial performance especially in long term, when compared to peers with low ESG quality. Even though there is limited support for a negative link with overall sustainability scores and stock financial performance it is not consistent.

Companies that voluntarily adopted sustainability policies early, display high quality organizational processes when compared to low sustainability counterparts. Early adopters often have strong stakeholder engagement and surpass their counterparts in accounting and firm value-based performance (Eccles et al. 2014). Bruna et al. (2022) examined the ESG-CFP relationship in European markets with time-lagged panel data model over the period 2014-2019. They found evidence of a positive non-linear impact

of ESG on financial performance. They also discovered indication of amplifying effect of EU NFRD, which began during sample period.

Shanaev & Ghimire (2022) researched impact of 748 ESG rating changes to stock returns with calendar-time portfolio methodology. Data consisted of 658 US firms rated by MSCI during years 2016 – 2021. Firms were assigned to 7 different categories, from AAA to CCC. Study focused on the impact in change of value when ESG rating upgraded or downgraded at least one category. Upgrades in ESG ratings relate to smaller and occasionally unnoticeable positive abnormal returns, but downgrades tend to lead to much weaker stock performance. This results in negative returns of -1.0% to -1.4% per month. This underscores the importance of ESG risk factors and amplifies value of information in ESG ratings for institutional and individual investors.

3.2.2 Cost of capital

Environmental issues create risks to companies, which affect the cost of financing. Firms can access lower cost for debt by implementing suitable ESG conducts to decrease risks. Enhanced corporate governance can also reduce cost of debt, as firms with better environmental managements have lower credit spreads. Better sustainability policies also have been shown to lead to more favourable credit ratings. Effective corporate governance and good environmental score lead to a decreased cost of equity, especially in emerging economies. Companies can lower their cost of debt with environmental management, employee well-being and efficient disclosure practises (Clark et al. 2015).

Sharfman & Fernando (2008) examined relationship of environmental risk management and cost of capital. Companies that have strategic environmental risk management are compensated by financers. They conclude that the effect stems from lowered cost of equity, due to reduction in the company stock volatility.

Bond price can be considered as negotiation result between the firm and the lenders who are shown to be sensitive to ESG issues. Because of this the price of debt tends to reflect ESG risks. Weight of different ESG factors is often dependant on industry. Still, it has been shown that all pillars of ESG have significant negative correlation to bond yields. Apergis et al. (2022). Chava (2014) examined effect of environmental problems on cost of capital. Environmental difficulties have significant increase to cost of equity and debt. Chava concluded that even though greenhouse gas emissions are were not regulated, investors recognize these issues. Results also indicate that cost of equity and debt are not decreased by environmental strengths. Instead, investors demand lower bank loan interest

rates from companies that operate in environmentally sustainable way. Eliwa et al. (2021) also studied impact to lenders. Their findings indicate that companies may lower their capital cost from lenders by improving ESG performance. Lending institutions have crucial role in improving relevancy and reliability of ESG performance and disclosure.
El Ghoul et al. (2011) investigated governance and social parameter impact on cost of capital in US firms. Companies with elevated corporate sustainability ratings have significantly decreased cost of equity. Research gives indication that investing resources to CSR is crucial when competing for financing. Employee relations, environmental policies, and product strategies had largest roles in decreasing cost of equity. In a different study conducted in global setting with 30 different countries, El Ghoul et al. (2018) studied the impact of environmental responsibility on the same subject. Investments to corporate environmental responsibility reduce cost of equity capital. Especially, company's commitments to environmental responsibility have the potential to decrease firm risk, lowering the cost of equity. Investors are more likely to invest in transparent companies that have prior track record with ESG performance. They are equipped better to tolerate ESG challenges, which further leads to a lower cost of equity. Impact of ESG risks on value has grown which has led to difficulties in attracting investments for companies that have lacking ESG disclosure. ESG disclosure has crucial role when it comes to gaining trust with sustainability (Ng & Rezaee 2015).

3.2.3 Effects of regulation policies

Chen et al. (2018) conducted difference-in-differences study on mandatory corporate social responsibility disclosure, which came to effect in China in 2008. Companies that faced mandated reporting had reduced profitability post mandate. Mandate even affected cities, as cities that were impacted the most by the legislation had lower wastewater and sulphur dioxide levels. Results indicate that mandatory disclosure can change behaviour of companies and carry positive impact environment, at stockholders expense. Li et al. (2022) studied the effects of the same regulation in China in 2008. They concluded that mandatory disclosure can substantially increase total factor productivity of companies' trough research and development and innovation expenditures.
Lucarelli et al. (2023) investigated effect of EU Taxonomy on company investments with differences-in-differences approach. The results indicate that EU Taxonomy didn't lead to growth in investments to Taxonomy eligible companies. Instead, company size and the uncertainty surrounding eligibility became significant factors in changes of corporate

investments. EU Taxonomy's influence to sustainable company investments is credible when the regulation has distinct specification for sectors and eliminates vagueness. Still, EU Taxonomy may decrease disparity between ESG ratings of different data providers. Even so, the results indicate that potential of decreasing disparity in measurement has not been reached yet (Dumrose et al. 2022).

The volume and quantity of CSR information may benefit capital markets with increased liquidity, lower capital costs and enhanced capital allocation. Disclosures also potentially impact the behaviour of companies especially if the aim of mandatory reporting is to change the CSR activities of companies and deal with externalities that stem from their actions. Real impacts likely arise compulsory reporting instead of voluntary disclosures. It indicates that reporting mandate could be seen as a primary tool to create environmental change, but it may contain risk of unintended consequences. It can potentially create undesirable company behaviour from the aspect of society and investors. Disclosures may lead to proprietary and litigation costs. It may give out too much information about company operations, strategy or production processes. These outlooks complicate the task for researchers that try to assess the effect of CSR disclosures on capital markets (Christensen et al. 2021).

Mandatory ESG disclosure regulations could also create more ESG disclosures instead of improving actual ESG activities. There is lacking empirical evidence showcasing statistically significant relationship between mandatory ESG disclosures and actual improvements in real actions. Enforcing ESG disclosures is built on the belief that the disclosures will increase CSR activities and not only increase engagement in symbolic actions. Contrary to the consensus of creating more corporate social responsibility, mandatory disclosures could lead to a reduction of CSR initiatives (Oranhirg 2022). ESG ratings created from self-regulated and possibly misleading voluntary disclosures, are not sustainable in long time span. Mandatory disclosures are predicted to create standardization and lead to decreased costs for companies that currently rely on voluntary disclosure. Although mandatory disclosure can raise the stakes and create expenses for companies, which do not currently employ ESG matters in their disclosure analysis. The outcome of standardization is expected to increase reliability of ESG information (El-Hage 2021).

3.3 Effects of NFRD on reporting and ESG rating

Fiechter al. (2022) investigated impact of EU NFRD on reporting activity. Companies under the mandate increased their CSR activities, often before directive came into effect. The impact of increased reporting was stronger for firms that were laggards in CSR reporting and were most likely going to be strongly affected by the new legislation. Aluchna et al. (2022) studied relationship of NFRD and ESG scores in Poland, which originally had weak institutional conditions for sustainability reporting. Only 5% of listed companies had NFR practises before the directive came to effect. Directive had positive effect on ESG performance, resulting in growth of reporting volume and quality. The results indicate major improvement in overall ESG performance for companies subject to the NFRD legislation.

Agoraki et al. (2023) Investigated the correlation between ESG reputational risk and financial performance within companies under NFRD. Companies with decreased ESG reputational risk experienced less information asymmetry and financial problems, and had enhanced performance. Adverse impact of reputational risk on CFP is clearer when information asymmetries are decreased by NFRD. Reduced ESG reputational risk elevates CFP by communicating information to investors. Disclosure regulations are beneficial for firms, stakeholders, and shareholders alike. Cicchiello et al. (2023) used a differences-in-differences estimation to study impact of NFRD on ESG performance, with US firms as control group. Firms under the regulation have significantly enhanced ESG ratings which might stem from increased external stakeholder pressure. In addition to NFRD increasing ESG ratings, it also diminishes the rating disparity with companies that already possessed high ESG rating and companies that had low ESG rating (Bigelli et al. (2023).

3.4 Research hypothesis

The first research question is investigating the impact of ESG rating on company financial performance, which is the basis of hypothesis 1 and 2.

H1: ESG rating has significant positive relationship with accounting-based financial performance.

H2: ESG rating has significant positive relationship with market-based financial performance.

Second research question is if NFRD increases the impact.

H3: EU Non-Financial Reporting Directive 2014/95/EU has strengthening impact on this relationship.

4 RESEARCH DESIGN, DATA AND SAMPLE

4.1 Data collection

The data used in this chapter is retrieved from LSEG Workspace Screener app, formerly known as Eikon Refinitiv Workspace. Collected data is from years 2011–2022. Data contains 1972 European listed companies from 32 different countries, and 10 different GICS sectors. Financial sector is excluded from sample for its different way of accounting and legislation. Time period used is 2011-2022, which has good coverage for period before changes in legislation. Sample was built in Screener app by choosing European listed companies, excluding firms that did not have ESG rating. Sample contains companies that did not have ESG rating in the start of the sample but acquired it during the time span. In 2017 ESG rating has 1171 missing values and by 2020 it falls to 204, and by 2021 it is 0. Appendix 3 contains graph of missing ESG ratings. Panel data used in this study is unbalanced. ESG rating and ROA have missing values for some companies in the data. Models and methods used in this study can work with unbalanced panel data (Croissant & Millo 2008).

All variables were added with LSEG Screener's functions. Naturally large portion of the companies come from few individual countries, France, Germany, UK, Switzerland, and Italy cover over half of the sample. Sectors are distributed more evenly expect for industrials being largest, and utilities and energy sector being least common. To reduce negative impact of outliers, all variables are winsorized at 1 and 99 percentiles. All regression models and graphs used in this thesis are made with RStudio and its different packages.

4.2 Methods

The objective of the empirical research is to answer the two research questions: Does ESG rating hold significant positive effect on firm's financial performance in Europe and does EU NFRD strengthen the impact. As the data is in panel form, this study will use pooled ordinary least squares and fixed effects regressions. This empirical part tests the previously mentioned theories of connection between ESG, firm value and positive effect of NFRD. Regressions and nature of the panel data can make determining causality of the

results difficult. This empirical work aims to find statistically significant relationships that can be explained with theoretical framework.

In the pooled ordinary least squares approach observations are grouped in the model, dismissing time-series characteristics. If homogenous sample shows non existing evidence of unobserved heterogeneity, then pooled OLS can create efficient estimates. Pooled OLS is used to approximate parameters. It falls short on some requirements, but it is often used for its simplicity and ability to pool the data to get rid of individuality and heterogeneity (Wooldridge 2019, 162; Hasan et al. 2022). It can also be a very restrictive model for studying changes as it creates unified slope and intercept to entire sample cross-sections, neglecting individual heterogeneity (Atan et al. 2018).

Fixed effects models are a straightforward method for controlling unobserved differences, making them widely used in this field of study. It has good performance to deal with collinearity in different clusters. This ensures a valid comparison of fixed-effects coefficients within each cluster. (Laurent 2018) Fixed effects model can have the best performance and yield efficient and consistent estimates when the sample shows significant heterogeneity correlated with its regressor (Hasan et al. 2022).

FE model controls analysis concerning individual characteristics, for instance country, sector, or year. It can capture internal variability in company size and financial performance, making it easier to capture the relationship between changes in ESG rating and financial performance on the year mandatory reporting began (Aluchna et al. 2022).

4.2.1 Variables

Dependent variables used in regressions are Tobin's Q and Return on Assets. Tobin's Q is considered as market-based valuation method for the firm, and ROA is considered as accounting-based method of valuation. Tobin's Q is calculated by dividing firm market value with firm total assets. ROA is net income for fiscal year divided by its assets. The independent variable chosen for regressions is the LSEG ESG Combined Score. It is well rounded score of the three pillars containing ESG controversies, which means that negative news and controversial business practices impact the ESGCS score negatively. Discounting ESG score by negative media stories gives it a more truthful rating as negative ESG news have strong impact (Krueger 2015; Agoraki et al. 2023; Alfalih 2023). Three ESG pillars are weighed in the score according to industry, leading to more coherent rating (LSEG 2023A). LSEG calculates over 630 ESG measures and subsets them into 186 different ESG variables. The most important metrics for different industries

determine overall company assessment. Environmental pillar consists of use of resources, innovations and emissions. Social pillar contains labor, human rights, community, and product responsibility. Governance pillar consists of shareholder and sustainability strategy and management metrics (LSEG. 2023B). LSEG official definitions for variables are in appendix 2.

4.2.2 Moderator variables and control variables

Different dummy variables are used to study the impact of EU legislation on ESG rating and firm value. The reporting group that falls under NFRD and is studied in this thesis is directive 2013/34/EU (2013) requirements for large undertakings and directive 2014/95/EU limit of 500 employees. Reporting group consists of firms that have more than 500 employees, and either balance sheet exceeding €20 million or net turnover exceeding €40 million. Firms had to report according to NFRD for the first time in 2018 for fiscal year 2017 (EY LAW, The Non-Financial Reporting Directive 2022**)**. Moderator variables are used to estimate the impact of reporting legislation. For instance, NFRDyear for reporting years 2018-2022 and Largedummy for firms that meet NFRD requirements are used together as moderator variable.

Control variables that have been chosen are firm size, risk and sector as they have been shown to affect the relationship of ESG and financial performance. Size matters as smaller firms do not often use as many resources in corporate sustainability. Variable for firm size is natural logarithm of firm's total assets. Firms with good ESG practices are shown to be less risky and have lower level of debt. The risk used in this thesis is ratio between firm total debt and total assets (Waddock & Graves 1997; Beck et al. 2018; Quéré et al. 2018; Hasan et al. 2022). Table 1 below contains variables and their definitions.

Table 1. Variables used in regressions.

Variable	Used for	Definition
Dependent variables		
ROA	Accounting-based performance	Profit after taxes / Assets
Tobin's Q	Market-based performance	Market cap / Total assets

Variable	Used for	Definition
Independent Variables		
ESGCS	ESG performance	LSEG ESG combined score
Control variables		
Leverage	Estimate for risk	Firm debt / Assets
Size	Estimate for firm size	Natural logarithm of assets
Sector	Dummy variable for sector	GICS sector classification
Largedummy	NFRD reporting group	Firms that meet NFRD requirements
NFRDyear	Years companies had to report by NFRD	Years 2018-2022
First rating	Impact of first ESG ratings	NFRD Eligible firms that had no ESG rating prior 2018
Post18	dummy for years 2018-2021	Estimate the change in reporting and ESG impact
Pre18	dummy for years 2014-2017	Estimate the change in reporting and ESG impact

4.2.3 Pooled OLS

With vast amount of data points panel data increases the degree of freedom and reduces collinearity of independent variables, resulting in more effective statistical model. Panel data contains effects specific to its entities, also known as heterogeneity. The sample should be homogenous for POLS to generate efficient estimates because the time-series aspect of data is ignored when observations in the model are pooled together. Pooling of data neglects heterogeneity and individuality in the sample firms, which is why Fixed effects model is also used in this thesis. The POLS model becomes more effective when the estimates show linearity with small variance. As this research uses a relatively large

sample size the estimates can become more consistent. This research applies POLS estimator to parameters because it has been shown to be successful in similar research questions. It is not perfect model for its assumptions, but it is simple, easy to perform and provides valuable insights of parameters (Wooldridge 2019, 440-472; Hasan et al. 2022).

Model (1) is the POLS model used to test hypothesis 1 and 2.

$$TOBIN'S\ Q_{i,t+1}, ROA_{i,t+1} = \beta_1 ESGCS + \beta_2 LEVERAGE + \beta_3 SIZE + \beta_4 SECTOR + \varepsilon_{i,t} \quad (1)$$

Sector is used as dummy variable for controlling sector based effects.

Model (2) is the second POLS model used to test hypothesis 3 of how NFRD affects the relationship.

$$TOBIN'S\ Q_{i,t+1} = \beta_1 ESGCS + \beta_2 LEVERAGE + \beta_3 SIZE + \beta_4 SECTOR + \beta_5 ROA_{i,t-1} + \beta_6 LARGEDUMMY * NFRDYEAR * ESGCS + \varepsilon_{i,t} \quad (2)$$

Largedummy is dummy variable that takes value 1 if the firm meets the reporting requirements of NFRD. NFRDyear is dummy that takes value 1 if the year is 2018 or later. Standard errors are clustered in both models by year and country.

4.2.4 Fixed effects model

Fixed effects model is more widely used model in studies of this field. The use of FE model allows for individual intercepts among sample firms, unlike constant intercepts that are in POLS model. FE model makes it possible to capture the distinct characteristics and factors within firms, sectors, and countries. FE controls time-invariant variables, which makes it a better fit for the goals of this research. It assumes constant characteristics that do not cause variations in each specific firm over time. FE model contains correlation between individual effects and explanatory variables. Any unaccounted variance is absorbed into the error terms $\mu_{i,t}$ (Angrist & Pischke 2008, 165-186; Bell & Jones 2015; Aluchna et al. 2021; Agoraki et al. 2023).

Model (3) is the simplest FE model used for hypothesis 1 and 2. Fixed effects are sector, year and country. Standard errors are clustered by year and country.

$$TOBIN'S\ Q_{i,t+1}, ROA_{i,t+1} = \beta_1 ESGCS + \beta_2 LEVERAGE + \beta_3 SIZE + \beta_4 ASSETS + \mu_{i,t} \quad (3)$$

FE model 4 tests hypothesis 3. Fixed effects are year, country, and sector for ROA, and for Tobin's Q fixed effects are year and country, and sector is used as dummy. Standard errors are clustered by year and sector. Model (5) is FE model used to estimate different impacts of ESG rating to different sectors, with fixed effects year and country and standard errors clustered by year and country.

$$ROA_{i,t+1} = \beta_1 ESGCS + \beta_2 LEVERAGE + \beta_3 SIZE + \beta_4 LARGEDUMMY * NFRDYEAR * ESGCS + \beta_5 ROA_{i,t-1} + \mu_{i,t} \quad (4A)$$

$$TOBIN'S\ Q_{i,t+1} = \beta_1 ESGCS + \beta_2 LEVERAGE + \beta_3 SIZE + \beta_4 LARGEDUMMY * NFRDYEAR * ESGCS + \beta_5 ROA_{i,t-1} + SECTOR + \mu_{i,t} \quad (4B)$$

$$TOBIN'S\ Q_{i,t+1} = \beta_1 LEVERAGE + \beta_2 SIZE + \beta_3 ROA_{i,t-1} + \beta_4 ESGCS * SECTOR + \mu_{i,t} \quad (5)$$

FE model (6) estimates individual impact of three ESG parameters post 2018. FE models (7) and (8) compare ESG rating estimates pre and post 2018 up to t+3 and t-3 and demonstrate the effect of increased ESG reporting in recent years. Model 6 has year and country fixed effects, and standard errors are clustered by year and country. Models 7 and 8 have year, country and sector fixed effects and standard errors clustered by year and country. Pre18 is dummy variable that takes value 1 for years 2014-2017, Post18 takes value 1 for years 2018-2021.

$$TOBIN'S\ Q_{i,t+1} = \beta_1 ENV * NFRDYEAR + \beta_2 SOC * NFRDYEAR + \beta_3 GOV * NFRDYEAR + \beta_4 LEVERAGE + \beta_5 SIZE\mu_{i,t} + \beta_6 SECTOR + \beta_7 LARGEDUMMY + \mu_{i,t} \quad (6)$$

$$TOBIN'S\ Q_{i,t+1}, ROA_{i,t+1} = \beta_1 ESGCS + \beta_2 LEV + \beta_3 SIZE + \beta_3 PRE18 * ESGCS * LARGEDUMMY + \beta_4 ROA_{i,t-1} + \mu_{i,t} \quad (7)$$

$$TOBIN'S\ Q_{i,t+1}, ROA_{i,t+1} = \beta_1 ESGCS + \beta_2 LEV + \beta_3 SIZE + \beta_3 POST18 * ESGCS * LARGEDUMMY + \beta_4 ROA_{i,t-1} + \mu_{i,t} \quad (8)$$

Model (9) estimates the impact of ESG rating just after company has acquired rating for the first time in 2018. In 2018 many firms started getting ESG ratings either for it being more mandatory or for voluntary reasons. First rating is dummy variable that takes value 1 if firm has NA values on ESG rating before 2018 and a rating post 2018, and firm belongs to large firms.

$$TOBIN'S\ Q_{i,t+1} = \beta_1 ESGCS * FIRST\ RATING * POST18 + \beta_2 ESGCS * POST18 + \beta_3 LEVERAGE + \mu_{i,t} \quad (9)$$

Model (10) is two-way fixed effects model of the change for large companies. Fixed effects are year and firm and standard errors are clustered by year and country.

$$TOBIN'S\ Q_{i,t+1} = \beta_1 ESGCS + LEVERAGE + SIZE + \beta_2 (YEAR,\ ESGCS * LARGEDUMMY\ , 2018) | FIRM + YEAR + \varepsilon_{i,t} \quad (10)$$

5 Results

This chapter contains findings and estimates from previously mentioned regression models.

5.1 Regression results

5.1.1 Descriptive statistics

Table 2. Descriptive statistics.

Variable	Mean	Std. Dev	Min	Max	N
TOBIN'S Q	1.240	1.550	0.0000	9.3940	22 144
ROA	0.060	0.070	-0.178	0.308	11 215
ESGCS	51.04	19.1600	8.15	88.08	12 912
ASSETS $*10^{-9}$	7.360	19.760	0.00056	13.569	22 144
LEVERAGE	0.240	1.80	0.00	0.7917	22 144
SIZE	20.81	2.10	15.55	25.63	22 143
ENV	48.550	26.660	0.00	95.50	12 912
SOC	55.430	23.840	4.10	95.70	12 910
GOV	52.70	22.110	7.365	93.313	12 910

Table 3. Correlation matrix.

	TOB' Q	ROA	ESGCS	ASSET	LEV	SIZE	ENV	SOC	GOV
TOB Q	1.00								
ROA	0.531	1.00							
ESGCS	-0.067	-0.02	1.00						
ASSET	-0.192	-0.075	0.190	1.00					
LEV	-0.279	-0.268	0.093	0.085	1.00				
SIZE	-0.361	-0.137	0.405	0.736	0.187	1.00			
ENV	-0.164	-0.052	0.770	0.409	0.099	0.573	1.00		
SOC	-0.082	-0.022	0.814	0.356	0.087	0.487	0.710	1.00	
GOV	-0.055	-0.034	0.615	0.262	0.074	0.312	0.372	0.420	1.00

Table 2. contains descriptive statistics of the sample. Table 3. has correlation matrix of variables. Surprisingly, ESG rating has negative correlation with both dependent variables. Table 4. below shows distribution of sample firm headquarter locations.

Table 4. Distribution of firms by country.

Austria	**Belgium**	**Czech Republic**	**Denmark**	**Faroe Islands**	**Finland**
30	43	1	54	1	75
France	**Germany**	**Gibraltar**	**Greece**	**Guernsey**	**Hungary**
164	240	1	20	11	5
Iceland	**Ireland**	**Isle of Man**	**Italy**	**Jersey**	**Luxembourg**
7	22	3	100	4	22
Malta	**Netherlands**	**Norway**	**Poland**	**Portugal**	**Romania**
6	52	68	28	14	4
Russia	**Slovenia**	**Spain**	**Sweden**	**Switzerland**	**Ukraine**
39	2	60	299	153	2
United Kingdom	**Cyprus**				
435	7				

5.1.2 Regression results on financial variables

This sub chapter summarises results concerning H1 and H2.

Table 5. Regression results from models (1) and (3).

Results of first POLS models and FE models. Models are numbered as in earlier chapter. Standard errors are clustered at year and country level to deal with heteroskedasticity. Markings ***, ** and * signify statistical significance at the 1%, 5%, and 10% levels.

	POLS 1A	**POLS 1B**	**FE 3A**	**FE 3B**
Dependent variable	**ROA**	**Tobin's Q**	**ROA**	**Tobin's Q**
	Estimate (Robust SE)	Estimate (Robust SE)	Estimate (Robust SE)	Estimate (Robust SE)

	POLS 1A	POLS 1B	FE 3A	FE 3B
Dependent variable	**ROA**	**Tobin's Q**	**ROA**	**Tobin's Q**
ESGCS	0.00013 (0.0001)	0.0074*** (0.0022)	0.00028* (0.0001)	0.0100*** (0.0019)
LEVERAGE	-0.0985*** (0.0131)	-1.9119*** (0.2541)	-0.084*** (0.0158)	-1.7170*** (0.3160)
SIZE	-0.0036 (0.0022)	-0.2633*** (0.0429)	0.0045 (0.0045)	-0.3238*** (0.0215)
ASSETS	-	-	0.87e-13 (0.11e-12)	0.56e-11 (0.17e-11)
CONSTANT	0.1716*** (0.0107)	7.3478*** (0.9782)	-	-
SECTOR DUMMY	Yes	Yes	No	No
Observations	8 644	12 852	8644	12 851
Groups	1 389	1 971	Fixed effects: 1 853	Fixed effects: 1 692
Fixed effects by:	-	-	Sector, year and country	Sector, year and country
SE clustered:	Year and country	Year and country	Year and country	Year and country
Adj. R^2	0.1001	0.2417	0.1522	0.2696

Table 5. contains evidence that outcomes of all four regression models are comparable when it comes to ESG rating. ESG score has positive and significant impact in three out of the four models, with POLS 1A being only near the 10% significance level, implicating H1 and H2 to be correct. ESG seems to increase accounting and market-based valuation. Results give implication that rise of one point in the ESG score results in an approximately 0.01 unit increase in Tobin's Q when other variables are constant. Although the effect is small, it is significant. Size has negative and significant impact on Tobin's Q, and similar but non-significant impact on ROA. Possibly suggesting that larger companies have lower valuations.

Table 6. Regression results from models (5) and (6).

Results of FE models 5 and 6. Markings ***, ** and * denote statistical significance at the 1%, 5%, and 10% levels.

	FE 5	**FE 6**
Dependent variable	Tobin's Q	Tobin's Q
ESGCS	-0.0118* (0.0059)	-
LEVERAGE	-0.8720*** (0.2759)	-1.3497*** (0.1547)
SIZE	-0.2416*** (0.0232)	-0.2036 *** (0.0163)
$\mathbf{ROA_{i,t-1}}$	10.126*** (1.238)	-
SECTOR DUMMY	Yes	Yes
ENV **SOC** **GOV** **ENV*POST18** **SOC*POST18** **GOV*POST18**		0.0006 (0.0018) 0.0045** (0.0017) -0.0002 (0.0011) 0.0024** (0.0011) 0.0001 (0.0016) 0.0017* (0.0009)
ESGCS*SECTOR **Consumer disc** **Consumer Stap** **Energy** **Health Care** **Industrials** **Information Tech** **Materials** **Real Estate** **Utilities**	 0.0195** (0.0065) 0.0125** (0.0054) 0.0219*** (0.0054) 0.0105 (0.0086) 0.0182** (0.0060) 0.0167* (0.0076) 0.0160* (0.0086) 0.0161** (0.0053) 0.0154** (0.0066)	
Observations	8 644	12 850
Fixed effects	255	264
Fixed effects by:	Year and country	Year and country
Standard errors clustered:	Year and country	Year and country
Adj. $\boldsymbol{R^2}$	0.4665	0.1477

Model 5 in table 6 estimates the impact of ESG on Tobin's Q by different sectors. Largest and most significant effect is on energy sector, which is understandable as it is one of the

ESG-risk industries. Consumer discretionary and industrials also have large effects. Health care sector had the smallest, as it doesn't face many industry ESG risks.

FE model 6 is the only model in this study to estimate impact of individual ESG parameters as it is not one of the main questions of this study. It seems that overall, the social score has largest impact but when narrowing down post 2018 the environmental factor has largest and most significant impact in model FE 6. These models do not strictly answer the research questions, nevertheless the results seem to be in line with H1.

5.1.3 Regression results on changes in legislation

This subchapter focuses on the impact of EU legislation. NFRD reporting variable is created to make results easier to read. It is combination of NFRDyear and Largedummy variables that together create the moderator for reporting group and years.

Table 7. Results of FE models (4) and (2).

Markings ***, ** and * denote statistical significance at the 1%, 5%, and 10% levels. The term ESGCS*NFRD Reporting is the group to study the impact of legislation.

	POLS 2	**FE 4A**	**FE 4B**
Dependent variable	**Tobin's Q**	**ROA**	**Tobin's Q**
ESGCS	0.0075 (0.0055)	3.46e-18 (2.35e-18)	0.0091** (0.0043)
ESGCS * NFRD REPORTING	0.0160*** (0.0041)	1.73e-18** (5.74e-19)	0.0140*** (0.0043)
LEVERAGE	-0.9547*** (0.0843)	-1.47e-17 (1.15e-17)	-0.6748*** (0.1410)
SIZE	-0.2112*** (0.0097)	-1.51e-18 (2.34e-18)	-0.1545*** (0.0178)
$\mathbf{ROA_{i,t-1}}$	10.198*** (0.1997)	1.00*** (3.0e-16)	5.292*** (0.7904)
LARGEDUMMY	-0.3146 (0.2195)	0.00 (7.7e-17)	0.1264 (0.2492)
LARGEDUMMY*NFRDYEAR	-0.9247*** (0.2638)	-2.2e-16 (1.13e-16)	-0.7359*** (0.2044)
ESGCS*LARGEDUMMY	-0.0032 (0.0042)	0.00 (1.82e-18)	-0.0062 (0.0045)

	POLS 2	FE 4A	FE 4B
ESGCS*NFRDYEAR	-0.0159** (0.0047)	-1.73e-18 (1.68e-18)	-0.0115*** (0.0039)
SECTOR DUMMY	Yes	No	Yes
Observations	7 924	8 403	8 403
Groups	1 417	Fixed effects: 1 665	Fixed effects: 253
Fixed effects by:	-	Year, sector and country	Year and country
Standard errors clustered:	Year and country	Year and sector	Year and sector
Adj. R^2	0.4236		
Adj. Pseudo R^2		1.00	0.2027

To examine H3, the models in Table 7 contain an interaction term between ESGCS and the reporting group dummy, NFRD reporting. This moderator variable is built to capture the impact of NFRD. FE 4B model was changed for this panel, sector is no longer used as fixed effects, but as a dummy variable in the model. All models show positive relationship between ESG and financial variables when it comes to solely ESG, although the effect on ROA in FE 4A and Tobin's Q on POLS 2A is not quite significant. The effect of Largedummy * NFRDyear and ESGCS*NFRDyear suggests that large firms have had worse performance overall after 2018 and that ESG score has had negative impact on Tobin's Q after 2018. The negative impact is very small and could possibly arise as one value of variable increases, resulting to the increase to the slope of the relationship between the other variable.

When the reporting group, reporting years and ESG are combined as ESGCS * NFRD Reporting the effect is positive and significant, although marginal on ROA in FE4A. After NFRD legislation the rise of 1 ESG rating has 0.0140 – 0.0160 impact on Tobin's Q or 1.73e-18 effect on ROA. It still seems that the moderator variable increases the positive effect of ESG at least with market-based method. Earlier model FE 3A had significant and much larger impact on ROA. It seems odd that the effect of NFRD and ESG is smaller

on ROA than only ESG, when the effect is much stronger on Tobin's Q. It could result from weak model specification and ESG effect on ROA being unsignificant. The impact of FE 4A is very marginal and non-significant. R Models in table 7 show positive impact of ESG on market-based firm value even though only FE 4B has statistically significant estimate on ESG without moderator. Impact on ROA is positive and significant when ESG is combined with NFRD, but still very small. All models show positive and statistically significant impact of NFRD. Models seem to support H1 with market-based valuation and H3 with impact of NFRD.

Table 8. Regression results from models (7) and (8).

Markings ***, ** and * denote statistical significance at the 1%, 5%, and 10% levels. The models 7A and 7B use the Pre18 variables for years 2014-2017. Models 8A and 8B use Post18 variables for years 2018-2021. Pre18 GROUP and its post equivalent are combinations of the year dummy and Largedummy, making the reporting group.

	FE 7A (pre)	**FE 7B (pre)**	**FE 8A (post)**	**FE 8B (post)**
Dependent variable	**Tobin's Q**	**ROA**	**Tobin's Q**	**ROA**
ESGCS	-0.0010 (0.0037)	-5.69e-19 (4.02e-19)	0.0123** (0.0050)	2.60e-18 (1.88e-18)
ESGCS * PRE18 GROUP	-0.0130*** (0.0036)	-7.05e-19* (3.60e-19)	-	-
ESGCS * POST18GROUP	-	-	0.0185*** (0.0060)	3.47e-18 (2.12e-18)
LEVERAGE	-0.6454** (0.2627)	-3.12e-18 (3.97e-18)	-0.6494** (0.2645)	-3.16e-17* (1.68e-17)
SIZE	-0.1541*** (0.0230)	-9.52e-19 (6.41e-19)	-0.1538*** (0.0223)	-4.87e-19 (1.15e-18)
$\mathbf{ROA_{i,t-1}}$	5.2345*** (0.5956)	1.00*** (8.42e-17)	5.240*** (0.5826)	1.00*** (2.31e-16)
LARGEDUMMY	-0.5109*** (0.1847)	4.12e-17 (2.46e-17)	0.3153* (0.1652)	2.77e-17 (2.95e-17)
LARGEDUMMY * PRE18 / POST 18	0.7836*** (0.1658)	1.74e-17 (3.42e-17)	-1.0524*** (0.2180)	2.95e-17 (6.98e-17)

	FE 7A (pre)	FE 7B (pre)	FE 8A (post)	FE 8B (post)
ESGCS* LARGEDUMMY	0.0045 (0.0035)	4.88e-19 (3.71e-19)	-0.010** (0.0047)	-2.60e-18 (1.91e-18)
ESGCS* PRE18 OR POST18	0.0119*** (0.0031)	-2.17e-19 (4.91e-19)	0.0168*** (0.0055)	0.00 (1.93e-18)
Observations	8 402	8 403	8 402	8 403
Fixed effects	1 664	1 665	1 664	1 665
Fixed effects by:	Year, country and sector	Year, country and sector	Year, country and sector	Year, country and sector
Standard errors clustered:	Year and country	Year and country	Year and country	Year and country

Table 8. contains post and pre model for both variables. These models study the possible change closer to the year 2018. Models show negative impact of ESG on pre and positive impact on post, but only the FE 8A has significant effect on only ESG. The combined moderating effect of Pre group or Post group and ESG is negative for Pre18 and positive Post18. Estimates are statistically significant expect for effect of FE 8B on ROA. All the models have the same fixed effects and clusters of standard errors. FE models 7 and 8 show positive moderating effect for year 2018 and is in line with H3.

Table 9. Regression results from model (9).

FIRST RATING is variable of companies that belong to the large companies and started getting ESG ratings in 2018. ***, ** and * denote statistical significance at the 1%, 5%, and 10% levels.

	FE 9
Dependent variable	Tobin's Q
ESGCS	-0.0032*** (0.0010)
LEVERAGE	-2.0641*** (0.2248)
FIRST RATING * ESGCS	0.0087*** (0.0022)

	FE 9
ESGCS*POST18	-0.0026*** (0.0006)
Observations	12 399
Fixed effects by:	Year and country
Standard errors clustered:	Year and country
Adj. R^2	0.090

Many companies in the original sample had NA values for ESG prior to 2018. Many of them started acquiring ESG rating at that point for the NFRD or some time earlier for precautionary reasons. Many smaller firms also started acquiring ESG ratings early because EU published CSRD which starts coming to effect in 2024 – 2026 and affects them. For a firm to be in the FIRST RATING group it must be large firm and have NA values in ESG prior to 2018. The variable covers for the period of Post18 variable, 2018-2021. A shown in table 9, the interaction with beginning of ESG reporting and firm value is positive and significant. The effect is small and its indicates that ESG rating and the beginning of ESG reporting has positive impact on valuation. Model is in line with H3.

Table 10. Regression results from model (10).

DiD 10 model is simple difference-in-difference setup estimation of the change. ***, ** and * denote statistical significance at the 1%, 5%, and 10% levels.

	DiD10
Dependent variable	Tobin's Q
ESGCS	0.00127 (0.0010)
LEVERAGE	-0.9946 *** (0.1213)
SIZE	-0.2044*** (0.0366)
ESGCS*2011	-0.0005 (0.0010)
ESGCS*2012	-0.0019* (0.0011)
ESGCS*2013	-0.0020* (0.0011)

	DiD10
ESGCS*2014	-0.0007 (0.0009)
ESGCS*2015	-0.0023*** (0.0007)
ESGCS*2016	-0.0012 (0.0010)
ESGCS*2017	0.0004 (0.0006)
ESGCS*2019	0.0014*** (0.0005)
ESGCS*2020	-0.0007 (0.0006)
ESGCS*2021	0.0024*** (0.0008)
ESGCS*2022	0.0024** (0.0008)
Observations	12 386
Fixed effects by:	Year and firm
Standard errors clustered:	Year and country
Adj. Pseudo R2	0.2586

This two-way fixed effects model in table 10 is not one of the main methods used in this section, but in can still give valuable estimation. The model estimates the effect of NFRD to large firms. It seems that ESG has negative effects prior to cut off year 2018 and more positive effects post 2018, although only six of the eleven years are significant. Figure 1 below is a plot of the effect. The plot shows some pre-emptive change prior to cut off which is not ideal. Model is in line with H1, but it is not statistically significant. All in all, model 10 gives support to H3.

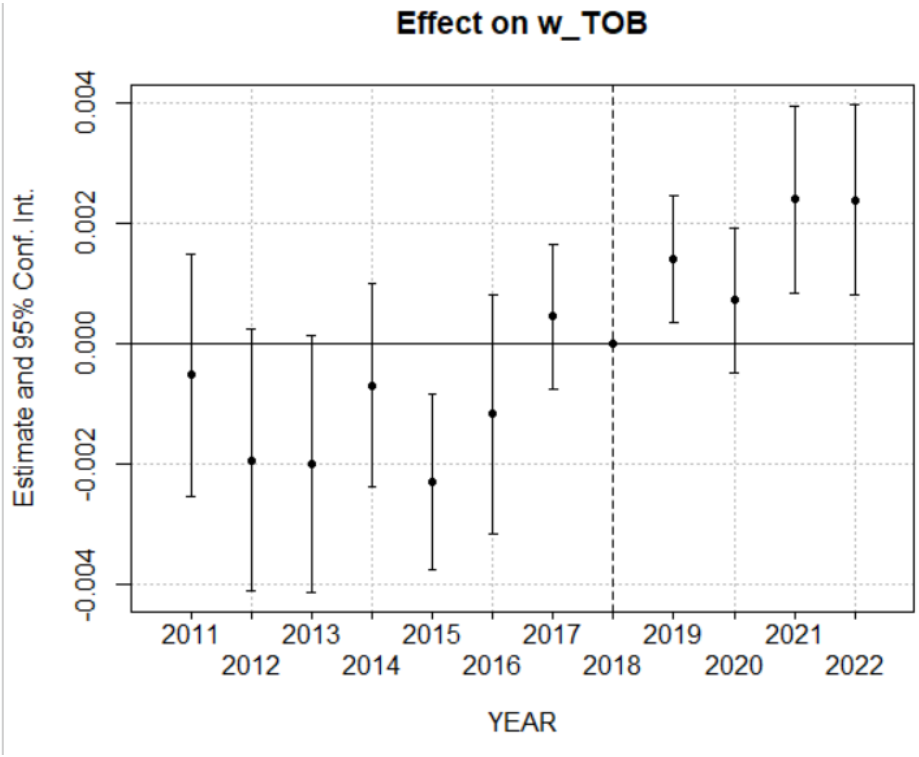

Figure 1. Graphed model (10) estimation.

5.1.4 Robustness, correlation and autocorrelation.

Different tests were conducted on the data and models to make the results more robust. Breusch–Godfrey and Breusch–Pagan test failed to reject null hypothesis, indicating possible presence of heteroskedasticity and high order serial correlation (Kleiber & Zeiles 2008). The problem is tackled with clustered standard errors, which should help as the sample and time-dimension is large (Hoechle 2007). F-test with anova function was used to test the utility of fixed effects used in regressions. Test p-values reject null hypothesis of redundancy, which helps in explaining the stronger explanatory effect of FE models (Kleiber & Zeiles 2008).

Wald-test was used on some predictor variables to test if they equal to zero. Assets variable on FE1 stayed on model for its low p-value on Wald-test. Models used in this research were often as stripped down as possible. Limiting the number of unnecessary control variables. Durbin-Watson test was used to test for correlation between residuals. Linear model versions of POLS2 with Tobin's Q as independent variable rejected null hypothesis, concluding presence of autocorrelation is residuals. Which is why the models use clustered standard errors (Kleiber & Zeiles. 2008).

Variance inflation factor was used to test multicollinearity. Good upper limit for VIF value is 5 -10 depending on research subject. VIF value rises to 7 and 9 for sector dummy

and ROA on test model, which is safe to ignore since dummy variables have large VIF value and control variables that are not of interest are allowed to have high VIF value. ESG rating on the larger POLS2 model rose above 10 because it is used also as product in the model (Allison 2012; Daoud et al. 2017).

Granger causality test was performed to determine causality. P-values for ESG rating causing ROA and Tobin's Q was significant at 0 with lag 5. Null hypothesis is rejected, ESG Granger causes the financial variables. Vice versa, granger test for financial variables causing ESG rating was 0.09 and 0.22 on lag 5. Null hypothesis is not rejected, time series of financial variables do not cause time series of ESG (Angrist & Pischke 2008, 177-178; Troster et al. 2018).

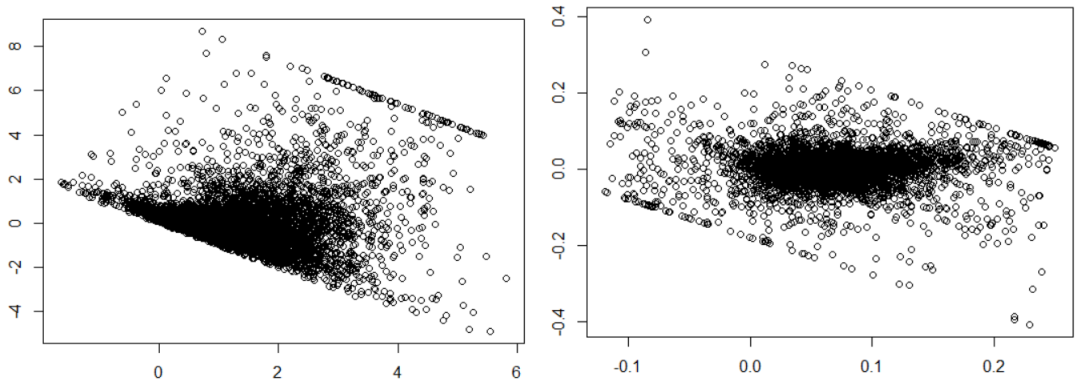

Figure 2. Plotted residuals of Tobin's Q on left and ROA on right.

Figure 2 shows residual plots of Tobin's Q and ROA. Winsorizing dampens the spread of observations, but they remain spread out. ROA is more evenly centered as much of the mass of Tobin's Q is focused on lower limit. Because of clear heteroskedasticity and autocorrelation, all models use clustered standard errors.

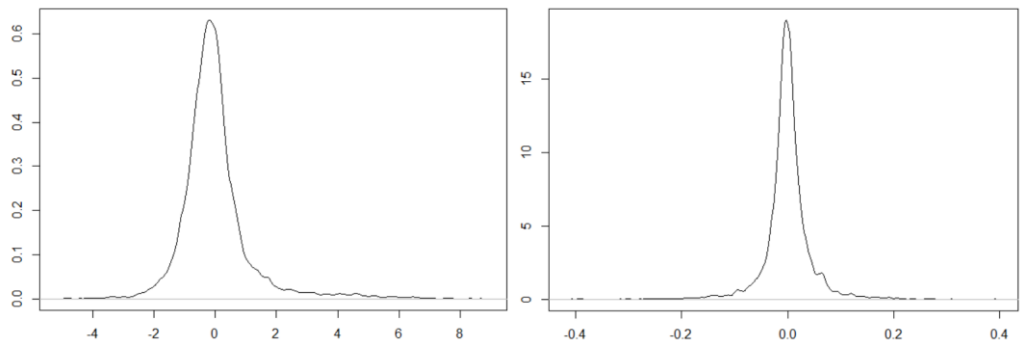

Figure 3. Density plots of Tobin's Q on left and ROA on right.

Residuals should have mean of zero to behave as error terms. Both graphs in the figure 3 are centered around mean of zero, although Tobin's Q could have better fit in it.

To test robustness of models, two subsets of data were made. Subset had 1 France, Germany, United Kingdom and Norway. Germany and France were picked because they are large EU countries with large number of companies. Norway and UK were picked because they are not part of EU (UK after Brexit) and have large number of companies. Subset 2 consists of France, Germany, Finland, Sweden and Denmark. France and Germany were chosen for similarity and the other three were chosen to get similar sample size of countries from EU. Both datasets were intended to contain similar countries, which is why samples are mix of northern and central European countries.

Similar model as fixed effects model 4 and POLS models 1B and 2 were remade with the new datasets with Tobin's Q as dependent variable. Table 11 shows the results of the regressions on these different datasets. POLS 1 model has very similar results as it estimates only the impact of ESG. POLS 2 and FE 4 that estimate ESG and impact of NFRD show significantly larger effects on countries that are from EU. Impacts of ESG are larger and more significant on subset 2 than with subset 1 and original sample. Subset 2 also has substantially more impactful NFRD estimates than the other two, which could give indication for robustness of overall regression results. Results are stronger with EU countries as NFRD directly applied to only EU countries. This test with subsets supports H3. FE models used year and sector as fixed effects. Table 11 only covers for ESG and NFRD variables. All models use the same clusters for standard errors, year and country.

Table 11. Results from robustness test with different data subsets.

comparison for different datasets. Original is the sample used earlier in all regressions. Subset 1 contains many non-EU countries and subset 2 contains only EU countries.

Data	**Original**		**Subset 1**		**Subset 2 (EU)**	
Variable	**ESG**	**NFRD**	**ESG**	**NFRD**	**ESG**	**NFRD**
POLS1	0.0074*** (0.0022)	-	0.0063*** (0.0021)		0.0071** (0.0031)	-
POLS2	0.0075 (0.0054)	0.0160*** (0.004)	0.0086 (0.0055)	0.0160*** (0.0034)	0.0181* (0.010)	0.0289*** (0.0049)
FE4	0.0086* (0.0045)	0.0115*** (0.0046)	0.0095* (0.0055)	0.0099*** (0.0032)	0.0157*** (0.0059)	0.0177** (0.0076)
SE clusters	Year and country	Year and country	Year and country	Year and country	Year and country	Year and country
Companies	1373		658		619	

Both subsets are of similar size. Original control variables are used but not displayed in table 11. Figure 4. below shows visual representation of the change of NFRD with EU focused subset 2 on right.

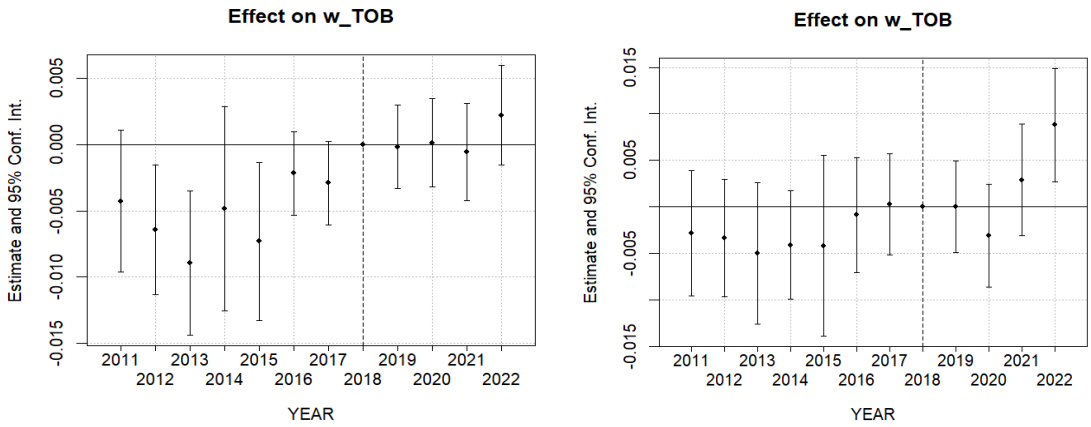

Figure 4. Change in impact of ESG rating.
Subset 1 on left and EU subset 2 on right. Cut off year is 2018, the implementation year of NFRD.

Models and data in this study suffer slightly from exogeneity and all OLS conditions are not completely fulfilled, but they are also compensated with winsorizing, large sample, many different models with similar results, and clustered standard errors as year, country and sector fixed effects control for impact of shocks and trends. Adoption of NFRD by 27 member states is set to increase the volume and quality, especially for companies which have suffered from lack of transparency. The goal of NFRD is motivating companies to create a responsible approach to business, generating improvement in transparency and ESG performance, which can lead to results showcased here.

5.2 Summary of results

5.2.1 ESG rating impact on firm value

Results support H1 and H2. ESG rating has significant connection to profitability and valuation of a firm. Drawing conclusion in this matter from this empirical standpoint is not easy but it can be plausible that ESG rating and investments in ESG activities are profitable for firms in EU, especially in recent years. The results are stronger for market-based valuation where many of the models achieved significant positive robust results. POLS model 1B, FE models 3A and 3B all found positive interaction and POLS 1A reached positive but insignificant results. Results with model FE 5 were in line with

expectations. ESG has larger impact on sectors that are considered to carry ESG risks. For instance, ESG did not have much impact on health care sector as it has minimal amount of ESG risks.

Regressions do not find any significant negative relationship with ESG and valuation. Some models find significant negative results on certain years in early 2010's. Results are also affected by smaller numbers of ESG reporting.

Stakeholder theory seems to provide better explanation of this impact than shareholder theory. ESG activities of firms generate value for shareholders and for other stakeholders, like employees, customers, suppliers, and local communities. Findings indicate that firms can increase their value and profits when they consider the interests of other stakeholders and not only shareholders. According to shareholder theory, investments to activities that are not connected to maximization of profits results in missed opportunities for shareholders. As, there was no significant negative impact between ESG and valuation, we can assume that shareholder theory does not apply to ESG area. Multiple stakeholder groups, such as shareholders, employees and communities, benefit from the ESG activities. Investors may have recognized the importance of ESG for it leads to higher valuation (Smith 2003; Aluchna et al. 2022; Hasan et al. 2022).

Results are stronger and more significant for market value-based approach. Results with ROA are more often non-significant and very marginal. Results with Tobin's Q were more robust, which is in line with Clark et al. (2015) and Friede et al. (2015) meta study results where majority of market value based ESG research found positive link between ESG and financial performance. Strong ESG performance leads to better stock values relative to companies with weaker ESG performance. It is also intuitive that results are stronger with market-based valuation as these models don't use time lags and capture more immediate impact. Markets can have a fast reaction to changes.

Results concerning ROA are positive and results are significant with only FE 3A model and FE 4A with NFRD moderator. Reasons for much weaker results could be the different relationship between ROA and ESG. Han et al. (2016) and

Nollet et al. (2016) found no significant linear relationship with ROA, instead they found U-shaped relationship between the two variables. They concluded that ESG pays off after some certain threshold limit, when measured with ROA. Models used in this thesis to estimate impact on ROA could have benefitted from different lags on dependent variables, quadratic terms with ROA or some different non-linear model. For instance,

Bruna et al. (2022) reached similar results but with accounting-based performance using time-lagged panel regression models.

5.2.2 Impact of NFRD and reporting on relationship of ESG and financial performance

The results support H3 indicating that ESG rating has postitive impact on market- and accounting-based valuation of large firms especially post 2018. Models showcased statistically significant increased impact after 2017 with different model specifications. ESG rating has positive effect on financial variables and NFRD group variable increases the positive effect of ESG. The directive requires disclosure of documents such as annual reports and sustainability reports of ESG categories from large public companies and financial institutions. All EU countries adapted it to their national laws and companies must comply accordingly. NFRD is a directive which means countries of EU have some independence when it comes to adopting it. Every country adopted it, but not in completely similar manner. The thresholds chosen for group of large firms are best proxy for the variable, in attempt to keep it simpler. The sample contains firms from other European countries, and not only EU. Research question is about whole Europe, as it is plausible that the ESG reporting of minority of companies outside EU countries converge to the ones within EU, since Taxonomy contains third party non-financial risks and future CSRD will contain more risks from subcontractors.

It is plausible to believe with these results that the EU legislation has positive and significant effect. It is very likely that part of the effect stems from overall growth of sustainability trend in the world and growth of ESG reporting. In this context some of the growth of ESG reporting is caused by EU legislation, which can be considered original cause of the increased correlation. The DiD figure 1 has good visual representation of the effect. NFRD was published in 2018, and preparatory work for larger classification framework of EU Taxonomy started. Figure 1 may show some signs of the impact of these announcements of large regulatory frameworks, and other legislation as EU is trying to reach the Green Deal goal. Fixed effects regressions 7 and 8 also indicate that NFRD boosted impact of ESG rating on the comparison years.

Companies affected by directive increase their sustainability activities and invest in corporate sustainability reporting before mandatory reporting is in effect. They invest heavily on sustainability infrastructure, which weakens the allegations of companies responding to mandatory reporting by green washing. (Fiechter et al. 2022). It is plausible

that some early adopters are adapting to CSRD reporting and increasing their CSR activities in years 2021 and 2022. Strong ESG policies and growth of ESG reporting quality and volume likely contribute to results of this thesis.

6 CONCLUSIONS

In this thesis I examined the relationship between ESG and firm value in Europe, as well as the potential impact of the EU NFRD sustainability directive. The empirical segment relies on relatively unexplored topic about NFRD's impact on ESG. Using different fixed effects and Pooled OLS regressions on a sample consisting of nearly 2000 firms across 32 countries from 2011 to 2022, findings reveal a significant and positive impact of ESG rating on firm market value. To determine the potential strengthening effects of NFRD on ESG scores impact on market value, moderator variables were introduced into models. Results indicate that ESG rating has significant positive effect on firm market-based financial performance. Impact on accounting-based financial performance ROA is less significant and impact is often small, but nevertheless there is some positive and significant results with it. Models studying ROA could benefit from different lags and higher order model specifications. ESG rating could be perceivable better on ROA with different metrics and time intervals. Results hold when firm riskiness, size, sector, year and other impactful factors are controlled, depending on the model in question. Results suggest firm investments towards corporate sustainability and ESG activities are beneficial for the firm and stakeholders. Markets reward the consideration of sustainability. Models also showed positive influence of a firm acquiring its first ESG rating.

In robustness checks we demonstrated how larger effects could have been possible with modified sample. Importantly, many models provide similar results which provides creditability to the results. Results indicate that companies can increase their market-based and accounting-based financial performance by stakeholder management that considers more than just shareholder interests. Good sustainability performance increases transparency, trust and stakeholder communication leading to increased financial performance. It is beneficial and possibly financially crucial for management to take into consideration the effects they have on environment and sustainability matters and integrate ESG factors into decision making, which is what NFRD was made for. NFRD forces companies to showcase how their own business practises influence their surroundings. Good ESG rating can work as safeguard against market risks, causing less volatility in financial markets. NFRD can be especially beneficial for companies with no prior sustainability reporting.

Implementation of NFRD was aimed to increase the volume and quality of reporting, especially for companies that were considered laggards in sustainability reporting. NFRD motivates companies in adopting more responsible approach to business, elevating transparency and ESG performance. This thesis contributes to the sustainability reporting literature by examining the effects of mandatory reporting on relationship between ESG and financial performance. Regression results indicate that ESG rating's influence on firm value increases on the years of implementation with large companies subject to NFRD. Findings support a positive impact of NFRD possibly increasing transparency and ESG activities.

There is evidence of important role of disclosure legislation, offering support to institutional legitimacy. The results show that legislations creating sustainability practices in firms have potential to shape norms of business conduct, reporting, and market behaviour. This change can happen even in absence of heavy enforcement mechanisms.

Research works of ESG have had mixed results and ESG rating has been under scrutiny for greenwashing and unreliability. It seems that the consensus is shifting towards positive direction. These findings contribute to economic sustainability theory. Value creation, profits, sustainability, resource- and information efficiency are becoming more integrated. Findings indicate that NFRD creates incentives for firm transparency and sustainability. Companies can create profits for themselves and stakeholders, while providing better quality goods, setting example and possibly receive funding with lower costs. These findings are important for managers and policymakers. Managers need assurance of the possible benefits and policymakers need to know the impact they create with legislations. These results indicate that investors value sustainability in investment decisions, which is valuable information to both parties. The large change starts from transparency of sustainability and policymakers creating legislation that supports the change.

These findings have their limitations. NFRD is relatively new directive, which translates to limited number of years in the post NFRD group. Sample consists of companies that have ESG rating at some point in the sample period. Every company in the sample has rating but many companies acquired ESG rating during the sample period. It possibly could change the results if every company was analysed with same time span. NFRD group consists of companies that are large and meet the NFRD limits. It would be interesting to see results with same mandate on smaller firms, which is possible with CSRD in future.

Because regressions can't show causality it is not possible to make certain conclusions of impacts. It is possible to conclude that there is connection with ESG rating, financial variables and NFRD mandate. It would require different estimation or event study to prove causality. Data used in this thesis also has its limitations. Data was gathered from the same source. Only one type of ESG rating was used in the models and ROA variable had missing values. Different model parameters could lead to different results, for instance: clustering at firm level, fixed effects at firm level, different mixes of fixed effects and clusters, different control- and moderator variables. Impact of NFRD may vary over time. It might experience strong start and fade away or get stronger during the years. Models use ESG ratings that can be affected by companies, and their disclosure practises. It would require research to determine impact of sustainability reporting legislation on actual sustainability performance.

Possible future research could examine larger population of companies in larger time span. Especially CSRD could provide such setting in the future. It could revolve around purely EU countries, study differing impact on sectors, use different measurement for ESG rating, and examine how much of the impact stems from institutional investors. The differing impact length or permanency of NFRD or CSRD could be also studied.

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Appendices

Appendix 1. Distribution of firms in different sectors

Sector	Firm count
Communication Services	1632
Consumer Discretionary	3372
Consumer Staples	1524
Energy	900
Health Care	2520
Industrials	6348
Information Technology	2796
Materials	1992
Real Estate	1692
Utilities	888

Appendix 2. LSEG definitions for used variables.

Variable	LSEG definition.
ESG combined score.	Company score based on the reported information in the environmental, social and corporate governance pillars with an ESG Controversies overlay.
Sector	Primary Global Industry Classification Standard (GICS) Sector Description.
Country	Country of Headquarters, also known as Country of Domicile.
ROA	Return On Assets – Actual. The company's actual value normalized to reflect the I/B/E/S default currency and corporate actions (e.g. stock splits).

Variable	LSEG definition.
Market Cap	company market capitalization represents the sum of market value for all relevant issue level share types.
Assets	Total Assets [ATOT] represents the total assets reported by a company. If Total assets is not reported, it will be the sum of total Current Assets and total non-current assets.
Debt	Total debt of firm. Represents outstanding, which includes: Notes Payable/Short-Term Debt, Current Portion of Long-Term Debt/Capital Leases and Total Long-Term Debt.
Revenue	Revenue from business activities. Represents total consolidated revenue of a company.
Employees	Average of employees at the beginning and at the end of the fiscal year.

Appendix 3. Change in amount of sample firms without ESG rating.