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Beyond Profits: Unraveling the Impact of ESG Initiatives on Firm Valuation

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DEDICATION

This work is a culmination not merely of hours of research and writing but of countless influences, encouragements, and moments of unwavering support. I want to dedicate my dissertation First and foremost, to my family, the foundation of my very being. Their love has been the beacon guiding me through the toughest nights and the brightest days. The sacrifices made, the beliefs held, and the faith shown are the wind beneath the wings of this journey. My parents have been my first teachers, teaching me not just to read and write, but to question, think, and imagine. Every step I have taken has been with the strength and wisdom they've imparted. My siblings always supported me through thick and thin throughout this challenging journey.

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This journey has been an exploration of my own capabilities, resilience, and passion. Along the way, I've unearthed strengths I didn't know I possessed and conquered challenges I once believed insurmountable. I've learned the importance of self-belief and the power of persistence. This work is not only a testament to my academic pursuits but also a journey of personal growth and self-discovery.

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ABSTRACT

Beyond Profits: Unraveling the Impact of ESG Initiatives on Firm Valuation

This thesis aims to analyze the impact of Environmental, Social, and Governance activities on the firm value of publicly listed companies in Europe. For this analysis, the data for ESG score and other financial variables is collected from the Refinitiv database from 2010 to 2024. Various statistical techniques are used to examine the relationship, including the diagnostic and robustness test. The findings of this study show a significant negative relationship between ESG and firm value (measured by TobinQ), suggesting that the cost of ESG activities might outweigh the immediate financial benefits. Along with the combined ESG score, the individual components are also analyzed in the whole sample and among the regions. Furthermore, the relationship between the cost of capital with firm value and ESG score is also analyzed. The results show that the cost of capital is significantly negatively related to firm value which shows that a higher cost of capital decreases the firm value. Contrary to this, the positive relationship with ESG shows that ESG activities might not benefit firms in obtaining funds at low cost, although the R-square is very low, suggesting a very small variation in the cost of capital might be caused by the ESG score. The relationship among the variables is also analyzed in different regions (Eastern, Western, Northern, and Southern) and the results show that the negative relationship exists in these regions except the Southern region where the impact is insignificant. Additionally, this thesis also analyzed the impact of the European Union's directives, mainly NFRD and CSRD. For this, the sample is subdivided into three time periods and the results show that before NFRD, the relationship is insignificant whereas it becomes significant and negative afterwards. This could be due to pressure from stakeholders and authorities to engage in ESG activities but the cost of these activities is more than the financial benefits or companies are not implementing it in such a way that may also enhance financial benefits. To ensure robustness, this thesis employs Quantile regression and the results show that the impact of ESG and sub-components on firm value is significantly negative particularly in higher quantiles whereas the impact in lower quantiles varies. Other than this another proxy is used for firm value (ROA) and the results are quantitatively similar to previous findings. Furthermore, this thesis also addresses the issue of endogeneity by using two-stage least square regression and advancing the dependent variable by one period. The results show that the impact of ESG score, sub-components, and other variables remain quantitatively same even after controlling for endogeneity.

Keywords: Firm value, Environmental, Social, Governance, ESG, cost of capital, CSRD, regression analysis

ABSTRACT

Oltre i Profitti: Analisi dell'Impatto delle Iniziative ESG sulla Valutazione Aziendale

Questa tesi si propone di analizzare l'impatto delle attività ambientali, sociali e di governance (ESG) sul valore delle società quotate in Europa. Per questa analisi, i dati relativi ai punteggi ESG e ad altre variabili finanziarie sono stati raccolti dal database Refinitiv per il periodo compreso tra il 2010 e il 2024. Sono state utilizzate diverse tecniche statistiche per esaminare la relazione, inclusi test diagnostici e di robustezza. I risultati di questo studio mostrano una relazione negativa significativa tra il punteggio ESG e il valore aziendale (misurato tramite il Tobin's Q), suggerendo che i costi delle attività ESG potrebbero superare i benefici finanziari immediati. Oltre al punteggio ESG complessivo, sono stati analizzati anche i singoli componenti ESG sia nell'intero campione che a livello regionale. Inoltre, è stata analizzata la relazione tra il costo del capitale, il valore aziendale e il punteggio ESG. I risultati mostrano che il costo del capitale è significativamente e negativamente correlato al valore aziendale, indicando che un costo del capitale più elevato riduce il valore dell'azienda. Al contrario, la relazione positiva con il punteggio ESG suggerisce che le attività ESG potrebbero non favorire le aziende nell'ottenimento di fondi a basso costo, sebbene l'R-quadro sia molto basso, indicando che solo una piccola parte della variazione del costo del capitale potrebbe essere attribuita al punteggio ESG. La relazione tra le variabili è stata analizzata anche in diverse regioni (Europa orientale, occidentale, settentrionale e meridionale), e i risultati mostrano che la relazione negativa è presente in tutte le regioni tranne che in quella meridionale, dove l'impatto è insignificante. Inoltre, questa tesi ha analizzato l'impatto delle direttive dell'Unione Europea, in particolare la NFRD (Non-Financial Reporting Directive) e la CSRD (Corporate Sustainability Reporting Directive). A tal fine, il campione è stato suddiviso in tre periodi temporali, e i risultati mostrano che prima dell'introduzione della NFRD la relazione era insignificante, mentre diventa significativa e negativa successivamente. Ciò potrebbe essere dovuto alla pressione degli stakeholder e delle autorità affinché le aziende si impegnino in attività ESG, ma i costi di tali attività superano i benefici finanziari, oppure le aziende non le implementano in modo da massimizzare anche i vantaggi finanziari. Per garantire la robustezza dei risultati, questa tesi utilizza la regressione quantile, che mostra che l'impatto del punteggio ESG e dei suoi sottocomponenti sul valore aziendale è significativamente negativo, specialmente

nei quantili superiori, mentre l'impatto nei quantili inferiori varia. Oltre a ciò, è stato utilizzato un altro proxy per il valore aziendale (ROA) e i risultati sono quantitativamente simili a quelli precedenti. Infine, questa tesi affronta il problema dell'endogeneità utilizzando la regressione a due stadi (2SLS) e anticipando la variabile dipendente di un periodo. I risultati mostrano che l'impatto del punteggio ESG, dei suoi sottocomponenti e delle altre variabili rimane quantitativamente invariato anche dopo aver controllato per l'endogeneità.

Chapter 01

Introduction

1.1 Background

The growing interest of investors and global awareness about risks, particularly those related to the environment, social responsibility, and governance, put pressure on companies to enhance their focus on non-financial aspects. Stakeholders, including investors, employees, suppliers, customers, and governments, increasingly expect firms to actively address these areas, implement necessary risk mitigation measures, and report their efforts transparently. Companies typically disclose their performance on these risks through the Environment, Social, and Governance (ESG) disclosure. However, from the firm's perspective, addressing these issues requires investment. A central question in board meetings and relevant committees is whether such investments and resource allocation are financially justifiable.

The global concern regarding environmental sustainability encouraged firms to incorporate corporate social responsibility (CSR) in their business operation as they realized the importance of taking part in CSR activities (Mark-Herbert and Von Schantz, 2007). The sustainability and competitiveness of a firm need to be socially and ecologically responsible (Orlitzky et al., 2011), therefore it is gaining attention from professionals and academicians (Madueno et al., 2015).

The corporate world was forced to reshape its relationship with stakeholders, particularly after the financial crisis of 1924. The success of corporations also depends upon awareness of the needs of society. European Commission (2001) defined “CSR as a concept whereby companies integrate social and environmental concerns in their business operations and their interaction with their stakeholders voluntarily”. CSR has broadened the domain of the corporate sector from stockholders to stakeholders.

The Lisbon Summit in 2000 urged enterprises to be involved in social causes related to ongoing education and training, work organization, equal opportunities, inclusion in mainstream society, and sustainable development. The strategic goal for the European Union (EU) is to become the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth, and CSR seems to as a business contribution to sustainable development.

According to the Edelman Trust barometer report 2022, societal fears are on the rise, people believe that business needs to step up on societal issues and societal leadership should be a core

function of the business. A total of 80% of the general population wants CEOs to be personally visible while discussing public policy with external stakeholders and also want their CEO to speak out on controversial issues they care about. Edelman[1] did research on trust for more than 20 years and believes that it is most important for all institutions (companies, governments, NGOs, and media) to build a relationship with their stakeholders. An organization can operate, lead, and succeed based on trust. Trust is the strongest insurance against competitive disruption and the ladder towards growth. It is not possible to build credibility and reputation without trust. To build trust effectively, it is important to balance competence (delivering on promises) and ethical behavior (doing the right things and work to improve society).

The strategic plan of Europe 2020 is to become a smart, sustainable, and inclusive economy. While these global agendas provide a proving ground for CSR, people are doubtful regarding the hidden agenda of CSR. Some are concerned that companies doing good now may end up doing bad in the future. The actions of firms have a significant impact on the lives of people around the world in terms of the products and services they offer, job opportunities, working conditions, human rights, health, the environment, innovation, education, and training. For this reason, EU citizens rightly expect that companies understand their positive and negative impacts on society and the environment, and also try to prevent negative impact. Living up to this duty is commonly known as "Corporate Social Responsibility" or "Responsible Business Conduct" (RBC).

Responsible business conduct necessitates compliance with laws and responding to societal expectations (i.e., respecting human rights, environmental protection, labor relations, and financial accountability). The Commission has defined CSR as the responsibility of a firm for its impact on society. To meet their corporate social responsibility, the firm should integrate social, environmental, ethical, human rights, and consumer concerns into their business strategy and operations with the collaboration of their stakeholders. The core purpose of a firm is to maximize the value for its shareholders, stakeholders, and society at large as well as identify, prevent, and mitigate the possible adverse impacts.

CSR is a growing topic that shows different views and approaches related to the relations of corporations with society. According to the United Nations Industrial Development Organization (UNIDO), "Corporate Social Responsibility is a management concept whereby companies integrate social and environmental concerns in their business operations and interactions with their

[1] The 2022 Edelman Trust Barometer is the 22nd annual trust and credibility survey.

stakeholders". Through CSR the corporation can achieve a balance of economic, environmental, and social imperatives (Triple Bottom-Line approach) while addressing the expectations of stockholders and stakeholders.

CSR shows the responsibility of business towards the environment, stakeholders, and society (Blowfield, 2005). The concept of CSR began to emerge in the 1950s as a philosophy of business doing good for society including philanthropy (Bowen, 1953), and then led to wider social concerns in the 1960s (Carroll and Shabana, 2010). Although the concept of CSR was not completely adopted as a business strategy until the 2000s, the focus was on business to meet the needs of stakeholders (Bice, 2015; Lee, 2008). During the 2000's, Steurer et al., (2005) examined the relationship between business strategy and sustainable development. Global challenges such as climate change shift the concept of CSR from voluntary activity to an integrated response of business (Allen and Craig, 2016).

The Friedman Doctrine also known as shareholder theory suggests that the responsibility of a business is to maximize the value of shareholders as shareholders are the backbone of the company and should get most of the value. The doctrine criticizes the CSR activities done by corporations. Contrary to this view, many scholars believe that CSR increases the value of shareholders. The percentage of Fortune Global 250 firms increased from 44% in 2011 to 78% in 2017 which indicates the section of annual reports for reporting CSR activities (KPMG, 2017). It is still debatable whether CSR increases the benefits of shareholders or wastes the resources of firms.

CSR provides a competitive advantage, which improves the financial strength of the business (Margolis, Elfenbein, & Walsh, 2009). The belief regarding the positive relationship between CSR and financial performance is based on the stakeholder theory (Freeman, 1984). The theory emphasizes that the relationship of a company with stakeholders determines the success of a company and is an important factor for value creation (Hammann et al., 2009). Another perspective is the negative relationship between the two constructs. According to this concept, it wastes the scarce resources of the company without any substantial return (Friedman, 1970). In other words, social action involves a cost that affects profit negatively (such as costs incurred on charity, better working conditions, and pollution control).

Rapid advancements in technology and evolving business practices globally necessitate that firms implement substantial measures to survive in the dynamic business environment (Chouaibi et al., 2022). Moreover, robust economic growth worldwide appears to be undermining the ability of

firms to meet customer demand sustainably (Agoraki et al., 2023). Furthermore, challenges associated with climate change and poverty have compelled the United Nations to introduce Sustainable Development Goals (SDGs) applicable to organizations across various sectors globally (Hossain, 2022; Waqas et al., 2022). In response, governments around the world have either enacted legislation or voiced their commitment to meeting the UN's SDGs. Stakeholders, too, have expressed increased concern regarding sustainable business practices. However, achieving sustainability for manufacturing firms hinges on creating firm value (Larbi-Siaw et al., 2022). Manufacturing firms, particularly those in emerging markets, face significant vulnerability and encounter challenges while transforming their business practices (Ghosh et al., 2022). Firms enhance the reputation in the minds of customers, thus distinguishing them from competitors (Abdi et al., 2022) and ESG factors emerged as dominant determinants of firm value (Bancel et al., 2023).

1.2 Development and Significance of ESG

ESG stands for Environmental, Social, and Governance refers to how well companies manage environmental, social, and governance activities. This term is often compared to CSR, which mainly focus on the social aspects rather than environmental and governance activities. While both concepts aim to promote responsible business practices, ESG takes a more holistic approach by integrating all three dimensions into corporate valuation.

ESG disclosure practices have gained significant momentum in recent years, playing a critical role in addressing the interests of various stakeholders. These disclosures encourage corporations to actively engage in transparent reporting to create positive social and environmental impacts. Through ESG practices companies benefit from enhanced brand image, growth opportunities, and higher value. Although ESG reporting is not a new concept in the corporate world, the definition and components of ESG have evolved over time. As both shareholders and organizations demand sustainability and transparency, ESG has gained academic interest in analyzing the relationship between ESG disclosures and firm performance.

In the financial literature, research often focuses on both individual and combined ESG factors, analyzing how these disclosures influence corporate performance. Integrating sustainability reporting with Sustainable Development Goals (SDGs) is considered as a key driver in improving ESG performance.

The UN Global Compact in 2000 was the largest voluntary initiative for weighing the corporate sustainability which was offered a practical framework to guide the companies that are committed

to adopting sustainable and ethical business practices. This initiative guides the companies to integrate sustainability into their business models and investment strategies. The UN Global Compact (2004) has identified the economic and environmental considerations as core pillars of sustainability in the investment sector. The ESG falls under the broader category of socially responsible investing (SRI) that are often referred to by various terms such as impact investing, sustainable investing and the community investment (Silva and Cortez, 2016). This regulatory framework positions institutional investors as key players in driving growth and sustainability. It aims to promote responsible investing practices around the globe. The stakeholders across sectors are increasingly aligned in their commitment to promoting responsible and sustainable investments (Sandberg 2011) inclusively.

ESG is increasingly seen as a critical component in the face of sustainable business models. The companies with strong ESG practices are regarded as better at managing dynamic business environments. These firms are prepared to address regulatory changes (Mirza et al. 2023), climate-related challenges (Shan et al. 2023), and the social issues (Becchetti et al. 2023). Therefore, the investors are increasingly integrating ESG factors to effectively evaluate the ability of firms to manage both existing and the potential future risks (Umar et al., 2022).

The relationship between the ESG rating of a company and its market valuation is also becoming more evident and important. The firms that are actively adopting ESG principles are able to typically enjoy stronger valuations because their ESG performance is associated with responsible business practices, efficient risk management and a long-term sustainability focus that they incorporated into. This alignment with ethical and sustainable investment strategies has led the investors to place a higher value on companies with a positive ESG performance (Tang et al. 2024). Furthermore, the companies that comply with the ESG standards are perceived to be carrying a lower risk profile. Also, the strong governance, social responsibility and the environmental stewardship practices help to reduce the likelihood of corporate crises or reputational damage (Zhang et al., 2023) that occur under volatile conditions. Consequently, the investors tend to assign a lower risk premium to such companies thus leading to a higher valuation (Rojo-Suárez & Alonso-Conde, 2023).

Apart from traditional financial valuation, the ESG practices play a pivotal role in shaping the long-term strategic decisions of the firms. In a world that is increasingly focused on sustainability, the companies that integrate ESG considerations into their core strategies are not only better at

mitigating potential and possible risks but are also capitalizing on new existent opportunities. By addressing environmental impacts, social issues and the governance transparency, these firms have chance to build trust with stakeholders, hence to attract more investors and achieve greater resilience during high uncertain conditions like COVID.

1.3 EU Regulations- Concept of NFRD and CSRD

The European Union within its pursuit of achieving climate and sustainability goals, is striving hard to sharpen the competitive edge for its businesses on the global stage. To enhance sustainability by 2050, the European Union has introduced a series of legal frameworks that are used to drive sustainable practices across industries especially with the help of CSR initiatives (Zetzsche and Anker-Sørensen, 2022). A pivotal early move in this direction was the Non-Financial Reporting Directive (Directive 2014/95/EU) which aimed to bring in a standardized approach for companies to report their non-financial information particularly related to ESG. EU adopted the NFRD in 2014 and it was implemented in 2017. In order to ensure the transparency of ESG to stakeholders, NFRD requires large companies to disclose the non-financial data. Hence, it all leads to promoting the transparency and accountability within the corporate operations. There were limitations of the NFRD as it had limited scope and because of that few companies were included. It also lacks standardization in reporting, leading to inconsistent and incomparable data.

By using the baseline proposed by the NFRD, the EU accompanied by the Corporate Sustainability Reporting Directive (CSRD, Directive 2022/2464/EU) has started expanding the horizons of sustainability disclosures. With the introduction of the CSRD, companies are now required to align with the European Sustainability Reporting Standards (ESRS), ensuring a more consistent, in-depth disclosure of ESG-related activities. This isn’t a mere suggestion; it's a stringent mandate, marking a departure from the once-voluntary nature of such reports. The CSRD broadens the scope from only listed companies for compliance, as of January 1, 2024, large companies, and even small to medium-sized enterprises (SMEs), will be swept under this regulatory umbrella.

The European Commission (2021) states that the NFRD was insufficient in its scope and content to keep up with regulatory changes (Baumüller & Grbenic, 2021). In April 2021, the European Commission introduced a draft of the Corporate Sustainability Reporting Directive (CSRD), aiming to revise previous regulations. It also mandates external auditors to provide full assurance of the sustainability information reported. One key update was renaming the directive from "non-financial" to "sustainability" reporting, to clarify the financial significance of sustainability

information. The directive outlines more specific details on the information companies must disclose, in line with EU sustainability reporting standards, and requires this data to be included in management reports in a digital, machine-readable format, allowing eventual integration into a unified European data repository. Additionally, the CSRD demands verification of reported sustainability information and introduces stricter reporting requirements as compared to the NFRD workflow. These updated standards that are based on the principle of double materiality address both the social and environmental impacts as well as financial implications exclusively.

Furthermore, the CSRD introduces tougher standards that are guided by the principle of double materiality. These principles insist that the companies do not only just consider how the environmental and social factors affect financial performance but also how their routine operations impact society and the environment. The stringent guidelines of directives on the verification of sustainability data raise the bar well beyond the common NFRD.

The CSRD came into effect on the 5th January of 2023 which is focusing on updating and enhancing the requirements for companies regarding the reporting of their social and environmental information. This directive expands the range of businesses that are obligated to report their sustainability measures including large companies and listed SMEs. The new regulations aim to provide investors and other stakeholders with the necessary information that is required to assess the impacts of companies on social and environmental issues. This transparency will help the investors to assess the financial risks and opportunities associated with climate change and other sustainability challenges before investments. The first companies will need to implement these new rules for the 2024 fiscal year with reports due for publication in 2025.

The shift towards more comprehensive sustainability reporting under the CSRD reflects the strategic effort of the EU to ensure that businesses contribute actively and effectively to environmental and social responsibility while also making sure to improve transparency for investors and stakeholders. This approach emphasizes a broader movement across Europe to align their corporate behavior with sustainability targets and reduce the environmental and social risks innate in day-to-day business operations.

1.4 ESG, Firm Value, and Cost of Capital

Firm value is considered a reflection of investor perceptions and is closely associated with stock prices in the market (Martini et al., 2014). The primary purpose of a company is to maximize the wealth of its shareholders. The share price indicates the market value of a company whereas a rise

in share price signals an increase in shareholder wealth (Ibrahim & Isiaka, 2020). Various factors may drive firm value. Narula et al. (2023) discussed that these can be categorized into micro and macro factors. Micro-factors include firm-specific elements, such as profitability, liquidity, market capitalization, leverage, and strategic initiatives like R&D, innovation, and brand equity. Industry-specific factors also play a role. Rappaport (1987) identified key determinants of firm value such as growth rate, operating profit margins, tax rates, and capital investments.

The significance of ESG is underscored by the increase in international funds allocated to sustainable initiatives by the end of December 2020 (Sorrosal-Forradellas et al., 2023). The positive relationship between ESG and firm value has been documented in previous studies (Bruna et al., 2022; Saygili et al., 2022). Fatemi et al. (2018) examined that ESG strengthens firm value, and among them, environmental factor significantly enhanced the financial performance of firms (Sandberg et al., 2023). Yoon et al. (2018) have also reported a positive relationship between ESG performance and firm valuation among Korean companies. Alareeni and Hamdan (2020) examined 500 firms and confirmed that ESG positively influences financial performance. Further, the literature has identified the positive impact of ESG practices (Klerk et al., 2015; Reverte, 2016), increased firm value (Zuraida et al., 2018), improved ROA and ROE (Buallay, 2019), and lower costs (Vitolla et al., 2020).

The investors and lenders play an important role in generating capital for a company. The Investment decisions are majorly dependent upon the expected returns and ultimately the cost of capital of a company. The capital structure which involves determining the optimal balance between equity and debt is crucial in minimizing the cost of capital. Demirguc-Kunt et al. (2019) have described the capital structure as the mix of debt and equity that the companies use to finance their long-term operations and workflows.

Some of the research studies indicate that by incorporating ESG practices into operations, firms can improve their access to finance by reducing capital costs (Muraveva et al. 2022). Debt providers are concerned with default and credit risk, prioritizing companies with stable cash flows and solvency. They show interest in non-financial information, such as environmental, social, and governance performance when determining loan allocations and credit quality (Mohammad & Wasiuzzaman, 2021). The studies suggest that emphasizing the environmental and social aspects of ESG can reduce debt costs over time. Consequently, firms prioritize ESG activities to secure loans and finance growth (Arora and Sharma 2022). Ahmed et al. (2019) found significant effects

of ESG on firm value and a reduction in the cost of debt. Raimo et al. (2021) also found that ESG contributes to lowering the cost of debt. Similar findings have also been documented by Crifo et al. (2017) that firms emphasizing ESG disclosure experience comparatively lower borrowing costs.

Efficient firms maximize the use of capital by taking advantage of tax shields, whereas companies with low competitiveness and high debt burdens face increased bankruptcy risks and often need to reduce their debt ratios. Mismanagement of capital, especially through excessive debt, can lead to financial leverage, where the costs of borrowing outweigh the benefits. As a result, companies adopt varying capital structure strategies based on their financial circumstances. Among the various determinants of firm value, capital structure plays a critical role. The relationship between capital structure and firm value, however, remains debated in academic literature. Some empirical studies show that firms with debt ratios often exhibit better performance. The positive correlation between higher debt levels and business valuation has been documented in the literature (Aggarwal & Padhan, 2017; Ayuba et al., 2019; Ramli et al., 2019; Nguyen et al., 2023). This aligns with tax shield theory (Modigliani and Miller, 1963), which suggests that debt provides a tax advantage by reducing taxable income, thereby increasing firm value. Contrary to this, firms with excessive debt may also face an increased risk of default, which can harm their long-term value. This implies that the optimal capital structure depends on a company's ability to manage debt responsibly, balancing the tax benefits of debt with the risks associated with high leverage.

The regulatory authorities worldwide are also emphasizing sustainable initiatives and information disclosure. For instance, the Australian Corporation Act, 2001, the Shanghai and Shenzhen Stock Exchanges from 2008 onwards, the Johannesburg Stock Exchange after 2010, and the North American Securities and Exchange Commission all demand non-financial reporting to validate a firm's adherence to SDGs practices (Turzo et al., 2022). In addition to conventional financial indicators, ESG scores are becoming critical for assessing a company's risk profile (Apergis et al. 2022). The credit rating agencies like Moody's, S&P and Fitch now have incorporated ESG initiatives into their firm value evaluation.

The existing literature unveils that the developed countries with their robust ethical frameworks and pro-societal systems have adopted ESG disclosure which significantly influences their firm performance (Chouaibi et al. 2022). Over the last two decades, the prominence and implementation of ESG practices have risen dramatically in developed economies (Naeem et al. 2022).

Consequently, there has been heightened attention towards social rights and the environmental sustainability among the stakeholders. It arises as a response to rising pressure and regulatory mandates from governments to integrate ESG frameworks into their business strategies. Ghoul et al. (2017) have documented favorable correlation between the ESG disclosure and the economic development. Luo and Tang (2022) argue that the ESG exposes firms to their vulnerabilities and the issue of carbon emissions thus contributing to a reduction in environmental damage. Similarly, the ESG performance of firms attracts investment by supporting market reputation which eventually promotes corporate sustainability (Husted & de Sousa-Filho, 2019). Additionally, the firms that are sensitive to the environmental damage which may be caused by their operations are more inclined to assess their ESG performance (Garcia et al., 2017). Some studies have suggested that the ESG can mitigate corporate risks and influence profitability and corporate sustainability by attracting investors and helping in gaining their trust. (Hawn et al., 2018; Zhao et al., 2018).

Despite of growing global interest into the ESG initiative, yet its influence on the financial performance and firm value need to be further investigated (Krueger et al., 2020; Stroebel & Wurgler 2021). The previous studies have underscored the need to investigate into the factors that may influence the relationship between the ESG and firm performance (Zhou & Wang 2022). Although the literature provides shreds of evidence on ESG but the findings regarding incorporating ESG for enhancing the firm value remain inconclusive (Alareeni & Hamdan 2020; Paolone et al. 2022; Zhou et al. 2023). However, usual small and medium firms refrain from ESG initiatives due to the anticipated higher costs associated with such activities and initiatives (Rahman et al. 2023). But the volatile business environment challenges the long-term survival of firms thus the role of ESG in firm valuation remains an evolving area of study (Mohammad & Wasiuzzaman 2021) and requires thorough investigation.

1.5 Problem Statement

The growing prominence of Environmental, Social, and Governance criteria as a measure of corporate performance has sparked widespread debate in both academic and business communities. Companies increasingly face pressure from investors, regulators, and consumers to adopt responsible business practices. It leads to the inclusion of ESG metrics into corporate strategies. Despite the heightened focus on sustainability, a fundamental question persists: How do ESG ratings impact firm value, particularly in the context of balancing the interests of shareholders and other stakeholders? Moreover, the financial implications of ESG practices, such as their effect

on a firm's cost of capital, also remain an area of debate in existing literature. The maximization of firm value is a fundamental objective for companies, as it directly correlates with shareholder wealth and reflects investor perceptions in the market. Prior research also discussed various firm-specific factors, such as profitability, market capitalization, and strategic initiatives, that significantly impact firm value (Rappaport, 1987; Martini et al., 2014).

Despite the growing importance of ESG, studies on its impact offer mixed results, with outcomes varying based on market conditions and disclosure policies across countries. While many stakeholders consider ESG disclosures as a gimmick strategy for uplifting the market value of firm and also the empirical findings suggest that the effects are not uniformly positive always. As Harjoto & Jo (2011) and Kalia & Aggarwal (2023) have point outed that while ESG reporting can be beneficial in certain scenario but its role is not guaranteed as always to yield favorable outcomes for each and every firm.

The research on the relationship between the ESG ratings and the firm value has generated a sort of mixed outputs. Some studies have highlighted strong ESG performance that contributes in positive terms to the firm value by mitigating risks, enhancing reputation and supporting long-term sustainability goals. On the other side, some studies have argued that excessive focus on ESG issues may divert essential resources away from major profit-generating activities thus ultimately reducing the shareholder returns (Giannopoulos et al., 2022; Mishra et al., 2024). This trade-off between creating shareholder value and addressing broader stakeholder interests is a critical issue that requires further and deeper investigation. There are numerous ambiguities that need to addressed such as; are companies these days investing in ESG initiatives chiefly for the benefit of shareholders? or are they focusing too much on their non-financial aspects that potentially contribute to the detriment of their firm value?

Moreover, the relationship between the ESG ratings and the cost of capital of firm has not been fully untapped yet. One of the key challenges is to understand how ESG practices affect the cost of capital of a firm. Some studies have suggested that by incorporating ESG into corporate strategies, their workflows can reduce capital costs thereby improving access to finance by enhancing the reputation of company and mitigating associated risks (Muraveva et al. 2022). Although, this relationship remains inconclusive because some of the firms are hesitant about adopting ESG initiatives due to their perceived higher implementation costs (Rahman et al. 2023). The relationship between the ESG and reduced cost of debt (Raimo et al., 2021) also necessitates

further examination because it has been found that those firms that prioritize non-financial metrics might experience alterations into their cost of financing over time. Furthermore, it has been observed conversely that traditional investors primarily put emphasis on financial returns and there is growing evidence that environmental and social factors influence long-term financial performance that are further complicating the analysis of impact of ESG over the firm value. There is an emerging debate that whether companies with higher ESG ratings enjoy lower costs of capital owing to enhanced trust and risk management or whether the firms that have already benefited from lower capital costs are more likely to adopt ESG practices as part of their long-term strategy. The direction of causality between the ESG ratings and the cost of capital is still quite unclear and requires thorough and detailed empirical investigation.

In addition to these, another critical domain that remains less explored is the analysis of the bi-directional relationship between the ESG performance and the firm value. While most studies assume that ESG performance influences firm value, it is equally possible that firms with greater financial success are better positioned to invest in ESG activities. The current studies also discussed about the existence of bi-directional relationship between ESG and firm value which show that changes in market value can impact ESG rating and vice versa (Sheehan et al., 2023; Wedajo et al., 2024). This relationship between financial and non-financial performance may significantly change the dynamics of how ESG impacts corporate value and needs to be analyzed to provide a more comprehensive understanding of this relationship.

Furthermore, the relationship between ESG ratings and firm value may be influenced by firm-specific variables, such as size, profitability, and risk profile. The current literature lacks a detailed examination of how these factors moderate the ESG and firm value relationship. A more subtle analysis that regulates such variables could provide deeper insights into how different types of firms could benefit or fail to benefit from strong ESG performance.

There is also a significant gap in the literature that lies in the geographical context of ESG practices. While most studies focus upon global and specific regional analyses there is left a limited understanding of how the relationship between the ESG ratings and the firm value varies across different regions of Europe. The firms that are operating in different parts of Europe including East, West, North, and South, may experience different market conditions, regulatory frameworks and the socio-economic pressures that might influence how ESG practices affect their financial performance. A cross-regional analysis is pivotal to understanding how such regional factors shape

the dynamic relationship between ESG and firm value and how companies across Europe can made capable to align their ESG strategies with the financial performance goals.

The NFRD and CSRD by European Union has introduced stringent implications for firms to disclose their non-financial information especially regarding their ESG activities. While previous research has largely established a positive relationship between ESG performance and firm value, the role of regulatory frameworks, such as the NFRD and CSRD, in shaping this relationship remains less explored. Firms that comply with the NFRD and CSRD are expected to experience improvement in transparency, reduced information asymmetry, and enhanced access to capital, which could positively affect their financial performance. However, the additional costs associated with ESG reporting may also impact firms' cost structures and capital decisions. Furthermore, the influence of the NFRD and CSRD on firm value may vary based on legal systems (e.g., civil law versus common law) and industry sensitivity to ESG issues.

1.6 Research Objectives

Based on the studies discussed in the previous section, there is a relationship between ESG, firm value and cost of capital and it leads to investors' decision-making. Consequently, this study sets forth the following objectives:

1) To analyze the relationship between ESG rating and firm value
2) To analyze the impact of ESG rating on cost of capital and vice versa
3) To determine the importance of ESG rating in the firm valuation process
4) To examine the impact of ESG rating after considering firm-specific variables that affect the firm value
5) To analyse the impact of NFRD/CSRD in public limited companies

1.7 Research Questions

1) What are the main connections between ESG rating and firm value? Do these activities create more benefits for shareholders, or do they focus too much on other stakeholders, thereby reducing the value of the company?
2) Does the ESG rating affect the firm cost of capital or does the opposite occurs?
3) Does ESG and firm value have a bi-directional relationship?
4) Does the relationship between ESG score and firm value with firm-specific variables?
5) Does the relationship vary after the implementation of NFRD/CSRD? Is there any change because of the legal framework?

1.8 Contribution of the study

This thesis aims to contribute substantially to our understanding of ESG and Firm value. The specific contributions are outlined as follows:

First, it provides a comprehensive analysis of how NFRD and CSRD compliance influences the relationship between ESG ratings and firm value, filling a gap in the literature where the role of regulatory mandates on sustainability reporting remains underexplored. By examining the role of regulatory frameworks like the NFRD and CSRD, the study offers new insights into how mandatory ESG disclosures enhance transparency, reduce information asymmetry, and improve firms' access to capital, ultimately influencing firm value. This contribution is particularly important for understanding the effects of ESG in a more standardized regulatory context, a dimension that has been underexplored in prior studies.

Second, this research investigates the individual impacts of the environmental, social, and governance dimensions on firm value, contributing to a more nuanced understanding of how each component influences corporate financial outcomes. Previous studies have examined ESG as a combined score in general but this thesis aids value to literature by considering ESG factors at the component level to determine their specific effects over the firm performance especially in different regions of Europe.

Third, the thesis examines the bi-directional correspondence between ESG performance and the firm value. It investigates whether the firm value drives the ESG and vice versa. This contributes to the literature by building on the empirical evidence on the relationship between the ESG and firm value as a new dimension that has been relatively underexplored in previous studies.

Fourth, by taking into account the capital structure disclosure and its interaction with the ESG ratings, the thesis presents a fresh perspective on how the cost of capital of a firm is affected by their ESG practices thereby contributing to continuing debates about the financial implications of sustainability initiatives. This accounts for analyzing the impact of the cost of debt and equity on the ESG performance and the firm value as a way of providing a holistic view of financial performance.

1.8.1 Theoretical Contribution

The major theoretical contributions of this thesis work are the integration of stakeholder theory, legitimacy theory and agency theory into the analysis that governs the relationship between the ESG ratings and firm value. In relation to stakeholder theory, the thesis examines the roles of ESG

practices over the interests of various stakeholders including investors, employees, and the broader community. The thesis deep dives into understanding how the firms find the tradeoff between the stakeholder expectations and firm value improvement through sustainable practices by analyzing the individual impacts of environmental, social, and governance attributes. The thesis also points outs that how regulatory frameworks such as the NFRD and CSRD can help firms to align their strategies against the societal and stakeholder interests thereby fostering stronger relationships and improving firm value on long-term basis.

In the realm of legitimacy theory, the thesis works towards understanding that how compliance with the NFRD and CSRD reporting requirements enhances legitimacy of a firm by increasing the transparency and accountability. The thesis also explores that how the firms that align their operations against the societal norms are able to strengthen their reputation and access to capital thereby improving the firm value. In addition, this thesis investigates that how the regulatory environment especially the key differences between the civil law and common law systems influence the ability of firm to maintain its legitimacy and subsequent financial value.

In regards to agency theory, the thesis dwells into finding the evidence that how the given ESG practices act as a mechanism to reduce agency conflicts such as; between managers and shareholders. By mandating transparency through ESG reporting, it has been evident that the interests of managers get aligned the goals of shareholders on maximizing the firm value. The investigation of bi-directional relationship between the ESG and firm value support agency theory by demonstrating that how transparency and sustainability initiatives could serve as effective governance tools thereby ensuring that the managers act in the best interest of the shareholders.

Overall, this thesis aids value to the theoretical understanding of how ESG practices and regulatory frameworks influence the non-monotonic relationship between the ESG and firm value without compromising the legitimacy of stakeholder, legitimacy, and agency theory thereby demonstrating the multi-dimensional impacts of ESG compliance over the long-term value of firms. These concrete contributions provide important insights to the policymakers, investors, and corporate leaders that have the vision of optimizing their ESG strategies under the regulatory environment.

Chapter 02

Literature Review

2.1 Background

To be sustainable and achieve sustainable development, a firm needs to have a competitive advantage (Boubaker et al., 2018). CSR can enable a firm to have a competitive advantage by decreasing cost or differentiation in products with the support of stakeholders and establishing a good brand image.

CSR has been studied by researchers from different perspectives including cost perspective, agency theory, stakeholder theory, resource-based perspective, and reputation theory. Hu et al., (2018) found that drawing upon stakeholder theory and a resource-based view, CSR has a positive relationship with firm value. The credit rating agencies also assign relatively higher scores to the firms that report CSR activities (Jiraporn et al., 2014). It is also found that the relationship between CSR performance and cost of equity capital is negative, therefore it impacts positively on the firms (Dhaliwal et al., 2011).

Afterward, Carroll (1991) revised the definition by replacing discretional expectations with philanthropic responsibilities while other components remained same for the CSR. Business sustainability remained the focus of CSR research as it became interesting to examine how, why, and where CSR investments expand financial performance (Moura-Leite and Padgett, 2011).

2.2 Origin of ESG

Corporate Social Responsibility (CSR) was the dominant framework through which businesses addressed their social responsibilities for much of the late 20th century. However, this approach began to shift as the millennium approached, with sustainability emerging as a crucial issue. This brought forward the idea that investors should integrate ESG (Environmental, Social, and Governance) factors into their portfolio strategies to mitigate risks related to the environment (particularly climate change), society (such as human rights), and governance, all of which could negatively impact long-term investment performance. Today, the financial model of ESG investing is the global standard, reflected in ESG metrics, ratings, guidelines, and regulatory frameworks. This model emphasizes the role of capital and investors in driving sustainable practices while giving less focus to board decision-making and the fiduciary duties of directors.

Over recent years, sustainability, CSR, and ESG have coexisted, and have often been treated as interchangeable by professionals, standards bodies, and academics. However, upon closer

examination, significant differences between them become apparent (MacNeil & Esser, 2022). The concept of ESG can be traced back to the early ideas of CSR in the 1960s and 1970s, when businesses were encouraged to consider ethical and social factors in their operations. Thinkers such as Milton Friedman and Peter Drucker debated whether companies should prioritize profits or also address social responsibilities. Friedman argued that a business's sole duty was to generate profits for its shareholders, while Drucker and others believed companies could find a balance between profitability and societal concerns.

The 1990s marked a more structured approach to corporate responsibility. Global initiatives like the United Nations Global Compact, launched in 2000, urged businesses to align their practices with universal principles regarding human rights, labor, environmental protection, and anti-corruption. These efforts laid the foundation for the formalization of ESG frameworks. The transition to ESG represented a clear departure from traditional CSR, where the focus was on the direct impact of corporate actions. ESG introduced greater attention to stakeholder regarding corporate transparency through ESG policies. Therefore, the ESG ratings by third parties also emerged to meet rising demand. By the early 2000s, CSR had evolved to include ESG, corporate, social, and economic responsibility. Although CSR is not completely replaced by ESG as companies are reporting issues related to CSR, disclosing how they balance social and environmental obligations with profit maximization.

The term ESG grabbed more attention in 2004, with the publication of the *Who Cares Wins* report, initiated by Kofi Annan, and the Secretary-General of the United Nations afterward. After this report, the financial institutions focused on incorporating ESG issues into their decision-making processes. Moreover, the introduction of Principles for Responsible Investment (PRI) in 2006 laid the foundation of formal integration of ESG principles into financial markets. As the importance of incorporating ESG factors in financial performance became clear, investors show their concern for transparency and accountability regarding non-financial issues.

By the 2010s, ESG was not only viewed as a set of ethical principles but as a vital component of risk management and investment strategy. It is recognized by large institutional investors that incorporating ESG factors into their decision-making could reveal long-term risks and opportunities that traditional financial analysis might not consider. The Paris Agreement of 2015 also reinforced the need for companies to prioritize environmental considerations, driving ESG into a vital role in corporate governance.

Another initiative Task Force on Climate-related Financial Disclosures (TCFD) was introduced. It was established by the Financial Stability Board in 2015. TCFD developed a framework for companies to report on their climate-related financial risks, to help investors in rational decision-making by considering environmental risks. Many large companies and institutional investors have since adopted TCFD recommendations, making climate risk disclosure a key aspect of ESG reporting.

Governments and regulators around the world began introducing more stringent ESG reporting requirements. In the European Union, the Non-Financial Reporting Directive (NFRD) was expanded to require companies to disclose how environmental and social factors impact their performance, while the Corporate Sustainability Reporting Directive (CSRD), introduced in 2021, further increased the scope and quality of ESG disclosures required from companies.

2.3 Impact of ESG on firm value

In the literature, various studies demonstrate the impact of ESG (the concept emerged from the wider field of CSR research) on a firm value. This section discussed the literature on ESG and CSR (the term CSR and ESG are used by many researchers interchangeably (i.e Friede et al. 2015; Yoon et al., 2018; Wong et al., 2021) to analyze whether CSR/ESG increases the firm value or it only occurs the additional cost of the firm.

Clément et al., (2023) did a meta-analysis and compiled all definitions of ESG scores from peer-reviewed publications. Their analysis reveals five key themes related to ESG: financial performance, responsible investment, sustainability strategies, CSR, and ESG disclosure. The findings show that out of the 342 articles, ninety-five (28%) defined ESG scores as operationalizing a company's CSR policy. They consider ESG scores and CRS interchangeably. Other than this only nine articles (3%) use the term for ESG score analysis.

The previous literature on CSR and firm value, and later ESG dimensions firm value, have reflected mixed results. Several studies document how ESG affects firm value and profitability. CSR/ESG activities are most likely to increase the value of a firm when the activities are related to enhancing the reputation of the firm (Brown and Dacin, 1997) and employee commitment (Turban and Greening, 1996) if firms do CSR consistently over a long time (Godfrey, 2005). The goodwill created by CSR activities may enhance the morale of employees and attract highly qualified employees (Edmans, 2011), customer royalty (Banker and Mashruwala, 2007), leniency by regulators or government officials (Brown et al. 2006; Jensen, 2002), decrease the lawsuit and

environmental costs (Dhaliwal et al. 2011) and thereby improve financial performances (Pava and Krausz, 1996; Lev et al. 2010). It is documented by Waddock and Graves (1997) that higher CSR activities lead to higher financial performance. Young and Makhija (2014) show that CSR activities not only build good relationships with institutions but also maximize profits.

In 2000, the Global Reporting Initiative (GRI) began issuing sustainability reporting guidelines aimed at enhancing the quality and relevance of information in firms' annual reports concerning their environmental, social, and economic impacts. Many companies adopted the GRI framework, which has become a global standard for CSR activities, reflecting the growing importance of CSR for firms' sustainable growth (Willis, 2003; KPMG, 2015). Weber et al. (2008), have shown a positive link between sustainability activities and both financial and non-financial performance, using sustainability reports aligned with the GRI guidelines. Additionally, Chang and Choi (2010) found that CSR positively influences financial performance by enhancing a firm's image, which leads to higher accounting returns and, eventually, increased firm value. This evidence suggests that investing in CSR activities improves non-financial activities and ultimately boosts financial performance and firm value (Cochran and Wood, 1984; Dhaliwal et al., 2012).

Many businesses are doing philanthropic activities and considering the integration of sustainability and financial performance in annual reports as best practices because of customer demands for sustainable business practices. According to KPMG (2015) report, many firms started to issue higher-quality corporate responsibility reports all over the world. There are two possible views discussed in the literature regarding the impact of CSR activities on the financial performance of a firm such as shareholder perspectives versus stakeholder perspectives, and mixed empirical results.

According to the Shareholder perspective, CSR is deemed to be the necessary cost of doing business however the main responsibility of firms is to maximize profit but the value of a firm can be decreased because of firms' unnecessary expenditure to invest in CSR activities (Friedman 1970). This argument suggests that CSR expenditure may not be directly related to revenue generation activities. Many studies have documented the negative relationship between financial measures and CSR, showing the private benefits of managers from corporate philanthropic activities (Wright & Ferris, 1997; Brown et al., 2006; Barnea & Rubin, 2010.).

2.3.1 The positive relationship between ESG/CSR and firm value

Contrary to the neoclassical view, the stakeholder theory claims that it is an obligation of the companies to work for the benefit of a larger group of stakeholders and use the resources that not only benefit the shareholders (Freeman, 1984). Many studies provide evidence of the positive relationship between CSR and financial performance. By using various measures of financial performance and reputation index as a proxy for CSR, Cochran and Wood (1984) found that the firms having higher CSR ranking also have higher asset value and higher financial performance. Similarly, Pava and Krausz (1996) documented a positive relationship between CSR and financial performance. They analyzed the financial performance in the long run by using various measures (i.e., market-based, accounting-based, risk-based, and firm-specific) for US firms. Herremans et al. (1993) also documented a positive correlation between corporate reputations and various accounting-based financial measures, stock return, and risk respectively, among USA-based manufacturing companies. They also found that in the industries for which investors are more concerned about social impact (such as the chemical industry), the effects are more noticeable. The news regarding environmental performance rewards also has a positive impact on the performance of the stock market (Klassen and McLaughlin, 1996). Varenova et al. (2013) argued that according to executives of FTSE, CSR activities can improve financial performances if the integration of these activities and financial performances are in synergy.

Investment opportunities can also have an impact on the relationship between CSR and financial performance as investors prefer to make investments in firms that use CSR activities for selling the products in the market (Mackey et al., 2007). Therefore, rather than a negative impact on the present value of cash flow, CSR activities can have a positive impact on the cash flow. Due to this demand and supply for CSR activities can create economic value of the firm. The companies that make significant investments in various CSR activities will get rewards, implying the reputational benefits from CSR activities (Bird et al., 2007). Based on the model developed by Moskowitz (1972), the positive relationship between investment in CSR activities and profitability is documented by Alexander and Buchholz (1978).

CSR activities may also improve production efficiency and reduce uncertainties by saving lawsuits and environmental costs (Dhaliwal et al. 2011), leading to enhanced financial performance (Lev et al., 2010). People want to resist unfair transactions which could affect the long-term performance of firms because the reputation of a company is not developed within a short time

period, firms need to do CSR activities consistently to improve financial performance. Waddock and Graves (1997) studied the relationship between CSR and accounting returns (such as ROA, and ROE), and found a significantly positive correlation with past accounting returns. Landon and Smith (1997) documented that market reputation is more important for customers and it implies that CSR activities could improve financial performance over the long term (Roberts and Dowling, 2002).

Many researchers documented a positive impact of ESG performance on firm value or profitability. Velte (2017) demonstrated that in German firms, there is a positive impact of ESG on firm value and profitability. Yoon et al. (2018) analyzed the impact of ESG ratings on market value in Korea and found that CSR activities have a positive impact on the firms' value but it varies with the characteristics of the firm. Zhao et al. (2018) analyzed listed energy companies in China and found that higher ESG performance enhances financial performance. Similarly, the ESG score has a positive relationship with financial performance in Indian firms (Dalal and Thaker, 2019). Fatemi et al. (2018) examined the trend of ESG activities in US companies between 2006 to 2011 and determined that they enhance the firm value. Considering the large sample from global firms, Xie et al. (2019) found that the majority of ESG initiatives have a positive impact on financial performance. Bhaskaran et al. (2020) analyzed the effects of ESG on the financial performance from 2014 to 2018 for 4887 firms using firm value and operational performance (ROE and ROA). Their results recommend that companies better at ESG dimensions lead to greater market value. Similarly, De Lucia et al. (2020) investigated a sample of 1038 publicly listed companies from 22 European countries and found a positive relationship between ESG factors and financial performance. In their study spanning 1042 companies from emerging markets between 2010 and 2019, Naeem et al. (2022) reported that both individual and combined ESG scores are positively and significantly associated with the Tobin's and ROA. Research on the FTSE-listed companies further strengthens these analyses. Using the dataset of 367 FTSE-listed companies between 2004 to 2013, Li et al. (2018) demonstrated a positive impact of ESG reporting on the firm value, emphasizing the importance of the role of stakeholder trust and accountability in uplifting the firm value. Ahmad et al. (2021) found that the overall ESG scores positively affect the financial performance at one end but the results for individual ESG components are mixed. Moreover, the sector-specific studies also reflect such type of trend. The work from Abdi et al. (2022) examined the airline industry from 2009 to 2019 and found that governance-related investments uphold the

company's market-to-book ratio, whereas participation into social and environmental activities increases financial efficiency.

2.3.2 The negative relationship between ESG/CSR and firm value

Friedman (1970) supports the neo-classical theory and argues that a manager has to make decisions to maximize the long-term market value of a firm, including the wealth of shareholders (Bird et al., 2007). Manager act as an agent for shareholders; therefore, they are not required to take initiatives for social activities that are not profitable for the firm (Pava and Krausz, 1996). This view implies that investments in CSR activities are a competitive disadvantage for the firm, which causes a negative relationship between social activities and market performance (Aupperle et al., 1985). Supporting the neo-classical view, there are a few studies that find a significant negative relationship between CSR activities and financial performance. Vance (1975) argues that it is not good to invest in firms involved in more CSR activities because of a negative relationship between CSR and stock return.

Similarly, Hassel et al. (2005) examined that there is a high cost of environmental performance which negatively affects the expected earnings and market value for Swedish companies. There are various findings of the study. First, the environmental performances of companies are perceived as window dressing of financial performance. Secondly, the cost of environmental activities is incurred at the expense of increased profits. Third, the market is oriented towards short-term benefits, and investors ignore long-term environmental information while making decisions. The negative relationship between stock return and CSR activities is documented in British firms (Brammer and Millington, 2006). Barnea and Rubin (2010) also documented the negative relation between inside ownership and CSR and interpreted the results as when managers have low inside ownership will do more philanthropic spending because of higher private benefits from firms' philanthropic behavior.

An agency theory has been exercised to confirm the negative relationship between ESG and firm value (Buchanan et al., 2018). This theory suggests that the conflict of interest between the agents (managers) and the principals (shareholders) ought to motivate managers to prioritize their wealth at the cost of shareholders, which results in generating agency problems and evolving agency costs within the firm (Jensen & Meckling, 1976). The negative side of this ESG-firm value relationship originates from the argument that ESG activities can intensify such agency problems (Benabou & Tirole, 2010) causing a negative impact on the firm value (Groening & Kanuri, 2013). In particular,

the managers could participate in ESG initiatives for personal growth, such as alleviating their professional reputation (Benabou & Tirole, 2010; Barnea & Rubin, 2010) thereby ignoring more profitable opportunities that might better serve the interests of shareholders. However, ESG investments could result in an inefficient allocation of resources thereby diverting funds away from more productive projects, which eventually downgrades the long-term performance of a given firm (Friedman, 2007). Some scholars hold opposing views over ESG investments negatively impacting profitability and firm value. For example, Barnett (2007) argues that corporate social responsibility (CSR) plans could harm financial performance by redistributing resources from efficient shareholders to under-performing players. In relation to this, many country-specific studies favor such a negative relationship between ESG performance and firm value. For instance, Brammer et al. (2006) examined the corporate social performance of various UK firms and hence determined that the companies with lower social scores outperform the market in terms of returns. Landi and Sciarelli (2019) worked on curating the list of 54 regional Italian firms between 2007 and 2015, likewise reported a negative relationship between ESG scores and financial performance. Folger-Laronde et al. (2020) analyzed the relationship between the ESG ratings and the financial returns of exchange-traded funds (ETFs) within the Canadian ecosystem during the Covid-19 pandemic which gave insights that the high ESG performance did not guarantee protection during severe market crashes. Other studies in this domain have resulted into similar outcomes as well. For example, Nollet et al. (2016) investigated the relationship between the social and financial performance among the S&P 500 companies between 2007 and 2011 and concluded with a negative correlation in linear models while the relationship became positive within the non-linear models. Marsat and Williams (2011) reported negative mapping between the CSR ratings and firm value over the worldwide MSCI ESG ratings. Some multi-country studies have also revealed negative relationships of such. Duque-Grisales and Aguilera-Caracue (2021) examined a sample of 104 multinational organizations within Latin America, determining the negative link between ESG scores and financial performance. In addition, Garcia and Orsato (2020) compared 2165 different firms from emerging and developed nations from 2007 to 2014 and found that ESG has a negative impact on financial performance in emerging markets.

2.3.3 The insignificant/no relationship between ESG/CSR and firm value

The studies discussed above either show a positive or negative relationship between CSR and financial performance. There is also evidence that CSR does not have a significant impact on the

financial performance of the firm. One explanation for an insignificant or no relationship can be based on the degree of involvement in CSR activities. Jeong et al. (2016) found that firm value is more likely to increase if firms engage in CSR activities permanently for strategic purpose because doing temporary CSR activities are not enough to increase the reputation of the firm and compensation for the cost incurred on the activities. Alexander and Buchholz (1978) also examined that the relationship between CSR and stock returns depends on the degree to which a company is engaged in social activities.

Aupperle et al. (1985) surveyed CEOs of American corporations to analyze the orientation of firms toward social responsibilities as there is a correlation between social activities and return on assets. They documented an insignificant relationship between CSR and financial performance and argued that the profitability of a firm does not depend on having a corporate social responsibility committee on the board. Guidry and Patten (2010) also found no significant impact of CSR on financial performance, suggesting that investors do not assign value to sustainability reports.

2.3.4 Mixed impact of ESG on firm value

In contrast, a group of researchers has identified mixed results on the relationship between ESG performance and firm value. In this regard, Han et al. (2016) conducted an analysis from 2008 to 2014 of publicly listed companies on the Korea Stock Exchange. The results show an insignificant impact of the social score but a positive relationship for the governance score, and a negative relationship for the environmental score. Similarly, Atan et al. (2019) evaluated the impact of ESG scores on the profitability, firm value, and cost of capital for publicly listed firms in the Malaysia stock exchange but found an insignificant impact on firm value and profitability. Saygili et al. (2021) investigated the effect of ESG performance on the financial outcomes of listed firms in the Türkiye stock exchange from 2007 to 2017. The findings from this study revealed that environmental factors negatively impact financial performance while stakeholder involvement positively influences social dimensions, and governance is positively related to financial performance. Giannopoulos et al. (2022) did a similar type of study on Norwegian listed firms between 2010 and 2019 and determined similarly mixed outcomes i.e., the ESG scores were positively related to the firm value Tobin's Q but negatively linked to ROA. Following a similar approach, Behl et al. (2022) explored the relationship between the ESG trend and firm value within the Indian energy sector and uncovered the mixed relationship between the two. Similarly, Lopez-

de-Silanes et al. (2020) conducted a cross-country analysis to examine the impact of ESG reporting and revealed that ESG scores have no significant impact on financial performance.

2.4 ESG Components

A company's ESG score is derived from its performance across three main components: environmental, social, and governance. Each of these subfactors has been studied in relation to corporate financial performance with mixed findings in the literature. These sub-factors can influence firm value differently, and the overall ESG score is not always indicative of a unified impact on financial performance (Friede et al., 2015; Galema et al., 2008). Some researchers, like Limkriangkrai et al. (2017), suggest using the combined ESG score to assess its relationship with FP, while others argue for evaluating the individual contributions of the environmental, social, and governance dimensions (Humphrey et al., 2012; Duque-Grisales & Aguilera-Caracuel, 2021). They highlight that factor such as a company's country of origin, stakeholder pressures, and institutional context can cause variations in how each dimension affects firm value. Therefore, understanding the distinct roles of E, S, and G subfactors is crucial in determining their specific effects on corporate performance.

2.4.1 Environmental Factor

The ESG Environmental Score reflects a company's efforts in managing its environmental impact, which includes aspects such as resource consumption, emission reduction, and environmental innovation. A higher score in this dimension indicates stronger environmental performance. Numerous studies have highlighted that environmental performance plays a critical role in enhancing a company's overall sustainability and long-term value. Friede et al. (2005), in a meta-analysis of ESG research, found that the environmental component tends to exhibit more positive relationships with firm value compared to the social and governance factors.

The relationship between environmental performance and firm value has been an important topic in academic research, beginning in the 1980s. McGuire et al. (1988) were among the first to explore the theoretical link between strong environmental practices and increased firm value, suggesting that companies that perform well in environmental areas tend to see long-term benefits, including higher profitability. Several studies have reinforced this notion, arguing that strong environmental performance can lead to higher revenues, cost savings, and improved stock returns. For example, Jacobs et al. (2010) argue that firms with positive environmental practices send strong signals to investors, which can translate into better financial outcomes. In addition, Aboud

& Diab (2018) found a significant positive correlation between a company's environmental performance and its market value, affirming that environmentally responsible firms are often perceived as more stable and future-focused, attracting long-term investors.

Furthermore, environmental performance is increasingly being linked to a company's competitive advantage. By reducing waste, optimizing resource use, and investing in environmentally friendly innovations, firms can lower operational costs and improve efficiency. This, in turn, enhances profitability and firm valuation over time. As the global emphasis on sustainability intensifies, particularly due to regulatory and consumer pressures, firms with higher ESG environmental scores are expected to gain even more investor attention, as they are seen as better prepared to navigate future environmental regulations and market shifts.

Dowell et al. (2000) provide evidence of a positive relationship between environmental performance and firm value. Similarly, Derwall et al. (2005) investigate the concept of eco-efficiency and demonstrate a positive, non-linear relationship between corporate eco-efficiency and Tobin's q, though they note that achieving these positive effects is more challenging in environmentally sensitive sectors due to the higher costs associated with environmental performance improvements. Purnomo and Widianingsih (2012) also report a positive impact of environmental performance on financial outcomes, though they find that CSR disclosures do not significantly enhance the relationship between environmental performance and financial performance. On the other hand, Elsayed and Paton (2005), focusing on the UK market, found a positive but statistically insignificant relationship between environmental performance and Tobin's q, indicating some variability in the strength of this relationship across different contexts.

Deswanto and Siregar (2018) examined the relationship between the disclosure of environmental information, financial performance, environmental performance, and firm value. Their findings revealed that financial performance does not directly influence the level of environmental disclosure. However, they did observe that better environmental performance leads to more extensive environmental disclosure. Additionally, they concluded that the disclosure of environmental information does not significantly affect firm value, nor does it mediate the relationship between financial performance and environmental performance on firm value.

In contrast, Setiadi and Suhardjanto (2017), using data from Indonesia, found a significant positive relationship between environmental disclosure and firm value. This suggests that in certain contexts, greater transparency about environmental practices can enhance a company's value.

Furthermore, numerous studies, such as those by Klassen and McLaughlin (1996) and Jacobs et al. (2010), argue that strong environmental performance can boost a company's reputation, increase revenues, reduce costs, and generate positive abnormal stock returns. These effects are often viewed as sending positive signals to investors, in line with legitimacy theory, which posits that companies seek to shape public perception by enhancing their image through the disclosure of environmental performance. This theory underscores the idea that a firm's environmental performance is critical in managing how it is perceived in relation to its impact on the ecosystem.

2.4.2 Social Factor

Social performance refers to how an organization engages with its employees, the community, and its clients through responsible products and services. The ESG Social Score captures various aspects of a company's social responsibility, including workforce treatment, human rights, product responsibility, and community engagement. A higher ESG social score reflects stronger performance in these areas, indicating that the company excels in addressing social concerns.

According to Melinda & Wardhani (2020), modern businesses are no longer solely focused on financial success; they are also expected to act as responsible corporate citizens. This expanded role means companies need to take responsibility for their social and environmental impacts. One way to demonstrate this commitment is through the disclosure of social sustainability reports, which can significantly enhance a company's reputation. In turn, a strong reputation has implications for improving a company's overall value. Legitimacy theory supports the idea that societal recognition and approval are essential for a company's long-term success, as it ensures that the company's operations are seen as aligned with broader social values.

Supporting this, Aydoğmuş et al. (2022) found that social performance has a positive and significant effect on firm value. Simpson and Kohers (2002) discovered that banks more involved with their communities tend to perform better financially. Similarly, Esteban-Sánchez et al. (2017) demonstrated that banks with better employee relations also exhibit stronger financial performance. These studies collectively suggest that socially responsible practices not only enhance reputation but also directly contribute to better financial outcomes.

In extending these insights, companies that invest in social performance through improved working conditions, community engagement, and responsible product offerings can foster long-term loyalty from both employees and customers. This, in turn, enhances brand value, reduces turnover, and potentially increases market share. As stakeholder expectations continue to evolve,

companies with higher ESG social scores are more likely to be perceived as sustainable and resilient, further attracting investment and securing long-term profitability.

According to the Resource-Based View (RBV) theory, social disclosures and strategies aimed at enhancing social engagement help foster a positive corporate culture and reputation within the market (Branco & Rodrigues, 2006). By engaging in socially responsible activities, firms build a stronger market reputation, which can serve as a competitive advantage. This advantage allows them to charge slightly higher prices than their competitors (Fomburn & Shanley, 1990). Additionally, socially responsible companies benefit from access to low cost of capital, as they tend to receive better credit ratings (Attig et al., 2013; Sharma et al., 2019).

When companies invest in internal social responsibility measures, such as employee diversity, engagement, and product quality, they develop intangible assets like loyal employees and an enhanced reputation (Jo & Harjoto, 2011). These intangible resources further contribute to the firm's long-term success.

Disclosing ESG performance, particularly through social sustainability reports, is another way firms can manage and improve their reputation. A strong reputation has significant implications for a company's value, as highlighted by legitimacy theory, which emphasizes the need for companies to align with societal expectations to ensure their long-term success. Social responsibility, in turn, is widely viewed as a strategy that enhances long-term benefits and supports the sustainability of a firm. Aboud and Diab (2018) found a significant positive impact of social performance on firm value, confirming the findings of Fatemi et al. (2018.

2.4.3 Governance Factor

Corporate governance refers to the mechanisms and processes through which power is exercised within a company, ensuring that the board of directors and executives prioritize the interests of shareholders (Jamali et al., 2008). The ESG Governance Score reflects how well a company manages its governance structures, including management practices, CSR strategies, and shareholder relations.

Good corporate governance can significantly boost stock prices because investors expect that fewer resources will be diverted, leading to a larger share of profits which they may get in the form of dividends (La Porta et al., 2002). Furthermore, effective governance can lower the expected return on equity by reducing the costs which in turn lowers the overall cost of capital for the

company (Shleifer & Vishny, 1997). This combination of enhanced accountability and reduced monitoring costs creates a favorable environment for long-term value creation.

According to Friede et al. (2005), the governance factor within ESG presents the highest number of positive as well as negative relationships with financial performance. This inconsistency in findings makes the effect of corporate governance an intriguing sub-area in the study of ESG's impact on firm value. Recent literature widely discusses governance, particularly the role of governance disclosures and initiatives in reducing agency costs and promoting sustainable corporate transparency, which is crucial for firm value (Giannarakis et al., 2020).

While governance research often examines either internal or external governance factors, both play key roles in shaping corporate performance. Internal governance studies frequently focus on factors such as board independence, board size, and debt financing. The independent boards are more likely to act in favor of shareholders, leading to higher earnings per share (MacAvoy and Millstein, 1999). Yermack (1995) finds that larger boards negatively impact corporate financial performance, suggesting that smaller boards operate more efficiently and make better decisions. On the other hand, research into external governance primarily explores corporate control and block ownership. Studies like those by Reddy et al. (2008) and Jo & Harjoto (2011) investigate the influence of external governance on firm performance, emphasizing the importance of external pressures in driving corporate accountability.

Consistent with stakeholder theory, the strong corporate governance practices in a company's sustainability report send a positive signal to investors about the firm's dedication to ethical management and long-term value creation. This transparency positively influences investor confidence, which in turn enhances the firm's market valuation. Corporate governance plays a pivotal role not only in fulfilling regulatory requirements but also in building trust with various stakeholders. By showing good governance, companies reassure their stakeholders that decision-making processes are aligned with broader social, ethical, and financial standards, which is critical for long-term stability and growth.

In alignment with perspective, Melinda & Wardhani (2020) found that corporate governance performance has a significant positive effect on firm value. They argued that the more transparent and well-structured a company's governance practices are more likely to attract investor attention and capital. Investors view companies that report their governance initiatives as being more stable

and capable of sustaining growth. This alignment between corporate governance and investor expectations is a crucial factor in driving firm value.

Furthermore, Aboud and Diab (2018) also highlight the positive relationship between governance performance and corporate value. They found that firms with higher governance standards tend to outperform their peers in terms of market valuation. Because strong governance minimizes risks associated with mismanagement, fraud, and inefficiencies, making the company a safer investment. High-performing governance structures lead to better decision-making processes, ensuring that the company is agile enough to respond to market changes while maintaining accountability to shareholders. This reinforces the notion that investors are more likely to invest in firms that demonstrate a commitment to governance excellence, as it reduces uncertainties and enhances long-term profitability.

2.5 ESG and cost of capital

Along with analyzing the link between CSR and financial performance, researchers have also studied the impact of CSR on the cost of debt and the cost of equity. To explain the relationship between CSR and financial performance different approaches have been used as stakeholder theory (Freeman, 1984; Sen et al., 2006), the resource-based view (Barney, 1991), transaction cost economics (Jones, 1995), and also others (Ullmann, 1985; Pava and Krausz, 1995; Griffin and Mahon, 1997; Margolis and Walsh, 2003; Orlitzky et al., 2003; McWilliams et al., 2006; Schadewitz and Niskala, 2010).

To examine the link between CSR and the cost of capital is important to understand the impact of CSR activities on the financing cost of the firm and can be helpful in strategic planning. Weber et al. (2010) documented that the sustainability of a firm can influence its creditworthiness of the firm and lead to improve financial performance. The cost of equity and debt is the return required by investors and debtors respectively and reflects the perceived risk of the firms' cash flows. Based on the theoretical framework of Merton (1987) and Heinkel et al. (2001), Ghoul et al. (2011) hypothesized that keeping other factors constant, the firms with high CSR have a low cost of equity due to lower perceived risks. They found that the firms having higher CSR score exhibits cheaper equity financing because investing in improving responsible employee relations, environmental policies, and product strategies contributes significantly to reducing the cost of equity. These results exhibit that investment in socially responsible activities may increase the firm value and lower the risk (Heinkel et al., 2001).

The non-financial aspects of the business are considered in business as they can also reduce risk and lessens the information asymmetry faced by lenders and investors in the financial market (Perrini et al., 2011). Therefore, CSR could reduce the agency costs faced by a company that pursues external financing and promote non-financial disclosure (Carroll and Shabana, 2010). On the basis of the risk mitigation strategy, the response of the capital market in improving environmental risk management has been analyzed and it is documented that it reduces the cost of capital (equity and debt financing). Whereas, Ye and Zhang (2011) found that the cost of debt financing is higher for the firms either doing extremely high or low CSR activities in China.

By using a sample of 25 countries Feng et al. (2015) analyzed that better performance of CSR reduces the cost of equity in Europe and North America but not in Asian countries. The negative relationship between CSR and the cost of equity is also documented by Dhaliwal et al. (2014) in the countries which are more stakeholder-oriented. Moreover, CSR activities also lead to obtaining debt at lower rates because of improved credit ratings (Jiraporn et al., 2014; García-Sánchez et al. 2019) and also reduce the cost of bank loans (Goss and Roberts, 2011). Similarly, Attig et al. (2013) found that companies with good social performance get higher credit ratings. Several organizations defaulted during the 2008 financial crisis because of the credit crunch, CSR also plays an important role in reducing the default risk of a firm (Verwijmeren and Derwall, 2010; Cui et al. 2017). By engaging in CSR activities, the firm can reduce the probability of bankruptcy by having high moral and ethical values.

In recent years, firms have been compelled to disclose non-financial performance initiatives alongside their financial performance metrics, with the potential to influence stakeholders. While financial performance is presented in annual statements, ESG performance is disclosed to explain the firms' non-financial activities (Amel-Zadeh & Serafeim, 2018). Despite the extensive discussion in the literature concerning the association between financial information and financial performance, the disclosure of sustainable practices has increasingly garnered the attention of firms, stakeholders, investors, and regulatory authorities (Nazir et al., 2022). Moreover, a firm's ESG performance reflects its genuine approach toward society and the environment. Both investors and executives concur that ESG performance significantly contributes to a firm's success (Ng & Rezaee, 2015).

However, the cost of capital, which sets the minimum return for every project or a firm's capital planning, has been recognized as a pivotal factor influencing financial performance (Manner,

2018). Furthermore, the cost of capital delineates the minimum return expected by an investor in conjunction with the level of risk associated with cash flow (Kenton, 2019). Other studies have underscored that the voluntary disclosure of a firm's non-financial initiatives notably reduces the cost of capital (Nazir et al., 2022). Correspondingly, higher ESG performance paves the way for easier access to, and lower costs of, capital (Dhaliwal et al., 2011). However, the relationship between ESG performance and the cost of capital may fluctuate across different sectors (Dahiya & Singh, 2021). It is also noteworthy that the interplay between ESG performance and the cost of capital becomes particularly compelling when considering the risks associated with technology, failure, and imitation (Manner, 2018). This is primarily because the technology sector requires a continuous supply chain and often faces pressure to secure said supply at lower costs in order to offer competitive pricing.

More specifically, over time, firms have been compelled to disclose their ESG activities as a means of ameliorating their societal and environmental impact (Qureshi et al., 2021; Yang et al., 2021). Furthermore, businesses can potentially amplify their return, as consumers are disposed to pay a premium for products from companies implementing sustainable practices (Ahmed et al., 2019; Eliwa et al., 2021). Consequently, ESG significantly forecasts a firm's cost of capital. As Erragragui (2017) suggests, robust environmental and governance practices have a notable influence on the cost of capital. Their results also exhibit that superior environmental and governance practices each play an instrumental role in attenuating the cost of debt. ESG mitigates the investment risk and bolsters the firm's value. Investors also demonstrate a willingness to invest in firms that outperform in ESG activities, as this reduces the cost of capital (Manner, 2018). Similarly, the voluntary disclosure of ESG curtails information asymmetry, buttresses business value, and augments overall reputation (Naeem et al., 2022; Nazir et al., 2022).

2.6 Civil Law and Common Law

The country's legal system can bring rapid transformative shifts in organizational practices and ideologies, particularly in response to social and environmental challenges presented by the dynamic business landscape (Baldini et al., 2018). Legal restrictions can further shape the mindset of investors, compelling them to adopt ESG practices (Clementino & Perkins, 2021; Dyck et al., 2019). As per Porta et al. (1998), the global legal framework is bifurcated into two systems: Common Law and Civil Law. Civil Law, which is steeped in Roman law, serves as the most ancient, significant, and frequently utilized legal framework. It employs a comprehensive array of

legislations and detailed rules to regulate myriad scenarios, particularly those pertaining to economic affairs. It is the legal system of choice for several nations such as France, Germany, and the Scandinavian countries (Ciobanu, 2015; Porta et al., 1998). Civil Law relies heavily on legislation, where court judgments do not influence the laws implemented in the country. This system is heavily stakeholder-focused, relying on extensive codification (Porta et al., 1998). Conversely, under the Common Law system, court decisions become an integral part of national law (Porta et al., 1998; Salhi et al., 2020). This legal framework is embraced by countries such as England, Canada, and India. Common Law countries lean toward prioritizing shareholders' interests and exhibit superior economic growth when compared to their Civil Law counterparts (Cappiello & Cappiello, 2020). Graff (2008) further notes that Common Law countries tend to outperform in terms of business effectiveness.

Mandatory ESG regulations are more likely to be adopted in countries with common law systems and those with higher per capita carbon emissions. This trend is notable as common law countries typically have a greater need for ESG disclosure due to a larger gap between the supply of and demand for ESG information, even though ESG performance at the firm level is generally higher in civil law countries. This suggests a stronger need for mandatory disclosure in common law jurisdictions. Empirical evidence further indicates a correlation between higher emissions and environmental degradation in common-law countries, primarily due to lower ESG performance and regulatory constraints (Jansen, 2017). Conversely, Civil Law nations tend to outperform in ESG implementation, due to more stringent regulations imposed on firms to mitigate environmentally hazardous operations (Chouaibi et al., 2022). Companies tend to adopt ESG initiatives more readily within regulated and demanding institutional settings. As such, firms in civil-law countries, which typically have robust legal systems designed to protect stakeholder interests, are more likely to undertake sustainability efforts compared to their counterparts in common-law countries (García-Sánchez et al., 2013).

Castillo-Merino & Rodríguez-Pérez (2021) found that financial firms in civil-law countries achieve higher ESG scores than those in common-law nations, reinforcing the good governance perspective. This view argues that when managerial incentives are aligned with regulations, companies adopt a broader focus that benefits all stakeholders. The findings also imply that in the financial industry, more regulated environments, typical of civil-law countries, correlate with greater sustainability performance.

2.7 ESG in Developed and Developing Countries

Recent years have seen numerous regulatory restrictions and initiatives pertaining to ESG due to its implications for society and the environment. A cross-country comparison conducted by Singhania and Saini (2023) reveals that developed nations such as the United States, European Union, Canada, Japan, Australia, and New Zealand boast high ESG ratings in comparison to developing nations such as Brazil, Indonesia, India, South Africa, Vietnam, and China. Significantly, Vietnam and Indonesia recorded particularly low ESG scores, situating them within the nascent stages of the ESG framework. In contrast, Brazil, India, South Africa, Argentina, and China are progressing towards advanced stages of ESG development. Moreover, South Africa, India, Australia, Japan, Canada, and the USA all exhibited sustainability reporting rates exceeding 90%, while Argentina and Brazil demonstrated rates above 80%. The EU, New Zealand, and China, for their part, achieved rates above 70%. Furthermore, all the aforementioned nations, with the exception of Indonesia and Vietnam, have pledged to achieve carbon neutrality by 2030 in alignment with the Sustainable Development Goals.

A regional study was conducted by the ASEAN-Japan Centre, surveying 143 companies across 10 ASEAN member states, to examine the impact of ESG investments on a firm's financial performance. Predominantly, these companies were listed in the Forbes Global 200 and Nikkei Asia 300 rankings for the years 2017 and 2018 (Sahar et al., 2022). The study's findings unveiled that ESG investments bolster cost-effectiveness, ultimately leading to an approximate increase in profitability by 12%. Concurrently, another study identified that ESG fosters employee engagement in the workplace, which is a critical contributor to enhanced firm performance (Flammer et al., 2019). Moreover, ESG embodies risk mitigation and revenue growth, aspects that further competitiveness and the creation of sustainable value (E-Vahdati & Binesh, 2022).

The escalating pressure from stakeholders and regulatory authorities has prompted firms to pay attention to non-financial performance, particularly environmental and societal aspects (Alshehhi et al., 2018; Carnini Pulino et al., 2022). In addition, the United Nations' report on responsible investment cites ESG as a fundamental construct encompassing ecological, social, and environmental performance (Paolone et al., 2022; Zhou & Wang, 2022). In light of these environmental and societal concerns, firms in developed economies are particularly mandated to report on socio-environmental concerns in addition to financial matters (Adams & Akobeng, 2021). However, firms in developing economies, such as China, Malaysia, Taiwan, and India, lag

behind their counterparts in developed economies, as their reports primarily focus on efforts toward environmental and societal concerns rather than concrete expenditures in these areas (Rahman et al., 2023; Zhou & Wang, 2022).

ESG performance is highly valued as a strategic corporate strategy in both developing and developed economies, fulfilling the expectations of stakeholders and shareholders regarding socially responsible investment (Ye & Li, 2021). However, ESG performance is considerably influenced by national-level factors. For instance, the political framework of emerging economies often neglects societal factors, thereby providing leeway for corporations to overlook initiatives that are environmentally friendly and socially responsible (Naeem et al., 2022). Another study found that companies in these emerging economies do not experience pressure to invest in sustainable practices, a fact which often results in suboptimal firm performance, high levels of corruption, and inequality (Amini & Dal Bianco, 2017). Conversely, in developed nations, laws addressing environmental and social issues are already in place due to the rapid expansion of the industry and economy, which poses numerous risks to society and the environment (Naeem et al., 2022). Consequently, companies in developed economies disclose their ESG measures in order to comply with laws, ultimately aiming to enhance their corporate value.

Prior studies have also noted that firms in developed economies, which are sensitive to social and environmental concerns, tend to experience superior financial performance due to their ESG measures compared to firms in emerging economies (Lozano & Martínez-Ferrero, 2022; Naeem et al., 2022). Contrarily, in emerging economies where ESG strategies necessitate significant investment, ESG practices are largely still in their infancy (Sahar et al., 2022). Moreover, there exists a dearth of literature that compares the relationship between ESG and firm valuation across both developed and developing nations, thus hindering consensus on a particular predictor (Lozano & Martínez-Ferrero, 2022).

2.8 ESG Score

Empirical evidence indicates that a firm's social and financial performance is contingent upon its ESG score (Halbritter & Dorfleitner, 2015). The ESG scores, as recommended by Thomson Reuters, quantify the efficacy, commitment, and overall performance of a firm in relation to ESG dimensions. These scores specifically evaluate performance across ten broad categories, namely: emissions, innovation, resource utilization, product and services, societal impact, human rights, labor practices, corporate social responsibility, senior management, and shareholder relations. The

ESG rating further delineates a company's strategic framework and its alignment with social and environmental objectives (Thomson Reuters, 2017). Hence, in pursuit of sustainable outcomes, the importance of ESG factors is indisputable. Nonetheless, it raises the question regarding which particular elements should be emphasized to optimize ESG performance. Prior studies have identified several pertinent factors to ESG initiatives. One study noted that ESG performance is contingent upon three central initiatives, namely, clean energy, green investment, and green growth (Shalhoob & Hussainey, 2023). Moreover, environmental, social, and governance mechanisms are crucial, as they furnish invaluable data-driven information necessary for assessing a firm's progress toward sustainable outcomes (Clementino & Perkins, 2021; Luo & Tang, 2022).

2.9 Theoretical Framework

Previous studies suggest that integrating CSR and ESG practices helps firms develop unique intangible resources, such as technological expertise to reduce environmental pollution (Teece, 1980). These practices also contribute to considering social transparency (Barney, 1991) and a strong reputation through the integration of ESG practices. While such intangible resources may initially seem costly and could negatively impact short-term economic value (Friedman, 1970), but they may provide potential long-term economic benefits for all stakeholders (Freeman, 1999). Freeman's (1999) stakeholder theory argues that a firm's primary objectives should address the interests of all stakeholders (including customers, employees, society, government, investors, and regulators) rather than focusing solely on maximizing shareholder wealth, which has traditionally been the central focus of finance literature (Jensen, 2001).

2.9.1 Stakeholder Theory

Freeman (2010), the main proponent of stakeholder theory, argues that business issues are not separate from the social responsibility of a firm due to the various demands from stakeholders. He suggests integrating these activities into business operations to achieve effective management. Stakeholder theory asserts that ESG activities align with stakeholders' interests and can improve corporate performance and firm value (Yu & Xiao, 2022). A company that manages relationships with all stakeholders effectively is likely to achieve greater success, with firms having stronger ESG profiles experiencing higher growth than those with weaker profiles. The theory emphasizes that firms should generate returns for stakeholders from ESG investments, with engagement in ESG concerns leading to sustainable benefits and profits.

Hörisch et al. (2020) discussed the concept of Accounting for Sustainability and Stakeholders, which enhances the value-creation process by addressing stakeholder concerns on sustainability issues. As a result, firms use sustainability disclosures to cater to various stakeholders' interests (Hazaea et al., 2022). Meeting stakeholder expectations provides similar costs and benefits as sustainability activities, thus making them more competitive in the long term (Yoon & Chung, 2018). Managing stakeholder engagement optimally from their perspective leads to improved financial performance.

ESG activities create value through two mechanisms: the first is by increasing expected cash flows and lowering the discount rate (Pedersen et al., 2021), while the second maximizes shareholder benefits (Lev et al., 2010; Dam & Scholtens, 2015). For example, shareholders can assess the environmental or social impact of ESG activities and the cash flows they generate, benefiting from companies that fulfill ESG commitments.

Additionally, nonprofit-directed efforts such as sustainability improve a company's reputation and increase trust among stakeholders, leading to positive sentiments from consumers, communities, and investors, ultimately boosting profitability and firm value (Ikram et al., 2020). Stakeholders' understanding of ESG significantly influences corporate performance, encouraging firms to disclose ESG efforts publicly (Al Amosh & Khatib, 2022).

This broader approach to stakeholder engagement has supported CSR practices in the past (Belyaeva et al., 2020) and continues to enhance ESG practices in modern times, impacting firm value (Buallay, 2019). However, the trade-off theory views ESG as a potential cost that may lead to inefficient resource use and the destruction of shareholder wealth (Friedman, 1970; Jha & Rangarajan, 2020). Therefore, it remains unclear whether ESG disclosures are perceived as a cost that reduces firm value or as a long-term investment that will eventually yield benefits. Chen and Yang (2020) suggest that value creation from ESG is a positive short-term signal, with potential reversals in the long term due to investor exaggeration. In contrast, Patel et al. (2020) argue that investors do not expect significant short-term growth from firms experimenting with ESG. Additionally, Azmi et al. (2020) propose a U-shaped relationship in emerging economies, where low levels of ESG activity positively impact firm value, but returns diminish as activity scales up.

2.9.2 Agency Theory

In the context of CSR, Friedman (1962) was an early advocate of agency theory, as he argued that CSR initiatives reflect the self-serving behavior of managers (agents), which ultimately negatively

impact shareholders (principals) by reducing profits. According to Friedman, when managers prioritize social and environmental goals over profit maximization, they act against the best interests of shareholders, who expect higher financial returns. Agency theory focuses on the relationship between corporate executives or managers and the firm's owners or shareholders, highlighting the potential conflicts of interest that can arise due to differing objectives and information asymmetry (Rezaee, 2016). Since agents manage the day-to-day operations, they may have access to more information than the shareholders, potentially leading to decisions that serve the managers' interests rather than maximizing shareholder value. This theory is central to understanding corporate governance mechanisms and the need to align the interests of principals and agents.

The implications of agency theory in previous studies of CSR, such as the works of Galaskiewicz (1985) and Atkinson & Galaskiewicz (1988), further support this perspective. Galaskiewicz (1985) found that CEOs often adopt philanthropic strategies to gain approval and respect from local business elites, rather than focusing on profit generation. Similarly, Atkinson & Galaskiewicz (1988) demonstrated a negative relationship between corporate philanthropy and CEO ownership. CEOs who own a higher percentage of company stocks tend to be more profit-driven and less inclined to allocate resources toward philanthropic causes.

In the context of ESG activities, agency theory suggests that such initiatives may create conflicts between managers and shareholders. From this perspective, ESG expenditures are viewed as a misuse of corporate resources, with cash outflows directed toward ESG efforts reducing profits and firm value. According to the theory, these expenditures do not align with shareholders' best interests, as they prioritize social and environmental objectives over financial performance.

Several studies have provided empirical support for agency theory's stance on ESG investments. Barnea & Rubin (2010) argue that managers may overinvest in ESG-related activities to enhance their personal reputation, even if it comes at the expense of shareholder wealth. Similarly, Garcia et al. (2017) found that firms with the highest ESG performance tend to have lower profits, suggesting that excessive focus on ESG can detract from financial success.

Furthermore, agency theory posits that the information asymmetry between corporate management and stakeholders may encourage firms to use CSR and ESG activities as signals to compensate for underlying weaknesses or to mitigate ESG risks (Duque-Grisales & Aguilera-Caracuel, 2021). In some cases, companies that engage in irresponsible social or environmental practices may use CSR

initiatives to improve their corporate image, potentially harming shareholder interests. This view aligns with the broader argument that ESG performance can negatively correlate with firm value, as managers may divert resources toward ESG initiatives to correct their reputation rather than focusing on maximizing financial returns. Kao et al. (2018) and Velte (2019) also observed that investments in ESG initiatives may create a negative correlation between ESG performance and firm profitability, supporting the idea that ESG activities can be detrimental to shareholders.

Agency theory holds that managers might engage in ESG and CSR activities not to benefit shareholders but to serve their personal interests or to offset negative corporate behavior. While such activities may improve a company's public image, they could lead to lower profitability and reduce firm value, highlighting a potential conflict between ESG performance and shareholder wealth.

2.9.3 Legitimacy Theory

Legitimacy theory posits that companies disclose sustainability information to demonstrate their commitment to society, aligning with stakeholder theory. Legitimacy theory reflects that ESG disclosures show the dedication of a firm to societal well-being and help generate sustainable profits. The firms and stakeholders believe these investments provide long-term benefits, although some scholars argue that immediate financial gains may not be realized (López et al., 2007; Groening & Kanuri, 2013).

This theory is foundational in explaining CSR reporting practices, as it emphasizes how non-financial disclosure can be strategically used to manage a company's public legitimacy. Legitimacy theory further suggests that organizations seek public acceptance and support by aligning their actions with societal norms and values (Rezaee, 2016). Failure to adhere to this can damage an organization's societal standing and financial stability. Thus, companies use ESG disclosures to maintain or restore legitimacy in the eyes of stakeholders (Guthrie et al., 2006; Deegan, 2019).

Guthrie and Parker (1989) introduced the idea of a social contract between businesses and society, arguing that societal values shape corporate actions, a core concept of legitimacy theory. Accounting literature has widely used this argument to explain why companies disclose social and environmental information (Deegan, 2002). Increasingly, corporations are held accountable for their impact on societal issues, prompting them to enhance their sustainability disclosures (Patten & Shin, 2019). Maintaining legitimacy drives efforts to improve sustainability reporting (Patten, 2020). Strengthening legitimacy within the community is recognized by stakeholders, leading to

higher returns and improved financial performance and contributing to long-term value creation (Ali et al., 2021).

Furthermore, the relationship between ESG practices and firm value is also supported by the resource-based view (RBV). It suggests that ESG practices positively impact firm value. Russo and Fouts (1996) highlighted the role of RBV in connecting sustainable and economic performance, a relationship further supported by other researchers (McWilliams and Siegel, 2000; Branco & Rodrigues, 2006; McWilliams et al., 2006).

2.10 Hypothesis Development

There have been different views about the linkages between ESG and firm performance despite the cost or benefits associated with it. Some studies have found a positive relationship (Eccless & Serafeim, 2013; Kotsantonis & Serafeim, 2019), a negative relationship (Giannopoulos et al., 2022) and a mixed relationship (Buallay,2019; Yawika & Handayani, 2019). Many businesses are doing philanthropic activities and considering the integration of sustainability and financial performance in annual reports as best practices because of customer demands for sustainable business practices.

Fatemi et al. (2018) examined the trend of ESG activities in US companies between 2006 to 2011 and determined that they enhance the firm value. Considering the large sample from global firms, Xie et al. (2019) found that the majority of ESG initiatives have a positive impact on financial performance. Bhaskaran et al. (2020) analyzed the effects of ESG on the financial performance from 2014 to 2018 for 4887 firms using firm value and operational performance (ROE and ROA). Friede et al. (2015) reviewed 2200 papers to analyze the relationship between ESG and firm performance and they found that about 90% of studies show positive relationship between ESG and financial performance. The findings of meta-analysis by Alshehhi et al. (2018) show that 78% of studies reported a positive relation between sustainability and the firm's financial performance. Moreover, Whelan et al. (2021) analyzed more than 1000 papers to examine the relationship between ESG and financial performance. They reported that 58% of the papers found a positive relationship between ESG and financial performance. Based on the findings, this study hypothesized that:

H1: There is a positive relationship between ESG rating and firm value

The researchers have discussed the combined and individual impact of ESG components on financial performance. Limkriangkrai et al. (2017) suggest using the combined ESG score to assess

its relationship with FP, while others argue for evaluating the individual contributions of the environmental, social, and governance dimensions (Humphrey et al., 2012; Duque-Grisales & Aguilera-Caracuel, 2021). They highlight that factor such as a company's country of origin, stakeholder pressures, and institutional context can cause variations in how each dimension affects firm value. Therefore, understanding the distinct roles of E, S, and G subfactors is crucial in determining their specific effects on corporate performance. Therefore, this study also examined:

H1a: Environmental factor has an impact on firm value

H1b: Social factor has an impact on firm value

H1c: Governance factor has an impact on firm value

Most of the studies in the literature mainly focused on the direct relationship between ESG and firm value whereas very few have focused on the causal relationship (Dhaliwal et al., 2011; Yadav et al., 2016; Aguilera-Caracuel, 2019). Moreover, the current studies also discussed about the existence of bi-directional relationship between ESG and firm value which show that changes in market value can impact ESG rating and vice versa (Sheehan et al., 2023; Wedajo et al., 2024). It is important to perform bi-directionality testing, as Jha and Rangarajan (2020) found insignificant results based on data from the sectors. They discussed the importance and need of testing bi-directionality to test the application of the slack resource theory (firm value impacts ESG) and the good management theory (ESG impacts firm value).

Various theories explain the causal relationship between sustainability and financial performance. Donaldson and Preston (1995) suggest that sustainability has an impact on financial performance. Whereas the slack resources hypothesis indicate that financial performance affects sustainability (Waddock and Graves 1997). The relationship between sustainability and financial performance found to be significant to run in both directions (Waddock and Graves, 1997), showing the existence of a virtuous cycle (Surroca et al., 2010). Buallay (2019) examined the causal relationship between ESG and firm performance for the banking sector and reported inconclusive results for the causality of this link.

The resource-based view suggests that a firm's access to both tangible and intangible resources is often made possible by surplus cash reserves and high profitability (Barney et al., 2011). This aligns with the slack resource theory, which posits that companies with abundant reserves are more likely to engage in CSR activities and subsequently improve their financial performance (Waddock

& Graves, 1997). This suggests that there is a probability of a virtuous cycle or a two-way relationship between these factors. Therefore, the hypothesis is:

H2: There is a bi-directional relationship between ESG and firm value

The literature regarding impact of ESG on the cost of capital is currently scarce, which either focuses on the cost of debt (i.e Goss and Roberts, 2011; Oikonomou et al., 2012), the cost of equity (i.e Sharfman & Fernando, 2008; El Ghoul et al., 2011) or both (i.e Adeneye et al., 2022; Gonçales et al., 2022; Yilmaz, 2022) without more focused on the weighted average cost of capital as a dependent variable. However, incorporating ESG data into annual reports often presents a trade-off for companies, as it can incur costs due to the additional resources needed for non-financial reporting. This can sometimes lead to a short-term reduction in financial performance (Chen et al., 2018).

The expectations of stakeholders regarding environmental, social, and governance issues are constantly evolving. Therefore, to meet these expectations, managers concern about CSR disclosure to maintain their legitimacy and reputation and therefore to manage firm risk (Ferrero-Ferrero et al., 2016; Sultana et al., 2018). Firm risk can be proxied by the cost of capital (Khanchel & Lassoued,2022), important for both investors and firms regarding decision making. It is interesting to examine the relationship between CSR disclosure and the cost of capital as managers may align CSR activities with core values and know about the expectations of debtholders and equity providers in order to reduce firm risk.

The businesses which focus on CSR activities have fewer agency issues and ultimately the lower cost and wastage of resources (Ferrell et al., 2016). Harjoto et al. (2015) documented that CSR activities improve internal and external corporate governance. Contraray to this, ESG may negatively affects shareholder value. ESG investments divert precious resources, and companies with high ESG ratings face agency issues. Managers engage in CSR for their gains at the expense of shareholders (Krüger, 2015). Moreover, the advantages of CSR for stakeholders come directly from higher cost of equity (Dahiya and Singh, 2021). Although theoretical research on this issue is scarce, a few recent publications imply that superior ESG performance is associated with a reduced cost of capital (Pastor et al., 2021; Derrien et al., 2021) Irawan and Tatsuyoshi (2021) revealed that ESG ratings have a considerable beneficial effect on business valuations. Another Wong et al. (2021) analyzed strong beneficial effect of ESG ratings and disclosures on firms' cost of capital.

Despite these costs, Eliwa et al. (2021) suggest that ESG disclosure is negatively correlated with the cost of debt, depicts that companies that engage in comprehensive ESG reporting may experience reduced borrowing costs. This reduction in financial risk reflects the market's perception of ESG-compliant companies as more transparent, responsible, and sustainable, ultimately benefiting their long-term financial performance. Whereas Nazir et al. (2022) show that ESG performance is positively linked to both the cost of equity and the cost of debt, indicating that firms with strong ESG practices face higher capital costs. This suggest that investor view ESG initiatives as an extra financial burden rather than a value-enhancing factor. The analysis could be influenced by reverse causality, where firms with better performance and lower cost of equity are more likely to engage in ESG activities. In other words, a firm's decision to adopt CSR initiatives may be influenced by its cost of equity (El Ghoul et al., 2011).

H3: There is a relationship between ESG rating and cost of capital

H3a: ESG rating has an impact on the cost of capital

Over time, firms have been compelled to disclose their ESG activities as a means of bettering their societal and environmental impact (Qureshi et al., 2021; Yang et al., 2021). Consequently, ESG significantly forecasts a firm's cost of capital. As Erragragui (2017) suggests, robust environmental and governance practices have a notable influence on the cost of capital. Their results also exhibit that superior environmental and governance practices each play an instrumental role in attenuating the cost of debt. ESG mitigates the investment risk and bolsters the firm's value. Investors also demonstrate a willingness to invest in firms that outperform in ESG activities, as this reduces the cost of capital (Manner, 2018). Similarly, the voluntary disclosure of ESG curtails information asymmetry, buttresses business value, and augments overall reputation (Naeem et al., 2022; Nazir et al., 2022).

Therefore, this study examines the hypothesis:

H4: The relationship between ESG and firm value varies because of the cost of capital

The European Union's directives such as NFRD and CSRD introduced stringent requirements for firms to disclose non-financial information, particularly regarding their ESG activities. The CSRD seeks to ensure that stakeholders have access to essential information to evaluate companies' environmental and social impacts, as well as financial risks and opportunities tied to climate change and sustainability issues. Over the medium to long term, organizations are likely to see reduced reporting costs due to the alignment of reporting standards (EU Commission, 2024).

The lack of mandatory standards in the past resulted in sustainability reports within the EU that were difficult to compare and it raised concern and uncertainty among investors (European Commission, 2023). Over the past decade, the corporate world has increasingly acknowledged the significance of sustainability reporting. Stakeholders have shown growing interest in non-financial disclosures, and investors now require non-financial data for effective risk management (Benvenuto et al., 2023). With the introduction of the CSRD, the EU aims to reach a major milestone in sustainability reporting. The main purpose is to anallyze the environmental and social impacts of corporations, allowing stakeholders and investors to assess risks and opportunities regarding sustainability related challenges.

While previous research has largely established a positive relationship between ESG performance and firm value, the role of regulatory frameworks, such as the CSRD, in shaping this relationship remains less explored. Firms that comply with the CSRD are expected to experience improvement in transparency, reduced information asymmetry, and enhanced access to capital, which could positively affect their financial performance. However, the additional costs associated with ESG reporting may also impact firms' cost structures and capital decisions. Furthermore, the influence of the CSRD on firm value may vary based on legal systems (e.g., civil law versus common law) and industry sensitivity to ESG issues.

Therefore, this study examines the hypothesis:

H5: The relationship between ESG and firm value varies with the implementation of EU directives.

Chapter 03

Data, Methodology, and Results

3.1 Introduction

This thesis seeks to examine the connection between the ESG ratings and the valuation of the company. To achieve this, the secondary data has been used from DataStream, and statistical methods such as panel regression and quantile regression are applied. Furthermore, the robustness tests are conducted to confirm the reliability of our findings.

3.2 Data

For this thesis, the data has been gathered from the year 2010 to 2024 across 20 different European countries. The companies are chosen from different regions of the Europe including Eastern, Western, Northern, and Southern Europe to account for diversity. The dataset includes ESG scores, financial performance and the control variables for all the publicly traded companies from these 20 countries that have been sourced from the Refinitiv database. Initially, the sample comprised of 9,041 firms resulted into 135,615 total observations. The firms within the financial sector are then excluded in accordance with the previous studies as Velte (2017) recommended their exclusion strategy owing to industry-specific regulations. Moreover, the Refinitiv did not provide complete data for all the firms and those without ESG data hence have been immediately removed thus we are left with 2,319 firms in the final dataset.

3.2.1 ESG Rating Score

The ESG scores used in this study have been sourced using Refinitiv that are known for maintaining one of the most comprehensive ESG databases globally. Their database covers ESG data for over 70% of the global market capitalization. More than 500 ESG data points are gathered across distinct sources including annual reports, company websites, NGO, stock exchange filings, CSR reports and news outlets. These data points are then reviewed by a team of over 150 research analysts before a company is assigned any rating, which is then added to the ESG database. Additionally, their ESG ratings are updated on a weekly basis to ensure accuracy and consistency in-bound. Refinitiv ESG scores are widely favored by the researchers in their studies (Chairani & Siregar 2021, DuqueGrisales & Aguilera-Caracuel 2021, Naeem et al. 2022, Giannopoulos et al. 2022). Refinitiv offers one of the largest ESG datasets available with records accumulated from 2002. It evaluates the ESG performance of companies based on 10 themes and 3 main pillars using over 600 criteria.

The scoring is based on a quantitative approach where companies are rated on their ESG performance relative to their industry peers. The scores are standardized to allow cross-industry comparisons, ensuring consistency. Each ESG pillar (Environmental, Social, Governance) is weighted based on its material relevance to the sector.

Refinitiv also incorporates controversy monitoring, where negative events (e.g., regulatory violations, scandals) can lower a company's score. The final ESG score ranges from 0 to 100, with

higher values indicating stronger sustainability practices. Companies are often classified into percentile-based groups (e.g., quartiles) to simplify analysis.

Along with an extensive database, the methodology of ESG score is made publicly accessible by Refinitiv. The users can tailor their queries to extract specific ESG indicators related to their analysis regarding trend analysis, benchmarking, and correlation with financial performance. Previous research on ESG investments and performance has highlighted some inconsistencies in how companies disclose their ESG data Kotsantonis and Serafeim (2019) highlighted the inconsistencies in the disclosure of ESG data by companies while analyzing the ESG investment and performance. This was due to the various reporting standards of ESG and the company chose the way they can show strong performance. However, Refinitiv's ESG scores penalize companies for failing to disclose their ESG data points. These data points are weighted differently, with higher penalties being assigned for non-disclosure of more heavily weighted criteria (Refinitiv 2021). The various data points are grouped into ten categories which are then used to assess the score of companies across each ESG pillar

Moreover, Refinitiv's Datastream database is crucial for sustainable investing and it offers investors and analysts valuable insights into corporate sustainability practices. The ESG data covers a broad range of metrics including environmental impact, social responsibility, and governance frameworks, all of which are vital for informed investment choices and sound risk management. To ensure the quality and reliability of ESG data it involves a thorough process of acquisition, standardization, and validation. ESG metrics from several sources are compiled by Datastream including corporate reports, regulatory filings, and third-party evaluations. Therefore, it allows for more comprehensive coverage of thousands of companies across various sectors and regions.

ESG data helps in aligning investments with global sustainability goals as investors may positively contribute to societal outcomes, and ensure the long-term sustainability of investment portfolios. As regulatory requirements for ESG disclosures grow, utilizing robust databases like Datastream becomes increasingly essential for stakeholders seeking to navigate the intricacies of sustainable investments.

While comprehensive, the methodology has limitations, such as dependence on self-reported data, variations in disclosure quality, and sectoral differences in ESG reporting practices. Despite this, it remains a widely recognized framework for assessing corporate sustainability performance.

3.2.2 Firm Value

This thesis aims to evaluate the impact of ESG performance on firm valuation. There are three major categories of valuation methods for determining the intrinsic value of a firm (Abbas et al., 2022). The first is Market-Based Valuation which utilizes market multiples like Price-to-Sales and Price-to-Earnings ratios for comparing firms with their industry peers. The second is Income-Based Valuation such as Discounted Cash Flow analysis which estimates the value of a company on the basis of projected future cash flows discounted to their present value. The third is Asset-Based Valuation which calculates the value of a firm by adding tangible and intangible assets and subtracting liabilities. Each approach has its advantages and drawbacks and the choice of the most suitable method depends upon the specific characteristics of the firm and the purpose of the valuation. Regardless of the approach, the firm value is always a function of underlying fundamentals (Syed et al., 2023). A comprehensive valuation often involves combining multiple categories with fundamental assessments to know the worth of a company (Khatri 2023).

In this thesis, we utilize three measures of firm value to examine their sensitivity to ESG performance. The first proxy is the TobinQ ratio which evaluates how well the market value of a company aligns with the replacement cost of its assets. There are two key components of TobinQ; the Market Value which reflects the total value of outstanding shares of a company and price (Umar et al. 2022) and the Replacement Cost which refers to the cost of a company that would incur to rebuild its assets at the current market prices (Umar et al., 2023). The value of TobinQ below 1 indicates that the market values the company at less than the cost of replacing its assets thus possibly reflecting that its assets are underutilized or its market is undervalued. Conversely, a ratio greater than 1 implies that the market value of the company exceeds its asset replacement cost which is an indicator of its overvaluation (Faria et al., 2022). Whereas, 1 indicates that the market value of the company aligns with the cost of replacing its assets hence justifying its fair valuation. There are several benefits of using TobinQ as a proxy for firm value as its mainly focuses on asset efficiency. Additionally, the TobinQ provides a long-term perspective about investments thus enabling investors and companies to evaluate sustainability and competitive advantages of business over the time. Unlike other valuation approaches, TobinQ emphasizes that the relationship between the market value of a company and the cost of replacing its assets is particularly valuable in highly asset-based industries such as; manufacturing, real estate, and oil and gas (Faria et al. 2022). While Tobin's Q is effective for evaluating asset-intensive industries and long-term

company prospects, it may not be ideal for firms that primarily rely upon their intangible assets. To address this limitation, in this thesis, we have excluded financial institutions from our sample size.

The second proxy that analysts and financial professionals commonly use ROA to evaluate the profitability of a firm but it reflects only how effectively a company uses its assets to generate earnings, compared to Tobin's Q value. A higher ROA is considered favorable as it indicates more efficient resource management. Many researchers also opt for TobinQ as a metric for measuring firm value (Dalal & Thaker, 2019, Atan et al. 2019, Saygili et al. 2021, Naeem et al., 2022, Giannopoulos et al. 2022). Likewise, the Return on Assets (ROA) is frequently used as a proxy for profitability/firm value in the research analysis (Saygili et al. 2021, Naeem et al. 2022, Giannopoulos et al., 2022). The ROA is one of the most widely accepted accounting-based indicators of financial performance that represents the profitability company relative to its total assets. While the accounting-based measures provide valuable insights into the investment portfolio, the market-based metrics are essential in empirical studies because they account for figures that are rarely influenced by earning management practices (Velte 2017). Therefore, Tobin's Q value is also considered in this study as a measure of financial performance.

The third proxy is the enterprise value-to-sales (EV/Sales) ratio which is a widely used metric for several reasons and aspects. Firstly, it is straightforward and universally applicable across industries and different business stages (Zhu, Sun & Xiang 2020). Unlike metrics such as Price-to-Earnings (P/E) or Price-to-Book (P/B) ratios which rather focus more on earnings or book value, the EV/Sales predominately focus on the revenue of a company. This makes it particularly useful for evaluating businesses with fluctuating earnings and emerging startups (B. Zhu, Liang, Mirza & Umar 2023). Additionally, the EV/Sales ratio facilitates relative comparisons thus allowing analysts to assess the performance of a company also against its industry peers or historical norms thereby identifying concrete potential investment opportunities and risks involved (Islam, Li & Wheatley 2023).

Moreover, the metric remains neutral to accounting practices as it is not influenced by non-cash flow items and accounting treatments thus making it less susceptible to manipulation as compared to common measures like P/E (Wild & Wild 2022). EV/Sales also provide a more comprehensive valuation by considering the market capitalization of companies and their debt profile thus offering a broader perspective on its total value beyond just its stock price. A lower EV/Sales ratio may

suggest that a company is undervalued relative to its revenue and potentially providing an indication for a promising investment opportunity. On the other hand, a higher EV/Sales ratio could indicate that the investors are willing to pay a premium for each dollar on the sales of the company that is signaling that the firm is potentially overvalued stock. However, it is advisable to employ the EV/Sales ratio alongside other financial metrics, market conditions and qualitative factors to get a well-rounded view of the valuation and investment potential of a given company.

3.3.3 Control Variables

The control variables used in this thesis include cost of capital, leverage, capital expenditure, and growth rate. The firm size is determined as the natural log of the sum of equity (market) value and the total (book) debt. Generally, the smaller firms are associated with higher valuations. The leverage is defined as the ratio of current and non-current debt to total assets. In addition to providing greater tax savings, the higher leverage is likely to impose stronger managerial discipline (Jensen 1986) in the firm. The growth captures potential growth opportunities for a business. The higher capital expenditures are expected to generate greater cash flows in the future which should correlate with higher valuations. Lastly, the year and industry dummy variables are also included in this thesis to account for fluctuations and differences across the industries.

Table 1 Description of Variables

Variable	Definition	Description	Source
ESG	Environmental, Social, and Governance factor Score Range for ESG		Refinitiv
	0 to 25	Poor ESG performance	
	26-50	Relatively Satisfactory ESG performance	
	51-75	Good ESG performance	
	76-100	Excellent ESG performance	
Env	Environmental factor score	The score that contains items related to the performance of a company in environmental practices	Refinitiv
Soc	Social factor score	The score that contains items related to the performance of a company in Social practices	Refinitiv
Gov	Governance factor score	The score that contains items related to the performance of a company in Governance activities	Refinitiv
Tobin Q	Proxy for firm value	TQ= (Total assets+ Market value- Book value)/Total assets	Calculated
ROA	Proxy for firm value	ROA=Net income/Total assets	Calculated
Lev	Leverage of firm	Lev=Total debt/Total assets	Calculated
GR	Sales growth rate	The ratio of sales of previous year divided by sales of the current year minus 1	Calculated
Capex	Capital expenditure	The ratio of capex to sales	Refinitiv
CoC	Cost of capital	Weighted average cost of capital	Refinitiv
Size	Size of firm	log of total assets	Refinitiv

3.3 Methodology

Our thesis uses statistical techniques especially regression analysis to test the proposed hypotheses. The panel and quantile regression methods have been applied and analyzed.

3.3.1 Model Selection

The panel data analysis integrates both the time series and cross-sectional data that allows to examine multiple entities over different periods. Choosing an appropriate panel data model is pivotal for accurately estimating relationships between the control variables while accounting for complexities in the data trends. There are two main models used in panel data analysis, the fixed effects and random effects models that depend upon the characteristics of the dataset being used.

The fixed effects models are used when unobserved individual heterogeneity exists which refers to characteristics that remain constant over time but could inject bias into the results if not properly assessed and addressed. This model focuses on analyzing variations within the same entity over time which makes it suitable for controlling all time-invariant characteristics. On the other hand, the random effects models assume that the individual-specific effects are uncorrelated with the independent variables. This approach incorporates both, the within-entity and between-entity variations thus making it a more efficient estimator when the assumptions are valid. The random effects models are generally preferred when the focus is on variables that vary across entities and when the dataset includes a large number of firms with relatively few time observations. Such type of models provides more degrees of freedom thus potentially helping in further improvising the precision of the estimates.

Therefore, the Hausman test is exercised to determine whether the fixed or random effects model is more appropriate and effective for the given dataset distribution. This statistical test assesses whether the unique errors are correlated with the regressors in the model. If the test reveals significant differences in the coefficients between the two models then the fixed effects model is favored but if no significant differences are found then the random effects model is considered more suitable and favorable.

3.3.1.1 Hausman Test

The Hausman test is a statistical tool to analyze whether a fixed effects (FE) or random effects (RE) model is more appropriate for a given dataset. The selection between these models is based on the assumptions regarding the correlation between the unobserved individual effects and the independent variables maps.

The main purpose of the Hausman test is to determine if the unique errors (unobserved effects) are correlated with the regressors in the model or not. If these unobserved effects are correlated with the independent variables, the fixed effects model which accounts for unobserved individual heterogeneity will provide unbiased results.

The null hypothesis for the Hausman test is "H0: The random effects model is appropriate and the unobserved individual effects are not correlated with the independent variables".

If the p-value of the Hausman test is less than a chosen significance level then the null hypothesis is rejected thus indicating that the fixed effects model is more suitable and vice versa.

3.3.1.2 Multicollinearity

Multicollinearity is a critical factor in regression analysis that can affect the reliability of results. It occurs when two or more independent variables are highly correlated making it difficult to accurately estimate the coefficients of the regression model. This condition complicates the ability to assess the variability of each independent variable for the dependent variable. Therefore, by detecting and addressing multicollinearity we can get accurate estimation and interpretation of regression models that lead to more reliable findings under such empirical research analysis.

Moreover, the Variance Inflation Factor (VIF) is used to quantify the degree of multicollinearity by measuring how much the variance of estimated regression coefficients is inflated due to the severity of multicollinearity. The VIF assesses the impact of independent variables on the variance of each other. To calculate VIF, a regression is performed with one independent variable as the dependent variable by using the remaining independent variables as predictors. This process is repeated for all the independent variables. The value of VIF exceeding 10 (in some contexts 5 is threshold) indicates the problematic and non-plausible multicollinearity (Chase 2013).

3.3.1.3 Autocorrelation and Heteroskedasticity

Autocorrelation that is also known as serial correlation, refers to the correlation of a variable with itself across different time periods and instances. In the panel data which involves multiple entities (such as firms or countries) observed over time, the autocorrelation occurs when the residuals (errors) of a regression model are correlated over time within its own same entity. This violates the assumption of independent and identically distributed dataset that potentially may lead to inefficient estimates and biased statistical inferences.

On the other hand, the heteroskedasticity refers to a situation in regression analysis where the variance of the error terms (residuals) changes across different levels of the independent variables.

In simpler terms, the spread or variability of the residuals differs depending upon the value of the independent variable(s). This violates a key assumption of ordinary least squares (OLS) regression which assumes a constant variance (homoskedasticity) in the residuals.

3.3.1.4 Wooldridge Test

The Wooldridge test for autocorrelation is a widely and commonly used method for detecting the presence of serial correlation in panel data models. Autocorrelation arises when the error terms in a given regression model are correlated over time for the same entity thus potentially leading to inefficient estimates and biased inferences. Wooldridge (2010) highlighted some situations where a negative serial correlation of idiosyncratic errors may be expected when using them within the estimator. Nevertheless, it is essential to test for the presence and type of serial correlation. In this thesis work, we have conducted the Wooldridge test to determine whether the serial correlation is present or absent or prevalent.

In the presence of autocorrelation, researchers may use such robust standard errors or generalized least squares (GLS) to enhance the efficiency and reliability of the results. This is crucial and critical for making valid inferences and ensuring that the robustness of econometric results is retained in the presence of autocorrelation.

3.3.1.5 Breusch-Pagan Test

The Breusch-Pagan Test used to detect heteroskedasticity in regression models, particularly in the context of ordinary least squares (OLS) regression analysis. Heteroskedasticity occurs when the variance of the error terms is not consistent across all levels of the independent variables which may lead to inefficient estimates and biased standard errors. The main objective of the Breusch-Pagan Test is to determine whether the variance of the error terms is related to the independent variables in the model or not. If heteroskedasticity is detected, it violates the OLS assumption that the error terms should have constant variance (homoskedasticity).

When the Breusch-Pagan Test reveals heteroskedasticity, it suggests that the OLS estimates may be inefficient and the standard errors may be biased thus resulting in unreliable hypothesis testing. In such cases, alternative estimation methods, such as Generalized Least Squares (GLS) or robust standard errors, should be applied to correct for heteroskedasticity and improve the reliability of the model estimates.

3.3.2 Regression Analysis

Regression analysis is performed to analyze the effect of ESG on firm value. The analysis starts with univariate regressions to investigate the effect of ESG on firm value.

Model specification for hypothesis 1:

In this hypothesis, I examined the impact of ESG on firm value, and the model is as follows:

$$FV_{it} = \alpha + \beta_1 ESG_{it} + \beta_2 FE_ind_{it} + \beta_3 FE_time_{it} + e_{it}$$

……(1)

$$FV_{it} = \alpha + \beta_1 ESG_{it} + \beta_2 Size_{it} + \beta_3 Lev_{it} + \beta_4 GR_{it} + \beta_5 Capex_{it} + \beta_6 FE_ind_{it} + \beta_7 FE_time_{it} + e_{it}$$ ……..……(2)

Where FV_{it} represents firm value (proxies are TobinQ and ROA), ESG is the ESG score of the firms, $Size$ show the size of the firm, *Lev* shows the leverage, *GR* is the sales growth rate, *Capex* is the capital expenditure of a firm, *FE_ind* is the industry fixed effects, and *FE_time* is the year fixed effect.

Model specification for hypothesis 2:

The second hypothesis examined the bi-directional relationship between ESG and firm value, and the model is as follows:

$$ESG_{it} = \alpha + \beta_1 FV_{it} + \beta_2 FE_ind_{it} + \beta_3 FE_time_{it} + e_{it}$$ ……(3)

$$ESG_{it} = \alpha + \beta_1 FV_{it} + \beta_2 Size_{it} + \beta_3 Lev_{it} + \beta_4 GR_{it} + \beta_5 Capex_{it} + \beta_6 FE_ind_{it} + \beta_7 FE_time_{it} + e_{it}$$ ……(4)

Where FV_{it} represents firm value, ESG is the ESG score of the firms, $Size$ show the size of the firm, *Lev* shows the leverage, *GR* is the sales growth rate, *Capex* is the capital expenditure of a firm, *FE_ind* is the industry fixed effects, and *FE_time* is the year fixed effect.

Model specification for hypothesis 3:

The third hypothesis examined the bi-directional relationship between ESG and cost of capital, and the model is as follows:

$$CoC_{it} = \alpha + \beta_1 ESG_{it} + \beta_2 FE_ind_{it} + \beta_3 FE_time_{it} + e_{it}$$ ……(5)

$$CoC_{it} = \alpha + \beta_1 ESG_{it} + \beta_2 Size_{it} + \beta_3 Lev_{it} + \beta_4 GR_{it} + \beta_5 Capex_{it} + \beta_6 FE_ind_{it} + \beta_7 FE_time_{it} + e_{it}$$ ……(6)

$$ESG_{it} = \alpha + \beta_1 CoC_{it} + \beta_2 FE_ind_{it} + \beta_3 FE_time_{it} + e_{it}$$ ……(7)

$$ESG_{it} = \alpha + \beta_1 CoC_{it} + \beta_2 Size_{it} + \beta_3 Lev_{it} + \beta_4 GR_{it} + \beta_5 Capex_{it} + \beta_6 FE_ind_{it} + \beta_7 FE_time_{it} + e_{it}$$ ……(8)

Where CoC_{it} represents the cost of capital, ESG is the ESG score of the firms, $Size$ show the size of the firm, *Lev* shows the leverage, *GR* is the sales growth rate, *Capex* is the capital expenditure of a firm, *FE_ind* is the industry fixed effects, and *FE_time* is the year fixed effect.

Model specification for hypothesis 4:

The fourth hypothesis examined the impact of cost of capital on the relationship between ESG and firm value and the model is as follows:

$$FV_{it} = \alpha + \beta_1 ESG_{it} + \beta_2 CoC_{it} + \beta_3 FE_ind_{it} + \beta_4 FE_time_{it} + e_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots(9)$$

$$FV_{it} = \alpha + \beta ESG_{it} + \beta_2 CoC_{it} + +\beta_3 Size_{it} + \beta_4 Lev_{it} + \beta_5 GR_{it} + \beta_6 Capex_{it} + \beta_7 FE_ind_{it} + \beta_8 FE_time_{it} + e_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots(10)$$

Where *FV* is the firm value, CoC_{it} represents the cost of capital, ESG is the ESG score of the firms, $Size$ show the size of the firm, *Lev* shows the leverage, *GR* is the sales growth rate, *Capex* is the capital expenditure of a firm, *FE_ind* is the industry fixed effects, and *FE_time* is the year fixed effect.

To examine hypothesis 5, the same models are used but in different time periods to analyze the impact of European Union Directives (i.e NFRD, CSRD)

3.3.3 Quantile Regression

To examine the relationship among ESG and firm valuation, quantile regression proposed by Koenker and Bassett (1978) is also used. The quantile regression helps analyze the idiosyncratic momentum profits in wide-range distribution. Using quantile regression, the distribution of idiosyncratic momentum returns can be defined better by considering outliers. The coefficient is usually assumed to be constant but can be differentiated by various quantiles. It shows significant differences instead of showing the sign coefficient in other techniques like OLS and GMM.

Peng et al. (2010) argue that in contrast to OLS, the quantile regression estimator is robust to extreme values and not only explains the mean or median value of the dependent variable but also the estimation of coefficients across a wide spectrum of dependent variables. It was also documented that the quantile regressions reduce the estimated bias in skewed samples (Koenker & Hallock, 2001). It is used in the literature to investigate various relationships such as the political cycle and stock market (Santa-Clara & Valkanov, 2003), the impact of size (Barnes & Hughes, 2002), and risk management (Viscusi & Born, 2005) among others.

As Ahmed and Doukas (2021) suggested, the quantile regression model runs at the 5th, 10th, 25th, 50th, 75th, 90th, and 95th quantiles of the firm value with bootstrapping resampling technique

with 400 replications to estimate the standard errors. This bootstrapping helps develop the joint distribution and the F-statistics in examining the significant differences in the coefficients across the conditional distribution of quantiles.

One of the key advantages of using quantile regression is its robustness to extreme values. This feature is particularly important in financial studies where datasets often contain outliers due to market shocks or extreme economic events. By analyzing multiple quantiles, researchers can identify whether the impact of predictors varies across the spectrum of returns, from the lower tail (e.g., 5th percentile) to the upper tail (e.g., 95th percentile). This comprehensive approach ensures that the findings are not skewed by outliers and provides a more accurate representation of the relationships under study.

3.4 Descriptive Statistics and Correlation

The descriptive statistics for the variables give important insights into the characteristics of the sample. Table 2 shows the results of the descriptive statistics of the variables. The mean value of Tobin's Q is slightly above 1, indicating that the market values the firm's assets more than their replacement cost. This value indicates the positive growth expectations in a company. The low standard deviation suggests that the values are clustered closely around the mean, indicating relatively consistent firm valuations among the sample. The average ESG score is about 49.4, indicating a moderate level of environmental, social, and governance practices. The high standard deviation reflects significant variability in ESG scores among the firms, suggesting that while some firms excel in their ESG efforts, others lag significantly behind.

The environmental, social, and governance scores further demonstrate moderate levels of commitment, with averages of 48.0, 54.2, and 50.5, respectively, showcasing substantial diversity in management practices. The mean value of the cost of capital is 6.8%, suggesting that firms can finance their operations at a reasonable cost. The small standard deviation indicates that most firms have the similar cost of capital. Size suggests that firms in the sample are generally large, with a relatively low standard deviation indicating similar sizes among firms. The average capital expenditure is 0.84, indicating a significant investment in assets. The average leverage ratio is high at 0.721, suggesting that firms in the sample use a significant amount of debt relative to equity. The mean ROA of 0.992 suggests firms are generally effective in generating profits from their assets. The enterprise value has a mean above 1, suggesting that the market values firms higher

than their book values, which indicates positive growth prospects. The low standard deviation suggests uniformity in valuation across the sample.

***Table 2*: Descriptive Statistics**

The table 2 shows the descriptive statistics including the mean, standard deviation, minimum, maximum, and quartile for all the variables. The data covers the period of 2010 to 2024 for the publicly listed companies in Europe. This study includes the variables that explain the relationship among firm value (TobinQ, ROA), Environmental factor (Env), Social factor (Soc), Governance factor (Gov), the combined effect of ESG (ESG), cost of capital (CoC), Size, capital expenditure (capex), and leverage (Lev).

Variable	Obs	Mean	Std. Dev.	Min	Max	1st Quartile	2nd Quartile	3rd Quartile
TobinQ	18275	1.006	0.054	.838	1.165	0.974	1.002	1.036
ESG	18327	49.399	19.688	0.627	95.006	35.414	50.334	64.451
Env	18325	48.003	27.676	0.000	99.290	25.227	48.954	71.564
Soc	18325	54.178	24.042	.121	98.47	35.993	55.923	73.959
Gov	18327	50.462	23.227	.323	98.751	31.596	51.303	69.408
CoC	18327	0.068	0.025	0.028	0.127	0.054	0.063	0.079
Size	18327	21.654	1.704	18.459	24.748	20.461	21.678	22.863
Capex	18256	0..840	0.070	0.694	0.967	0.797	0.841	0.885
ROA	18296	0.992	0.067	0.862	1.127	0.956	0.9947	1.028
GR	18327	0.106	0.137	0.017	0.319	0.001	0.100	0.110
Lev	18130	0.721	0.047	0.600	0.879	0.612	0.712	0.799

Table 3 represents the correlation among the variables of the study. The correlation matrix provides a comprehensive overview of the relationships among key variables related to firm performance and sustainability. Tobin's Q, a measure of firm valuation has a negative correlation with both ESG scores (-0.052) and capital expenditure (-0.185), suggesting that firms with higher ESG performance may not necessarily have higher firm valuations. Conversely, Tobin's Q shows a positive correlation with ROA (0.315), indicating that firms with better operational efficiency tend to have higher market valuations.

The ESG score exhibits strong positive correlations with environmental (0.800), social (0.856), and governance (0.693) dimensions, highlighting that firms with robust overall ESG practices also tend to excel in specific categories. However, the correlation between ESG and ROA is negative (-0.321), which may suggest that firms prioritizing ESG factors might face trade-offs affecting their immediate financial performance.

Furthermore, capital expenditure is negatively correlated with Tobin's Q and ROA, hinting that higher capital investments do not guarantee enhanced market valuation or operational efficiency. The leverage ratio displays a significant negative correlation with ROA (-0.611) and Tobin's Q (-0.303), indicating that firms with higher debt levels tend to perform less efficiently and have lower market valuations.

***Table 3*: Pairwise Correlation**

The table 3 shows the correlation for all the variables. The data covers the period of 2010 to 2024 for the publicly listed companies in Europe. This study includes the variables that explain the relationship among firm value (TobinQ, ROA), Environmental factor (Env), Social factor (Soc), Governance factor (Gov), the combined effect of ESG (ESG), cost of capital (CoC), Size, capital expenditure (capex), growth rate (GR) and leverage (Lev).

Variables	TobinQ	ESG	Env	Soc	Gov	CoC	Size	Capex	ROA	Lev	GR
TobinQ	1.000										
ESG	-0.052	1.000									
Env	0.133	0.800	1.000								
Soc	-0.058	0.856	0.738	1.000							
Gov	-0.044	0.693	0.455	0.481	1.000						
CoC	0.116	-0.037	-0.087	-0.061	0.026	1.000					
Size	0.111	0.477	0.548	0.510	0.365	-0.145	1.000				
Capex	-0.185	0.317	0.384	0.340	0.205	-0.067	0.451	1.000			
ROA	0.315	-0.321	-0.391	-0.309	-0.265	0.065	-0.434	-0.611	1.000		
Lev	-0.303	0.176	0.195	0.184	0.112	-0.187	0.121	0.258	-0.097	1.000	
GR	0.044	0.016	0.003	-0.002	0.001	-0.003	-0.042	-0.210	0.032	-0.020	1.000

3.5 Diagnostic Tests Results

Before conducting the panel data regressions, firstly we determine the most suitable panel data model for my analysis. There are three types of static linear panel data models: pooled, random effects, and fixed effects. The relevant tests are applied to identify the model that best fits the data. Initially, we compare the pooled model with the fixed effects model using the F test for individual effects, which indicates that the fixed effects model is more appropriate than the pooled model. Next, the pooled and random effects models were assessed through the Breusch-Pagan Lagrange Multiplier test. This test reveals that the random effects model is a better choice than the pooled model. If the null hypothesis is rejected, it suggests that the variance of the individual effects is significantly different from zero, leading me to prefer a random effects model over a pooled OLS model (Breusch and Pagan, 1980). Finally, we compare the fixed effects and random effects models using the Hausman test, which shows that the fixed effects model is more suitable than the random effects model.

To check for serial correlation, the Breusch-Godfrey/Wooldridge test is used, which confirms that there is no serial correlation present in the model. Additionally, the Breusch-Pagan test is used to assess heteroskedasticity, revealing that heteroskedasticity exists within the model. To address these issues, this study used robust standard errors in the fixed effects regression. After completing these steps, I proceed with running the fixed effects models. Each firm in dataset possesses its own fixed characteristics that change very little over time. The fixed effects model effectively controls for all firm-specific observable or unobservable features that remain relatively constant, thereby reducing the potential for omitted variable bias.

The multicollinearity can either be analyzed through correlation matrix or Variance Inflation Factor (VIF), which assesses how much the independent variables influence each other's variation. The VIF is determined by running a regression where one independent variable is treated as the dependent variable, while the other independent variables are used as predictors. This process is repeated for each of the independent variables. Typically, a VIF value of 5 or 10 is considered indicative of multicollinearity (Chase, 2013). All the variables of this thesis have a VIF less than 10.

The robust standard error in fixed effect regression is beneficial to improve the reliability of coefficient estimates and enhances the accuracy of estimates. Robust standard errors adjust for heteroskedasticity, which occurs when the variance of the errors differs across observations. In panel data errors may be correlated across time periods and result in autocorrelation. The robust standard errors can help address issues arising from this autocorrelation, leading to more accurate estimates. By providing valid standard errors, robust methods improve the accuracy of statistical inference, reducing the likelihood of Type I errors (false positives). In empirical research, data often does not meet all assumptions required for traditional statistical methods. Using robust standard errors makes findings more generalizable across different samples and contexts. When using a fixed effects model, the focus is on within-group variation over time.

3.6 Panel Regression Analysis

This study used regression analysis to examine the relationship among firm valuation, ESG, and other firm-specific factors. The analysis begins with the fixed effect panel regressions to examine the impact of variables of interest on the firm value. To test hypothesis (H1) regarding the impact of ESG on firm value, the analysis starts with univariate regression. Also, these analyses examine the H4 when considering the effects of cost of capital on firm value. Table 4 shows the results of the fixed effect panel regression analysis. In Model (1), the dependent variable is the firm value (measured by TobinQ) and only one independent variable (combined ESG score) is included. Whereas, Model (2) also includes the cost of capital (CoC) as an independent variable along with ESG, and in Model (3) other control variables are included. The coefficients for ESG are -0.010, -0.011, and -0.013 respectively. The results are aligned with Baird et al. (2012), Landi and Sciarelli (2019) and Duque-Grisales and Aguilera-Caracuel (2021). The results show that ESG is negatively associated with firm value even after controlling for other variables. The negative coefficient suggests that higher ESG ratings may be associated with lower market valuations, potentially

reflecting investor skepticism regarding the immediate financial benefits of robust ESG practices. This may imply that the costs associated with implementing high ESG standards might outweigh the perceived value in the eyes of investors. Moser and Martin (2012) argued that many firms believe that being a good corporate citizen is most important even when it decrease the benefits of shareholders. Additionally, shareholders also concern about CSR action even at the cost of financial benefits (Mackey, Mackey, & Barney, 2007).

Similarly, the negative impact of the cost of capital (-0.022, -0.015) on firm value suggests that companies facing higher financing costs may struggle to maintain profitability, further emphasizing the importance of cost management in driving shareholder value. The results are aligned with the study of Dhaliwal et al. (2014). Conversely, the results show a positive relationship between firm size and firm value similar to one of the findings of Melinda and Wardhani (2020). The positive coefficient for firm size (Size) indicates that larger companies tend to be valued more favorably, likely due to economies of scale. Also, the growth rate (GR) positively impacts the firm valuation. The significant negative relationship with leverage (Lev) highlights the risk associated with high debt. Furthermore, the negative coefficient for capital expenditure (Capex) indicates that excessive investments without corresponding returns could lead to diminished market valuations. The control variable results align with the findings of Nguyen, Rahman, and Zhao (2018).

Table 4: Fixed Effect Panel Regression

Table 4 represents the coefficients and standard error for the fixed effect panel regression from 2010 to 2024 for the publicly listed companies in selected European countries. This study includes the variables that explain the relationship among firm value (TobinQ), the combined effect of ESG (ESG), cost of capital (CoC), size (Size), capital expenditure (capex), GR (growth rate), and leverage (Lev).

	(1)	(2)	(3)
	TobinQ	TobinQ	TobinQ
ESG	-.010***	-.011***	-.013***
	(.002)	(.002)	(.002)
CoC		-.022***	-.015***
		(.007)	(.004)
Lev			-.180***
			(.018)
Size			.024***
			(.002)
GR			.006***
			(.001)

Capex			-.118***
			(.013)
C	1.049***	1.049***	.794***
	(.007)	(.007)	(.049)
Obs	18275	18275	18022
Adj R-squ	.011	.013	.220
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes

Robust standard errors are in parentheses

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

In addition to this, H1 is further examined by analyzing the impact of sub-components of ESG on firm value. The study distinguish the unique effects of Environmental (Env), Social (Soc), and Governance (Gov) factors on firm value. While sustainability is often considered as a combined concept, prior studies also argued suggests that each dimension may have distinct impact on financial performance. Analyzing them separately provides a more granular understanding of how different aspects of corporate sustainability impact firm value. Additionally, it allows for identifying whether certain sustainability dimensions have a stronger or weaker effect, which is critical for investment and policy decisions. Table 5 shows the results of the Environmental factor (Env), Social factor (Soc), and Governance factor (Gov) on firm value. In Panel A, the environmental factor (Env) shows a significant negative coefficient across all three models, indicating that higher environmental concerns or lower environmental scores are associated with reduced firm value. One possible explanation is that higher environmental risks (e.g., carbon emissions, regulatory fines, and poor sustainability practices) may lead to increased costs and reduced profitability, thereby negatively impacting firm valuation. These findings reinforce the importance of environmental responsibility in corporate financial performance, as firms failing to meet environmental standards may face higher regulatory risks. Panel B shows the results of social factor (Soc) which also exhibits a significantly negative coefficient in all models. The CoC continues to show a significant negative effect, reaffirming its impact on firm value. In Panel C, the governance factor (Gov) presents a significant negative coefficient across all models, indicating that poor governance ratings correlate with reduced firm value, similar to the findings for environmental and social factors. Weak governance structures (i.e. ineffective boards, lack of transparency, or unethical business practices) can increase investor uncertainty and financial mismanagement which leads to decrease in firm performance.

In the results of all the panels of Table 4, the impacts of CoC and other control variables remain the same. The cost of capital (CoC) also demonstrates a negative relationship suggesting that higher CoC negatively impacts firm valuation. The leverage also has a negative coefficient which shows that that higher debt levels are detrimental to perceived firm value. Firm size (Size) and growth rate (GR) have a positive and significant effect, contributing positively to firm value. Conversely, capital expenditure (Capex) has a significant negative relationship with Tobin's Q. The results for the sub-components are similar to the findings of Duque-Grisales and Aguilera-Caracuel (2021)

Table 5: Fixed Effect Panel Regression -Subcomponents of ESG

Table 5 represents the coefficients and standard error for the fixed effect panel regression from 2010 to 2024 for the publicly listed companies in selected European countries. This study includes the variables that explain the relationship among firm value (TobinQ), Environmental factor (Env), Social factor (Soc), Governance factor (Gov), cost of capital (CoC), size (Size), capital expenditure (capex), GR (growth rate), and leverage (Lev).

PANEL A

	(1) TobinQ	(2) TobinQ	(3) TobinQ
Env	-.006***	-.006***	-.005***
	(.001)	(.001)	(.001)
CoC		-.021***	-.014***
		(.007)	(.004)
Lev			-.191***
			(.018)
Size			.024***
			(.002)
GR			.006***
			(.001)
Capex			-.128***
			(.014)
C	1.029***	1.029***	.786***
	(.004)	(.004)	(.051)
Obs	17315	17315	17120
Adj R-squ	.009	.011	.234
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

PANEL B

	(1) TobinQ	(2) TobinQ	(3) TobinQ
Soc	-.007***	-.006***	-.006***
	(.001)	(.001)	(.001)
CoC		-.024***	-.016***
		(.008)	(.005)
Lev			-.183***
			(.018)
Size			.024***
			(.002)
GR			.006***
			(.001)

Capex			-.128***
			(.013)
C	1.031***	1.031***	.791***
	(.005)	(.005)	(.049)
Obs	18273	18273	18020
Adj R-squ	.006	.008	.216
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

PANEL C

	(1) TobinQ	(2) TobinQ	(3) TobinQ
Gov	-.01***	-.009***	-.009***
	(.001)	(.001)	(.001)
CoC		-.023***	-.016***
		(.008)	(.005)
Lev			-.18***
			(.018)
Size			.024***
			(.002)
GR			.006***
			(.001)
Capex			-.123***
			(.013)
C	1.042***	1.042***	.794***
	(.005)	(.005)	(.049)
Obs	18275	18275	18022
Adj R-squ	.013	.015	.223
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Further, to analyze the relationship among the variables of this study, we analyzed each region to determine whether the relationship varied. Table 6 shows the results of fixed effect regression for the regions of Europe.

In Northern Europe, the fixed effects regression results reveal a significant negative relationship between ESG scores and Tobin's Q, with coefficients ranging from -0.012 to -0.013. This suggests that higher ESG scores may reflect concerns about costs that could impact firm value. Moreover, the cost of capital (CoC) negatively affects Tobin's Q, indicating that higher financing costs hinder firm value, as seen in coefficients of -0.023 and -0.016. Leverage also shows a strong negative impact, with a coefficient of -0.162, further emphasizing that firms with higher debt levels may face reduced firm valuation due to potential financial distress. Conversely, firm size positively correlates with Tobin's Q, showing that larger firms tend to be perceived as more valuable. Overall,

the results for Northern Europe indicate that while ESG considerations are important, they may have a detrimental effect on perceived firm value in this region.

In Southern Europe, the analysis shows a lack of a significant relationship between ESG scores and Tobin's Q, with coefficients -0.003, suggesting that ESG factors may not significantly influence investor perceptions of firm value in this region. The cost of capital presents a mixed effect, with coefficients fluctuating and not reaching statistical significance. However, leverage does exhibit a negative relationship with Tobin's Q at -0.281, indicating that firms with higher debt levels face a considerable decline in value. Size shows a positive relationship with Tobin's Q, with a coefficient of 0.019, highlighting the importance of firm size in this market.

The results for Eastern Europe demonstrate a significant negative relationship between ESG scores and Tobin's Q with coefficients of -0.017, -0.019, and -0.013 respectively. This indicates that higher ESG scores correlate with lower firm value, suggesting that investors may associate these scores with additional costs of ESG activities. Additionally, the cost of capital shows a significant relationship with Tobin's Q. Leverage maintains a negative correlation, with a coefficient of -0.132, further emphasizing the adverse effects of high debt on firm value. Size continues to exhibit a positive impact on Tobin's Q.

Similarly, in Western Europe, there is a consistent negative relationship between ESG scores and Tobin's Q. The cost of capital presents a negative relationship with Tobin's Q as well, with a coefficient of -0.022, suggesting that higher financing costs negatively impact firm valuation. Leverage is significantly negative across the models. Furthermore, firm size has a positive impact on Tobin's Q, with a coefficient of 0.026, affirming that larger firms are generally favored in terms of valuation.

The comparison of fixed effects regression results across the four European regions reveals distinct patterns in how ESG scores and other financial variables influence firm value, as measured by Tobin's Q. In Northern and Eastern Europe, higher ESG scores correlate negatively with Tobin's Q. This negative relationship is less pronounced in Southern Europe, where ESG scores appear to have minimal impact on firm valuation. In contrast, Western Europe demonstrates a consistent negative association between ESG scores and Tobin's Q, similar to Northern and Eastern Europe. Additionally, leverage consistently shows a significant negative relationship with Tobin's Q across all regions, emphasizing the detrimental effect of high debt levels on perceived firm value. Firm

size positively influences Tobin's Q in all regions, indicating that larger firms are generally perceived as more valuable.

Table 6: Fixed Effect Panel Regression-Regions

Table 6 represents the coefficients and standard error for the fixed effect panel regression from 2010 to 2024 for the publicly listed companies in selected European countries in different regions. This study includes the variables that explain the relationship among firm value (TobinQ), the combined effect of ESG (ESG), cost of capital (CoC), size (Size), capital expenditure (capex), GR (growth rate), and leverage (Lev).

	Northern			**Southern**			**Eastern**			**Western**		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ
ESG	-.012***	-.013***	-.010***	-.003	-.003	-.005	-.017***	-.019***	-.013***	-.012***	-.012***	-.011***
	(.003)	(.003)	(.003)	(.005)	(.005)	(.004)	(.005)	(.005)	(.004)	(.002)	(.002)	(.002)
CoC		-.023***	-.016***		.039	.065		.078**	.030*		-.057*	-.029*
		(.008)	(.005)		(.047)	(.047)		(.037)	(.035)		(.036)	(.039)
Lev			-.162***			-.281***			-.132**			-.188***
			(.024)			(.068)			(.062)			(.03)
Size			.026***			.027***			.021***			.019***
			(.003)			(.004)			(.006)			(.004)
GR			.004*			.004			.006*			.01***
			(.002)			(.004)			(.005)			(.002)
Capex			-.143***			-.125***			-.131***			-.08***
			(.02)			(.04)			(.041)			(.022)
C	1.06***	1.06***	.757***	.993***	.992***	.79***	1.058***	1.056***	.808***	1.05***	1.052***	.863***
	(.011)	(.011)	(.064)	(.019)	(.02)	(.087)	(.018)	(.018)	(.152)	(.009)	(.009)	(.101)
Obs	8595	8595	8418	2123	2123	2115	980	980	972	6577	6577	6517
Adj R-squ	.010	.014	.245	.001	.002	.211	.058	.066	.26	.016	.018	.193
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Furthermore, fixed effect regression analysis is also performed for the subcomponents of ESG in all the regions. Table 7 presents the results for Env, Soc, and Gov components along with other control variables. Similar to the finding of ESG, the Environmental factor has a negative relationship with firm value but interestingly it is also significant in the Southern region. In the Southern region, the environmental factor displays a slight positive relationship in the models, suggesting that environmental considerations may not adversely affect firm value as much as in the Northern region. However, the significance of these coefficients is weaker compared to the Northern region, with CoC showing a marginally positive coefficient in the first model. The significance of leverage and size remains consistent, with leverage negatively impacting firm value

and size positively correlated with Tobin's Q. In the Eastern region, the environmental factor maintains a negative correlation with Tobin's Q, similar to the Northern region. The CoC shows a positive coefficient in one model, indicating a unique regional characteristic where firms may face varying capital costs. The negative impact of leverage is consistent, reinforcing the trend observed in other regions.

The results for Western Europe demonstrate the most pronounced negative impact of environmental factors on firm value, with consistent negative coefficients across all models. CoC and leverage also follow the trend of negatively affecting firm value, while size retains a positive relationship, suggesting that larger firms tend to have higher valuations.

Panel B shows the results of social factor in all the regions. In the Northern region, the social factor exhibits a significant negative effect on TobinQ across all models with coefficients -0.007, -0.006, and -0.007 respectively. The cost of capital also shows a strong negative impact in models (2) and (3), suggesting that increased capital costs can significantly affect firm value. Leverage also show negative relationship with TobinQ, reinforcing the notion that higher debt levels negatively influence firm value. Size and growth rate have positive coefficients, suggesting that larger firms and those experiencing growth tend to have higher valuations. Capital expenditure consistently shows a significant negative impact, indicating that increased capital spending may not necessarily translate to higher firm valuations in this region.

In the Southern region, the social factor shows a non-significant impact on TobinQ, suggesting that social concerns may not affect firm value as significantly as in the Northern region. The cost of capital presents a marginally positive coefficient in the Model (1) but is not significant, indicating a less pronounced relationship compared to other regions. Leverage continues to demonstrate a negative relationship with TobinQ, consistent with the trend observed in the Northern region. Size remains positively correlated with firm value, and capital expenditure exhibits a significant negative relationship, reinforcing the findings from the Northern region. The results of the Eastern region are mostly similar to the Northern region, with a significant negative effect of the social factor on TobinQ. In contrast, the cost of capital shows a slight positive relationship in the Model (1), but this effect is not consistent across the other models. In the Western region, the social factor consistently shows a significant negative relationship with TobinQ, echoing the trends observed in the Northern and Eastern regions.

Panel C of Table 6 show the results of governance factor in all the regions. The results in the Northern region show that the governance factor has a significant negative relationship with Tobin's Q across all three models, with coefficients of -0.015, -0.012, and -0.008 respectively. The negative effect is consistent even when controlling for other variables such as cost of capital (CoC) and leverage (Lev), which also show significant negative relationships with Tobin's Q. In the Southern region, the governance factor remains statistically significant with coefficients of -0.010, -0.007, and -0.009. Similar to the Northern region, these results imply that governance issues negatively impact firm value, albeit the coefficients are slightly lower in magnitude. This suggests that while governance remains important, its influence on firm value may vary by region. Similarly in the Eastern region, the governance factor shows significant negative effects as well, with coefficients of -0.007, -0.008, and -0.005. Additionally, other variables such as cost of capital and leverage continue to exhibit significant relationships, further emphasizing the interplay between governance and financial performance. The Western region results also indicate that governance has a consistent negative effect on Tobin's Q, with coefficients of -0.010, -0.011, and -0.012.

Table 7: Fixed Effect Panel Regression- Sub-components across the Regions

Table 7 represents the coefficients and standard error for the fixed effect panel regression from 2010 to 2024 for the publicly listed companies in selected European countries in different regions. This study includes the variables that explain the relationship among firm value (TobinQ), Environmental factor (Env), Social factor (Soc), Governance factor (Gov), cost of capital (CoC), size (Size), capital expenditure (capex), GR (growth rate), and leverage (Lev).

PANEL A

	Northern			**Southern**			**Eastern**			**Western**		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ
Env	-.009***	-.008***	-.007***	.002**	.003**	.015**	-.009***	-.01***	-.007***	-.003***	-.004***	-.004***
	(.002)	(.002)	(.001)	(.001)	(.005)	(.002)	(.002)	(.002)	(.002)	(.001)	(.001)	(.001)
CoC		-.022***	-.015***		.029*	.055		.063*	.017		-.037	-.002
		(.008)	(.005)		(.047)	(.048)		(.037)	(.036)		(.035)	(.038)
Lev			-.173***			-.277***			-.151***			-.212***
			(.025)			(.073)			(.055)			(.029)
Size			.026***			.027***			.019***			.02***
			(.003)			(.004)			(.006)			(.004)
GR			.004**			.004			.005			.01***
			(.002)			(.004)			(.005)			(.002)
Capex			-.146***			-.147***			-.124***			-.095***
			(.021)			(.042)			(.034)			(.022)
C	1.045***	1.045***	.753***	.977***	.976***	.776***	1.025***	1.022***	.833***	1.02***	1.021***	.845***
	(.006)	(.006)	(.068)	(.02)	(.02)	(.094)	(.008)	(.009)	(.15)	(.005)	(.005)	(.105)
Obs	8147	8147	8004	2034	2034	2027	939	939	932	6195	6195	6157
Adj R-squ	.013	.017	.248	0	.001	.223	.053	.058	.246	.006	.007	.232
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

PANEL B
PANEL C

	Northern			Southern			Eastern			Western		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ
Soc	-.007***	-.006**	-.007**	-.001	-.002	-.001	-.013***	-.013***	-.009***	-.006***	-.005***	-.005***
	(.003)	(.003)	(.003)	(.004)	(.004)	(.004)	(.003)	(.003)	(.002)	(.002)	(.002)	(.001)
CoC		-.024***	-.016***		.037	.061		.079**	.032		-.064*	-.036
		(.009)	(.006)		(.047)	(.047)		(.036)	(.036)		(.037)	(.04)
Lev			-.163***			-.28***			-.131**			-.197***
			(.024)			(.068)			(.063)			(.03)
Size			.026***			.026***			.02***			.019***
			(.003)			(.004)			(.006)			(.004)
GR			.004*			.004			.005			.01***
			(.002)			(.004)			(.005)			(.002)
Capex			-.151***			-.135***			-.136***			-.092***
			(.019)			(.041)			(.041)			(.022)
C	1.04***	1.041***	.752***	.987***	.985***	.787***	1.039***	1.035***	.814***	1.026***	1.029***	.863***
	(.01)	(.009)	(.064)	(.017)	(.017)	(.087)	(.01)	(.01)	(.154)	(.006)	(.007)	(.102)
Obs	8594	8594	8417	2123	2123	2115	980	980	972	6576	6576	6516
Adj R-squ	.004	.008	.243	0	.001	.209	.083	.091	.275	.006	.008	.184
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

	Northern			**Southern**			**Eastern**			**Western**		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ
Gov	-.015***	-.012***	-.008***	-.010*	-.007*	-.009**	-.007**	-.008**	-.005*	-.010***	-.011***	-.012***
	(.002)	(.002)	(.002)	(.004)	(.004)	(.004)	(.004)	(.004)	(.003)	(.002)	(.001)	(.002)
CoC		-.023***	-.016***		.041	.066		.044	.003		-.058*	-.029
		(.009)	(.005)		(.048)	(.048)		(.038)	(.037)		(.035)	(.038)
Lev			-.161***			-.282***			-.156**			-.188***
			(.024)			(.068)			(.064)			(.03)
Size			.026***			.027***			.022***			.019***
			(.003)			(.004)			(.006)			(.004)
GR			.003*			.003			.006			.01***
			(.002)			(.004)			(.006)			(.002)
Capex			-.147***			-.125***			-.149***			-.088***
			(.019)			(.04)			(.038)			(.021)
C	1.052***	1.053***	.754***	1.007***	1.005***	.800***	1.022***	1.020***	.810***	1.041***	1.044***	.863***
	(.008)	(.008)	(.064)	(.016)	(.016)	(.087)	(.014)	(.014)	(.155)	(.008)	(.008)	(.101)
Observations	8595	8595	8418	2123	2123	2115	980	980	972	6577	6577	6517
Adj R-squ	.013	.017	.247	.006	.007	.219	.009	.012	.237	.017	.019	.195
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

To examine H2 regarding the bi-directional causality of firm value and ESG, this study followed one of the suggested methodologies (multivariate panel regression) of Jha and Rangarajan (2020) and Velte (2019). As earlier the relationship is analyzed by using TobinQ as a dependent variable, now ESG and sub-components are used as a dependent variable. Table 8 shows the results of fixed effect panel regression to examine the bi-directional relationship. Panel A includes ESG as an independent variable whereas, Panel B, Panel C, and Panel D include sub-components as an independent variable. The results depict that there is a significantly negative relationship between ESG and its components with TobinQ but the adjusted R-square is very low which shows that only a very small variation in ESG is caused by firm value. The results show that firm with higher value does not necessarily spend more on ESG investment as an aggregate or individual component 'E,' 'S,' and 'G,' however higher firm value can only be achieved with strategic investments in the long run only. The consistently negative coefficients for TobinQ in the models imply that companies with higher valuations might not be giving as much importance to ESG initiatives as compared to those with lower valuations. This observation can be understood in a few different ways: it might mean that investors are not factoring ESG considerations into their evaluations of companies, or it could indicate that firms concentrating on growth and short-term profits might overlook sustainability efforts. Behl et al. (2022) and Jha and Rangarajan (2020) also analyzed the bi-directional relationship and found insignificant results in the context of India.

The bidirectional negative relationship between firm value and ESG suggests a reinforcing cycle, where firms that prioritize financial performance tend to underinvest in sustainability, while lower ESG engagement is associated with declining firm value. The significant negative coefficient while analyzing impact of firm value on ESG indicates that firms having higher value may not prioritize ESG initiatives, likely due to a focus on short-term profitability rather than long-term sustainability investments. Conversely, the negative relationship in the ESG to firm value direction implies that firms investing in ESG may experience reduced firm value, possibly due to the perception of ESG as an additional cost. It suggests that the market may not yet fully reward ESG efforts or that ESG benefits materialize over the long term. These findings highlight a potential market inefficiency where firms struggle to balance financial returns and sustainability commitments.

Table 8: Fixed Effect Panel Regression- ESG

Table 8 represents the coefficients and standard error for the fixed effect panel regression from 2010 to 2024 for the publicly listed companies in selected European countries in different regions. This study includes the variables that explain the relationship among firm value (TobinQ), Environmental factor (Env), Social factor (Soc), Governance factor (Gov), ESG rating (ESG), cost of capital (CoC), size (Size), capital expenditure (capex), GR (growth rate), and leverage (Lev).

PANEL A

	(1) ESG	(2) ESG	(3) ESG
TobinQ	-.081***	-.078***	-.139***
	(.012)	(.012)	(.015)
CoC		.269	.232
		(.196)	(.162)
Lev			.344**
			(.171)
Size			.094***
			(.012)
GR			-.003
			(.016)
Capex			1.74***
			(.128)
C	3.799***	3.78***	-.014
	(.002)	(.014)	(.309)
Obs	18038	18038	17779
Adj R-squ	.01	.014	.1
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

PANEL B

	(1) Env	(2) Env	(3) Env
TobinQ	-.116***	-.111***	-.183***
	(.019)	(.02)	(.023)
CoC		.447	.399*
		(.272)	(.228)
Lev			.516*
			(.282)
Size			.114***
			(.017)
GR			.006
			(.022)
Capex			2.132***
			(.184)
C	3.726***	3.694***	-1.027**
	(.003)	(.02)	(.461)
Obs	17079	17079	16881

Adj R-squ	.008	.012	.062
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

PANEL C

	(1) Soc	(2) Soc	(3) Soc
TobinQ	-.074***	-.071***	-.131***
	(.018)	(.018)	(.021)
CoC		.266	.232
		(.197)	(.165)
Lev			.258
			(.219)
Size			.091***
			(.018)
GR			-.034
			(.021)
Capex			1.598***
			(.163)
C	3.842***	3.823***	.303
	(.003)	(.015)	(.441)
Obs	18036	18036	17777
Adj R-squ	.005	.008	.056
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

PANEL D

	(1) Gov	(2) Gov	(3) Gov
TobinQ	-.102***	-.099***	-.174***
	(.014)	(.014)	(.017)
CoC		.243	.219
		(.192)	(.167)
Lev			.406**
			(.192)
Size			.112***
			(.012)
GR			-.018
			(.022)
Capex			1.35***
			(.144)
C	3.783***	3.766***	-.136
	(.002)	(.014)	(.315)
Obs	18038	18038	17779
Adj R-squ	.01	.012	.058

Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

To examine H3 "there is a relationship between ESG and cost of capital and ESG rating has an impact on the cost of capital", this study analyzed regression where cost is capital is considered as a dependent variable. The results are mentioned in Table 9 where ESG and its components are analyzed along with other variables. The results of Table 8 (Panel A) indicate the positive coefficients of ESG in Model 1 to Model 3 which show that firms with higher ESG practices have costs of capital. Although the adjusted R-square is very low to consider the variability depending on ESG. The results are consistent with the findings of Nazir et al. (2022) and it suggests that investors might view ESG initiatives as an extra financial burden rather than a value-enhancing factor. Additionally, from the low adjusted R-square it can be predicted that ESG may not be considered as an important factor for determining cost of capital. Conversely, the negative coefficients for TobinQ show that firms with greater valuations benefit from reduced costs of capital due to investor confidence in their future profitability. The negative relationship between leverage and cost of capital implies that firms' debt financing can effectively lower the cost of capital mainly because of tax advantage. Size and growth rate has no impact on the cost of capital, as shown in the results. Moreover, the positive coefficient for Capex signifies that firms investing more in capital expenditures may incur a higher WACC, reflecting the costs associated with expansion efforts. Similarly, the results are positively significant for Env, Soc, and Gov factors as shown in Panel B, Panel C, and Panel D respectively.

Table 9: Fixed Effect Panel Regression-Cost of Capital

Table 9 represents the coefficients and standard error for the fixed effect panel regression from 2010 to 2024 for the publicly listed companies in selected European countries. This study includes the variables that explain the relationship among firm value (TobinQ), Environmental factor (Env), Social factor (Soc), Governance factor (Gov), ESG rating (ESG), cost of capital (CoC), size (Size), capital expenditure (capex), GR (growth rate), and leverage (Lev).

PANEL A

	(1) CoC	(2) CoC	(3) CoC
ESG	.016***	.015***	.015***
	(.003)	(.003)	(.003)
TobinQ		-.008***	-.006***
		(.002)	(.002)
Lev			-.065***
			(.014)
Size			-.004
			(.003)
GR			0

			(.002)
Capex			.062***
			(.013)
C	.009	.013	.111***
	(.01)	(.01)	(.041)
Obs	18327	18038	17779
Adj R-squ	.005	.006	.009
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

PANEL B

	(1) CoC	(2) CoC	(3) CoC
Env	.011***	.011***	.01***
	(.003)	(.003)	(.003)
TobinQ		-.009***	-.006***
		(.002)	(.002)
Lev			-.069***
			(.015)
Size			-.004
			(.003)
GR			0
			(.002)
Capex			.072***
			(.013)
C	.028**	.031***	.13***
	(.011)	(.011)	(.047)
Obs	17358	17079	16881
Adj R-squ	.006	.007	.009
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

PANEL C

	(1) CoC	(2) CoC	(3) CoC
Soc	.01***	.01***	.009***
	(.002)	(.002)	(.002)
TobinQ		-.009***	-.007***
		(.002)	(.001)
Lev			-.062***
			(.014)
Size			-.004
			(.003)
GR			.001
			(.002)
Capex			.073***
			(.015)
C	.03***	.034***	.109***
	(.007)	(.006)	(.041)
Obs	18325	18036	17777
Adj R-squared	.003	.005	.007
Year fixed effects	Yes	Yes	Yes

Industry fixed effects	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

PANEL D

	(1) CoC	(2) CoC	(3) CoC
Gov	.009***	.009***	.008***
	(.001)	(.001)	(.001)
TobinQ		-.009***	-.007***
		(.002)	(.001)
Lev			-.063***
			(.014)
Size			-.004
			(.003)
GR			0
			(.002)
Capex			.076***
			(.015)
C	.035***	.039***	.113***
	(.004)	(.004)	(.041)
Obs	18327	18038	17779
Adj R-squ	.003	.004	.007
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

As the Non-Financial Reporting Directive (NFRD) was adopted by the European Union in 2014, and companies were required to start implementing its provisions for financial years beginning on or after January 1, 2017. Furthermore, NFRD was revised into the Corporate Sustainability Reporting Directive (CSRD) which expand the scope of sustainability reporting requirements. The CSRD was proposed in April 2021 and is expected to come into effect in 2024. Based on this, the sub-sample analysis is performed to analyze the impact of EU regulations, and the sub-sample is divided into the period before NFRD (2010-2016), after the implementation of NFRD, and before the proposal of CSRD (2017-2020) and after discussion of CSRD (2021-2024).

The results in Table 10 illustrate the relationship between Tobin's Q and various independent variables across sub-samples: 2010-2016, 2017-2020, and 2021-2024. During the period before introduction of NFRD (2010-2016), the coefficient for ESG is positive but not statistically significant. It shows that ESG initiatives do not have a notable impact on firm value. Contrary to this, the coefficients for ESG are significantly negative during 2017-2020 (after introducing NFRD). It shows that higher ESG scores are associated with lower Tobin's Q values and it could be because of higher costs for ESG activities. This result is consistent with our previous finding.

This trend continues into the 2021-2024 period (after discussion of CSRD)[2], where the negative relationship persists and is statistically significant. The findings imply that firms may not prioritize ESG initiatives in a way that enhances their market valuations or the cost associated with these initiatives outweigh the benefit in terms of firm value.

Table 10: Fixed Effect Panel Regression- Sub-sample Analysis

Table 10 represents the coefficients and standard error for the fixed effect panel regression from 2010 to 2024 for the publicly listed companies in selected European countries. This study includes the variables that explain the relationship among firm value (TobinQ), ESG rating (ESG), cost of capital (CoC), size (Size), capital expenditure (Capex), GR (growth rate), and leverage (Lev).

	2010-2016			**2017-2020**			**2021-2024**		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ
ESG	.002	.002	0.000	-.011***	-.011***	-.01***	-.017***	-.017***	-.01***
	(.003)	(.003)	(.003)	(.003)	(.003)	(.002)	(.003)	(.003)	(.003)
CoC		-.166***	-.103*		-.022	-.036		-.013**	-.01***
		(.056)	(.055)		(.036)	(.026)		(.006)	(.003)
Lev			-.219***			-.155***			-.164***
			(.038)			(.019)			(.053)
Size			.022***			.027***			.02***
			(.004)			(.004)			(.004)
GR			.007***			.007***			.008***
			(.002)			(.002)			(.003)
Capex			-.112***			-.039**			-.155***
			(.042)			(.019)			(.03)
C	.996***	1.007***	.812***	1.05***	1.051***	.625***	1.071***	1.071***	.893***
	(.011)	(.012)	(.113)	(.012)	(.012)	(.088)	(.01)	(.01)	(.119)
Obs	5006	5006	4938	4546	4546	4476	8723	8723	8608
Adj R-squared	0.001	.005	.253	.120	.13	.316	.120	.130	.129
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

[2] As the implementation of CSRD starts in 2025 for the financial year 2024, there is unavailability of data for this particular time period. Therefore, this study analyzed the impact based on discussion date.

Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

3.7 Robustness Tests

To analyze the robustness of results, this thesis employed quantile regression and different proxies for firm value.

3.7.1 Quantile Regression

The quantile regression model suggested by Koenker & Bassett (1978) is employed to analyze the effects of explanatory variables on firm value in different quantiles. It helps in analyzing the impact of each variable by looking at the sign of the coefficient across the distribution. The results of quantile regression are shown in Table 11. The results show that ESG, Env, and Soc have a positive relationship with TobinQ in q(10) whereas Gov, GR, and Coc are insignificant. The other variables of the study as Lev, Size, and Capex show a significantly positive relationship with TobinQ.

The environmental factor consistently shows a negative impact on firm value in all quantiles negative. The social factor (Soc) shows mixed results, with positive coefficients in q10 and q25, but negative in the higher quantiles. Governance (Gov) factors appear to have a more variable impact, showing no significant effect in some quantiles while being statistically significant in others. The impact of ESG and Soc varies in q(25) and becomes insignificant. The results in q(50) are mixed for all the factors in various models but contrary to the above the explanatory variables show a significant impact in higher quantiles (q75 and q90). The findings in higher quantiles are similar to the results of fixed effect panel regression for ESG, sub-components, and other explanatory variables. The findings for quantile regression are aligned with the study Wu and Chang (2022) in such a way that the relationship varies across the quantile. In contrast to their findings, the results of this study show opposite signs.

Table 11: Quantile Regression

Table 11 represents the coefficients and t-statistics for the fixed effect panel regression from 2010 to 2024 for the publicly listed companies in selected European countries in different regions. This study includes the variables that explain the relationship among firm value (TobinQ), Environmental factor (Env), Social factor (Soc), Governance factor (Gov), ESG rating (ESG), cost of capital (CoC), size (Size), capital expenditure (capex), GR (growth rate), and leverage (Lev).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ
q10												
ESG	0.006**				0.006***				0.006***			
	(2.84)				(4.85)				(3.92)			
Env		-0.002**				-0.001				-0.005***		
		(-2.60)				(-1.26)				(-6.46)		
Soc			0.004**				0.004**				0.003*	
			(3.09)				(3.16)				(1.98)	
Gov				0.001				0.001				-0.002
				(0.97)				(1.11)				(-1.73)
CoC					0.085	0.076	0.089	0.081	0.026	0.033	0.031	0.043
					(1.10)	(1.14)	(1.55)	(1.15)	(0.49)	(0.55)	(0.47)	(0.60)
Lev									-0.323***	-0.304***	-0.315***	-0.302***
									(-17.40)	(-19.60)	(-17.42)	(-15.65)
Size									0.006***	0.008***	0.007***	0.008***
									(11.49)	(23.19)	(8.66)	(14.31)
GR									0.003	0.003	0.004	0.005
									(0.71)	(1.46)	(1.04)	(1.02)
Capex									-0.092***	-0.082***	-0.091***	-0.085***
									(-8.28)	(-7.41)	(-9.96)	(-8.97)
C	0.922***	0.952***	0.930***	0.941***	0.915***	0.946***	0.925***	0.936***	1.159***	1.139***	1.159***	1.142***
	(108.63)	(320.77)	(187.62)	(235.73)	(112.16)	(140.44)	(137.29)	(164.23)	(53.66)	(57.09)	(50.82)	(45.89)
q25												
ESG	0.001				-0.001				-0.001			
	(0.18)				(-0.09)				(-0.16)			
Env		-0.005***				-0.004***				-0.007***		
		(-9.53)				(-7.60)				(-10.42)		

Soc			0.004				0.005				-0.012	
			(0.83)				(0.89)				(-0.14)	
Gov				-0.000792				-0.001				-0.031***
				(-1.15)				(-1.91)				(-5.17)
CoC					0.111*	0.094*	0.112**	0.116*	0.038	0.042	0.038	0.042
					(2.03)	(2.17)	(3.03)	(2.36)	(0.97)	(0.98)	(0.84)	(0.84)
Lev									-0.285***	-0.273***	-0.284***	-0.280***
									(-25.51)	(-31.30)	(-31.02)	(-25.84)
Size									0.007***	0.008***	0.007***	0.008***
									(27.32)	(39.79)	(25.64)	(25.46)
GR												
									0.009***	0.010***	0.011***	0.009**
Capex									(3.87)	(3.69)	(3.75)	(3.12)
									-0.098***	-0.095***	-0.091***	-0.098***
C	0.974***	0.991***	0.972***	0.977***	0.967***	0.985***	0.965***	0.972***	1.156***	1.141***	1.155***	1.155***
	(273.98)	(505.96)	(399.09)	(380.02)	(168.23)	(263.17)	(275.18)	(277.49)	(92.13)	(109.74)	(94.58)	(78.43)
q50												
ESG	0.003				0.004				-0.003***			
	(0.47)				(0.54)				(-3.47)			
Env		-0.008***				-0.007***				-0.009***		
		(-10.02)				(-11.03)				(-13.94)		
Soc			-0.002				-0.033				-0.002**	
			(-0.43)				(-0.43)				(-3.03)	
Gov				0.001**				0.001				-0.003***
				(2.77)				(1.82)				(-3.44)
CoC					0.133***	0.137**	0.135***	0.133***	0.080**	0.079*	0.077*	0.088
					(3.47)	(3.25)	(3.88)	(3.47)	(2.67)	(2.42)	(2.46)	(1.90)
Lev									-0.306***	-0.307***	-0.305***	-0.304***
									(-26.32)	(-49.23)	(-32.18)	(-30.46)
Size									0.010***	0.0113***	0.001***	0.001***
									(33.40)	(50.67)	(24.19)	(28.59)
GR									0.017***	0.015***	0.017***	0.017***
									(4.37)	(5.23)	(4.42)	(5.55)

Capex									-0.178***	-0.164***	-0.180***	-0.180***
									(-25.78)	(-19.53)	(-27.25)	(-31.44)
C	1.001***	1.028***	1.003***	0.998***	0.991***	1.019***	0.994***	0.989***	1.229***	1.207***	1.227***	1.228***
	(338.82)	(362.14)	(447.14)	(628.32)	(250.44)	(291.79)	(267.16)	(344.22)	(99.02)	(143.50)	(95.26)	(91.78)
q75												
ESG	-0.096***				-0.095***				-0.098***			
	(-7.26)				(-8.44)				(-8.68)			
Env		-0.012***				-0.014***				-0.013***		
		(-20.60)				(-18.22)				(-14.37)		
Soc			-0.008***				-0.007***				-0.0078***	
			(-8.83)				(-10.61)				(-8.10)	
Gov				-0.005***				-0.006***				-0.004***
				(-4.90)				(-5.63)				(-6.14)
CoC					0.134***	0.134***	0.128***	0.144***	0.126***	0.134***	0.118***	0.125***
					(5.86)	(3.73)	(4.19)	(4.75)	(5.84)	(4.07)	(5.27)	(3.81)
Lev									-0.328***	-0.312***	-0.332***	-0.332***
									(-31.39)	(-28.62)	(-23.03)	(-35.60)
Size									0.010***	0.012***	0.010***	0.009***
									(28.41)	(34.31)	(25.50)	(27.27)
GR									0.0210***	0.028***	0.028***	0.032***
									(4.90)	(6.48)	(4.45)	(5.50)
Capex									-0.233***	-0.223***	-0.233***	-0.240***
									(-36.33)	(-22.48)	(-32.32)	(-29.34)
C	1.073***	1.082***	1.069***	1.059***	1.063***	1.072***	1.057***	1.048***	1.337***	1.287***	1.334***	1.343***
	(191.32)	(411.01)	(281.13)	(213.44)	(241.55)	(305.30)	(292.04)	(219.73)	(121.98)	(81.95)	(100.92)	(136.49)
q90												
ESG	-0.025***				-0.024***				-0.024***			
	(-14.11)				(-13.00)				(-10.46)			
Env		-0.018***				-0.017***				-0.021***		
		(-18.18)				(-13.34)				(-23.53)		
Soc			-0.020***				-0.019***				-0.018***	
			(-12.15)				(-11.76)				(-9.83)	
Gov				-0.015***				-0.016***				-0.014***

				(-9.67)				(-7.70)				(-8.13)
CoC					0.130***	0.122*	0.148***	0.158**	0.132***	0.117***	0.121***	0.141***
					(4.50)	(2.52)	(4.35)	(3.21)	(5.26)	(3.35)	(3.42)	(4.39)
Lev									-0.314***	-0.298***	-0.319***	-0.321***
									(-20.00)	(-18.33)	(-17.17)	(-16.36)
Size									0.009***	0.015***	0.009***	0.008***
									(15.73)	(21.05)	(13.35)	(14.06)
GR									0.029***	0.028***	0.034***	0.033***
									(5.07)	(3.57)	(3.92)	(5.07)
Capex									-0.268***	-0.257***	-0.269***	-0.279***
									(-20.51)	(-16.70)	(-19.26)	(-25.21)
C	1.169***	1.138***	1.151***	1.130***	1.154***	1.128***	1.139***	1.123***	1.443***	1.367***	1.441***	1.457***
	(161.36)	(293.39)	(169.40)	(182.42)	(160.11)	(176.34)	(172.88)	(137.25)	(89.27)	(70.91)	(61.67)	(70.20)

t statistics in parentheses

="* p<0.05 ** p<0.01 *** p<0.001"

3.7.2 ROA as a dependent variable

Furthermore, for robustness, this thesis analyzed the impact of ESG on firm value by using ROA as a dependent variable instead of TobinQ. Table 12 depicts the results of fixed effect panel regression. Similar to the results of Table 4, where TobinQ is used as a proxy for firm value, ESG show a significantly negative impact on ROA. Additionally, the results show a positive relationship between firm size and firm value, indicating that larger companies tend to be valued more favorably, likely due to economies of scale. The significant negative relationship with leverage (Lev) highlights the risk associated with high debt. Furthermore, the negative coefficient for capital expenditure (Capex) indicates that excessive investments without corresponding returns could lead to diminished market valuations. Contrary to the results in Table 4, the cost of capital is insignificant in Model (2) while using ROA as a dependent variable.

The analysis is also performed for the sub-components of ESG on ROA and the results are shown in Table 13. The results are almost quantitatively similar to the results for TobinQ as all the factors (Env, Soc, and Gov) show a statistically negative relationship with firm value (ROA) in all the models. The cost of capital shows a negative relationship with ROA in some models which implies that an increase in the cost of capital leads to a decrease in ROA, indicating that higher financing costs can negatively impact operational efficiency. Capex and leverage show a statistically negative impact on ROA whereas growth shows an insignificant impact on firm value.

Table 12: Fixed Effect Panel Regression-ROA

Table 12 represents the coefficients and standard error for the fixed effect panel regression from 2010 to 2024 for the publicly listed companies in selected European countries. This study includes the variables that explain the relationship among firm value (ROA), the combined effect of ESG (ESG), cost of capital (CoC), Size, capital expenditure (capex), GR (growth rate), and leverage (Lev).

	(1) ROA	(2) ROA	(3) ROA
ESG	-.042***	-.043***	-.019***
	(.002)	(.002)	(.002)
CoC		-.029	-.019**
		(.018)	(.01)
Lev			-.017**
			(.018)
Size			0.020*
			(.001)
GR			0.001
			(.001)
Capex			-.699***
			(.017)
C	1.155***	1.156***	1.641***
	(.008)	(.008)	(.024)
Obs	18296	18296	18067
Adj R-squ	.112	.115	.571
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Table 13: Fixed Effect Panel Regression -Subcomponents of ESG

Table 13 represents the coefficients and standard error for the fixed effect panel regression from 2010 to 2024 for the publicly listed companies in selected European countries. This study includes the variables that explain the relationship among firm value (ROA), Environmental factor (Env), Social factor (Soc), Governance factor (Gov), cost of capital (CoC), Size, capital expenditure (capex), GR (growth rate), and leverage (Lev).

	(1) ROA	(2) ROA	(3) ROA	(1) ROA	(2) ROA	(3) ROA	(1) ROA	(2) ROA	(3) ROA
Env	-.021***	-.021***	-.01***						
	(.001)	(.001)	(.001)						
CoC		-.031	-.019*		-.034	-.021*		-.035	-.021*
		(.02)	(.01)		(.021)	(.011)		(.022)	(.011)
Lev			.008			-.013**			-.015*
			(.017)			(.018)			(.018)
Size			0.002**			0.004**			0.005**
			(.001)			(.001)			(.001)
GR			.001			0.001			0.002
			(.01)			(.01)			(.01)
Capex			-.724***			-.715***			-.715***
			(.017)			(.017)			(.017)
Soc				-.027***	-.026***	-.012***			
				(.002)	(.002)	(.001)			
Gov							-.026***	-.026***	-.013***
							(.001)	(.001)	(.001)
C	1.067***	1.068***	1.636***	1.094***	1.095***	1.635***	1.09***	1.091***	1.637***
	(.004)	(.004)	(.024)	(.007)	(.007)	(.024)	(.005)	(.005)	(.024)
Obs	17346	17346	17159	18294	18294	18065	18296	18296	18067
Adj R-squ	.069	.073	.579	.066	.07	.563	.066	.07	.565
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Moreover, to analyze the robustness of results, this thesis also checked for endogeneity problem. Endogeneity refers to a situation in statistical analysis where an explanatory variable is correlated with the error term in a regression model. This correlation can arise for several reasons, such as omitted variable bias, measurement error, or simultaneous causality. When endogeneity is present, it can lead to biased and inconsistent estimates of the model parameters, making it difficult to draw valid conclusions about the relationships between variables. To analyze whether the results of this thesis are influenced because of endogeneity problem or not, we perform two statistical tests by following the methodology of Yu and Xiao (2022) and these are advancing the dependent variable by one period and 2SLS regression.

3.7.3 Advancing the dependent variable by one period

For endogeneity that can be due to reverse causality between ESG and firm value, this study re-estimated the above model (1-3) by using the dependent variable with one period ahead. Table 13 shows the results of fixed effect regression where the dependent variable is one period advance. As shown in Table 14 (Panel A to Panel D), the results are consistent with earlier findings. ESG, Env, Soc, and Gov consistently show a significantly negative impact on firm value. It shows that after controlling for endogeneity issues, the results remain the same. However, the significance level for cost of capital is decreased as compare to the previous results but is statistically negative.

Table 14: Fixed Effect Panel Regression -TobinQ+1

Table 14 represents the coefficients and standard error for the fixed effect panel regression from 2010 to 2024 for the publicly listed companies in selected European countries. This study includes the variables that explain the relationship among firm value one period ahead (TobinQ+1), ESG score (ESG), Environmental factor (Env), Social factor (Soc), Governance factor (Gov), cost of capital (CoC), Size, capital expenditure (capex), GR (growth rate), and leverage (Lev).

PANEL A

	(1) TobinQ+1	(2) TobinQ+1	(3) TobinQ+1
ESG	-.013***	-.012***	-.011***
	(.002)	(.002)	(.002)
CoC		-.013*	-.009*
		(.008)	(.006)
Lev			-.109***
			(.016)
Size			.013***
			(.001)
GR			.002*
			(.002)
Capex			-.099***
			(.011)
C	1.052***	1.052***	.949***
	(.007)	(.007)	(.032)
Obs	15956	15956	15746
Adj R-squ	.015	.016	.091
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

PANEL B

	(1) TobinQ+1	(2) TobinQ+1	(3) TobinQ+1
Env	-.006***	-.006***	-.005***
	(.001)	(.001)	(.001)
CoC		-.014*	-.010*
		(.009)	(.007)
Lev			-.116***
			(.016)
Size			.013***

			(.001)
GR			.002
			(.002)
Capex			-.111***
			(.012)
C	1.025***	1.026***	.94***
	(.004)	(.004)	(.034)
Obs	15103	15103	14933
Adj R-squ	.008	.01	.09
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

PANEL C

	(1) TobinQ+1	(2) TobinQ+1	(3) TobinQ+1
Soc	-.007***	-.007***	-.007***
	(.001)	(.001)	(.001)
CoC		-.015*	-.010*
		(.009)	(.007)
Lev			-.114***
			(.016)
Size			.013***
			(.001)
GR			.002
			(.002)
Capex			-.109***
			(.011)
C	1.032***	1.033***	.947***
	(.006)	(.006)	(.032)
Obs	15954	15954	15744
Adj R-squ	.008	.009	.085
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

PANEL D

	(1) TobinQ+1	(2) TobinQ+1	(3) TobinQ+1
Gov	-.009***	-.009***	-.009***
	(.001)	(.001)	(.001)
CoC		-.014*	-.010*
		(.009)	(.007)
Lev			-.11***
			(.016)
Size			.013***
			(.001)
GR			.002
			(.002)
Capex			-.107***
			(.011)
C	1.039***	1.04***	.948***
	(.005)	(.005)	(.032)

Obs	15956	15956	15746
Adj R-squ	.014	.015	.09
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

3.7.4 2SLS Regression

For the endogeneity, another statistical technique is 2SLS regression and the results are shown in Table 15. The estimation results of the first stage are shown in Column (1) where ESG is a dependent variable and ESG_ind (industry year average of combined ESG score) is an independent variable. The regression results for the second stage is shown in column (2) where TobinQ is a dependent variable. The results show that the estimated coefficient of ESG_ind is positive and statistically significant (0.867), suggesting that the instrumental variable (ESG_ind) is positively correlated with ESG performance in their industry. These results also show that endogeneity does not drive the results. All other variables show the same impact on firm value except the cost of capital having a lower significance level.

Table 15: 2SLS Regression: ESG and Firm Value

Table 15 shows the results of 2SLS regression from 2010 to 2024 for the publicly listed companies in selected European countries. This study includes the variables that explain the relationship among firm value (TobinQ), ESG score (ESG), cost of capital (CoC), Size, capital expenditure (Capex), growth rate (GR), and leverage (Lev).

Dependent Variable	(1) First stage	(2) Second stage
	ESG	TobinQ
ESG		-0.005***
		(0.001)
ESG_ind	0.867***	
	(0.013)	
CoC	3.800*	-0.012*
	(0.797)	(0.002)
Lev	4.010***	-0.163***
	(0.166)	(0.010)
Size	1.485***	0.005***
	(0.086)	(0.001)
GR	2.069	0.015***
	(0.862)	(0.003)
Capex	4.275***	-0.125
	(0.139)	(0.007)
C	-4.798	1.024***
	(0.538)	(0.008)

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Chapter 4

Conclusion

4.1 Conclusion

This thesis aims to analyze the relationship between ESG along with its sub-components and firm value by considering other variables that may affect firm value. For this, the data has been collected for twenty European countries for all the regions (Eastern, Western, Northern, and Southern) for the period 2010 to 2024. The data is retrieved from the Refinitiv database for ESG and financial variables. The ESG scores by Refinitiv transparently and objectively measure an organization's relative ESG performance, commitment, and effectiveness based on more than 500 comparable metrics in ESG and other controversial categories (Lee & Raschke, 2023). Also, the financial markets database includes sources for approximately 70% of worldwide company market capitalizations (Naseer et al., 2024).

To examine the hypothesis of this thesis, different statistical techniques have been used along with the robustness test. The analysis starts with panel regression after performing all the necessary diagnostic tests. Among the panel models, the fixed effect model was chosen based on the nature of the data and results from the diagnostic tests. The first regression model analyzed the impact of ESG on firm value (TobinQ) and it included other variables of the study that may affect firm value. The results of fixed effect panel regressions show that ESG scores have a significantly negative impact on firm value possibly due to investor skepticism about immediate financial benefits. The cost of capital also negatively affected firm value, indicating that higher financing costs can hinder profitability. Conversely, larger firm size is positively related to firm value, while leverage and capital expenditure showed a negative relationship. Furthermore, the impact of sub-components has also been analyzed. The findings demonstrate that all the sub-components (environmental, social, and governance) consistently show a significant negative impact across all models. The cost of capital (CoC) also shows a significant negative effect on firm value. Throughout all panels, the negative relationship of CoC remains evident, emphasizing that higher financing costs negatively affect firm valuation. Additionally, leverage shows a negative coefficient, indicating that increased debt levels harm perceived firm value. On the positive side, firm size and growth rate significantly enhance firm value, whereas capital expenditure displays a significant negative relationship with Tobin's Q.

Moreover, the analysis is performed across the region in Europe including East, West, North, and South. The analysis of fixed effect regression results across four regions of Europe highlights varying relationships between ESG scores and firm value, measured by Tobin's Q. In Northern Europe, a significant negative relationship is observed, with ESG coefficients ranging from -0.012 to -0.013, suggesting that higher ESG scores may raise concerns about associated costs impacting firm value. Similarly, the cost of capital (CoC) negatively affects Tobin's Q, with leverage also showing a strong negative correlation (-0.162), indicating that firms with higher debt levels may experience reduced market valuations. In Southern Europe, ESG scores show minimal impact on Tobin's Q, with coefficients around -0.003, while leverage reveals a notable negative relationship (-0.281). In Eastern Europe, significant negative coefficients for ESG scores (-0.017 to -0.013) imply that investors associate higher ESG ratings with potential risks. Western Europe exhibits a consistent negative association between ESG scores and Tobin's Q, alongside a negative relationship with CoC and a significant negative correlation with leverage (-0.188). Across all regions, firm size positively influences Tobin's Q, reinforcing the notion that larger firms are perceived as more valuable. Overall, these findings indicate distinct regional patterns in the impact of ESG considerations and financial variables on firm valuation.

Along with this, the sub-components are also analyzed for the regions. The Environmental factor consistently shows a negative correlation with firm value, particularly pronounced in Northern Europe, where it significantly impacts valuations. In Southern Europe, while the environmental factor shows a slight positive relationship, its significance is weaker, indicating that environmental considerations may not affect firm value as much as in the North. Eastern and Western Europe exhibits the strongest negative impact of environmental factors. The Social factor shows significant negative effects across all models in Northern Europe, with the cost of capital also adversely affecting valuations, while in Southern Europe, its impact is non-significant. Eastern and Western regions reflect similar negative trends regarding social concerns. Lastly, the Governance factor displays a significant negative relationship with firm value across all regions, reinforcing the importance of governance in determining market valuations, although the impact varies slightly by region.

To investigate the bi-directional causality between firm value and ESG, this study employs the multivariate panel regression method suggested by Jha and Rangarajan (2020). While TobinQ serves as the dependent variable in earlier analyses, ESG and its sub-components are now treated

as dependent variables. The findings indicate a significantly negative relationship between ESG scores and TobinQ; however, the low adjusted R-squared suggests that only a minimal portion of the variation in ESG is attributable to firm value. The consistently negative coefficients for TobinQ imply that firms with higher valuations may prioritize ESG initiatives less than those with lower valuations. This may reflect investor indifference toward ESG factors or a tendency for firms focused on growth and short-term gains to neglect sustainability efforts.

To examine another hypothesis regarding the relationship between ESG and the cost of capital, this study conducted regression analysis with the cost of capital as the dependent variable. The results reveal positive coefficients for ESG across all models, indicating that firms with stronger ESG practices tend to experience higher costs of capital. However, the low adjusted R-squared suggests that ESG may not significantly cause variance in the cost of capital. Investors may perceive ESG initiatives as an additional financial burden rather than enhancing value. In contrast, the negative coefficients for TobinQ imply that firms with higher valuations benefit from lower costs of capital and this could be because of investors' trust in future profitability.

Furthermore, this thesis also analyzed the impact of European Union Directives on the adoption of ESG and its impact on firm value. The NFRD was adopted by the European Union in 2014, requiring companies to implement its provisions for financial years starting on or after January 1, 2017. The directive was later revised into the Corporate Sustainability Reporting Directive (CSRD), proposed in April 2021 and expected to take effect in 2024. This study conducted a sub-sample analysis to evaluate the impact of these EU regulations, dividing the analysis into three periods: before NFRD (2010-2016), after NFRD implementation and before CSRD proposal (2017-2020), and after the CSRD discussions (2021-2024). The results show that the ESG coefficient is positive but not statistically significant during the pre-NFRD period (2010-2016). However, the coefficient for ESG is significantly negative during the NFRD period (2017-2020) which shows that ESG activities might incur higher costs. This negative trend continues into the 2021-2024 period, showing that the cost of ESG initiatives outweighs the potential benefits.

To ensure the robustness of the results, this thesis conducted quantile regression and different proxies for firm value. The quantile regression analyzes how explanatory variables affect firm value across various quantiles. The findings indicate a positive relationship between ESG, environmental (Env), and social (Soc) factors with TobinQ at the lower quantile (q10), while governance (Gov), growth rate (GR), and cost of capital (CoC) were found to be insignificant.

Other variables such as leverage (Lev), size, and capital expenditure (Capex) positively correlated with TobinQ. The environmental factor consistently exhibited a negative impact across all quantiles, whereas the social factor showed mixed results, with positive coefficients in q10 and q25 but negative in higher quantiles. Governance factors demonstrated variability in significance across different quantiles. While the explanatory variables had a significant impact in the higher quantiles (q75 and q90), the results differed from the findings of Wu and Chang (2022).

Additionally, the thesis explored the impact of ESG on firm value using return on assets (ROA) as a dependent variable instead of TobinQ. Similar to previous findings, ESG negatively affected ROA, while firm size positively influenced firm value. The analysis show a significant negative relationship with leverage and capital expenditure, indicating risks associated with high debt and excessive investments. However, the cost of capital was insignificant in this model. The effects of ESG sub-components on ROA were also examined, showing similar trends to TobinQ, with all factors (Env, Soc, and Gov) showing a statistically negative relationship with ROA. The cost of capital negatively impacted ROA in some models, suggesting that higher financing costs could reduce operational efficiency, while growth had an insignificant effect on firm value.

To enhance the robustness of the results, this thesis also examined potential endogeneity issues. Endogeneity occurs when an explanatory variable is correlated with the error term in a regression model, which can stem from various factors such as omitted variable bias, measurement errors, or simultaneous causality. The presence of endogeneity can result in biased and inconsistent parameter estimates, complicating the ability to make valid inferences about variable relationships. To investigate the influence of endogeneity on the results, two statistical tests were performed following the methodology outlined by Yu and Xiao (2022): advancing the dependent variable by one period and employing a two-stage least squares (2SLS) regression.

In the first test, the dependent variable was advanced by one period to assess any reverse causality between ESG and firm value. The results of this fixed effects regression, indicated consistency with previous findings, revealing that ESG, along with its sub-components (Env, Soc, and Gov), maintained a significantly negative impact on firm value. This consistency suggests that controlling for endogeneity did not alter the fundamental relationships identified earlier. However, it was noted that the significance level for the cost of capital was reduced compared to previous results, although it remained statistically significant and negative. This analysis reinforces the

study's conclusions regarding the impact of ESG factors on firm value while addressing potential endogeneity concerns.

4.2 Contribution and Practical Implications

There is a lot of debate going on regarding the relationship between firm value and ESG as there are mixed findings in the literature, this study makes several important contributions to the fields of corporate governance, finance, and sustainability, providing valuable insights for researchers, practitioners and investors. The findings offer practical guidance for corporations on the strategic management of ESG initiatives. By illustrating the potential costs and benefits associated with these practices, the study equips firms to make informed decisions that align sustainability efforts with financial performance.

This study offers empirical evidence regarding the relationship between Environmental, Social, and Governance (ESG) factors and firm value, particularly in the context of publicly listed companies across various European regions. By employing robust statistical methods, this study found a negative relationship between ESG and firm valuations.

By analyzing the impact of ESG on firm value across different European regions (Northern, Southern, Eastern, and Western Europe) the study highlights significant regional disparities in how ESG factors are perceived and valued by investors in different regions. Along with this, the analysis of ESG sub-components (Environmental, Social, and Governance) helps to understand how individual factors contribute to firm valuation.

The findings have significant implications for policymakers and business leaders. They underscore the importance of ESG initiatives on the firm value and the cost incurred. This knowledge can guide companies in developing effective sustainability strategies that balance social responsibility with financial performance, ensuring that ESG efforts align with shareholder value creation.

4.3 Limitations and Future Directions

By filling gaps in the existing literature on the relationship between ESG factors and firm value, this study can be extended further. This study is not without its limitations, which are crucial to acknowledge for a comprehensive understanding of the findings:

The dataset focuses exclusively on publicly listed companies in European regions with a limited number of countries. Future research may consider expanding the scope to include firms from various continents to allow for a more comparative analysis. Also, future research can consider the various companies along with small and medium enterprises (SMEs). Other than this, this study

relies on ESG scores from the Refinitiv database but data may be used by different rating sources for more robustness and validity in analyzing its impact. This variability can affect the reliability of the conclusions drawn from the ESG data.

Future studies could investigate the impact of ESG factors across a wider array of industries beyond the selected European countries. This approach would help identify industry-specific trends and nuances in the relationship between ESG and firm value. Conducting longitudinal studies would allow researchers to observe how ESG practices and their impacts on firm value change over time. Moreover, incorporating qualitative research methods, such as interviews or case studies, could provide deeper insights into how stakeholders perceive and respond to ESG initiatives. This qualitative approach could complement quantitative findings and enhance understanding of the underlying mechanisms driving investor behavior.

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Appendix

Table A

This table represent the number of firms reported ESG in twenty countries of Europe. The sample consist of twenty countries from the year 2010 to 2024.

S.No	Countries	Firms	NFRD/CSRD	Accounting standards
1	Hungary	111	Yes	IFRS for listed companies
2	Poland	747	Yes	IFRS for listed companies
3	Bulgaria	252	Yes	IFRS for listed companies
4	Romania	362	Yes	IFRS for listed companies
5	Austria	628	Yes	IFRS for listed companies
6	Luxembourg	342	Yes	IFRS for listed companies
7	Netherlands	300	Yes	IFRS for listed companies
8	France	709	Yes	IFRS for listed companies
9	Germany	931	Yes	IFRS for listed companies
10	Belgium	412	Yes	IFRS for listed companies
11	Denmark	171	Yes	IFRS for listed companies
12	Finland	186	Yes	IFRS for listed companies
13	Sweden	961	Yes	IFRS for listed companies
14	Norway	303	Yes	IFRS for listed companies
15	Ireland	1489	Yes	IFRS for listed companies
16	Italy	455	Yes	IFRS for listed companies
17	Spain	316	Yes	IFRS for listed companies
18	Portugal	50	Yes	IFRS for listed companies
19	Greece	182	Yes	IFRS for listed companies
20	Cyprus	134	Yes	IFRS for listed companies