ESG Reporting Practices and Firm Value: Empirical Evidence from India

Research Report

Submitted to

National Foundation for Corporate Governance

New Delhi 110 003

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ACKNOWLEDGEMENT

I sincerely acknowledge the financial support received from NFCG to successfully complete my research report titled, 'ESG Reporting Practices and Firm Value: Empirical Evidence from India'. I wish to specially place on record my thanks to Ms. Aman Preet Kaur, Consultant, NFCG and Mr. Karan Anand, Finance section of NFCG.

About NFCG:

In 2003, the Ministry of Corporate Affairs (MCA) led a unique PPP model to set up the National Foundation for Corporate Governance in partnership with the Confederation of Indian Industry, the Institute of Company Secretaries of India, and the Institute of Chartered Accountants of India. Subsequently, the Institute of Cost Accountants of India, National Stock Exchange and the Indian Institute of Corporate Affairs also joined with an objective to promote good Corporate Governance practices both at the level of individual corporates and Industry as a whole. NFCG endeavours to create a business environment that promotes voluntary adoption of good corporate governance practices.

Vision

Be the Key Facilitator and Reference Point for highest standards of Corporate Governance in India

Mission

To foster a culture of good Corporate Governance

To create a framework of best practices, structure, processes and

Ethics

To reduce the existing gap between Corporate Governance framework & actual compliance by corporates

To facilitate effective participation of different stakeholders

To catalyse capacity building in emerging areas of Corporate Governance

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CHAPTER I

INTRODUCTION AND DESIGN OF THE STUDY

Chapter I

Introduction and Design of the Study

1.1 Introduction

In sociology, anthropology, economics, politics, business management, and social accounting, the term "social responsibility" is widely used. As defined by H.R. Bowen, social responsibility entails “implementing policies, making sound decisions or complying with community measures that are appropriate for society's values and objectives.” According to George Goyder, it is no longer possible to view the industry as a private arrangement aimed at enriching shareholders in the 21st century. According to Goyder, Corporations are accountable to the public at large. He related this with the idea of trusteeship which was advocated by Mahatma Gandhi, accordingly, the social responsibility of a business includes the community development of the stakeholders. Many stakeholders are now involved, including management, workers, customers, suppliers, bankers, government, and society.

The objective of business in modern times should be the proper utilization of resources for the benefit of others. Profit is still important, but it should not be the sole focus. Businesses should also consider the impact they have on society and the environment. There are several ways that businesses can be socially responsible. They can donate to charity, support local businesses, and use sustainable practices. They can also create jobs and provide opportunities for education and training. Socially responsible businesses are not only good for society, but they are also good for business. Studies have shown that socially responsible businesses are more likely to be profitable and have a loyal customer base. In today's world, businesses have a responsibility to be good stewards of the planet and to help create a better future for all. By focusing on social responsibility, businesses can positively impact the world and create a more sustainable future.

Environmental, social, and governance (ESG) performance data about an organization is disclosed through the practice of sustainability reporting. It offers a transparent and thorough picture of an organization's sustainability initiatives and results. As humanity faces several environmental and social concerns, including climate change, resource depletion, social inequality, and human rights violations, sustainability has recently become a crucial worldwide issue. Businesses are a major influence on these challenges, and sustainability reporting enables them to take responsibility for their deeds and show their dedication to building a more sustainable future. Sustainability reporting is relevant and crucial for organizations across sectors. It enables them to measure, manage, and communicate their sustainability performance, thereby enhancing transparency, accountability, and stakeholder engagement. By embracing sustainability reporting, organizations can contribute to a more sustainable and resilient future for our planet and society.

1.2 Sustainability Reporting: A Conceptual Overview

The concept of sustainability has gained increasing attention across the globe, among governments, civil society, and business that aims to adopt a wide range of new sustainable economic, social, and environmental practices. (Apergis et al., 2022). In an organization with diverse and inclusive stakeholders, it is the responsibility of the organization to fulfill the economic, environmental, and social goals of these individuals (Buchholz and Rosenthal, 2005; Laplume et al., 2008). Sustainability reporting is an important channel through which organizations attempt to meet these goals. A private company's disclosure of sustainability information benefits them in many ways, for example, it improves transparency and enhances brand value, reputation, and legitimacy (Herzig and Schaltegger, 2006). Sustainability reporting is increasingly recognized as an important factor contributing to corporate sustainability (Lozano and Huisingh, 2011). Considering the historical development of sustainability reporting, during the 1970s, Western countries started including social reports

along with traditional financial reports. During the 1980s, environmental issues such as emissions and waste generation largely replaced social reporting. By the end of the 1990s, research, and practice began to integrate the social and environmental dimensions alongside traditional financial reports. The relevance of sustainability reporting grew gradually over the years and shows a direct relationship with the development of reporting standards like the Global Reporting Initiative (GRI) (Kolk, 2010; Vormedal and Ruud, 2009). As of today, the GRI is the "de facto global standard" for reporting on sustainable development (KPMG, 2011: 20; emphasis in original). There are, however, significant differences between companies from various institutional environments about the content and quality of sustainability reports (Fortanier et al., 2011), implying that global academic interest has also varied.

As stated in the European Commission's reports, corporate social responsibility or sustainability reporting is the responsibility, enterprises have towards society and the economy as a result of their impactful production actions. The production units must integrate social, environmental, ethical, human rights, and consumer concerns into their business operations and core strategy (European Commission, 2011). Likewise, ISO 26000, a worldwide standard for social responsibility, describes social responsibility as the organization's responsibility for its impact on society and the environment through transparent and ethical behavior (International Organization for Standardization, 2010). The concept of sustainability emerged as an initiative to prevent the depletion of natural or physical resources so that they will remain available for the long term. This idea transformed into the idea of Corporate Social Responsibility (CSR), which is a self-regulating business model that helps a company be socially accountable to itself, its stakeholders, and the public. Going further, the idea of shared value emerged into the stream of sustainability which considers policies and operating practices that enhance the competitiveness of a company while simultaneously advancing the economic and social conditions in the communities in which it operates. One of the most recent

developments in the sustainability stream is ESG, which is a framework that helps stakeholders understand how an organization is managing risks and opportunities related to environmental, social, and governance criteria (KPMG, 2020).

Sustainability accounting methods are used in sustainability reporting practices to quantify the sustainability-related performance of the corporate sector. The concept of sustainability accounting refers to those methods of information management and accounting that are aimed at the creation of data of high quality that are used to support internal decisions regarding the sustainability of a company. Using reliable accounting data, sustainability-related reporting provides information to internal and external stakeholders regarding the status and progress of corporate sustainability through formalized methods of communication (Schaltegger et al., 2006). Sustainable reporting benefits businesses in many ways, including the mitigation of adverse selection problems, the reduction of capital costs, the improvement of investor awareness, the monitoring of firm management, and the increase in transparency (Christensen et al., 2021). ESG framework helps to provide a unified and advanced framework for accounted sustainability measures of firms and helps in comparing the performance of individual firms with the industry standards.

1.3 ESG Framework: An Overview

ESG, elaboratively stated as Environmental, Social, and Governance, is today's most talked about and discussed topic among corporates and academics. The term 'ESG' was first coined in the year 2004, in a report prepared by a group of financial institutions as a response to a call by the then Secretary-General of the United Nations, Kofi Anon. To put it in simple terms, ESG practices deliver a note on the adoption of environmental, social, and governance responsibility by businesses (Gillan et al., 2021). Another watershed moment relating to ESG was in the year 2006 when the signatories to the UN Principles for Responsible Investment

committed to include aspects related to ESG while taking decisions related to investment and ownership (Amir and Serafeim, 2018). The pioneering work relating to the environment and economic growth was put forth by the great scholar Kuznets, (1955) wherein he opined that economic growth will be accompanied by the deterioration of the environment but after a threshold point, the environmental degradation will cease while the economic or the financial growth continues. The three pillars of ESG are the governance pillar, the social pillar, and the environmental pillar, according to PwC (2020). Climate change, natural resources, pollution and waste, and environmental opportunities are considered under the environmental pillar; human capital, product liability, stakeholder opposition, and social opportunities are considered under the social pillar; and corporate governance and corporate behaviour are taken into consideration under the governance pillar. CSR and ESG reporting were once thought to be of the same scope, but the governance component of ESG distinguishes it from CSR reporting (Gillan, Koch, and Starks, 2021). As customers and investors demand transparency in how major corporations respond to social and environmental challenges, the importance of sustainability reports has grown (Ionescu et al., 2019). Companies and enterprises can convey non-financial indications to clients and investors with the use of non-financial information reporting. Businesses may build good social capital by strengthening their brand and image (Bhimani et al. 2016). Along with its cost of accounting, the latitude that corporations enjoy in selecting non-financial metrics has drawn criticism. The demand for reporting guidelines has grown along with reporting practices. One of the first reporting standards was the triple bottom line, which combines economic, environmental, and social performance. It was developed by the United Nations Environment Programme (UNEP) and adopted by the Global Reporting Initiative (GRI) in 1997. Its goal was to establish a worldwide framework and raise the importance of sustainability issues to parity with financial reporting (Ioannou and Serafein, 2017). The United Nations' Sustainable Development Goals (SDGs) were considered by GRI

in 2015. The founding of SASB (Sustainability Accounting Standards Board), a non-profit organization created to assist organizations in understanding the implications of sustainability on financial performance, was another significant development (SASB, 2022). GRI and SASB comparison. While GRI's guidelines are aimed at improving the comparability and quality of a firm's economic, environmental, and social consequences, SASB takes investors' perspectives on ESG issues into account.

There are further organizations that concentrate on certain ESG concerns, such as the Task Force on Climate-Related Disclosures (TFCD), which is solely concerned with climate-related issues (TFCD, 2022). Regulations become necessary as a result of the advancement in ESG reporting. The Non-Financial Reporting Directive, also known as EU Directive 2014/95/EU, was released in 2014 and mandates that Public Interest Entity (PIE) businesses with more than 500 workers report on non-financial and diversity issues (European Commission, 2022). Sustainability-related disclosure rules for the financial sector, or SFDR, were established by the European Union in 2019 and went into effect in March of the following year (Eurosif, 2022). The European Commission issued the Corporate Sustainability Reporting Directive (CSRD) later in 2021 to include more businesses.

The International Accounting Standard Board (IASB) or the Financial Accounting Rules Board (FASB) in the US was expanding its regulatory framework to incorporate non-financial information disclosure rules. While IASB and FASB were more respected in the business sector and had a well-established infrastructure and professional community to handle the need for creating non-financial information disclosure standards, GRI and SASB focus more on investors (Kristiina, 2022). Drawing up uniform sustainability reporting rules has been challenging due to the unequal growth and development of ESG reporting throughout the world. Using the criteria established by international organizations as a guide, nations separately adopt individual disclosure rules for non-financial topics.

Market, academicians, as well as regulators, sensed the importance of having robust moral and ethical practices in management so that there will be sustainable growth in businesses and hence the emergence of ESG practices. The relevance of ESG practices should be understood through the lens of socio-economic and environmental responsibility and this is in line with the Sustainable Development Goals (SDGs) put forward by the UN (Khan, 2022) and widespread support that has been on the rise for action against climate change. To be sustainable in the long run, any company has to be socially, environmentally, and morally responsible and hence the disclosure and reporting of non-financial aspects related to ESG practices (Albitar et al., 2020) have become important.

Unlike the standards that are put forward relating to financial reporting such as the IFRS framework (adopted by almost 140 countries), there is no single global framework relating to ESG disclosures. As of now, the most widely adopted guidelines are the 'Sustainability Standards' given by the Global Reporting Initiative (GRI). Other guidelines and frameworks are also there relating to ESG which are the report by Task Force on Climate-related Disclosures and Sustainability Accounting Standards Board. Most investors and regulators around the world adopt these standards or a combination of these three guidelines to capture ESG practices. Globally the adoption of ESG practices and disclosures relating to the same started as a voluntary move but now gradually it has been moving towards a robust regime wherein the regulators around the world are now making the disclosures relating to ESG mandatory. Asian countries are now evolving and adopting regulations relating to ESG practices and disclosures. For example, east Asian countries such as China, Indonesia, Vietnam, Thailand, and the Philippines have set a standard guideline for large, listed companies to mandatorily disclose ESG practices. The other major Asian economies such as Singapore, Hong Kong, and Japan are transitioning towards a mandatory regime from the erstwhile voluntary disclosure regime. Most of these countries follow the GRI guidelines while some

have adopted the earlier mentioned framework and have issued a framework of their own. This shows that non-financial reporting has gained prominence in the contemporary business environment and hence it is important to know the facts relating to ESG in the Indian context. It was in the year 2009 when the Ministry of Corporate Affairs through the issuance of a set of guidelines named 'National Voluntary Guidelines on CSR (NGVs)'. The reporting related to ESG was further strengthened when SEBI in the year 2012 mandated that the listed companies which are in the top 100 by market capitalization should draft a Business Responsibility Report along with their annual reports and this was extended to the top 500 listed companies in the year 2015. Then in the year 2017, SEBI introduced Integrated Reporting and announced that the top 500 companies voluntarily prepare the business responsibility report (BRR). Two years later, in 2019, National Guidelines on Responsible Business Conduct (NGRBC) was announced and in the same year, BRR was extended to the top 1000 companies. The ESG regime was strengthened in the year 2021 when SEBI amended the Listing Obligations and Disclosure Requirements (LODR) regulations and introduced Business Responsibility and Sustainability Report (BRSR) framework and ESG disclosures have been mandatory for the top 1000 companies from the financial year 2022 – 2023. The above discussion reveals that ESG has the attention of all stakeholders be it the investors, consumers, and governments and it is important to remember that ESG is a strategic non-financial indicator of a company that will give insights into the future. In this context, the nature of the relationship between ESG and firm value has been little explored in the existing literature, and the present study tries to evaluate the dynamics between ESG and firm value. Also, in addition to the moderating role of the board diversity and ownership structure will be explored.

1.4 Firm Valuation: Contextual Background

Firm valuation refers to the process of determining the economic worth of a company. It involves estimating the present value of the future cash flows generated by the firm,

considering various factors that can influence its value. Valuing a firm is crucial for investors, analysts, and stakeholders as it helps in making informed investment decisions, assessing the financial health of the company, and determining its attractiveness in the market**.** Modernization and privatization have made profits a major factor in the growth of an organization and as a result, every business is profit-oriented. A company's profit is regarded as one of the most important elements in enhancing it retain earnings to capital invested ratio because it creates a satisfactory return for investors and shareholders. A company's market value also increased as a result (Damodaran, 2012). The measure of how effectively the administrators operate the company is its profitability. Any company's profitability statistics may be used to gauge its effectiveness and profitability. Variables like market capitalization, Tobin's Q, P/E ratio, etc. can be used to calculate firm value. Firm Value: The phrase "Firm Value" refers to a company's overall economic value. The value of the firm is the speculative takeover price that an investor would be required to pay to buy a certain company. The firm value is determined as follows:

Tobin’s Q = Market Capitalization + Debt Value/Total Assets.

1.5 Motivation for the Study

When it comes to establishing the relationship between ESG and firm value few studies give insights relating to the same but the results are sometimes inconclusive and mixed. The sustainability reporting practices have been evolving over the years and there is no uniform format or pattern of sustainability reporting. In that context, ESG reporting practices act as a base for sustainability reporting and the materiality of ESG reporting practices unifies the concept of sustainability reporting. Even though the components of ESG reporting practices vary under different institutions, it has now become an umbrella term for all sustainability reporting. Under these circumstances, a detailed study of ESG reporting practices and their

impact on firm valuation is important. The factors that influence the relationship between ESG and firm value are also an important area of research, the present study will extend its scope to understand these factors.

1.6 Scope of the Study

The present study is based on the relationship between ESG reporting practices and firm value and it extends to understand the moderating role of board characteristics and ownership type in determining the ESG-firm value relationship. The study is based on the selected top 1000 companies based on their market capitalization. Since sustainability regulations are at their initial stages of development, most companies have yet to participate in ESG reporting practices, and of which the ESG scores for most of them are not yet available. Due to this, the study had to eliminate many of its samples in the initial cleaning period. The study considers all sectors in its scope as there are no clear differences between sectors based on ESG regulation.

1.7 Objectives

The objective of the study is divided into primary and secondary objectives based on the research questions.

(a) The Primary Objectives of the study are stated below:

- To investigate the extent of ESG reporting compliance by the Indian firms
- To examine the dynamics between ESG disclosures and firm value

(b) The Secondary Objectives are as follows:

- To evaluate the moderating role of ownership structure in impacting the relationship between ESG practices and firm value

• To assess the moderating role of board diversity in impacting the dynamics between ESG practices and firm value

1.8 Research design

1.8.1 Source of data: The data relating to ESG score, ESG controversy score, environmental score, social score, governance score, board characteristics, and institutional investors from Refinitiv Eikon. Data related to firm valuation, enterprise value, debt-to-equity ratio, and total fixed assets were collected from the CMIE database, prowess.

1.8.2 Sample size and period of study: The study considered the top 1000 companies in terms of market capitalization as of March 31st, 2022. Hence the period of study was for nine years from 2014 to 2022.

1.8.3 Analytical framework: To estimate the relationship between ESG and firm value and the moderating role of board characteristics and ownership type, we employed different econometric techniques namely the fixed effects panel regression. The board characteristics index was calculated from the board characteristics data that was collected. For ownership types, the percent investment of the institutional investors was considered. A detailed description of the empirical models and specifications is given in Chapter 3.

1.9 Limitations of the Study

The present study has included only the top 1000 firms in terms of market capitalization. The other listed firms were not included in the sample owing to paucity of time. The generalization of results must be exercised with caution. Other factors influencing firm valuation like forecasts, and board diversity have not been accounted and future research can be extended by accounting for these variables. The causality analysis of sustainability reporting is also an important area for future research.

1.10 Scheme of the Report

The rest of the reports is organized as follows; Chapter two deals with the review of recent and relevant empirical and conceptual studies related to sustainability reporting, ESG reporting, ESG reporting and firm valuation, board characteristics, and ownership type. The research gap from the previous studies is identified in chapter two. Chapter three gives a detailed description related to research design, empirical methodology, and empirical specification. Chapter four gives a brief history of sustainability reporting practices in India and its current position. Chapter Five presents the empirical analysis and results. Chapter six provides the summary of major findings, suggestions to policymakers, regulators, and other market participants, and concluding remarks and documents the direction for further research.

CHAPTER II

REVIEW OF LITERATURE

Chapter II

Review of Literature

2.1 Introduction

After introducing the study topic and its objective, this chapter will summarize the literature review on the subject matter of interest. To identify the research gap and to contribute to the existing frame of knowledge, a review of previous research studies from various articles, working papers, books, and reports of the regulatory authorities was conducted related to Corporate Sustainability, ESG reporting practices, ESG reporting practices and its relationship with firm valuation, the role of ownership and board characteristics in ESG reporting and firm value relationship. The literature review is divided into five review sections, with two sub-sections explaining the theoretical foundation of the explained concept.

2.2 Corporate Sustainability: A Review

Corporate sustainability is significantly related to the concept of sustainable development. Many terms are related to corporate sustainability, including corporate accountability, corporate social performance, corporate citizenship, corporate social responsibility, corporate governance, people, planet and profit, stakeholder approach, corporate communication, etc. (Signitzer and Prexl, 2007). This explains the different dimensions or scope of the concept of corporate sustainability. The concept of sustainability has been studied under other disciplines, including accounting (Braam and Peeters, 2018; Diebecker and Sommer, 2017; Adam and Whelan, 2009), economics (Epstein, 2018; Hobbs and Schneller, 2012), management (Carvajal and Nadeem, 2022; Buallay, 2022; Buallay and Marri, 2022); law (Keay, 2008). According to Brundtland (1987), the term used most frequently is “meeting the needs of the present without compromising the ability of future generations to meet their own needs.” Pfeffer (2010) has added the aspects of natural resource conservation and waste avoidance to the sustainability

definition. Later, Goldsmith and Goldsmith (2011) defined sustainability from a consumer's perspective as a choice that impacts the environment. Firm sustainability can be defined in different dimensions, like environmental, social, economic, and governance perspectives. The definition of firm or corporate sustainability changes with the change in the dimensions. Morelli (2011) connects the word 'Environmental' to the definition of sustainability and defined sustainable development by incorporating the concept of environmental sustainability. Even before, Corporate environmental sustainability referred to a company's actions involving preserving the environment and safeguarding natural resources (Hart, 1995). These initiatives involve minimizing resource use and environmental consequences (Gibson, 2001) through implementing green practices, addressing the issue of pollution, and preventing resource depletion (Henion and Kinnear, 1976; Kardash, 1974). Social sustainability, the second component of company sustainability, refers to ongoing initiatives that influence societal well-being (Elkington, 1997). Among these initiatives are charitable work (Chow and Chen, 2012), lowering social inequality (Alhaddi, 2015), defending human rights (Reichert, 2011), and providing care for employees regarding things like their health, working conditions, employee training, skill development, workplace injuries and illnesses, and workplace discrimination. These social initiatives address social problems and lessen the adverse social effects of the company's operations on society.

The third dimension is economic sustainability, which refers to a firm's maintaining a long-term presence in the market (Baumgartner and Ebner, 2010) by enhancing its financial performance (Bansal, 2005). Economic sustainability is defined by Basiago (1998) as implying "a system of production that satisfies present consumption levels without compromising future needs." More specifically, economic sustainability was defined by Hicks (1946) as "the amount one can consume during a period and still be as well off at the end of the period." The economic sustainability of a firm is essential to its viability (Simpson and Radford, 2012; Steurer et al.,

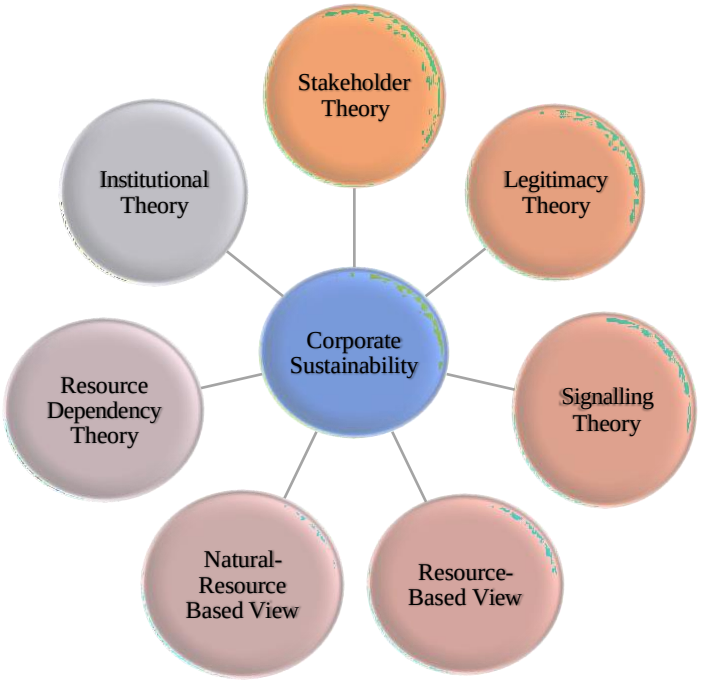
2005), and it focuses on a firm's ability to provide support for future generations (Sheth et al., 2011). The business's implementing principles to help the stakeholders monitor controls, resolve conflicts of interest, and uphold transparency are the firm's governance, the fourth pillar in firm sustainability (Buallay et al., 2017). In order to preserve the company's long-term sustainability, good corporate governance ensures that rules, regulations, and laws—particularly those related to economic, environmental, and social issues—are obeyed and that corrective action is taken. There are four elements to sustainability, three of which are non-financial (environmental, social, and governance) and one of which is regarded as financial (economic). To accomplish the fourth financial dimension of sustainability, there must be an interaction between the three non-financial aspects. However, studies have frequently ignored the connections between sustainability's many facets (e.g., Newman et al., 2014; Xie et al., 2015) to focus on one aspect at a time. The existence of many sustainability aspects enables stakeholders to assess sustainability from various angles (Bhinge et al., 2015). Researchers contend that integrating environmental, social, and governance initiatives results in achieving economic sustainability goals and competitive advantage (Uwuigbe and Egbide, 2012).

Further, the companies' environmental, social, and governance initiatives must be communicated to the stakeholders to serve the purpose and improve the companies' transparency. The way corporate information is transmitted and presented, with an emphasis on the intended recipients of this information, has changed significantly during the past 20 years in corporate reporting. Nowadays, firms directly report to a larger stakeholder group rather than only providing reports for shareholders (Phillips, 2009). This broader group of stakeholders calls for more varied, organized, and uniform corporate information. As a result, firms need to be more open about their internal measurements, business model procedures, and their impact on the organization and the surrounding environment (Eccles and Krzus, 2010).

2.2.1 Theoretical Foundation of Corporate Sustainability

Corporate sustainability and sustainability reporting relate to many finance, economics, and management theoretical foundations. Some of the essential theoretical underpinnings on which the current study is based include; stakeholder theory, legitimacy theory, resource-based view, signalling theory, natural resource-based view, resource dependency theory, and institutional theory.

Figure 2.1
Theoretical Understanding of Corporate Sustainability



i. *Stakeholder theory:* The idea of stakeholders introduced by Freeman in 1984 altered the scope of corporate sustainability. Shareholders and all other stakeholders are considered stakeholders, including employees, consumers, the environment, investors, the community, regulators, suppliers, and the government. According to Freeman (Freeman, 1984), external stakeholders are "any group or person in the company environment who can affect or are affected by the achievement of the organization's objectives." Further defining the term "stakeholders," Clarkson (1995) defined it as "anyone, employees, citizens, shareholders, NGOs, unions, and government agencies who are directly or indirectly involved with the

corporation of the firm." According to Mishra and Suar (2010), stakeholder theory has transformed business sustainability from a one-dimensional assessment to a multidimensional analysis. Companies must obtain approval and support from the stakeholders, namely the community based on which they operate and survive. If the companies maintain good communication and transparency with the stakeholders, there is a high chance of obtaining more profitability. Sustainable practices help companies to build better stakeholder engagement and dialogue.

ii. *Legitimacy theory:* A service agreement exists between the company and the society under the legitimacy theory. According to Brammer, Jackson, and Matern (2012), the contract's conditions state that the company can operate to make a profit but also meet societal standards. CSR is a vehicle that conveys the actions made by businesses by informing society and the community that the business is and has respected its side of the social compact, hence legitimizing the firm's existence. CSR has roots in legitimacy theory. This study's foundation includes legitimacy theory. When an organization's operations align with the objectives of a superior system, it is considered legitimate (Parsons, 1960). The legitimacy idea allows a business to enter into an unbroken social service contract with the community. However, the company is heavily responsible for carrying out the terms of the service contract, and as a result, companies may bear the consequences of non-fulfilment (Preston and Post, 1975). According to studies, a company's ability to remain in business depends heavily on the constant flow of money and labour (Chen et al., 2008).

iii. *Signalling theory:* Signalling theory is a framework that can be applied to various fields, including corporate sustainability reporting. It suggests that companies use their sustainability reports to signal their commitment to sustainable practices to external stakeholders such as investors, customers, and regulators. By voluntarily disclosing information about their environmental, social, and governance (ESG) performance,

companies aim to enhance their reputation, attract socially responsible investors, and differentiate themselves from competitors. The signalling theory addresses the issue of how to deal with information imbalance in a hostile environment. The approach primarily focuses on management's purpose to communicate with stakeholders, the market, and society and to absorb cues from these sources. In the organizational context, information asymmetry can lead to possible conflicts between management and agents (Bae et al., 2018; Taj, 2016). The signal closes the gap by conveying pertinent, high-quality information to stakeholders. According to a simple communication channel, the signalling theory consists of four components: a signaller, signals, receiver, and feedback. The flow of information (stock price news, dividends, environmental finance, CSR investment, etc.) is a signal, and management insiders (executives, directors, or managers) act as a signaller. On the other hand, the receivers are people, investors, and workers who are not insiders and are unaware of the knowledge. The interactions between signallers and receivers are reflected in the feedback. The signaller and the receiver are the leading players in the signalling process, and the signals transmit either positive or negative information to increase information asymmetry (Connelly et al., 2011).

iv. *Resource-based View and Natural-resource-based View:* Future profits are connected to a firm's competitive edge under the resource-based view (RBV). The connection between a company's internal competencies that are challenging to imitate and its resources, including material, intangible, and personnel-based resources (Grant, 1991), is known as a competitive advantage (Hart, 1995). The RBV encourages a company's capacity to organize its internal resources and competencies (Grant, 1991) in pursuit of both immediate and long-term profit. NBV is, however, incomplete since the natural environment is left out, particularly now that environmental deterioration is a growing worldwide concern (Hart, 1995). The natural resource-based view (NRBV) extends the perspective by

examining the connections between business assets, capabilities, sources of competitive advantage, and a constraining aspect of the natural environment that risks the firm's present and future profits. In other words, NRBV considers the natural environment when developing a strategy since it has become a constraining element in company management and will play a significant role in determining the existence of enterprises in the future. A company's ability to provide an environmentally and user-friendly product accepted by stakeholders, the community, and society will be critical to its survival in a sustainable environment.

v. *Resource dependency theory:* A resource dependence hypothesis is connected to the providing of a resource (such as expertise, reputation, and experience) to the company (Daily and Dalton, 1994; Gales and Kesner, 1994; Hillman and Dalziel, 2003; Pfeffer and Salancik, 1978). According to Wernerfelt (1984), a resource strengthens or weakens a company. Resource dependency also serves as the study's theoretical underpinning. Resource dependency theory has been discussed in several papers (Boyd, 1990; Daily and Dalton, 1994; Fama, 1980; Fama and Jensen, 1983; Gales and Kesner, 1994). Resource reliance, which also covers monitoring and resource provision, comprises the degree of CEO conservatism, the independent board size, and assurance service provider roles (Korn and Ferry, 1999). Research by scholars is enriched by knowledge of gender diversity, CEO conservatism, and employee disability in the framework of resource dependency theory in emerging economies.

vi. *Institutional theory:* 2008 Matten and Moon defined institutions as official and informal. Governmental and corporate entities are included in the formal. In addition to having norms and rules, institutions also have cultural norms and rules (Matten and Moon, 2008). According to institutional theory, a “stable, valued, and recurring pattern of behavior” (Huntington, 1969). According to Hall's definition of institutions (Hall, 1986), institutions

are "the formal rules, compliance procedures, and standard operating practice that structure the relationship between individuals in various units in the polity and economy." Mandatory CSR is based on a legal framework, and the institutional setting influences its implementation and effects. In the context of India, the institutional environment will either have a detrimental or beneficial impact on financial performance. According to Li and Ferreira, an institutional environment comprises a legal environment that supports company activities. It also covers the degree of policy assistance the local government provides in technical training, technical support, and information support, as well as the degree to which local culture is consistent with corporate philosophy (Li and Ferreira, 2011).

2.3 Sustainability reporting practices: An overview

Different stakeholders, academia, and industry have all shown an increasing interest in sustainability disclosure over the past few years. According to the GRI, "the practice of measuring, disclosing, and being accountable to internal and external stakeholders for organizational performance towards the goal of sustainable development" (GRI, 2006) is what sustainability reporting refers to. The practice of sustainability disclosure has gone through four stages historically. When the term CSR was first coined and the "social dimension" was highlighted, the first stage of development got underway. Stakeholders started to understand the "environmental dimension" of the second phase in the 1980s. Early in the 1990s, ten years later, the emphasis was placed on sustainability reporting that included social, environmental, and economic elements. The International Integrated Reporting Council Committee (IIRC) was established in 2010, as announced by the GRI and the Prince of Wales Accounting for Sustainability Project. Now, as an updated form of integrated reporting, ESG frameworks are widely recognized and followed as a standard way of measuring the sustainability

performances of firms. ESG-based financial products like ESG mutual funds, ESG bonds, etc., are available for investors to make decisions in the financial market.

The concept of CSR was initially started by Friedman (1962), which he used to consider CSR as a way companies can increase their profit without involving in fraudulent activities. Carroll (1979) added the philanthropic dimension to this definition stating that businesses should contribute to and support the society in which they exist. He also framed a pyramid of social responsibility, in which CSR's four responsibilities, namely, Economic responsibility, Legal responsibility, Ethical responsibility, and Philanthropic responsibility, are framed and explained. The next phase began in the 1980s when the idea of sustainability broadened its focus to include environmental and social reporting (Kolk and Van, 2010). This came about due to the increasing environmental difficulties businesses faced, including pollution, land degradation, and oil spills (Deegan, 2014). Some companies started including environmental concerns in their reports as stakeholder knowledge of businesses' environmental effects increased. According to Deloitte and Van-Staden (2011), voluntary reporting of environmental concerns in annual reports has enabled businesses to highlight their environmental accomplishments while avoiding disclosing information that can hurt stakeholders' choices. In order to influence the decisions of their stakeholders, businesses published their environmental efforts (Brown and Deegan, 1998; Deegan and Gordon, 1996).

In the 1990s, businesses started disclosing information about sustainability's social, environmental, and economic aspects. Elkington created a framework known as the triple-bottom-line (TBL) (Elkington, 1994). The TBL combines financial components with social and environmental performance. Sustainability reporting is a more modern term for the practice of documenting a company's economic, social, and environmental performance (Bebbington et al., 2014; Hahn and Kühnen, 2013; Lodhia and Hess, 2014; Manetti and Bellucci, 2016). Initially, the publication of sustainability reports was optional (Milne and Grey, 2013). As

sustainability issues arose, there was increased demand from many stakeholders, including shareholders, regulators, and civil society, for sustainability reporting. As a result, stand-alone sustainability reports began to emerge in the 1990s (Kolk, 1999). The way the sustainability information was governed, the type and quality of sustainability information, and its measurement parameters were always a matter of concern (Hohnen, 2012).

The Prince's Accounting for Sustainability Project was founded in 2004 to bridge the mismatch between social, economic, and environmental implications in sustainability reports through "connected reporting" (Hopwood, 2010). The King Code of Governance Principles for South Africa of 2009 (King III), which addresses integrated thinking, is where the concept of IR in South Africa first emerged (Steyn, 2014). Following the King III requirements' integration into the JSE listings standards, listed businesses must publish an integrated report on an apply-or-explain basis for financial years beginning on or after 1 March 2010. The Integrated Reporting Committee (IRC) was established when the idea of IR was included in the King III principles and was presided over by Professor Mervyn E. King SC, currently the IIRC chair. Leaders from the GRI, The Prince's Accounting for Sustainability Project, and the International Federation of Accountants (IFAC) founded the IIRC in 2010. Soon after, the World Business Council for Sustainable Development (WBCSD), United Nations Environment Programme (UNEP) Finance Initiative, the International Accounting Standards Board (IASB), the UN Global Compact, the Carbon Disclosure Standards Board (CDSB), and the International Organisation for Standardisation (IOSC) all emerged. King III's suggestion in the discussion paper titled "Framework for Integrated Reporting and the Integrated Report" led to the IRC publishing integrated reporting rules for the first time on January 25, 2011. From then, the concept of integrated reporting was adopted among companies, and it was informed by the principles of Strategic focus and future orientation, connectivity of information, etc.

According to PwC (2020), there are three pillars of ESG, that includes the environmental pillar, the social pillar, and the governance pillar. Under the environmental pillar, elements like climate change, natural resources, pollution and waste, and environmental opportunity are included; and elements like human capital, product liability, stakeholder opposition, and social opportunity are considered under the social pillar; and finally, corporate governance and corporate behaviour are included under governance pillar. CSR and ESG reporting have the same degree of scope, but the governance aspect in ESG differentiates corporate social responsibility from ESG reporting (Gillan et al., 2021). The relevance of sustainability reports has increased as investors and customers demand accountability for large companies' reactions to social and environmental issues (Ionescu et al., 2019). Non-financial information reporting helps companies and firms to communicate non-financial indicators to customers and investors. It helps companies brand themselves and improve their image to create positive social capital (Bhimani et al., 2016). Companies' freedom of choice in choosing non-financial indicators has received criticism, along with its cost of accounting.

The need for reporting guidelines has also increased as reporting practices have increased. Triple bottom line, i.e., economic, environmental, and social performance introduced by United Nations Environment Program (UNEP) launched by the Global Reporting Initiative (GRI) in 1997 was one of the pioneer reporting guidelines. It was launched with the purpose was to increasing the relevance of sustainability matters to the same levels as financial reporting and providing a global framework (Ioannou and Serafein, 2017). In 2015, GRI took United Nations' Sustainability Development Goals (SDGs) into consideration. Another significant breakthrough was the establishment of SASB (Sustainability et al.), a non-profit organization established to help organizations to understand the sustainability effects on financial performance (SASB, 2022). They are comparing SASB and GRI. SASB considers ESG matters from an investor's perspective, and GRI's standards are focused on providing better

comparability and quality of firms' economic, environmental, and social impacts. The growth and development of ESG reporting have been unevenly spread worldwide; therefore, drawing unified sustainability reporting guidelines has been difficult. Nations independently are setting individual disclosure standards for non-financial matters, referring to the standards set by international institutions.

There has been a long discussion and debate related to ESG and Financial performance (Elsayed and Paton, 2005). The concept of relating ESG and the financial performance of companies became prominent mainly because of the problem of climate change and its by-product, global warming. Global warming has been affecting all aspects related to human beings, and the business world is not an exception. Given global warming and other environmental aspects the companies and rising awareness among the public about this global issue has required firms to establish environmental regulations and disclose information regarding their commitments (Boiral, 2006; Buallay, 2018; Buallay et al., 2020; Nor et al., 2016). 'E' (Environment) in ESG information contains environmental dimensions such as pollution, loss of biodiversity, emissions of greenhouse gas, waste management, renewable energy, and energy efficiency; 'S' contains social dimensions such as quality of life, well-being, diversity, equality, employee retentions, and human capital management; 'G' contains governance dimensions such as internal control, routines, board, diversity, independence, information transparency, and risk management (Al-Qudah et al., 2022; Sultana et al., 2018; Xie et al., 2019). Having said much about the ESG, looking into the financial performance, it includes a firm's financial achievements for a specific period measured by capital adequacy, efficiency, leverage, liquidity, profitability, and solvency. Porter and Van der Linde (1995) debate that severe environmental regulation can often improve companies' revenue by encouraging them to concentrate on decreasing production costs and increasing consumer satisfaction and sales. Accordingly, firms' environmental regulations may be a "win-win"

solution for both firms and society. There is literature that throws light on the relationship between CSR practices and firm performance. For instance, Jha and Rangarajan (2020) chose a sample of the top 500 Indian firms covering the period from 2008 to 2018 to find out the relationship between Corporate Sustainability Practices (CSP) and Corporate Financial Performance (CFP) considering ESG at aggregate and disaggregate levels. Evaluation of CFP has been done in both accounting and market-based measures. Using the Granger causality test and multiple regression for panel data found that CSP- CFP linkage is mostly insignificant for Indian firms at the aggregate level but at individual levels negative association was found. In addition to investigating the relationship between CSR and FP, some studies connect sustainability and FP. A study by Bradford et al. (2017) attempted to determine the types of sustainability activities reported by companies and the understandability of external people towards such reports in correspondence to narratives of companies towards sustainability through a sample of sustainability reports prepared by GRI that is Global Reporting Initiative guidelines and found that the dimensions employed by the subjects differed in some significant ways from those dimensions used to construct the GRI format. Subjects evaluated sustainability efforts as primary efforts of being a good citizen with sustainability as an end rather than a constraint to be respected in achieving profitability goals.

2.4 Sustainability reporting practices and its impact on firm

Several literatures tried to explore the relationship between various sustainability reporting practices and their impact on financial and non-financial indicators of companies. ESG reporting is one of the recent reporting practices of sustainability reporting. Before ESG, Corporate Social Responsibility, Integrated reporting, Environmental reporting, etc., were considered sustainability reporting practices. ESG has brought an integrated framework for sustainability reporting practices. This section of the literature will explore various studies that

have focused on the impact of sustainability reporting, with a particular emphasis on ESG reporting and its impact on the firm's financial and non-financial parameters.

2.4.1 Sustainability reporting practices

According to Hahn and Kühnen (2013), organizations may gain several advantages by sharing sustainability information, including increased openness, enhanced reputation, staff motivation, and support for control procedures. Gaining a competitive edge and facilitating comparison with rivals are further advantages that Herzig and Schaltegger (2006) listed. Furthermore, it was shown in earlier research (Lindgreen et al., 2009) that companies might save costs and boost profits by reporting on sustainability. On the other hand, Kolk (2004) identified financial and non-financial costs associated with sustainability reporting. The non-financial cost includes; increased pressure from stakeholders, commitment to report to stakeholders, and environmental protection. Numerous studies have investigated the relationship between sustainability reporting and firm performance. The first two study papers were released in 1972 by Bragdon and Marlin and Moskowitz, respectively. Since then, tens of thousands of empirical researches have examined the connection between a company's financial success and sustainability reporting. This research, nevertheless, has produced a range of findings. For instance, Pava and Krausz (1996); Preston and O'Bannon (1997); Waddock and Grave (1997); Simpson and Kohers (2002); Ngwakwe (2008); Callan and Thomas (2009); Rettab et al. (2009); Castaldo et al. (2009); Samy et al. (2010); Uwuigbe and Egbide (2012); found a positive relationship between sustainability reporting and financial performance. According to Carter et al. (2000) and Jo and Harjoto (2011), disclosure of information on environmental practices increased financial performance. According to Margolis and Walsh (2003), revealing social information about a company improves its financial performance. According to Margolis and Walsh's findings from 2003, the firm's financial performance was

improved by providing social information about it. Moreover, Gompers et al. (2003; 2010) discovered that transparency in governance led to better financial performance.

Other studies (such as those by McGuire et al., 1988; Patten (1991); Riahi and Belkaoui, (1992); Sarkis and Cordeiro (2001)) have discovered a link between sustainability reporting and financial performance that is negative. Still, other research (such as Levy (1995); Buys et al. (2011)) found no association or relationship that was not statistically significant. According to Smith et al. (2007), there is a negative correlation between corporate performance and environmental disclosure. Rose (2016) discovered that governance transparency had a detrimental effect on return on assets and equity, while Balabanis et al. (1998) discovered a negative association between social disclosure and company performance. However, Hassan Che Haat et al. (2008) discovered that the performance of the market is not considerably impacted by governance disclosure.

The positive relationship between sustainability reporting and firm performance confirms the argument that the firm performance can be improved by satisfying the needs of the stakeholders and by strengthening the relationship between the stakeholders, employees, and customers through improved employee loyalty and firm reputation. On the other hand, the negative relationship between sustainability reporting and firm performance arises for many reasons. One is that spending on sustainability projects is unnecessary and will move the firm to a competitive disadvantage. The perks of sustainable performances cannot always be reflected through accounting-based performances; they mostly remain tangible (Lee et al., 2013). Scholars usually face three options when measuring firm performance: accounting-based, market-based, or a combination of both. Many scholars have preferred to use accounting-based measures of performance, which are a firm's return on assets (ROA) and return on equity (ROE). Other scholars, however, have selected market-based measures (i.e., Tobin's Q) (Wagner, 2010). Since accounting-based indicators represent what occurs in a company, they

are less complicated (López et al., 2007) and more accurate at predicting sustainability performance (McGuire et al., 1988). Since shareholders are assumed to be the primary stakeholder group, market-based metrics suffer from knowledge asymmetry between managers and shareholders (Cordeiro and Sarkis, 1997). Given the concerns of accounting-based measurements, several research (such as Callan and Thomas, 2009) have combined accounting- and market-based indicators. Therefore, accounting-based and market-based measurements are employed in this thesis to address the criticism of both methods.

When we separately consider the impact of environmental, social, and governance disclosures on the firm performance, the results are mixed and inconclusive. Considering the environmental disclosure and firm performance, Carter et al. (2000) and Jo and Harjoto (2011) have found a positive impact on themselves. In contrast, Smith et al. found an inverse relationship between environmental disclosure and firm performance. Margolis and Walsh (2003) found that social disclosing helped improve the firm's financial performance. In contrast, the study conducted by Balabanis et al. (1998) found a negative relationship between social disclosure and firm performance. Like trends in environmental and social disclosures and their relationship with financial performance, governance disclosures are also having a mixed and inconclusive relationship with the financial performances of the firm, i.e., Gompers et al. (2003) found a positive relationship, and Rose (2016) found a negative relationship. This relationship varies with industries and countries, as the firms' rules, regulations, objectives, and purposes differ. Following a review of the connections between sustainability reporting and various performance indicators (operational, financial, and market), a discussion of the connections between each of the distinct sustainability disclosure areas—environmental, social, and governance—and firm performance follows. Previous research on the connection between sustainability reporting and corporate success has produced a range of findings (Buallay, 2020). Even within the exact location, earlier research on the connection between

sustainability reporting and corporate success has produced conflicting findings. This could be brought on by how differently each nation's sustainability reporting rules are written. Sustainability reporting may be optional, where the scope and nature of reporting may differ significantly between businesses, or mandatory, where it is required by law to provide this information (Buallay, 2020).

2.4.2 ESG Reporting Practices

ESG is the most recent reporting framework the organization has used by government authorities for measuring the sustainability performance of the firms. It provides a unified platform that can help investors and regulators compare and analyse companies regarding sustainable practices. The impact of ESG on a firm's financial and non-financial elements has been a relevant area of research. While considering the relationship between ESG and firm value, few studies give insights relating to the same, but the results are sometimes inconclusive and mixed. One important aspect related to ESG is that firms achieve legitimacy by voluntarily providing ESG information that explains how their activities affect society and the environment and the measures instituted to assuage the negative impacts of their activities (Plumlee et al., 2015). This contrasts with the study by Matuszak and Różańska (2017), where the authors investigated the relationship between social responsibility disclosures and the financial performance of Polish firms. The authors found a negative relationship between the banks' social responsibility disclosures and their Net Interest Margin (NIM), suggesting that the banks that disclosed more social information performed poorer. This finding was supported by Buallay (2020), who examined the link between ESG reporting and the performance of banks in Europe and concluded that social responsibility reporting has a significant negative association with the banks' return on assets (ROA) and return on equity (ROE). Tobin's Q. This finding also implies that ESG reporting reduces the financial performance of banks. Even though these studies document a negative relationship between the variables, some studies give

a positive relationship between ESG and FP. For example, Garcia and Orsato (2020) found a positive and statistically significant relationship between ESG performance and CFP but a negative correlation between ESG and CFP at firms in emerging markets during the study in developed countries. At the same time, some studies show that there is no significant relationship. For instance, a study by (Adegboyegun et al. 2020; Elsayed and Paton, 2005; Matemane and Wentzel, 2019; Qiu et al., 2016) reveals no relationship between these components. Hence these mixed findings indicate that the direction of the relationship is not established clearly in the existing literature and reveals a gap that needs to be addressed. Hence, the present study explores the relationship between ESG and firm value and the moderating effect of ownership structure and board diversity.

Studies by (Giannopoulos et al., 2022; Singh et al., 2022) have found a negative relationship between ESG disclosure and financial performance. In the former study, the negative relationship exists in the short-term and exhibits a positive long-term relationship. Whereas, in the latter study, the relationship between ESG and financial performance measured in terms of ROA and Tobin's q indicates a substantial and unfavourable connection between ESG and company financial performance.

Bhimavarapu et al. (2022) tried to understand whether transparency and disclosures positively impact firms' valuation while considering ESG as a moderator variable. Based on the analysis results, the study says that, when considering transparency and disclosure (TD) individually, it has an inverse relation with a firm valuation. However, with interaction with ESG, there is a positive influence. Considering the disclosures, non-financial firms in India have a modest level of transparency. It was also found that the TD and ESG indices show a positive association, whereas the interaction term and the TD show a negative association. Mitchell (2022) tried to measure the magnitude and extent to which intellectual capital disclosure has changed due to mandating a sustainability reporting regime. The study results show that the

average magnitude and extent of sustainability and the joint sustainability/intellectual capital disclosure increased. In contrast, the average magnitude and extent of intellectual capital disclosure increased when regulatory discussion of a change to mandated sustainability reporting emerged. However, in the annual period, the mandated sustainability reporting became effective while the average magnitude and extent of intellectual capital disclosure declined. Regression analyses reveal a significant association between the change in the magnitude of sustainability disclosure and intellectual capital disclosure; and an insignificant relation with extent. This decline in the transition period can be because of the uncertainty of what mandated sustainability disclosures would ultimately be required.

2.4.3 ESG Ratings

Much attention has been paid to the performance of portfolios based on ESG criteria in the academic literature. Friede, Busch, and Bassen (2015) summarized the findings of more than 2000 studies and provided a good overview. Several recently published articles address this topic's various aspects (Steen et al., 2019; Dolvin et al., 2019; Engelhardt et al., 2021). On the other hand, the importance of ESG ratings has received much less attention. The term 'rating' was initially not even used by many authors, instead referring to 'ESG measures,' 'environmental performance metrics,' and the like. Hill et al. (2007) recognized that the term 'corporate social responsibility' was fluid and difficult to assess (Hill et al., 2007). According to Sandberg et al. (2009), who prefer the term Socially Responsible Investment or SRI, there are several heterogeneities implicit within this definition and the potential benefits of introducing some standardization into the definition. While they remained sceptical, they cited various cultural values among many stakeholders as contributing to their skepticism regarding the likelihood of achieving this goal. A study by Delmas, Etzion, and Nairn-Birch (2013) examined what they referred to as corporate environmental performance and attempted to identify the factors responsible for explaining most of the variance. Kimbrough et al. (2022)

studied the ESG rating agencies' agreement over their ratings for companies that voluntarily report ESG performance. It was found that the ESG disagreement among the ESG rating agencies is lower for firms who report ESG voluntarily.

According to Semenova and Hassel (2015), although the 'environmental performance metrics' are supposed to be driven by similar factors, they do not converge generally. According to Doyle (2018), ESG ratings tend to favour large companies and are more favoured towards firms domiciled in Europe rather than the United States. It has been argued by Walter (2020) that much can be improved in the field of ESG ratings. He suggested creating metrics linked to normative improvement (what are the outcomes one seeks to achieve?) and creating a certification procedure similar to that existing in the credit rating marketplace. Accordingly, Chatterji et al. (2015) and Dorfleitner, Halbritter, and Nguyen (2015) appear to have been the first authors to address this issue explicitly (and more quantitatively). The terms 'corporate social responsibility' and 'socially responsible investments' were used by Chatterji et al. instead of the term 'ESG.' Their analysis shows little correlation between the ratings of six rating agencies (Asset4 et al. and KLD). As a result of the different methods used by RAs to evaluate the same construct, there was no 'rating convergence' (their term). Based on their analysis of the correlation between ratings and the distribution of the ratings, Dorfleitner, Halbritter, and Nguyen (2015) have reached similar conclusions. Berg, Kölbel, and Rigobón 2022) attempted to identify the causes of this phenomenon, considering the lack of agreement among the RAs. According to the authors, RAs used different approaches to assess the performance of firms under the same category, which also caused the divergence. In addition, there were differences in the approaches taken by the RAs to assessing the E, S, or G merits of firms, which the authors referred to as 'scope divergence.' A total of six RAs was used in this study (Asset4, KLD, MSCI, RobecoSAM, Sustainalytics, and Vigeo Eiris). Based only on the ratings provided by three RAs (FTSE et al.), Dimson, Marsh, and Staunton (2020) reported several instances in

which a company received high ratings from one RA and low ratings from another. Billio et al. (2021) confirmed the heterogeneity of ratings reported by previous studies based on ratings provided by MSCI, Retinitis, RobecoSAM, and Sustainalytics. Even though ratings are based on an ordinal scale, these authors employed rank correlations, considered a more appropriate correlation metric than Pearson's correlation. They reported a low value of the 'percentage of observed agreement,' which they deemed very low at 24%. The authors failed to adjust for chance agreements when using this metric. As they suggest, the lack of a standard definition of ESG might also contribute to the disagreement in ratings (i.e., different rating agencies take different measures of ESG).

Unfortunately, another study concluded that significant rating discrepancies were positively correlated with higher returns (Brandon et al., 2021). This finding could be very detrimental for investors as it may encourage them to avoid companies with high environmental, social, and governance metrics ratings. An intriguing conclusion from another recent article on the conflict over ESG ratings is that: a greater level of ESG disclosure leads to greater levels of disagreement over ESG ratings (Christensen et al., 2022); unfortunately, this somewhat counterintuitive conclusion appears to indicate that transparency something most regulators encourage – contributes to confusion in the market. Gyonyorova, Stachon, and Stasek's (2021) study has relevance due to two distinctive features. In the first place, it provides the most comprehensive review of the literature on ESG ratings to date. Further, it uses an approach that differs significantly from all previous studies to address the disagreement in ESG ratings. These authors analysed using data from the SandP 1200 index and five research organizations (Bloomberg et al.). An exploratory factor analysis utilizing principal axis factoring and oblique rotation was employed, and an out-of-sample factor analysis was conducted to confirm the exploratory factor analysis. In their conclusion, the ratings did not demonstrate convergence validity (i.e., different ratings did not measure the same construct), and they suggested that

investors would be better served using several ratings simultaneously. As a result of the lack of agreement among ESG ratings, the financial press and some business publications have also expressed concern. There are usually examples in these articles in which the ratings diverge substantially, and there is an estimation of some correlation between the ratings.

2.4.4 Role of Board characteristics in ESG reporting and Firm valuation

Board characteristics like boards of directors, board size, board diversity, and board expertise are essential in determining a firm's strategies and work plans. Therefore, board characteristics play an essential role in deciding the sustainability practices of the firms. Thus, it is essential to consider them while studying the relationship between ESG reporting and firm valuation. In a corporate governance system, boards of directors are crucial. Boards responsibly balance all stakeholders' interests by implementing stakeholder engagement policies and CSR best practices (Ingley and Walt, 2004; Brennan and Solomon, 2008). More crucially, boards encourage the availability of information if there is a complementarity between the board and openness (Vitolla et al., 2019). Additionally, one of the primary control tools used by shareholders to lessen the severity of agency expenses in the case of agency issues is the board. Voluntary disclosure serves as a control mechanism for two agency relationships in this regard: (i) between shareholders and other stakeholders (Lorenzo et al., 2009; Prado et al., 2009); and (ii) between shareholders and the company's management (Frias-Aceituno et al., 2013). The study of Wasiuzzaman et al. (2014) included the cultural aspects of environmental, social, and governance disclosure and corporate performance. The study shows that variables, audit committee factors, and the audit committee's size are not significant. The study also shows a negative relationship between ESG Disclosure and energy companies' profitability. In their study, Khalid et al. (2022), in their study showed that there is a direct and robust association between board size with environmental and governance disclosure, and the firm's financial success is highly associated with ESG disclosure. Fahad et al. (2021) show a similar result in

their study that explains that firms with better growth rates and more borrowed funds disclose more ESG and environmental information. Gender diversity on the board and CSR disclosure Gender diversity on boards has recently gained importance in corporate governance structures worldwide (Terjesen et al., 2009). The stakeholder theory framework works well with WOCB. Some directors may lack knowledge of the CSR problem, even though boards must manage the interests of the many stakeholders through enterprises' CSR via corporate transparency (Harjoto et al., 2015; Jain and Jamali, 2016). Boulouta (2013) and Harjoto et al. (2015) assert that boards with female directors are more inclined to make CSR investments. The stakeholder theory offers numerous explanations for why this can be the case, which include the differences in perception of both genders (Wood and Eagly, 2009) and differences in background and experience (Hillman et al., 2002; Singh et al., 2008). Yadav et al. (2022) considered the significance of board gender diversity in explaining the relationship between ESG and the financial performance of firms. They found that a modest number of female directors has no impact on an organization's environmental and governance transparency score. The findings show a positive and statistically significant association between social disclosure score and BGD. The social component of the ESG framework, which aims to serve people both within and outside of the firm and necessitates enterprises to report on these efforts, is therefore impacted by the presence of female directors. A critical mass of female board members positively correlates with firms' ESG disclosure ratings but not with scores for pillars.

2.4.5 Role of ownership in ESG reporting and firm valuation

Other factors influencing ESG disclosure and performance include shareholder characteristics and ownership structure. This is particularly important in situations with information asymmetries since certain shareholders may have the abilities, drive, and expertise to stop information from being withheld and improve the nature and scope of disclosure (Donnelly and Mulcahy, 2008). Like this, specific ownership arrangements may impact the degree of

information asymmetry in certain business situations (Raimo et al., 2020). For instance, Raimo et al. (2020) find a positive effect of institutional ownership on the quality of integrated reports and a negative effect of ownership concentration, managerial ownership, and state ownership when analysing the role of ownership structure characteristics on the integrated reporting policies among listed international companies. These findings demonstrate how various ownership forms affect corporate interactions between businesses and their stakeholders (Lavin and Alejandro, 2021). In their study, Brickley et al. (1988) used institutional owners and their characteristics to understand the impact of ownership structure on a firm's anti-take-over amendments. They classified institutional investors into three categories based on their pressure on managerial and governance decisions. Based on that classification, institutional investors such as insurance companies, banks, and nonbank trusts as pressure-sensitive, institutions like pension funds, mutual funds, endowments, and foundations as pressure-resistant, and institutions like corporate pension funds, brokerage houses, investment firms, miscellaneous and unidentified institutions as pressure-indeterminate institutes. The study will use this classification of institutional investors to understand the role of institutional investors in determining the relationship between ESG and firm value.

2.5 Research Gap

Sustainability reporting has undergone many changes over the years, and ESG reporting practices are one of the recent developments in sustainability reporting. The previous studies mainly concentrated on sustainability reporting, CSR contributions, and integrated reporting. Even though studies considering ESG reporting are present, various dimensions related to ESG reporting and its impact on the firm are still to be explored more. ESG reporting practices and their impact on firm value have gained significant attention recently. Numerous studies have examined the relationship between ESG disclosure and firm performance, but the results of these studies are mixed and inconclusive. In addition, there is a research gap concerning the

role of board characteristics and ownership structure in determining this relationship. While the link between ESG reporting and firm value has been explored, it remains unclear how board characteristics, such as board size, diversity, expertise, and ownership structure, including ownership concentration and institutional ownership, influence the relationship between ESG disclosure and firm value. To date, limited research has investigated the moderating effect of board characteristics and ownership structure on the association between ESG reporting practices and firm value. Understanding how these factors influence the relationship is crucial, as they can potentially shape firms' strategic decisions and governance practices, thus impacting their overall performance and value.

2.6 Research Questions

Based on the previous literature, many unexplored research questions can help companies frame better policies and management strategies. The main research questions that the current study will focus on are: -

- How does ESG reporting practices or ESG performance impact firm value?
- How do Environmental, Social, and Governance performance individually impact the firm valuation?
- What is the relationship between board characteristics (e.g., board size, diversity, expertise) and the association between ESG reporting and firm value?
- How does ownership structure (e.g., ownership concentration, institutional ownership) moderate the relationship between ESG reporting and firm value?

2.7 Research Hypothesis

The research hypothesis framed based on the research questions are:

H_1: ESG has an impact on firm value

H_2: Environmental performance has an impact on firm valuation

H_3: Social performance has an impact on firm valuation

H_4 : Governance performance has an impact on firm valuation

H_5: Board characteristics have a moderating role in determining the ESG-Firm value relationship

H_6: Ownership structure has a moderating role in determining the ESG-Firm value relationship

2.8 Summary

The literature on ESG reporting practices and their impact on firm value has expanded significantly in recent years. Several studies have investigated the relationship between ESG disclosure and firm performance, with a growing recognition of the potential value-enhancing effects of robust ESG reporting practices. However, a research gap exists regarding the role of board characteristics and ownership structure in determining this relationship. Numerous studies have explored the association between ESG reporting and firm value, highlighting the positive influence of effective ESG practices on financial performance, cost of capital, and risk management. These findings indicate that firms with transparent and comprehensive ESG disclosures tend to attract more investors, improve stakeholder relations, and enhance long-term sustainability.

However, the role of board characteristics and ownership structure in shaping the relationship between ESG reporting and firm value remains relatively unexplored. Board characteristics, including board independence, diversity, and expertise, can potentially affect the adoption and implementation of ESG practices. Boards with diverse expertise and independent directors may provide valuable guidance in formulating ESG strategies and overseeing their effective execution, positively impacting firm value. Likewise, ownership structure, such as ownership concentration and institutional ownership, can significantly influence a firm's ESG reporting practices and subsequent firm value. Higher ownership concentration might incentivize long-

term value creation, including improved ESG performance. In contrast, institutional ownership may pressure firms to enhance ESG disclosure to meet their responsible investment criteria. Although limited research has examined the moderating effects of board characteristics and ownership structure, their impact on the relationship between ESG reporting and firm value remains unclear. Understanding how these factors interact with ESG practices can provide valuable insights into the strategic decision-making processes of firms, corporate governance practices, and their implications for firm performance and value.

To address this research gap, future studies can employ quantitative methods, such as regression analysis, to examine the moderating role of board characteristics and ownership structure in the association between ESG reporting and firm value. By filling this research gap, the findings can contribute to the existing literature by shedding light on the interplay between ESG reporting, board characteristics, ownership structure, and firm value. The results can inform stakeholders, including policymakers, managers, and investors, about the importance of considering board composition and ownership structure when formulating ESG reporting strategies. Ultimately, this research can provide practical recommendations for firms aiming to enhance their ESG practices and improve their overall performance and value.

CHAPTER III

RESEARCH DESIGN

Chapter III

Research Design

3.1 Introduction

The concept of sustainability has gained increasing attention across the globe, among governments, civil society, and business that aims to adopt a wide range of new sustainable economic, social, and environmental practices. (Apergis et al., 2022). In an organization with diverse and inclusive stakeholders, it is the responsibility of the organization to fulfill the economic, environmental, and social goals of these individuals (Buchholz and Rosenthal, 2005; Laplume et al., 2008). Sustainability reporting is an important channel through which organizations attempt to meet these goals. A private company's disclosure of sustainability information benefits them in many ways, for example, it improves transparency and enhances brand value, reputation, and legitimacy (Herzig and Schaltegger, 2006). Sustainability reporting is increasingly recognized as an important factor contributing to corporate sustainability (Lozano and Huisingh, 2011). In this context, the present study tries to explore the relationship between ESG and firm performance. The study also tries to understand the role of board characteristics and ownership classification in determining the role of ESG and firm performance.

3.2 Sample Selection and Source of Data

The study is based on the data collected from the top 1000 companies based on the market capitalization as of 2022 March 31st. The sample is collected for a period of nine years from 2014-2022, as ESG was introduced in India by SEBI in 2012 voluntarily among the top 100 companies. Thus, we have taken a gap of two years considering the compliances and procedures for the new adaptation. The ESG disclosure-related data, board characteristics, and

institutional ownership data are collected from the Refinitiv Eikon database, and other financial variables-related data are collected from the CMIE prowess database.

3.3 Variable Definition

A detailed description of the identified independent, dependent, moderating, and control variables are mentioned in the below table. The study considers ESG, individual E, S, and G parameters, and ESG controversy score as the independent variable and ROE and ROA as the dependent variable to measure the firm performance. The study also incorporates board and ownership characteristics as the moderating variable and included other control variables.

Table 3.1 Variables and definition

Variables	Definition
Panel A: Independent Variables	
ESG Score	The combined score of Environmental, Social, and Governance scores.
Env	Independent environmental parameter scores in the ESG Disclosure. Available at Refinitiv Eikon
Soc	Independent Social parameter scores in the ESG Disclosure. Available at Refinitiv Eikon
Gov	Independent governance parameter scores in the ESG Disclosure. Available at Refinitiv Eikon
ESGCon	The ESG Controversy Category Score is calculated based on 23 ESG controversy topics (the list of which is available in the appendix) and measures a company's exposure to environmental, social, and governance controversies and negative events reflected in global media. Available at Retinitis Eikon
ESGCom	A measure that rates companies on their level of ESG disclosure. Available at Retinitis Eikon
Panel B: Dependant Variables	
Tobin’s Q	The Q ratio, also known as Tobin's Q, equals the market value of a company divided by its assets' replacement cost. It is calculated by: Tobin’s Q= Total Asset Value of Firm/Total Market Value of Firm

Panel C: Moderating Variables and control variables

Board Characteristics	Board size, Board Member Compensation, Board Structure Policy, Board Attendance, Board Background and Skills, Board gender diversity, Board Specific Skills, CEO Chairman Duality, CEO Board Member.
Institutional Ownership	Percentage of common, or common equivalent, shares outstanding held by institutional investors (e.g., Mutual funds, banks, insurance companies, pension funds, etc) at the time of the proxy fight
TFA	Total Fixed assets
Debt to Equity	Leverage: Total debt/total assets
EV	Enterprise Value
CoC	A Financial metric used to calculate a firm's cost of capital in which each category of capital is proportionately weighted.

3.4 Data Cleaning and arriving at final Sample

The final firm-year observation after eliminating the duplicate values and the missing variables is 1595. The details of the elimination are represented in Table 2. As the ESG regulations began to change from voluntary to mandatory to an extensive scale, the companies have yet to disclose their sustainability reporting. Most of the companies have started reporting ESG disclosures in the recent two to three years.

Table 3.2 Details of the data cleansing exercise and arrival of the final sample

Particulars	Sample
The initial number of firm-year observations for the study period	9000
Loss due to duplicates	378
Loss due to absence of ESG disclosures and scoring and missing dependent and independent variables	7027
Final firm-year observations	1595

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3.5 Industry-wise classification of the Final sample

The industry-wise classification of the selected sample is represented in Table Four. The industries that lead in terms of ESG disclosures include Banks, Chemicals, the Oil and Gas

industry, Construction materials, and the IT industry. The detailed division of firm-year observations among the industries is represented below:

Table 3.3 Total firm-year observations GICS industry-wise

Sl.No	GICS Industry Name	Firm-year observations
1	Aerospace and Defense, Air Freight and Logistics, Airlines, Passenger Airlines	21
2	Auto and automobile Components, automobile industry	113
3	Banks, Capital Markets, Consumer Finance, Diversified Financial Services, Financial Services	266
4	Beverages	20
5	Biotechnology	4
6	Broadline Retail	3
7	Chemicals	107
8	Commercial Services and Supplies	2
9	Communications Equipment, Diversified Telecommunication Services, Wireless Telecommunication Services	44
10	Construction Materials, Construction and Engineering, Building Products	108
11	Electric Utilities, Electronic Equipment, Instruments and Com, Electrical Equipment, Energy Equipment and Services, Semiconductors and Semiconductor Equipment	83
12	Entertainment, Media, Interactive Media and Services	25
13	Equity Real Estate Investment Trusts	2
14	Food and Staples Retailing, Consumer Staples Distribution and Retail, Food Products, Containers and Packaging, Hotels, Restaurants and Leisure	82
15	Gas Utilities	21
16	Ground Transportation, Marine Transportation, Transportation Infrastructure, Road and Rail	29

17	Health Care Equipment and Supplies, Health Care Providers and Services	17
18	Household Durables, Household Products	19
19	IT Services. Software	71
20	Independent Power and Renewable Electric	31
21	Industrial Conglomerates	21
22	Insurance	23
23	Internet and Direct Marketing Retail	1
24	Life Sciences Tools and Services	10
25	Machinery	42
26	Metals and Mining	81
27	Office REITs	1
28	Oil, Gas and Consumable Fuels	70
29	Paper and Forest Products	6
30	Personal Care Products, Personal Products	32
31	Pharmaceuticals	103
32	Professional Services	14
33	Real Estate Management and Development	39
34	Specialty Retail	7
35	Textiles, Apparel and Luxury Goods	44
36	Thrifts and Mortgage Finance	10
37	Tobacco	11
38	Trading Companies and Distributors	12
Total firm-year observations		1595

3.6 Variables

The study main focuses on firm value and ESG parameters and their relationship. In order to incorporate the impact of other factors certain control variables have been included in the study. The study extends to understand the impact of board characteristics and ownership in

determining the relationship between ESG and firm value. The details of variables selected for understanding the relationships is described in detail in the following sections.

3.6.1 Dependant variable

The study primarily focus on understanding the impact of ESG based sustainability reporting in firm valuation. Prior studies have focused on analysis both firm performance and firm valuation. Studies mostly used Return on Equity and Return on Assets (Marri, 2022; Tandelilin and Usman, 2022; Buallay, 2022) as marketing and accounting measures respectively. Firm valuation has been considered as an important factor for analysing the impact of sustainability reporting in several previous literature. Tobin's Q is the most used measure for calculating firm valuation (Buallay and Marri, 2022; Shaikh, 2022; Ray and Goel, 2022). It has been considered as the ratio of total market capitalization to total assets. In this study, we have considered Tobin's Q as the measure for firm valuation.

3.6.2 Independent variables

ESG is an important framework that is used to understand the performance of the firms in terms of sustainability. Many third-party agencies provide performances of the firms on sustainability performance using different calculation methods and criteria. In this study, we have utilized the ESG scores provided by Refinitiv Eikon (Fatemi et. al., 2018; Bae et. al., 2021, Srivastava et. al., 2022), in which the score there are four components that constitute the ESG score. They include: - environmental score, social score, governance Score, and ESG controversy score. Environmental score is the score of the firm based on the performance towards environmental components like carbon emission, energy utilisation, natural resource utilization, recycling etc. Social score is based on the performance of the firm in components like, social development, employee satisfaction, community development etc. The third component, governance score is based on the performance of the firm in terms of the board member compositions, audit

committee, governance mechanisms etc. Finally, the last component is the ESG controversy score which marks the company's exposure to ESG controversies and negative events related in global media. The combined sum of the environment, social, governance, and controversy is called as the combined ESG score.

3.6.3 Moderating variables

Other than the primary objective of understanding the ESG and firm value relationship, the study also extends to understand the moderating role of board characteristics and Ownership type in determining the relationship between ESG and firm value.

Board Characteristics

Board characteristics is measured using various variables including board size, board member compensation, board structure policy, board attendance, board background and skills, board gender diversity, board specific skills, CEO duality, CEO board member (Harasheh et. al., 2022; Khalid et. al., 2022; Yadav et. al., 2022; Wasiuzzaman et. al., 2021). An index based on the scores given for each variable is calculated after standardizing the score in one scale. The impact is calculated based on the index score and the role of gender diversity and CEO duality is separately measured.

Ownership type:

In this study, we have considered the institutional investors to understand the role of ownership type in determining the relationship between ESG and firm value (Liu et. al., 2022). Institutional investors have been classified in to three categories based on the pressure exerting characteristics, i.e., pressure sensitive, pressure-resistant, and pressure-indeterminant (Brickley et. al., 1988). The major types of institutional investors considered in the study are: Individual adviser, Other Insider, Research Firm, Corporation, Individual investors (Pressure indeterminant); Sovereign Wealth Fund, Pension Fund, Hedge Fund (Pressure resistant); and

Insurance company, bank and trust, holding company (Pressure sensitive). We have studied, the impact based on both the total investment percent and individual investment percent of the different ownership types.

3.6.4 Controlling variables

The study has incorporated four control variables in the study based on the previous literature. Enterprise value, Leverage ratio, Cost of Capital, and total fixed assets. Enterprise Value is calculated as market capitalization, plus debt, minority interest and preferred shares, minus total cash and cash equivalents (Rezaee et. al., 2022; Behl et. al., 2022; Fahad and Busru, 2021). Leverage ratio is the ratio of total debt to total equity percent (Giannopoulos et. al., 2022; Wasiuzzaman et. al., 2021). Cost of Capital is a financial metric used to calculate a firm's cost of capital it has incurred. It is the sum of cost of debt and equity. Cost of debt is the marginal cost to the company of issuing new debt now and cost of equity is the return a theoretically pays its equity investors (Nazir et. al., 2021; Gray et. al., 2009). Finally, Total fixed assets which is the initial cost of establishment in terms of fixed assets (Carvajal et. al., 2022; Yahya and Vaihekoski, 2022).

3.7 Empirical Framework

In order to satisfy the objectives framed and test the hypotheses we employed fixed effects regression models to estimate the relationship between ESG and firm value. The Hausman test also indicates that fixed effects regression model is preferred over the random effects model. The following equations are estimated

$$Tobin'sQ_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 Controls_{i,t} + yearFE + industryFE + \varepsilon_{i,t} \quad -(1)$$

$$Tobin'sQ_{i,t} = \beta_0 + \beta_1 ESGCom_{i,t} + \beta_2 Controls_{i,t} + yearFE + industryFE + \varepsilon_{i,t} - (2)$$

$$Tobin'sQ_{i,t} = \beta_0 + \beta_1 E_{i,t} + \beta_2 Controls_{i,t} + yearFE + industryFE + \varepsilon_{i,t} \quad - (3)$$

$$Tobin'sQ_{i,t} = \beta_0 + \beta_1 S_{i,t} + \beta_2 Controls_{i,t} + yearFE + industryFE + \varepsilon_{i,t} \quad -(4)$$

$$Tobin'sQ_{i,t} = \beta_0 + \beta_1 G_{i,t} + \beta_2 Controls_{i,t} + yearFE + industryFE + \varepsilon_{i,t} \quad -(5)$$

$$Tobin'sQ_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 Controls_{i,t} + \beta_3 Board\ Characteristics_{i,t} + yearFE + industryFE + \varepsilon_{i,t} \quad -(6)$$

$$Tobin'sQ_{i,t} = \beta_0 + \beta_1 ESG_{i,t} + \beta_2 Controls_{i,t} + \beta_3 Institutional\ Investment_{i,t} + yearFE + industryFE + \varepsilon_{i,t} \quad -(7)$$

Here, Tobin's Q represents the firm value, ESG is the ESG score, ESGCom represents the ESG combined score which is the sum of ESG score and the controversy score. Board Characteristics include the index of different board characteristics and institutional investment includes the percent of ownership that institutional investors hold.

CHAPTER IV

ESG REPORTING PRACTICES IN INDIA- AN OVERVIEW

Chapter IV

ESG Reporting Practices in India- An Overview

4.1 Introduction

ESG (Environmental et al.) reporting practices have gained significant traction worldwide as companies recognize the importance of sustainable and responsible business practices (Buallay, 2020). The relevance of sustainability reporting is being discussed, and regulators, corporates, and investors widely acknowledge its role in the changing dynamic business environment. With increasing investment and growth across several industries, the Indian economy is expanding exponentially. With these enormous changes and shifts, firms that care more about people, the environment, and profit are being created increasingly frequently. With the conviction that business models that respect the triple bottom line of "profit, planet, and people" will only be successful in the long term, we are dedicated to promoting sustainable practices in our markets. The business can think long-term, have a broader awareness of risks and opportunities, and have a better connection between financial and non-financial drivers by adopting regulatory frameworks across all its divisions (BSE, 2022).

In India, ESG reporting has become a crucial corporate transparency and accountability aspect. Various factors, including regulatory developments, investor demands, and societal expectations, have driven the adoption of ESG reporting in India. The roots of ESG reporting in India can be traced back to the early 2000s when CSR initiatives began to gain prominence. The Indian Companies Act of 2013 introduced a mandatory CSR provision, which required certain companies to spend a portion of their profits on social development activities. This marked an important milestone in acknowledging the broader impact of businesses beyond financial performance. Over time, the focus expanded beyond CSR to encompass a broader range of environmental, social, and governance issues. In 2018, the Securities and Exchange

Board of India (SEBI), the regulatory body for the securities market, made it mandatory for the top 500 listed companies to disclose their annual business responsibility reports, which included ESG-related information. This move aimed to enhance transparency and enable stakeholders to make informed investment decisions. This section will detail the history of sustainability reporting practices in India.

4.2 History of Sustainability Reporting in India

Sustainability reporting in India has come a long way since it was first introduced in the early 2000s. Sustainability reporting was largely voluntary, but there has been a growing push for mandatory sustainability reporting in recent years.

This push for mandatory sustainability reporting has been driven by several factors (Tiwari, 2020), including:

- The increasing importance of sustainability to investors and consumers
- The growing availability of data and tools to measure and report on sustainability performance
- The rise of ESG investing, which has put pressure on companies to disclose their sustainability performance

In 2021, the Securities and Exchange Board of India (SEBI) introduced mandatory sustainability reporting requirements for India's top 1000 listed companies. These new requirements are designed to improve the quality and comparability of sustainability reporting in India and to help investors and other stakeholders make better decisions about where to invest their money. The new sustainability reporting requirements cover a wide range of topics, including (SEBI, 2021):

- Environmental Impact
- Social Impact

- Governance practices
- Risk management
- Performance indicators

Companies are required to report on their sustainability performance comprehensively and transparently. The new requirements also include specific guidance on measuring and reporting sustainability performance. The new sustainability reporting requirements are a significant step forward for sustainability reporting in India. They will help improve the quality and comparability of sustainability reporting and help investors and other stakeholders make better decisions about where to invest their money (Samtani, 2021).

Here are some of the key recommendations from across industries that have responded to the new format (Deloitte, 2021):

- Industry associations: Industry associations have called for SEBI to provide more guidance on implementing the new reporting requirements. They have also called for SEBI to exempt smaller companies from the new requirements.
- Investors: Investors have welcomed the new reporting requirements, but they have also called for SEBI to ensure that the information is presented in a way that is easy to understand.
- Companies: Companies have expressed concerns about the cost of complying with the new reporting requirements. They have also called for SEBI to provide more flexibility in implementing the requirements.

It is important to note that the new sustainability reporting requirements are still in their early stages. SEBI continues working with industry associations, investors, and companies to implement the new requirements. The requirements will likely be further refined in the coming years.

Despite the challenges, the new sustainability reporting requirements are a significant step forward for sustainability reporting in India. They will help improve the quality and comparability of sustainability reporting and help investors and other stakeholders decide where to invest their money.

4.2.1 Shift from Voluntary to Mandatory Regime

Sustainability reporting in India has come a long way in a short period. From the early days of voluntary reporting to the current mandatory requirements, sustainability reporting is now an integral part of corporate governance in India. The future of sustainability reporting in India is bright. As businesses become more aware of sustainability's importance and investors and consumers demand more transparency, sustainability reporting will become increasingly important (Saraf, 2021).

In India, sustainability reporting practices consist of both voluntary and mandatory frameworks. Here is an overview of the regimes of voluntary and mandatory sustainability reporting:

Voluntary Reporting Regime:

Global Reporting Initiative (GRI): The GRI framework is widely recognized globally and allows companies to disclose their sustainability performance voluntarily. Many Indian companies adopt the GRI Standards to report environmental, social, and governance (ESG) aspects.

United Nations Global Compact (UNGC): The UNGC provides a voluntary initiative for businesses to align their strategies and operations with ten universally accepted principles in human rights, labour, environment, and anti-corruption. Indian companies can voluntarily join the UNGC and report on their progress towards these principles.

Sustainability Indices: Indian stock exchanges, such as the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE), have launched sustainability indices. These indices track the performance of companies based on their ESG indicators and provide recognition to companies demonstrating good sustainability practices. Companies voluntarily participate and disclose relevant information to be considered for inclusion in these indices.

Mandatory Reporting Regime:

Business Responsibility Reporting (BRR): The Securities and Exchange Board of India (SEBI) introduced the BRR framework, which mandates the top 100 listed companies on the BSE and NSE to disclose their sustainability-related performance. The BRR guidelines require companies to report on environmental, social, and governance parameters in their annual reports.

CSR Reporting: The Companies Act mandates certain qualifying companies to spend a specified percentage of their profits on CSR activities. These companies are required to disclose their CSR initiatives and expenditure in their annual reports.

Companies Act Reporting: Through various amendments, the Companies Act has increased reporting requirements related to sustainability. Companies must disclose their environmental impact, energy conservation and natural resource management steps, and measures implemented for reducing greenhouse gas emissions.

It is important to note that while certain aspects of sustainability reporting are mandatory, companies are also encouraged to go beyond the mandatory requirements and voluntarily disclose additional sustainability-related information using frameworks like GRI and UNGC. This dual approach of combining mandatory reporting with voluntary frameworks aims to enhance transparency, accountability, and sustainable practices among Indian businesses.

In India, sustainability reporting practices consist of both voluntary and mandatory frameworks. The voluntary reporting regime is more flexible and allows companies to disclose their sustainability performance in a way that best suits their needs. On the other hand, the mandatory reporting regime is more rigid and requires companies to disclose specific information in a specific format. The dual approach of combining mandatory reporting with voluntary frameworks has several advantages. First, companies can tailor their sustainability reporting to specific needs and circumstances. Second, it encourages companies to go beyond the mandatory requirements and voluntarily disclose additional sustainability-related information. Third, it helps to ensure that sustainability reporting is more transparent and accountable.

The dual approach to sustainability reporting is still in its early stages in India. However, it is a promising development that has the potential to make a significant impact on the sustainability performance of Indian businesses (Brown, 2021).

4.3 Timeline of sustainability reporting practices in India

Sustainability reporting in India has evolved to address the growing concern for the environmental and social impacts of businesses. Here is a brief history of sustainability reporting in India:

- Early Stages (1990s-2000s):

The concept of sustainability reporting emerged globally in the 1990s, driven by international initiatives like the Global Reporting Initiative (GRI) and the United Nations Global Compact (UNGC). In India, the first major development in sustainability reporting came with the introduction of the National Voluntary Guidelines on Social, Environmental, and Economic Responsibilities of Business (NVGs) in 2011. These guidelines encouraged businesses to disclose their sustainability performance.

- Introduction of SEBI Guidelines (2012):

In 2012, the Securities and Exchange Board of India (SEBI), the regulatory authority for the securities market, introduced the Business Responsibility Reporting (BRR) framework.

The BRR framework mandated the top 100 listed companies on the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE) to include sustainability-related disclosures in their annual reports.

- CSR Mandate (2013):

In 2013, the Companies Act was amended, making it mandatory for certain qualifying companies to spend a specified percentage of their profits on CSR activities. As a result, companies started reporting on their CSR activities as part of their annual reports, although this was primarily focused on social aspects of sustainability.

- Adoption of GRI Guidelines (2015):

In 2015, the Ministry of Corporate Affairs (MCA) in India issued a notification allowing companies to use the GRI Sustainability Reporting Standards as an alternate reporting framework. This move aimed to align Indian reporting practices with global standards, facilitating greater comparability and transparency in sustainability reporting.

- Companies Act Amendments (2019):

In 2019, the Companies Act was further amended to enhance the reporting requirements on sustainability-related matters. Companies must disclose their environmental impact, steps to conserve energy and natural resources, and initiatives to reduce greenhouse gas emissions.

- The Rise of ESG Reporting:

Environmental, Social, and Governance (ESG) reporting has recently gained prominence globally and in India. Various stock exchanges, such as the BSE and the NSE, have introduced ESG reporting guidelines and voluntary reporting platforms, encouraging companies to disclose their ESG-related performance. It is important to note that sustainability reporting in India is still evolving, and regulatory bodies and industry associations continue to work towards enhancing reporting frameworks and guidelines to promote sustainable business practices.

4.3.1 Business Responsibility and Sustainability Reporting

Transitioning to sustainable development and adapting to and reducing climate change's effects have become key worldwide concerns in recent years. Growth in total assets and inflows into sustainable funds indicate that investors are placing more emphasis on sustainability investing. Globally, the total assets in sustainability funds climbed by 129%, or a CAGR of 35%, from USD 550 billion at the beginning of 2018 to USD 1,258 billion at the end of September 2020 (Morningstar, 2022). The Covid19 epidemic has also increased investors' interest in ESG factors.

Only about 0.05% of the world's assets in sustainable funds come from funds in India. Six of India's eight ESG-themed funds were introduced in 2020, demonstrating the country's growing interest in and desire for sustainable investment. Disclosure regulations must evolve together with the mainstreaming of ESG investment. While investors and other stakeholders have been putting growing pressure on firms to disclose their ESG risks, practices, and consequences, authorities worldwide also demand ESG disclosures more often (SEBI, 2021). For instance:

- The United Kingdom has mandated "comply-or-explain" climate change reporting for listed premium businesses starting in FY 2021–2022, based on the Taskforce on Climate-related Financial Disclosures (TCFD) recommendations. By gradually

expanding the scope of these disclosures and making them necessary, the economy will have adopted mandatory climate-related disclosures by FY 2024–25.

- The "Non-Financial Reporting Directive" of the European Union (EU), which mandates ESG disclosure from businesses with more than 500 workers doing business in the EU, is being strengthened.
- In New Zealand, by 2023, all listed equity and debt issuers must provide climate-related disclosures based on the TCFD framework.
- Additionally, the USA Securities and Exchange Commission has declared its aim to increase its emphasis on disclosures relating to the environment.
- Among Asian Countries, Taiwan has mandated disclosures regarding sustainability for companies above a particular amount of paid-up capital. Singapore has also implemented sustainability reporting on a "comply or explain basis" since June 2016. Hong Kong has mandated disclosures on board statements regarding significant climate change concerns that impact the issuer.

In March 2019, along with the release of the revised National Voluntary Guidelines (NVGs), i.e., National Guidelines on Responsible Business Conduct (NGRBCs), the Ministry of Corporate Affairs (MCA) constituted a committee on Business Responsibility Reporting. Considering global developments like the UN Sustainable Development Goals (SDGs), United Nations Guiding Principles on Business and Human Rights (UNGPs), and Paris Agreement on Climate Change, the committee recommended increasingly seeking businesses to be more responsible and sustainable towards their environment and society. The committee also conveyed that the investors are increasing their focus and interest in sustainability investing (SEBI, 2018). Based on the committee’s recommendation, the Business Responsibility Report (BRR) was converted into the Business Responsibility and Sustainability Report (BRSR).

Based on the new regulations, while framing the disclosures, companies had to follow nine principles laid down by the NGRBCs, which are:

1. Businesses should conduct and govern themselves responsibly: This principle emphasizes the need for businesses to adhere to ethical practices, integrity, and transparency in their operations, while also promoting good corporate governance.
2. Businesses should provide safe goods and services that contribute to sustainability: This principle focuses on ensuring the safety, quality, and sustainability of products and services offered by businesses. It encourages responsible production, responsible consumption, and the reduction of environmental impacts.
3. Businesses should promote the well-being of all employees: This principle highlights the importance of ensuring fair treatment, safety, and well-being of employees. It promotes equal opportunities, non-discrimination, and respect for workers' rights.
4. Businesses should respect the interests of and be responsive to all stakeholders, especially those who are disadvantaged or marginalized: This principle emphasizes the need for businesses to engage with and consider the interests of all stakeholders, including disadvantaged or marginalized groups. It encourages inclusive and participatory decision-making processes.
5. Businesses should respect and promote human rights: This principle underscores the respect for human rights by businesses and encourages them to avoid complicity in human rights abuses. It advocates for due diligence to identify and address any adverse human rights impacts of business activities.
6. Businesses should respect and try to protect and restore the environment: This principle promotes environmental sustainability by reducing environmental impacts, conserving resources, and adopting environmentally friendly practices. It encourages businesses to contribute to environmental protection and restoration.

7. Businesses, when engaging in influencing public and regulatory policy, should do so responsibly: This principle highlights the responsibility of businesses when engaging in public policy advocacy. It encourages transparency, integrity, and respect for the democratic process while advocating for sustainable development policies.
8. Businesses should promote inclusive growth and equitable development: This principle emphasizes the role of businesses in promoting inclusive economic growth and equitable development. It encourages companies to contribute to communities' social and economic well-being, particularly those in underprivileged regions.
9. Businesses should engage with and provide value to their customers and consumers responsibly: This principle focuses on responsible marketing, fair business practices, and delivering value to customers. It encourages businesses to ensure product and service safety, reliability, and quality while respecting consumer rights.

These nine principles are divided into Essential (mandatory) and Leadership (voluntary). The leadership indicator in the disclosure incorporates the sustainability performance of the value chain companies, thereby increasing the responsibility of the listed companies in ensuring a better and sustainable value chain based on the ESG principles. The significant elements of each parameter based on the committee's recommendation are shown in Figure 4.1. It has tried to incorporate most environmental, social, and governance elements.

Figure 4.1

Elements of the BRSR Report based on the NGRBCs committee recommendation

Environment Related Disclosure	Social Related Disclosure	Governance Related Disclosure
Essential Indicators: ▪ Resource usage: Energy consumption, water withdrawal, and consumption ▪ Air emissions: Scope 1, Scope 2 Greenhouse gases (GHG) and air pollutant emissions ▪ Waste management: Quantum of hazardous and non-hazardous waste generated, re-used, and recycled along with waste management practices ▪ Compliance with the Extended Producer Responsibility (EPR) plan submitted to Pollution Control Boards and the Performance-Achieve-Trade (PAT) Scheme of the Bureau of Energy Efficiency.	***Employees/workers related:*** ▪ Disclosures on gender and social diversity, including measures for differently abled employees and workers ▪ Turnover rates ▪ Median wages ▪ Welfare benefits to permanent and contractual employees/workers ▪ Occupational health and safety ▪ Training	***Role of the Board in Sustainability:*** ▪ Statement from the director responsible for the report ▪ To highlight sustainability-related challenges ▪ targets and performance
Leadership indicators: ▪ Energy consumption mix through renewable and non-renewable sources, water discharge, ▪ Water consumption in areas of water stress, ▪ Scope 3 GHG emissions ▪ Reclaimed products (as % of products sold)	***Community-Related:*** ▪ Disclosures on Social Impact Assessments (SIA) ▪ Rehabilitation and Resettlement ▪ Corporate Social Responsibility	***Conduct related:*** ▪ Disclosures on fines/penalties/action taken by regulatory authorities, judicial institutions, or any law enforcement agency on any of the principles.

▪ Impact on biodiversity
Consumer-related: ▪ Disclosures on product labeling ▪ Product recall ▪ Consumer complaints in respect of data privacy ▪ Cyber security

Here is a timeline outlining the key milestones in the development of sustainability reporting practices in India:

Figure 4.2
Timeline of Sustainability Reporting in India

This timeline highlights the significant milestones in the evolution of sustainability reporting practices in India, reflecting the growing recognition of environmental, social, and governance factors in business decision-making and transparency.

4.4 Current Scenario of sustainability reporting in India

The current scenario of sustainability reporting in India is witnessing significant progress and increasing momentum. Here are some critical aspects of the present situation:

- Increased Awareness and Adoption: There is a growing awareness among Indian companies about the importance of sustainability reporting and its potential benefits. More companies recognize the value of integrating environmental, social, and governance (ESG) factors into their business strategies and voluntarily adopt sustainability reporting practices.
- Regulatory Environment: The regulatory landscape in India has been instrumental in promoting sustainability reporting. The Securities and Exchange Board of India (SEBI) mandates the top 100 listed companies on the Bombay Stock Exchange (BSE) and the National Stock Exchange (NSE) to disclose their sustainability-related performance through the Business Responsibility Reporting (BRR) framework. Additionally, amendments to the Companies Act have enhanced reporting requirements on environmental and social aspects.
- Reporting Frameworks: Indian companies have increasingly adopted internationally recognized reporting frameworks such as the Global Reporting Initiative (GRI) Standards. The GRI framework provides comprehensive guidelines for reporting on economic, environmental, and social impacts, enabling companies to disclose their sustainability performance in a standardized and comparable manner.
- Focus on ESG Integration: Environmental, Social, and Governance (ESG) considerations are gaining prominence in sustainability reporting. Indian companies recognize the need to

integrate ESG factors into their business strategies and reporting practices to enhance long-term value creation, risk management, and stakeholder trust.

- Investor Demand and Financial Institutions: Investors, including domestic and international financial institutions, emphasize ESG factors more when making investment decisions. This has increased the demand for transparent and standardized sustainability reporting by Indian companies.
- Sector-Specific Initiatives: Several industry associations and sector-specific initiatives in India promote sustainability reporting practices. For example, the Confederation of Indian Industry (CII) has launched various programs and platforms to encourage sustainable business practices and reporting across sectors.
- Reporting Platforms and Indices: Stock exchanges like the BSE and NSE have introduced sustainability indices and reporting platforms that track and recognize companies based on their ESG performance. These platforms provide visibility and incentivize companies to improve their sustainability reporting practices.
- Reporting Beyond Compliance: Many companies in India voluntarily go beyond the mandatory reporting requirements and adopt additional reporting frameworks and standards to disclose their sustainability performance comprehensively.

Overall, sustainability reporting in India is witnessing positive developments with increased awareness, regulatory support, adoption of international frameworks, and growing investor interest. The focus on ESG integration and sector-specific initiatives further contributes to advancing sustainability reporting practices in the country.

Benefits of Sustainability Reporting:

Sustainability reporting has many benefits in the development of businesses, thereby, the development of the economy. Many studies (Hahn and Kuhnen, 2013; Schaltegger, 2006; Lindgreen et al., 2009) have studied the benefits of sustainability reporting. Moreover, some of the benefits of sustainability reporting in the Indian context are mentioned below:

- Improved transparency and accountability: Sustainability reporting can help to improve transparency and accountability by providing stakeholders with information about a company's sustainability performance. Stakeholders can use this information to make informed decisions about their investments, business relationships, and other activities.
- Reduced risk: Sustainability reporting can help to reduce risk by identifying and mitigating sustainability-related risks. For example, by disclosing information about its environmental impact, a company can identify and address potential risks to its operations, reputation, and financial performance.
- Improved decision-making: Sustainability reporting can help companies make better decisions by providing information about their sustainability performance. This information can be used to identify areas where the company can improve its sustainability performance and develop strategies for achieving its sustainability goals.
- Increased brand value: Sustainability reporting can help to increase brand value by demonstrating a company's commitment to sustainability. This can make the company more attractive to customers, investors, and other stakeholders.

Overall, sustainability reporting is a valuable tool that can help companies to improve their sustainability performance, reduce risk, improve decision-making, and increase brand value.

Here are some of the key trends that are likely to shape sustainability reporting in India in the coming years:

- Increased focus on ESG factors: ESG factors, such as environmental impact, social responsibility, and good governance, are becoming increasingly important to investors and consumers. As a result, businesses will need to focus on ESG factors in their sustainability reporting.
- Greater use of data and analytics: Data and analytics are becoming increasingly crucial for measuring and reporting sustainability performance. Businesses must use data and analytics to track their sustainability performance and identify improvement areas.
- Increased collaboration: Businesses must collaborate with other stakeholders, such as investors, consumers, and NGOs, to improve their sustainability performance. Collaboration will be essential for developing and implementing effective sustainability strategies.

Sustainability reporting is essential for businesses to communicate their sustainability performance to stakeholders. As sustainability becomes increasingly important, sustainability reporting will become a more critical tool for businesses.

4.5 Summary

In conclusion, the history of sustainability reporting in India, focusing on the Environmental, Social, and Governance (ESG) framework, demonstrates a remarkable journey toward greater transparency and accountability in business practices. The evolution of sustainability reporting in India has been driven by international initiatives like the Global Reporting Initiative (GRI) and the United Nations Global Compact (UNGC), as well as domestic regulatory bodies and industry associations.

The adoption of the ESG framework in India has emerged as a pivotal milestone, reflecting the recognition of the interconnectedness between environmental, social, and governance factors in business decision-making. The introduction of the Business Responsibility Reporting (BRR)

framework by the Securities and Exchange Board of India (SEBI) and subsequent amendments to the Companies Act have mandated sustainability reporting and encouraged companies to disclose their ESG performance. The integration of ESG reporting has been further propelled by investor demand as financial institutions increasingly consider ESG factors in their investment decisions. This has created a compelling business case for companies to adopt sustainable practices and disclose their ESG impacts, leading to improved risk management, stakeholder trust, and long-term value creation.

Furthermore, the voluntary adoption of internationally recognized frameworks such as the GRI Standards has facilitated standardized and comparable reporting practices, aligning Indian businesses with global sustainability standards. Sector-specific initiatives and industry associations have also played a significant role in providing guidance and support for companies to implement tailored ESG practices in their respective sectors. As sustainability reporting in India continues to evolve, it is evident that the journey toward a more sustainable and responsible business ecosystem is gaining momentum. The emphasis on ESG integration, transparency, and stakeholder engagement reflects the commitment of Indian companies to contribute to societal well-being, environmental stewardship, and sound corporate governance. Moving forward, businesses must build on the progress achieved, enhance reporting frameworks, and continue fostering a culture of sustainable development. By embracing the ESG framework and embedding responsible business practices, Indian companies can drive positive change, mitigate risks, and unlock new opportunities for sustainable growth to pursue a better future.

CHAPTER V

ANALYSIS AND DISCUSSION

Chapter V

Analysis and Discussion

5.1 Introduction

This chapter explains the empirical results from the appropriate econometric and statistical methods. The first part presents the analysis of the trend and pattern of ESG scores of the companies. The second part shows the relationship between ESG score and firm value. It also explores the relationship between environment, social, and governance scores with substantial value separately. Thirdly, the moderating role of board characteristics in impacting the relationship between ESG and firm value. It is followed by understanding the moderating role of ownership influencing the relationship between ESG and firm value. The present study uses the effects of panel data regression to understand the relationships based on the data collected for nine years from 2014-2022. The ESG regulations became mandatory towards the end of the study period; thus, after eliminating the missing values, most data points fell in the second half.

Table 5.1 represents the summary statistics of the data collected on ESG score, ESG controversy score, ESG combined score, and individual scores of Environmental, Social, and Governance parameters as the leading independent variables. The primary dependent variable considered in the study is Tobin's Q as a measure of firm valuation. The study incorporated variables like total institutional investors, types of institutional investors, and board characteristics index to understand their moderating role in determining the ESG-firm value relationship. The study includes variables total fixed assets, cost of capital, Debt to equity and y, and enterprise value as the control variable. We consider, Institutional investors as a variable for ownership and classified into three categories, i.e., Pressure-Indeterminate, Pressure-Sensitive, and Pressure-Resistant. The board characteristics matrix is calculated based on various board characteristics data, which include the board size, percentage of women on the

board, board attendance, board specialization, etc. Table 5.1 illustrates the statistical details of the selected variables.

Table 5.1 Summary Statistics

Variable	Observations	Mean	Std. Dev.	Min	Max
Year	1,595	2019.653	2.602669	2014	2022
TQ	1,595	0.7206	83.28201	0.001	24.6537
ESG	1,595	47.83263	18.2307	6.008865	93.25337
ESG Controversy	1,595	87.1262	25.12601	1.06383	100
ESG Combined	1,595	45.81304	16.99172	6.008865	92.49478
Env Score	1,595	38.66879	24.69219	0	97.26502
Soc Score	1,595	51.14222	21.62727	0.682354	96.8315
Gov Score	1,595	50.87341	22.41444	0.46595	97.31664
ROE	1,595	15.15996	26.31913	-748.7	176.47
ROA	1,595	5.805108	7.084503	-36.7	37.66
TFA	1,595	2.14	6.16	2519000	9.15
EV	1,595	5.33	1.20	-5.5	1.50
CoC	1,595	8.807318	6.467017	-4.34422	30.26894
CoD	1,595	3.641262	2.759492	-0.14239	18.26569
CoE	1,595	10.75276	7.989923	-5.7605	31.09604
Debt to EQ	1,595	160.326	1141.905	0	31407.42
Board Characteristics Index	1,595	0.082341	0.275372	-1.2178	4.130229
PI	1,595	20.2117	17.31137	0.0001	121.9814
PS	1,595	5.974449	11.44546	0	99.501
PR	1,595	6.632213	6.807574	0	90.4852
Total Institutional investment	1,595	32.81836	23.492	0.0084	185.7607

The table presents summary statistics for various variables in a dataset. Each row corresponds to a specific variable, and the columns provide information on the number of observations, mean, standard deviation, minimum, and maximum values for that variable. For instance, the "Year" variable has 1,595 observations, with a mean of 2019.653 and a standard deviation of

2.602669. The dataset covers a range of years from 2014 to 2022, with a relatively small variation around the mean. Tobin's Q ratio is in the range of 0.001 to 24.65 and with a mean of 0.72. The "ESG" variable represents the Environmental, Social, and Governance score, with an average of 47.83263 and a standard deviation of 18.2307. It indicates that the ESG scores vary across the observations, ranging from 6.008865 to 93.25337.

Similarly, other variables like "ESG Controversy," "ESG Combined," "Env Score," "Soc Score," "Gov Score," and others exhibit specific statistical measures, including mean, standard deviation, minimum, and maximum values. These summary statistics provide valuable insights into the characteristics of the dataset. They allow us to understand each variable's central tendency and dispersion, providing a snapshot of the data's distribution and range. Analyzing these statistics can help identify outliers, assess the variation level, and compare different variables within the dataset.

Table 5.2 presents a correlation matrix that shows the correlation coefficients between different variables. The correlation between two variables is represented in each cell, with values ranging from -1 to 1. A positive correlation indicates a direct relationship, while a negative correlation indicates an inverse relationship. The strength and direction of the relationship between these variables can be determined by examining the correlation coefficients in the table. For example, ESG, ESG Con, and ESG Com show moderate positive correlations with each other, indicating that they are related. Similarly, Soc and Env Score have a strong positive correlation, suggesting a close relationship between social and environmental performance. Additionally, some variables show weak or no correlation with each other. For instance, ROE and TQ have a near-zero correlation, implying no significant relationship between a company's return on equity and Tobin's q ratio. The correlation matrix provides insights into the interdependencies and associations among the variables, aiding in understanding the relationships and potential impact on the company's performance and financial metrics.

Table 5.2 Correlation Matrix

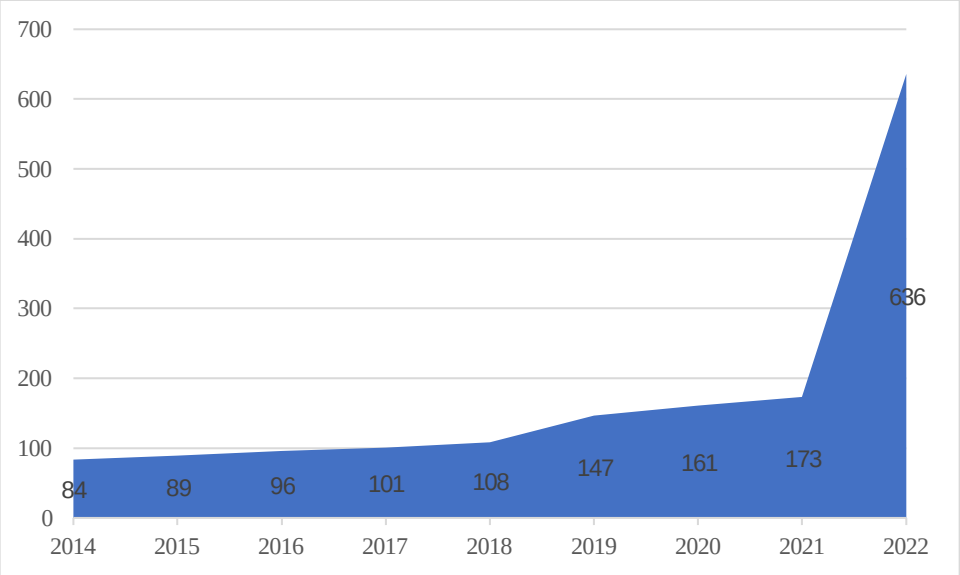
	ESG	ESG Con	ESG Com	Soc	Env Score	Gov	ROE	ROA	TFA	EV	TQ	CoC	CoD	CoE	Debt to EQ	Board C~d	PI	PS	PR
ESG	1																		
ESG Con	-0.2309	1																	
ESG Com	0.9397	0.0429	1																
Soc	0.8921	-0.2659	0.8337	1															
Env Score	0.8116	-0.2659	0.7523	0.7322	1														
Gov	0.585	0.0017	0.5613	0.2633	0.2033	1													
ROE	-0.0052	0.0217	-0.0032	0.0265	-0.0311	-0.0243	1												
ROA	0.1517	-0.0301	0.1374	0.1669	0.1028	0.0734	0.3917	1											
TFA	0.2207	-0.285	0.1231	0.245	0.2537	0.0091	-0.0605	-0.0661	1										
EV	0.2745	-0.1769	0.2333	0.2471	0.2199	0.1643	0.0312	0.1106	0.0942	1									
TQ	-0.0047	0.0425	-0.0045	-0.0175	0.0285	0.0236	0.0456	0.1537	0.0157	0.0714	1								
CoC	-0.0074	0.1247	0.0021	-0.0083	-0.0396	0.0172	-0.0362	-0.1238	-0.0333	0.049	0.1423	1							
CoD	-0.0641	0.1029	-0.0468	-0.0771	-0.0773	0.0018	-0.002	-0.0428	-0.0313	-0.0146	0.0696	0.5182	1						
CoE	0.0084	0.1085	0.0229	-0.0073	-0.023	0.038	-0.0633	-0.1478	-0.0255	0.1093	0.1453	0.8935	0.4864	1					
Debt to EQ	0.0207	0.0199	0.029	0.0119	0.0128	0.0318	-0.015	-0.0292	-0.0109	0.0148	0.0087	-0.055	-0.0222	-0.0165	1				
Board ChInd	0.1012	-0.0625	0.0919	0.1048	0.127	-0.0021	-0.0131	0.0341	0.0854	0.0489	-0.061	-0.0606	-0.0314	-0.0766	0.0166	1			
PI	0.1218	0.0116	0.1143	0.0776	0.051	0.1463	-0.0249	0.014	0.0977	0.0531	-0.0165	0.0158	0.0225	0.0045	-0.0037	0.023	1		
PS	0.077	-0.0449	0.0701	0.1047	0.1368	-0.0746	-0.0023	-0.0154	0.0664	0.0054	-0.0581	-0.0583	-0.0601	-0.0823	0.0781	0.0539	0.0276	1	
PR	0.2205	-0.0587	0.1952	0.1426	0.1142	0.226	0.0007	0.0516	-0.0317	0.0977	-0.088	-0.0713	-0.0675	-0.0384	-0.0019	-0.0307	0.2581	0.0198	1

5.2 Trends and Patterns of ESG Scores

This section will focus on understanding the trends and patterns of the ESG score, ESG controversy score, environment score, social score, and governance score. The study tried to understand the differences in these scoring based on the differences in market capitalization.

Figure 5.1

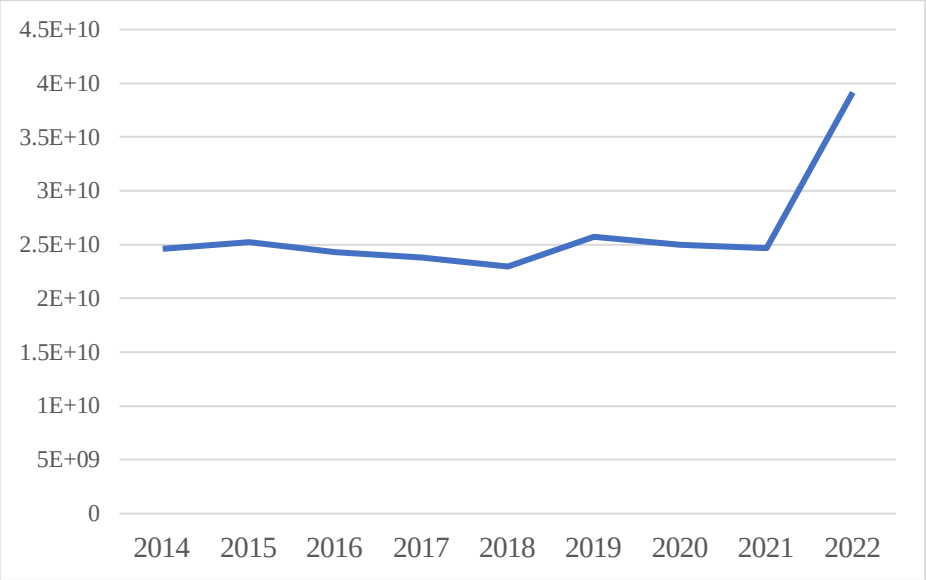
Total number of ESG reporting by companies- year-wise



The data shows an increasing trend in the total count of ESG scores over the years. In 2014, there were 84 ESG scores recorded, which gradually increased to 89 in 2015, 96 in 2016, and continued to rise steadily each year. The count reached 108 in 2018 and significantly increased to 147 in 2019. The upward trend continued with 161 scores in 2020 and further growth to 173 in 2021. The most notable change occurred in 2022 when the count of ESG scores dramatically increased to 636. This substantial jump suggests a significant increase in the availability or reporting of ESG scores for that particular year. Overall, the data indicates a rising awareness and importance of ESG considerations in assessing companies' sustainability and responsible practices. The increasing count of ESG scores reflects the growing emphasis on ESG factors and their integration into investment decisions and corporate reporting.

Figure 5.2

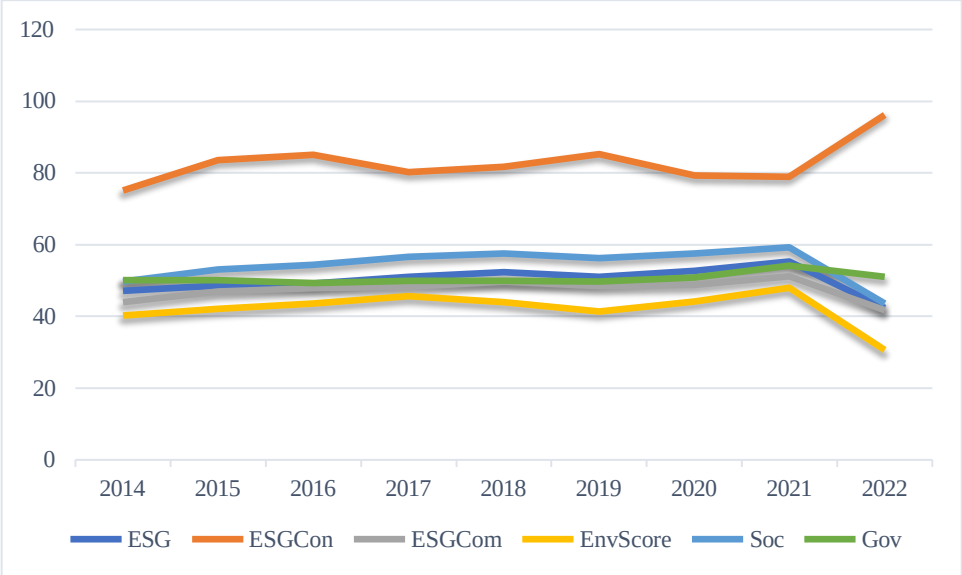
The average market capitalization of the ESG-reported companies



The table provides the yearly data for the market capitalization of companies for which ESG (Environmental, Social, and Governance) scores are available. In 2014, the market capitalization of these companies was approximately $24,603,981,492. There was a further decline in market capitalization in 2017, with companies' total value reaching roughly $23,808,877,311. The downward trend continued in 2018, as the market capitalization dropped that year. However, in 2019, there was a significant surge in market capitalization because of the government's regulations on listed companies regarding their sustainability reporting. Finally, in 2022, there was a substantial increase in market capitalization, as the SEBI mandated sustainability reporting of the top listed companies. Therefore, the data was available for calculating these companies' ESG scores. The data suggests that the market capitalization of companies with available ESG scores fluctuated over the years. The variations can be influenced by numerous reasons, including market conditions, companies' financial performance, industry trends, and investor sentiment.

Figure 5.3

The average ESG performance breakdown

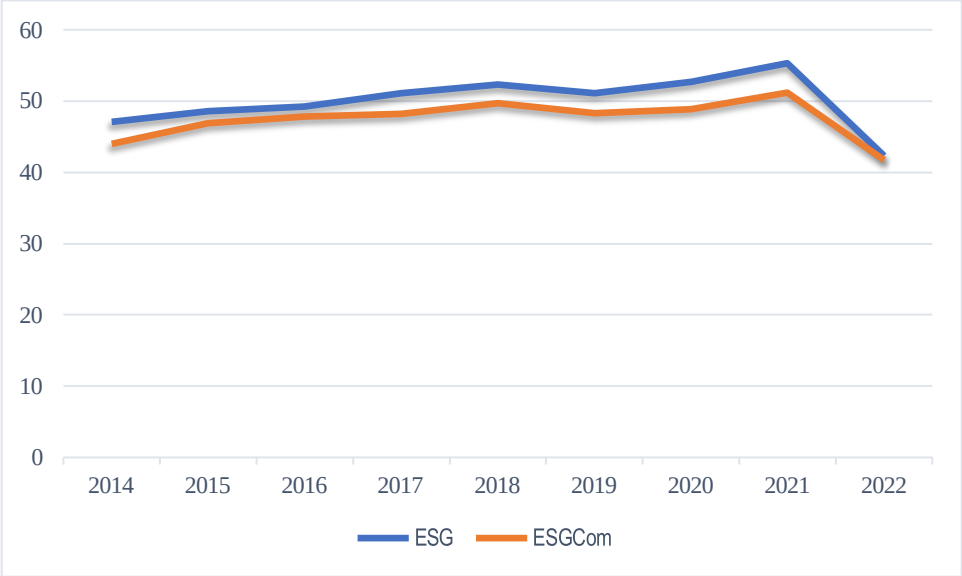


The table provides yearly data on ESG scores and their components for the available years. The overall ESG score fluctuated from 47.05 in 2014 to 55.31 in 2021. There was a notable decrease to 42.32 in 2022. The ESG controversy score represents the metrics that considers a firm's reputation in ESG matters; it is calculated based on the open-source information available on social media, newspaper, etc. The average ESG controversy scores of the companies have been improving over the years. The ESG combined score is the summed average of the ESG and ESG controversy scores. The Environment Score measures the environmental performance of companies. It displayed variations, with some years witnessing improvements, such as 47.99 in 2021, and others experiencing decreases, such as 30.64 in 2022. The social score reflects the social performance of companies. It showed an upward trend, increasing from 49.64 in 2014 to 59.26 in 2021. However, there was a notable decline to 43.60 in 2022. The governance score represents the governance performance of companies. It remained relatively stable over the years, with slight fluctuations but no significant upward or downward trends. Overall, the data highlights the varying performance of companies in terms of ESG factors. While some years showed improvements in overall ESG scores and individual

components, others experienced declines. Environmental and social aspects demonstrated more noticeable fluctuations compared to the governance component.

Figure 5.4

Comparison of ESG and ESG combined Score- Year-wise



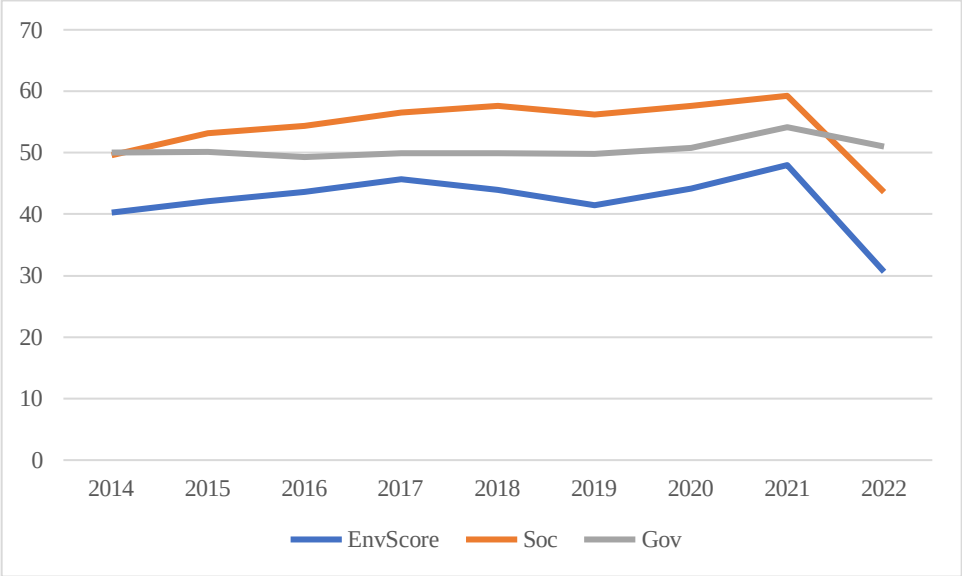
The ESG and ESG combined scores show fluctuations over the years, indicating potential changes in the assessment of environmental, social, and governance practices. In general, the ESG combined scores follow a similar trend to the ESG scores; the gap between them indicates the controversial score, which has improved over the years. The year 2022 has the lowest ESG combined score of 41.73260304, showing a potential decline in the overall ESG performance compared to previous years. The year 2021 has the highest ESG combined score of 51.18087416, suggesting a relatively better ESG performance for that year.

When we consider Figure 5.5, we can observe that the environmental score shows variations over the years, ranging from a low of 30.64121972 in 2022 to a high of 47.9908246 in 2021. The Social Score (Soc) generally exhibits an increasing trend over the years, indicating potential improvements in social responsibility practices. The Governance Score (Gov) is relatively stable, with minor fluctuations over the years. 2021 stands out with somewhat higher scores across all three categories (Environment, Social, and Governance), suggesting potential

environmental, social, and governance advancements. Conversely, 2022 has notably lower scores in both Environmental and Social Scores, indicating a possible decline in those aspects.

Figure 5.5

Comparison of Environmental, Social, and Governance scores



5.2.1 Comparison of Trends and Patterns of companies based on Market Capitalization

Among the selected companies, companies with a market capitalization above the mean market capitalization and companies with a market capitalization below the mean market capitalization are separated, and their performance in ESG is compared. Government regulations are being imposed periodically based on market capitalization, so it becomes one of the most critical indicators influencing ESG performance. A comparison of ESG, ESG combined score, environment, social and governance score is represented in the following graphs.

Figure 5.6

Comparison of ESG scores of companies with a different market capitalization

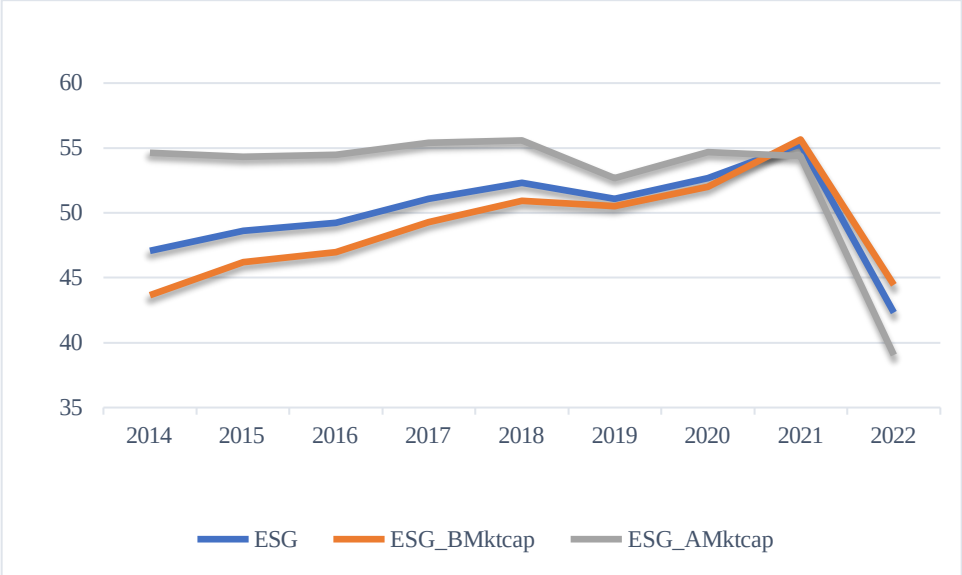


Figure 5.7

Comparison of ESG Combined scores of companies with a different market capitalization

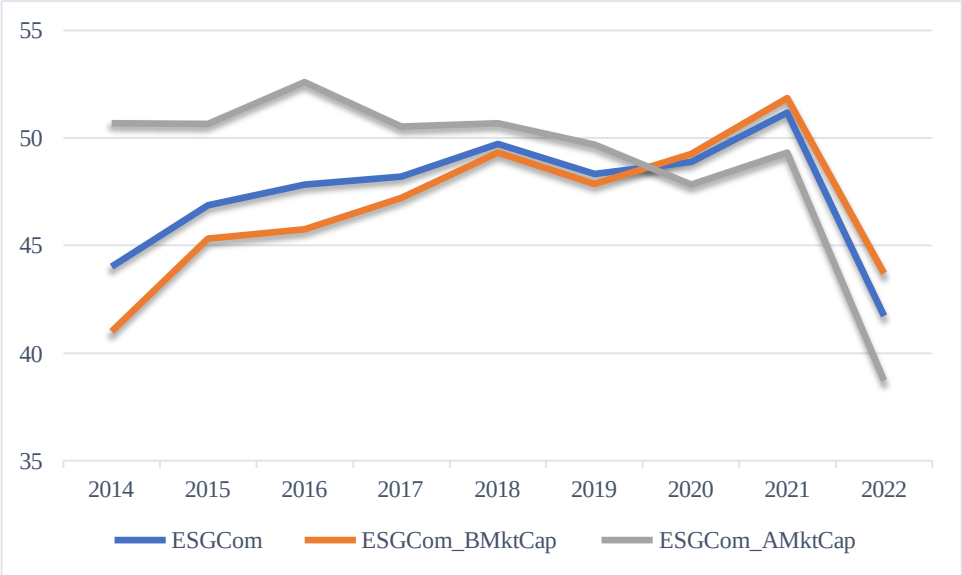


Figure 5.8

Comparison Environment score of companies with a different market capitalization

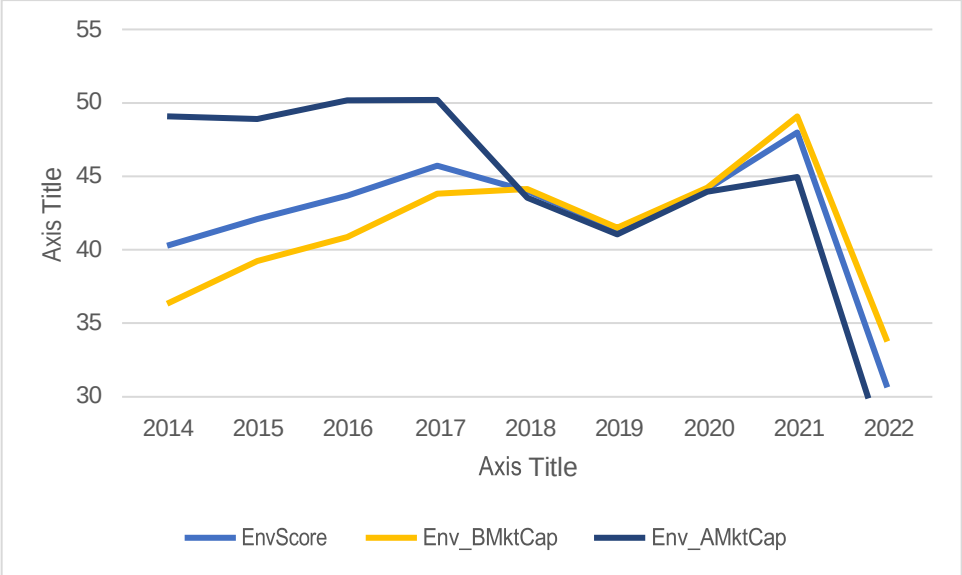


Figure 5.9

Comparison Social score of companies with a different market capitalization

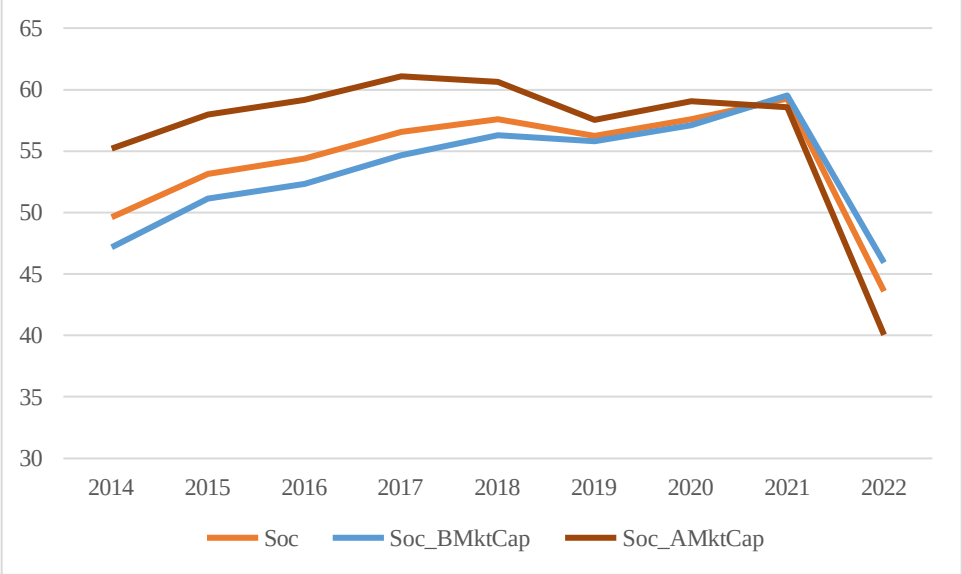
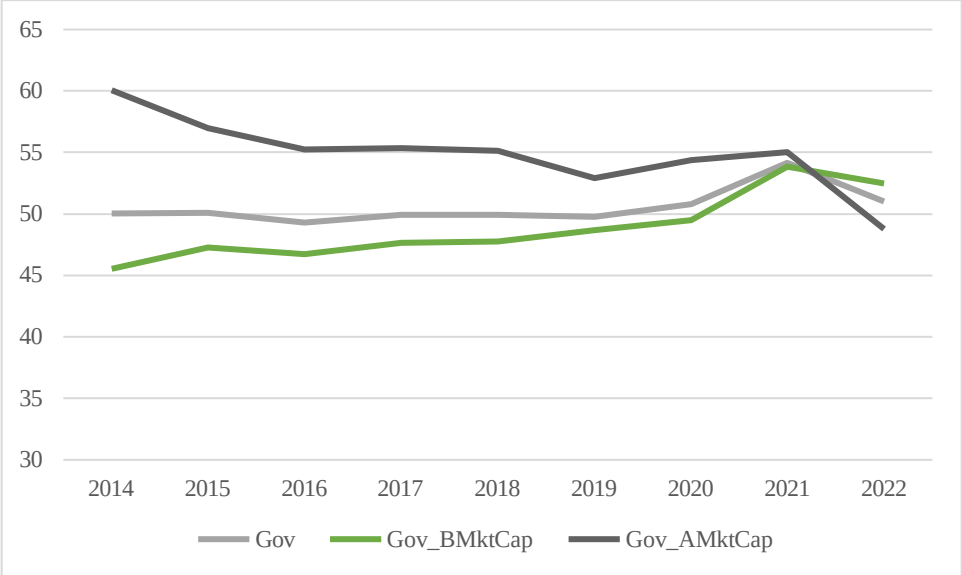


Figure 5.10

Comparison Governance score of companies with a different market capitalization



Both companies' below-mean market capitalization and above-mean market capitalization scores fluctuate over the years, suggesting potential changes in the ESG performance of companies in different market capitalization segments. Companies below market capitalization scores generally show an increasing trend over the years, indicating possible improvements in the ESG performance of smaller companies. Companies above market capitalization scores exhibit more variability and do not follow a clear upward or downward trend. The year 2022 stands out with a notably lower score of 39.05, potentially indicating a decline in the ESG performance of larger companies compared to previous years. A similar trend is shown regarding environmental, social, and governance scores as the companies with a market capitalization below mean market capitalization outperform the larger companies. This trend of outperforming takes place during the year 2021.

5.3 ESG and firm valuation: An empirical overview

In the first empirical analysis, the study has included the panel regression models with ESG, ESG combined, Environmental score, Social Score and Governance score as independent variables and Tobin's q as the dependent variable. Initially, the model has not incorporated any control or moderating variable in the initial fixed effect panel regression. Later, we included the control variables to see its impact. The regression results are represented in the following sub-sections with the tabular results.

5.3.1 Relationship between different E, S, and G metrics with firm value

The results of the panel data regressions are given below:

Table 5.3 ESG and firm value

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0091	Min	1
between = 0.0013	Avg	2.5
overall = 0.0000	Max	9
	F(1,958)	8.82
corr(u_i, Xb) = -0.0653	Prob > F	0.0031

Table 5.3(a) ESG and firm value

TQ	Coef.	Std. Err.	t P>t	[95% Conf.	Interval]
ESG	.2683923	.0903705	2.97 0.003	.0910453	.4457394
_cons	-23.0585	4.371366	5.27 0.000	-31.63706	-14.47995

Table 5.4 ESG combined and firm value

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0033	min	1
between = 0.0011	avg	2.5
overall = 0.0000	max	9
	F(1,958)	3.15
corr(u_i, Xb) = -0.0365	Prob > F	0.0764

Table 5.4(a) ESG combined and firm value

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
ESGCom	.1519115	.0856393	1.77	0.076	-.0161507	.3199737
_cons	-17.18012	3.977308	-4.32	0.000	-24.98536	-9.37488

Table 5.5 Environmental score and firm value

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0072	min	1
between = 0.0015	avg	2.5
overall = 0.0008	max	9
	F(1,958)	6.94
corr(u_i, Xb) = -0.0234	Prob > F	0.0086

Table 5.5(a) Environmental score and firm value

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
EnvScore	.1727479	.0655598	2.63	0.009	.0440905	.3014053
_cons	-16.90055	2.617459	-6.46	0.000	-22.03716	-11.76393

Table 5.6 Social score and firm value

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0120	min	1
between = 0.0025	avg	2.5
overall = 0.0003	max	9
	F(1,958)	11.61
corr(u_i, Xb) = -0.0888	Prob > F	0.0007

Table 5.6(a) Social score and firm value

TQ	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
Soc	.2656977	.077974	3.41	0.001	.112678	.4187173
_cons	-23.80896	4.040359	-5.89	0.000	-31.73794	-15.87999

Table 5.7 Governance score and firm value

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0002	min	1
between = 0.0000	avg	2.5
overall = 0.0006	max	9
	F(1,958)	0.23
corr(u_i, Xb) = -0.0346	Prob > F	0.6312

Table 5.7(a) Governance score and firm value

TQ	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
Gov	-.0370055	.0770669	-0.48	0.631	-.1882449	.1142339
_cons	-8.337998	3.974769	-2.10	0.036	-16.13826	-.537739

The analysis is based on 1,595 observations. The data is divided into 636 groups based on the Panel ID variable. For the first regression model of ESG and firm value, the regression analysis suggests a statistically significant positive relationship between ESG and Firm Value with 0.91 % the variation. As the ESG score increases, the firm value tends to increase as well. The average number of observations per group is 2.5, with a minimum of 1 and a maximum of 9. The F-statistic tests the overall significance of the regression model. In this case, F (1,958) = 8.82, indicating that the model is statistically significant. In this case, Prob > F = 0.0031, which is below the typical significance threshold of 0.05, suggesting that the relationship between ESG and Firm Value is statistically significant. The estimated coefficient for ESG is 0.2683923. In this case, the t-value for ESG is 2.97, indicating that it is statistically significant.

In the following model with ESG combined score, the regression analysis suggests no statistically significant relationship between ESG Combined Score and Firm Value. The coefficient for the ESG Combined Score is not statistically different from zero at the conventional significance level of 0.05. Regarding environmental and social scores, the regression analysis suggests a statistically significant positive relationship with a coefficient value of 0.17 and 0.26, respectively. As the environmental and social score increases, the firm value also increases. Whereas, in the case of governance score, the regression analysis suggests no statistically significant relationship between governance score and firm value.

5.3.2 Relationship between different E, S, and G metrics with firm value including control variables

Table 5.8 ESG, firm value, and control variables

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1127	min	1
between = 0.0096	avg	2.5
overall = 0.0167	max	9
	F (5,954)	24.23
corr(u_i, Xb) = -0.0119	Prob > F	0.0000

Table 5.8(a) ESG, firm value, and control variables

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
ESG	.1121791	.0930388	-2.21	0.022	-.2947635	.0704052
TFA	-2.04e-12	2.81e-12	-0.73	0.468	-7.57e-12	3.48e-12
EV	8.68e-12	1.29e-12	6.70	0.000	6.14e-12	1.12e-11
CoC	.8405413	.1341714	6.26	0.000	.5772362	1.103846
DebttoEQ	.001061	.0006262	1.69	0.091	-.0001678	.0022898
_cons	-16.61701	4.216841	-3.94	0.000	-24.89237	-8.34166

Table 5.9 ESG combined, firm value, and control variables

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1126	min	1
between = 0.0093	avg	2.5
overall = 0.0165	max	9
	F(5,954)	24.20
corr(u_i, Xb) = -0.0110	Prob > F	0.0000

Table 5.9(a) ESG combined, firm value, and control variables

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
ESGCom	-.0972449	.0842614	-1.15	0.249	-.2626039	.0681142
TFA	-2.03e-12	2.81e-12	-0.72	0.470	-7.56e-12	3.49e-12
EV	8.54e-12	1.28e-12	6.69	0.000	6.03e-12	1.10e-11
CoC	.8277633	.1320406	6.27	0.000	.5686397	1.086887
DebttoEQ	.0010558	.000626	1.69	0.092	-.0001727	.0022844
_cons	-17.34077	3.794184	-4.57	0.000	-24.78668	-9.894855

Table 5.10 Environmental score, firm value, and control variables

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1113	min	1
between = 0.0078	avg	2.5
overall = 0.0157	max	9
	F(5,954)	23.90
corr(u_i, Xb) = -0.0132	Prob > F	0.0000

Table 5.10(a) Environmental score, firm value, and control variables

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
EnvScore	.050031	.064523	2.08	0.038	-.01316266	.1216204
TFA	-1.95e-12	2.82e-12	-0.69	0.488	-7.48e-12	3.57e-12
EV	8.35e-12	1.27e-12	6.56	0.000	5.85e-12	1.08e-11
CoC	.8007356	.1322205	6.06	0.000	.5412589	1.060212
DebttoEQ	.0010126	.0006255	1.62	0.106	-.0002149	.00224
_cons	-21.27436	2.555378	-8.33	0.000	-26.28917	-16.25955

Table 5.11 Social score, firm value, and control variables

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1115	min	1
between = 0.0091	avg	2.5
overall = 0.0164	max	9
	F(5,954)	23.95
corr(u_i, Xb) = -0.0106	Prob > F	0.0000

Table 5.11(a) Social score, firm value, and control variables

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Soc	0.0377524	.0201025	-0.47	0.038	-.1949498	.1194451
TFA	-2.03e-12	2.82e-12	-0.72	0.472	-7.56e-12	3.51e-12
EV	8.43e-12	1.28e-12	6.58	0.000	5.92e-12	1.09e-11
CoC	.8175496	.1356963	6.02	0.000	.551252	1.083847
DebttoEQ	.0010309	.0006266	1.65	0.100	-.0001987	.0022606
_cons	-19.71829	3.893797	-5.06	0.000	-27.35969	-12.0769

Table 5.12 Governance score, firm value, and control variables

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1173	min	1
between = 0.0058	avg	2.5
overall = 0.0133	max	9
	F(5,954)	25.34
corr(u_i, Xb) = -0.0315	Prob > F	0.0000

Table 5.12(a) Governance score, firm value, and control variables

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Gov	.1874678	.0739829	-2.53	0.011	-.1326559	-.2422798
TFA	-1.82e-12	2.81e-12	-0.65	0.517	-7.33e-12	3.69e-12
EV	8.80e-12	1.27e-12	6.91	0.000	6.30e-12	1.13e-11
CoC	.8163474	.1294677	6.31	0.000	.562273	1.070422
DebttoEQ	.0011176	.0006246	1.79	0.074	-.0001082	.0023433
_cons	-12.35689	3.821934	-3.23	0.001	-19.85725	-4.856517

Adding control variables to the existing model exhibits a variation in the previous results. In the first model, the overall fit of the regression model is indicated by the R-squared values, which measure the proportion of variance explained by the model. In this case, within the model explains 11.27% (0.1127) of the variation, between the model explains 0.96% (0.0096) of the variation, and the overall model explains 1.67% (0.0167) of the variation. F-statistic tests the overall significance of the regression model. In this case, F(5,954) = 24.23, indicating that the model is statistically significant. In this case, Prob > F = 0.0000, which is below the typical significance threshold of 0.05, suggesting that the model is statistically significant. In summary, based on the regression, the ESG score appears to have a statistically significant relationship with firm value. The control variables EV and CoC show significant positive associations with firm value, suggesting that these variables impact firm value in the model. The significance of Debt to EQ is marginal, and TFA does not exhibit a significant relationship with firm value. However, with the inclusion of control variables, the r-square value of the model has improved.

Similarly, ESG combined score does not show any statistically significant relationship with firm value, even with the inclusion of control variables. In models with environment, social, and governance scores, the r-squared values have improved compared to the previous models without control variables and given a coefficient value of 0.05, 0.07, and 0.18, respectively.

The analysis finds a statistically significant negative relationship between the governance score and firm value in the final model with governance score. The control variables EV and CoC also show statistically significant positive associations with Firm Value in the model. However, the control variable Debt to EQ has a weakly significant relationship with Firm Value.

5.4 The role of board characteristics in determining the ESG-Firm value relationship

In the following models, we are adding variable called the board characteristic index to study the secondary objective of understanding the impact of board characteristics in determining the relationship between ESG and firm value.

Table 5.13 ESG, firm value, and board characteristics

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0111	min	1
between = 0.0004	avg	2.5
overall = 0.0002	max	9
	F(2,957)	5.37
corr(u_i, Xb) = -0.0525	Prob > F	0.0048

Table 5.13(a) ESG, firm value, and board characteristics

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
ESG	.286106	.091234	3.14	0.002	.1070642	.4651477
BoardChInd	-5.332407	3.861363	-1.38	0.168	-12.91012	2.245309
_cons	-23.46672	4.379286	-5.36	0.000	-32.06083	-14.87261

Table 5.14 ESG, firm value, control variables, and board characteristics

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1156	min	1
between = 0.0113	avg	2.5
overall = 0.0181	max	9
	F(6,953)	20.76
corr(u_i, Xb) = -0.0110	Prob > F	0.0000

Table 5.14(a) ESG, firm value, control variables, and board characteristics

TQ	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
ESG	.0918149	.0936424	1.98	0.037	.0155841	.2919542
TFA	-2.60e-12	2.83e-12	-0.92	0.359	-8.15e-12	2.95e-12
EV	8.86e-12	1.30e-12	6.83	0.000	6.32e-12	1.14e-11
CoC	.8334415	.134081	6.22	0.000	.5703134	1.09657
DebttoEQ	.001086	.0006256	1.74	0.083	-.0001418	.0023137
BoardChInd	6.545443	3.693644	-1.77	0.077	-13.79406	.7031731
_cons	-16.97504	4.216961	-4.03	0.000	-25.25064	-8.699435

Table 5.15 ESG, firm value, control variables, and gender

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1138	min	1
between = 0.0048	avg	2.5
overall = 0.0144	max	9
	F(6,953)	20.40
corr(u_i, Xb) = -0.0268	Prob > F	0.0000

Table 5.15 (a) ESG, firm value, control variables, and gender

TQ	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
ESG	.0983601	.0938474	2.05	0.025	-.2825316	.0858114
TFA	-2.13e-12	2.81e-12	-0.76	0.450	-7.65e-12	3.39e-12
EV	8.93e-12	1.31e-12	6.79	0.000	6.35e-12	1.15e-11
CoC	.8535674	.134661	6.34	0.000	.5893011	1.117834
DebttoEQ	.0010785	.0006263	1.72	0.085	-.0001505	.0023076
BGDP	1.42773	1.279394	-1.12	0.265	-3.938485	1.083026
_cons	-17.51205	4.291905	-4.08	0.000	-25.93473	-9.089375

Table 5.16 ESG, firm value, control variables, and CEO duality

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1129	min	1
between = 0.0091	avg	2.5
overall = 0.0167	max	9
	F(6,953)	20.21
corr(u_i, Xb) = -0.0138	Prob > F	0.0000

Table 5.16(a) ESG, firm value, control variables, and CEO duality

TQ	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
ESG	.1170487	.0936663	2.25	0.022	.0008648	.0667675
TFA	-2.04e-12	2.82e-12	-0.72	0.470	-7.56e-12	3.49e-12
EV	8.67e-12	1.30e-12	6.70	0.000	6.13e-12	1.12e-11
CoC	.8422874	.1342793	6.27	0.000	.5787702	1.105805
DebttoEQ	.0010634	.0006264	1.70	0.090	-.000166	.0022927
CEODu	2.359542	5.083075	0.46	0.643	-7.615771	12.33485
_cons	-16.65499	4.219369	-3.95	0.000	-24.93532	-8.374664

The above tables present regression results analysing the relationship between ESG scores, firm value, control variables, and different factors such as board characteristics (Table 5.13 and 5.14), gender (Table 5.15), and CEO duality (Table 5.16). In Table 5.13, the regression examines the impact of ESG scores and board characteristics on firm value. The ESG coefficient estimate is 0.286106 with a t-value of 3.14 and a significant p-value of 0.002. This suggests a positive relationship between ESG scores and firm value. However, the coefficient for board characteristics (BoardChInd) is -5.332407 with a t-value of -1.38, indicating a negative but not statistically significant relationship with firm value. The intercept term (_cons) is significant and negative, implying a baseline company value when all independent variables are zero.

Table 5.14 expands on the analysis by including additional control variables alongside ESG scores and board characteristics. The ESG coefficient estimate is 0.0918149 with a t-value of 1.98 and a marginally significant p-value of 0.037. This suggests a positive but weak relationship between ESG scores and firm value. Control variables EV and CoC have positive and significant coefficients, indicating a positive impact on firm value. DebttoEQ also exhibits a marginally significant positive relationship. Board characteristics (BoardChInd) have a coefficient of 6.545443 with a t-value of -1.77, suggesting a negative and slightly significant association ($p < 0.1$). The intercept term (_cons) remains significant and negative.

In Table 5.15, the analysis focuses on the relationship between ESG scores, firm value, control variables, and gender. The ESG coefficient estimate is 0.0983601 with a t-value of 2.05 and a significant p-value of 0.025, indicating a positive relationship between ESG scores and firm value. Control variables EV and CoC have positive and significant coefficients, while DebttoEQ shows a marginally significant positive relationship ($p < 0.1$). The inclusion of the gender variable (BGDP) is not statistically significant. The intercept term (_cons) remains significant and negative.

Lastly, Table 5.16 investigates the relationship between ESG scores, firm value, control variables, and CEO duality. The ESG coefficient estimate is 0.1170487 with a t-value of 2.25 and a significant p-value of 0.022, indicating a positive relationship between ESG scores and firm value. Control variables EV and CoC have positive and significant coefficients, while DebttoEQ shows a marginally significant positive relationship ($p < 0.1$). The coefficient for CEO duality (CEODu) is not statistically significant. The intercept term (_cons) remains significant and negative.

Overall, the regression results consistently suggest a positive relationship between ESG scores and firm value, regardless of including control variables and factors such as board characteristics, gender, or CEO duality. Control variables such as EV and CoC consistently have positive and significant coefficients, indicating their positive impact on firm value. However, the significance of other variables, such as board characteristics, gender, or CEO duality, varies across the tables.

Table 5.17 ESG combined, firm value and board characteristics

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0047	min	1
between = 0.0001	avg	2.5
overall = 0.0005	max	9
	F(2,957)	2.27
corr(u_i, Xb) = -0.0144	Prob > F	0.1036

Table 5.17(a) ESG combined, firm value, and board characteristics

TQ	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
ESGCom	.1649325	.0863267	2.91	0.056	-.004479	.334344
BoardChInd	-4.572351	3.866884	-1.18	0.237	-12.1609	3.0162
_cons	-17.40016	3.980833	-4.37	0.000	-25.21233	-9.587991

Table 5.18 ESG combined, firm value, control variables, and board characteristics

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1155	min	1
between = 0.0111	avg	2.5
overall = 0.0180	max	9
	F(6,953)	20.74
corr(u_i, Xb) = -0.0103	Prob > F	0.0000

Table 5.18(a) ESG combined, firm value, control variables, and board characteristics

TQ	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
ESGCom	-.0801397	.0847067	-0.95	0.344	-.246373	.0860936
TFA	-2.59e-12	2.83e-12	-0.92	0.359	-8.14e-12	2.96e-12
EV	8.75e-12	1.28e-12	6.84	0.000	6.24e-12	1.13e-11
CoC	.8231503	.1319142	6.24	0.000	.5642745	1.082026
DebttoEQ	.0010823	.0006255	1.73	0.084	-.0001452	.0023098
BoardChInd	-6.59559	3.689467	-1.79	0.074	-13.83601	.6448284
_cons	-17.54031	3.791468	-4.63	0.000	-24.9809	-10.09972

Table 5.19 ESG combined, firm value, control variables, and gender

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1138	min	1
between = 0.0044	avg	2.5
overall = 0.0141	max	9
	F(6,953)	20.40
corr(u_i, Xb) = -0.0271	Prob > F	0.0000

Table 5.19(a) ESG combined, firm value, control variables, and gender

TQ	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
ESGCom	-.0883624	.0845892	-1.04	0.296	-.254365	.0776402
TFA	-2.13e-12	2.81e-12	-0.76	0.450	-7.65e-12	3.40e-12
EV	8.82e-12	1.30e-12	6.79	0.000	6.27e-12	1.14e-11
CoC	.844015	.1327494	6.36	0.000	.5835002	1.10453
DebttoEQ	.0010764	.0006262	1.72	0.086	-.0001524	.0023052
BGDP	-1.484881	1.273386	-1.17	0.244	-3.983846	1.014083
_cons	-18.02801	3.838977	-4.70	0.000	-25.56183	-10.49418

Table 5.20 ESG combined, firm value, control variables, and CEO duality

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1128	min	1
between = 0.0088	avg	2.5
overall = 0.0165	max	9
	F(6,953)	20.18
corr(u_i, Xb) = -0.0129	Prob > F	0.0000

Table 5.20(a) ESG combined, firm value, control variables, and CEO duality

TQ	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
ESGCom	-.1019493	.0848968	-1.20	0.230	-.2685557	.064657
TFA	-2.03e-12	2.82e-12	-0.72	0.472	-7.55e-12	3.50e-12
EV	8.53e-12	1.28e-12	6.68	0.000	6.02e-12	1.10e-11
CoC	.8290985	.1321258	6.28	0.000	.5698074	1.08839
DebttoEQ	.0010582	.0006263	1.69	0.091	-.0001709	.0022873
CEODu	2.37372	5.087419	0.47	0.641	-7.610118	12.35756
_cons	-17.39126	3.797283	-4.58	0.000	-24.84326	-9.939254

The above tables present the results of fixed-effects regression analyses examining the relationship between ESG Combined score, firm value, and various control variables. Table 5.17 investigates the association between ESG combined score and firm value with board characteristics. The coefficient for ESGCom is positive (0.165) but not statistically significant ($p = 0.056$), suggesting a weak relationship between ESG performance and firm value. BoardChInd (Board Characteristics Index) also shows a negative coefficient (-4.572), though it is not statistically significant ($p = 0.237$). In Table 5.18, the analysis includes additional control variables such as TFA, EV, CoC, DebttoEQ, and BoardChInd. ESGCom now exhibits a negative coefficient (-0.080), although it remains statistically insignificant ($p = 0.344$). Among the control variables, EV (Enterprise Value) and CoC (Cost of Capital) have positive and significant coefficients, indicating a positive association with firm value. DebttoEQ (Debt-to-Equity ratio) and BoardChInd show positive coefficients but are not statistically significant. Table 5.19 introduces gender as a control variable alongside other control variables such as TFA, EV, CoC, DebttoEQ, and BGDP (Board Gender Diversity Percentage). ESGCom demonstrates a negative coefficient (-0.088) but does not reach statistical significance ($p = 0.296$). CoC and EV remain positively associated with firm value, and BGDP shows a negative coefficient, although it is not statistically significant.

Lastly, Table 5.20 includes CEO duality as a control variable. ESGCom exhibits a negative coefficient (-0.102) but lacks statistical significance (p = 0.230). Like previous tables, CoC and EV remain positively related to firm value. DebttoEQ and CEO duality show positive coefficients but are not statistically significant. The results suggest a limited and inconclusive relationship between ESG performance, firm value, and the examined control variables. While some control variables consistently demonstrate substantial associations with firm value (e.g., EV, CoC), the coefficient for ESGCom is generally small and statistically insignificant across the analyses, indicating that the impact of ESG factors on firm value may be nuanced and influenced by other variables not considered in the models.

Table 5.21 Environmental score, firm value, and board characteristics

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0091	Min	1
between = 0.0031	Avg	2.5
overall = 0.0022	Max	9
	F(2,957)	4.40
corr(u_i, Xb) = -0.0088	Prob > F	0.0125

Table 5.21(a) Environmental score, firm value, and board characteristics

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
EnvScore	.1862586	.0662804	2.81	0.005	.056187	.3163302
BoardChInd	-5.261133	3.870617	-1.36	0.174	-12.85701	2.334745
_cons	-16.98978	2.617125	-6.49	0.000	-22.12575	-11.85382

Table 5.22 Environmental score, firm value, control variables, and board characteristics

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1147	min	1
between = 0.0102	avg	2.5
overall = 0.0175	max	9
	F(6,953)	20.58
corr(u_i, Xb) = -0.0117	Prob > F	0.0000

Table 5.22(a) Environmental score, firm value, control variables, and board characteristics

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
EnvScore	.0127212	.065095	3.20	0.045	-.1150248	.1404673
TFA	-2.57e-12	2.83e-12	-0.91	0.363	-8.13e-12	2.98e-12
EV	8.58e-12	1.28e-12	6.72	0.000	6.07e-12	1.11e-11
CoC	.7942261	.1320801	6.01	0.000	.5350248	1.053427
DebttoEQ	.0010453	.0006248	1.67	0.095	-.0001809	.0022715
BoardChInd	-7.092868	3.705172	-1.91	0.056	-14.36411	.1783711
_cons	-21.31284	2.551895	-8.35	0.000	-26.32083	-16.30486

Table 5.23 Environmental score, firm value, control variables, and gender

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1128	min	1
between = 0.0032	avg	2.5
overall = 0.0132	max	9
	F(6,953)	20.20
corr(u_i, Xb) = -0.0310	Prob > F	0.0000

Table 5.23(a) Environmental score, firm value, control variables, and gender

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
EnvScore	.0078546	.0652948	3.12	0.024	-.1202835	.1359928
TFA	-2.07e-12	2.82e-12	-0.73	0.463	-7.59e-12	3.46e-12
EV	8.65e-12	1.30e-12	6.68	0.000	6.11e-12	1.12e-11
CoC	.8163629	.1327518	6.15	0.000	.5558432	1.076883
DebttoEQ	.0010366	.0006256	1.66	0.098	-.000191	.0022642
BGDP	-1.628664	1.284515	-1.27	0.205	-4.149468	.8921408
_cons	-22.05235	2.627222	-8.39	0.000	-27.20816	-16.89654

Table 5.24 Environmental score, firm value, control variables, and CEO duality

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1114	min	1
between = 0.0074	avg	2.5
overall = 0.0156	max	9
	F(6,953)	19.92
corr(u_i, Xb) = -0.0144	Prob > F	0.0000

Table 5.24(a) Environmental score, firm value, control variables, and CEO duality

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
EnvScore	.0068296	.0647847	2.11	0.016	-.1339667	.1203075
TFA	-1.94e-12	2.82e-12	-0.69	0.490	-7.47e-12	3.58e-12
EV	8.34e-12	1.27e-12	6.54	0.000	5.84e-12	1.08e-11
CoC	.8014119	.1322977	6.06	0.000	.5417835	1.06104
DebttoEQ	.0010132	.0006258	1.62	0.106	-.0002148	.0022412
CEODu	1.693327	5.073336	0.33	0.739	-8.262873	11.64953
_cons	-21.39015	2.579996	-8.29	0.000	-26.45328	-16.32702

The above table includes the results of several regression analyses examining the relationship between environmental score, firm value, and various variables such as board characteristics, control variables, gender, and CEO duality. Table 5.21 presents the results of a fixed-effects regression analysis. The F-statistic of 4.40 suggests a significant relationship between the variables. The coefficient estimates in Table 5.21(a) indicate that the environmental score has a positive and statistically significant effect on firm value, with a coefficient of 0.1862586. However, the board characteristics variable (BoardChInd) does not statistically affect firm value. Table 5.22 extends the analysis by including additional control variables. The model still consists of 1,595 observations from 636 groups. The R-squared values suggest that the overall model explains a higher proportion of the total variation (1.75%) compared to Table 5.21. The F-statistic of 20.58 indicates a significant relationship between the variables. The coefficient estimates in Table 5.22(a) show that the environmental score remains positively associated with firm value, but the coefficient is smaller compared to Table 5.21(a). Additionally, variables such as EV (enterprise value) and CoC (cost of capital) are positively and significantly related to firm value. At the same time, DebttoEQ (debt-to-equity ratio) and BoardChInd do not have statistically significant effects.

Table 5.23 examines the relationship between environmental score, firm value, control variables, and gender. The model includes the same number of observations and groups as the previous tables. The R-squared values indicate that the overall model explains 1.32% of the total variation. The F-statistic of 20.20 suggests a significant relationship between the variables. The coefficient estimates in Table 5.23(a) reveal that the environmental score remains positively related to firm value, and the coefficient is slightly larger compared to Table 5.22(a). Other control variables, such as EV and CoC, also have positive and statistically significant effects on firm value. The variable BGDP (board gender diversity percentage) does not have a statistically significant impact. Table 5.24 explores the relationship between environmental

score, firm value, control variables, and CEO duality. The model includes the same number of observations and groups as the previous tables. The R-squared values indicate that the overall model explains 1.56% of the total variation. The F-statistic of 19.92 suggests a significant relationship between the variables. The coefficient estimates in Table 5.24(a) show that the environmental score remains positively associated with firm value. The variable CEODu (CEO duality) does not have a statistically significant effect on firm value, while variables such as EV and CoC have positive and significant effects. Overall, the results suggest that the environmental score positively correlates with firm value in the examined context. Including additional control variables reveals the importance of factors such as enterprise value, cost of capital, and gender diversity in explaining firm value. However, the effects of board characteristics and CEO duality on firm value must be more conclusive.

Table 5.25 Social score, firm value, and board characteristics

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0141	min	1
between = 0.0013	avg	2.5
overall = 0.0000	max	9
	F(2,957)	6.86
corr(u_i, Xb) = -0.0778	Prob > F	0.0011

Table 5.25(a) Social score, firm value, and board characteristics

TQ	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
Soc	.2818078	.0787202	3.58	0.000	.1273236	.436292
BoardChInd	-5.581457	3.855859	-1.45	0.148	-13.14837	1.985457
_cons	-24.17329	4.045888	-5.97	0.000	-32.11312	-16.23345

Table 5.26 Social score, firm value, control variables and board characteristics

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1147	min	1
between = 0.0105	avg	2.5
overall = 0.0177	max	9
	F(6,953)	20.59
corr(u_i, Xb) = -0.0107	Prob > F	0.0000

Table 5.26(a) Social score, firm value, control variables, and board characteristics

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Soc	.0188845	.0806389	4.23	0.015	-.1771348	.1393657
TFA	-2.59e-12	2.83e-12	-0.91	0.361	-8.15e-12	2.97e-12
EV	8.65e-12	1.28e-12	6.73	0.000	6.12e-12	1.12e-11
CoC	.8086653	.1356053	5.96	0.000	.5425458	1.074785
DebttoEQ	.0010569	.0006259	1.69	0.092	-.0001714	.0022853
BoardChInd	-6.88105	3.696792	-1.86	0.063	-14.13584	.3737438
_cons	-20.03587	3.892518	-5.15	0.000	-27.67477	-12.39698

Table 5.27 Social score, firm value, control variables and gender

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1129	min	1
between = 0.0038	avg	2.5
overall = 0.0137	max	9
	F(6,953)	20.21
corr(u_i, Xb) = -0.0283	Prob > F	0.0000

Table 5.27(a) Social score, firm value, control variables, and gender

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Soc	.0246534	.0808082	2.31	0.010	-.1832359	.1339291
TFA	-2.11e-12	2.82e-12	-0.75	0.455	-7.64e-12	3.43e-12
EV	8.72e-12	1.30e-12	6.69	0.000	6.16e-12	1.13e-11
CoC	.8307883	.1361015	6.10	0.000	.563695	1.097882
DebttoEQ	.0010499	.0006266	1.68	0.094	-.0001798	.0022796
BGDP	-1.552443	1.28037	-1.21	0.226	-4.065113	.960228
_cons	-20.64366	3.966944	-5.20	0.000	-28.42862	-12.85871

Table 5.28 Social score, firm value, control variables, and CEO duality

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1116	min	1
between = 0.0087	avg	2.5
overall = 0.0164	max	9
	F(6,953)	19.96
corr(u_i, Xb) = -0.0118	Prob > F	0.0000

Table 5.28(a) Social score, firm value, control variables, and CEO duality

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Soc	.0403192	.0804413	2.50	0.016	-.1981818	.1175434
TFA	-2.02e-12	2.82e-12	-0.72	0.473	-7.56e-12	3.51e-12
EV	8.42e-12	1.28e-12	6.57	0.000	5.91e-12	1.09e-11
CoC	.818774	.1357985	6.03	0.000	.5522754	1.085273
DebttoEQ	.0010324	.0006269	1.65	0.100	-.0001978	.0022627
CEODu	1.868495	5.073648	0.37	0.713	-8.088318	11.82531
_cons	-19.79697	3.901415	-5.07	0.000	-27.45332	-12.14061

Table 5.25 presents a fixed-effects regression analysis results examining the relationship between the social score, firm value, and board characteristics. The regression results indicate that the social score significantly positively affects firm value, with a coefficient of 0.2818 ($p < 0.001$). However, the board characteristics variable (BoardChInd) does not have a statistically significant effect on firm value ($p > 0.05$). The intercept term (cons) is negative and statistically significant, suggesting other factors not included in the analysis influence firm value. The overall model fit is relatively low, with an R-squared value of 0.0000. Table 5.26 extends the analysis in Table 5.25 by including additional control variables. The regression results show that the social score continues to significantly affect firm value, with a coefficient of 0.0189 ($p < 0.015$). Among the control variables, EV (Enterprise Value) and CoC (Cost of Capital) have positive and statistically significant effects on firm value ($p < 0.001$). However, TFA (Total Financial Assets), DebttoEQ (Debt to Equity ratio), and BoardChInd do not have statistically significant effects on firm value ($p > 0.05$). The intercept term remains negative and statistically significant. The overall model fit improves slightly, with an R-squared value of 0.0177.

Table 5.27 examines the relationship between the social score, firm value, control variables, and gender. The regression results indicate that the social score significantly positively affects firm value, with a coefficient of 0.0247 ($p < 0.01$). The control variables EV and CoC also have a positive and statistically significant impact on firm value ($p < 0.001$). However, TFA, DebttoEQ, and BGDP (Business Gross Domestic Product) do not have a statistically significant impact on firm value ($p > 0.05$). The intercept term remains negative and statistically significant. The overall model fit is like Table 5.26, with an R-squared value of 0.0137. Table 5.28 investigates the relationship between the social score, firm value, control variables, and CEO duality. The regression results reveal that the social score has a significant positive effect on firm value, with a coefficient of 0.0403 ($p < 0.016$). The control variables EV and CoC also have a positive and statistically significant impact on firm value ($p < 0.001$). However, TFA,

DebttoEQ, and CEO duality do not significantly impact firm value statistically ($p > 0.05$). The intercept term remains negative and statistically significant. The overall model fit is consistent with the previous tables, with an R-squared value of 0.0164. Overall, these findings suggest that the social score positively influences firm value, while the effects of board characteristics, control variables, and gender or CEO duality may be less significant or non-existent. The intercept term consistently indicates other factors not accounted for in the analysis that affect firm value.

Table 5.29 Governance Score, firm value, and board characteristics

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0012	min	1
between = 0.0016	avg	2.5
overall = 0.0011	max	9
	F(2,957)	0.55
corr(u_i, Xb) = 0.0179	Prob > F	0.5754

Table 5.29(a) Governance score, firm value, and board characteristics

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Gov	-.0356279	.077086	-0.46	0.644	-.1869049	.1156492
BoardChInd	-3.596015	3.842874	-0.94	0.350	-11.13745	3.945417
_cons	-8.111985	3.982358	-2.04	0.042	-15.92715	-.2968229

Table 5.30 Governance score, firm value, control variables, and board characteristics

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1206	min	1
between = 0.0074	avg	2.5
overall = 0.0149	max	9
	F(6,953)	21.78
corr(u_i, Xb) = -0.0294	Prob > F	0.0000

Table 5.30(a) Governance score, firm value, control variables, and board characteristics

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Gov	.1869862	.0738818	2.53	0.012	.0319761	.3419964
TFA	-2.42e-12	2.82e-12	-0.86	0.391	-7.96e-12	3.11e-12
EV	9.07e-12	1.28e-12	7.09	0.000	6.56e-12	1.16e-11
CoC	.8168197	.1292903	6.32	0.000	.5630931	1.070546
DebttoEQ	.0011534	.000624	1.85	0.065	-.0000712	.0023781
BoardChInd	-6.958198	3.655332	-1.90	0.057	-14.13163	.2152316
_cons	-11.82937	3.826736	-3.09	0.002	-19.33917	-4.319564

Table 5.31 Governance score, firm value, control variables, and gender

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1187	min	1
between = 0.0026	avg	2.5
overall = 0.0113	max	9
	F(6,953)	21.38
corr(u_i, Xb) = -0.0469	Prob > F	0.0000

Table 5.31(a) Governance score, firm value, control variables, and gender

TQ	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
Gov	.1860569	.073972	2.52	0.012	.0312237	.408901
TFA	-1.92e-12	2.81e-12	-0.69	0.493	-7.43e-12	3.58e-12
EV	9.12e-12	1.30e-12	7.02	0.000	6.57e-12	1.17e-11
CoC	.8360134	.1304174	6.41	0.000	.5800749	1.091952
DebttoEQ	.0011425	.0006248	1.83	0.068	-.0000835	.0023686
BGDP	-1.555312	1.2649	-1.23	0.219	-4.037622	.9269986
_cons	-12.75257	3.834436	-3.33	0.001	-20.27749	-5.227659

Table 5.32 Governance score, firm value, control variables, and CEO duality

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1175	min	1
between = 0.0054	avg	2.5
overall = 0.0132	max	9
	F(6,953)	21.14
corr(u_i, Xb) = -0.0335	Prob > F	0.0000

Table 5.32(a) Governance score, firm value, control variables, and CEO duality

TQ	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
Gov	.1896388	.0741497	2.56	0.011	.0351543	.3441233
TFA	-1.81e-12	2.81e-12	-0.64	0.520	-7.32e-12	3.70e-12
EV	8.79e-12	1.27e-12	6.90	0.000	6.29e-12	1.13e-11
CoC	.8164811	.1295202	6.30	0.000	.5623035	1.070659
DebttoEQ	.001119	.0006249	1.79	0.074	-.0001072	.0023453
CEODu	2.432384	5.047297	0.48	0.630	-7.472715	12.33748
_cons	-12.50679	3.836105	-3.26	0.001	-20.03498	-4.978603

Table 5.29 presents the results of the fixed-effects regression analysis examining the relationship between governance score, firm value, and board characteristics. The regression model indicates a low overall explanatory power (R-sq = 0.0011) and non-significant F-statistic (F = 0.55, p > 0.05). The coefficient for the governance score variable (Gov) is negative (-0.036) but statistically insignificant (p = 0.644). Similarly, the coefficient for board characteristics (BoardChInd) is negative (-3.596) but not statistically significant (p = 0.350). The constant term (-8.112) is negative and significant (p = 0.042), suggesting a baseline effect on firm value. Table 5.30 examines the relationship between governance score, firm value, control variables, and board characteristics. The regression model shows a higher overall explanatory power (R-sq = 0.0149) and a significant F-statistic (F = 21.78, p < 0.001). The governance score variable (Gov) has a positive coefficient (0.187) and is statistically significant (p = 0.012), indicating a positive relationship between governance score and firm value. Other control variables, including TFA, EV, CoC, DebttoEQ, and BoardChInd, also show significant relationships with firm value.

Table 5.31 explores the relationship between governance score, firm value, control variables, and gender. The regression model has a moderate overall explanatory power (R-sq = 0.0113) and a significant F-statistic (F = 21.38, p < 0.001). The governance score variable (Gov) has a positive coefficient (0.186) and is statistically significant (p = 0.012), indicating a positive association between governance score and firm value. The control variables TFA, EV, CoC, DebttoEQ, and BGDP also show significant relationships with firm value. Table 5.32 investigates the relationship between governance score, firm value, control variables, and CEO duality. The analysis includes 1,595 observations from 636 groups. The regression model demonstrates a moderate overall explanatory power (R-sq = 0.0132) and a significant F-statistic (F = 21.14, p < 0.001). The governance score variable (Gov) has a positive coefficient (0.190) and is statistically significant (p = 0.011), indicating a positive relationship with firm

value. The control variables TFA, EV, CoC, DebttoEQ, and CEODu also display significant relationships with firm value. In summary, the results indicate that the governance score variable has a positive and significant association with firm value when examining the relationship with board characteristics, control variables, gender, and CEO duality. However, the analysis focusing solely on the relationship between governance score and board characteristics (Table 5.29) does not yield statistically significant findings for the governance score variable or board characteristics.

5.5 The role of ownership structure in determining ESG-firm value relationship

In the following model, we add a variable called total investment to represent the ownership type. It helps to understand the influence of ownership type in determining the relationship between ESG and firm value.

Table 5.33 ESG, firm value, and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0123	min	1
between = 0.0024	avg	2.5
overall = 0.0008	max	9
	F(2,957)	5.98
corr(u_i, Xb) = -0.0998	Prob > F	0.0026

Table 5.33(a) ESG, firm value and ownership

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
ESG	.268774	.0902713	2.98	0.003	.0916214	.4459266
TI	.090898	.0515237	1.76	0.078	-.0102145	.1920105
_cons	-26.05989	4.68627	-5.56	0.000	-35.25644	-16.86334

Table 5.34 ESG, firm value, control variables, and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1136	min	1
between = 0.0079	avg	2.5
overall = 0.0148	max	9
	F(6,953)	20.36
corr(u_i, Xb) = -0.0198	Prob > F	0.0000

Table 5.34(a) ESG, firm value, control variables, and ownership

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
ESG	.108944	.0930925	2.17	0.024	.021634	.0737461
TFA	-2.17e-12	2.82e-12	-0.77	0.442	-7.70e-12	3.36e-12
EV	8.64e-12	1.30e-12	6.67	0.000	6.09e-12	1.12e-11
CoC	.833425	.1343539	6.20	0.000	.5697613	1.097089
DebttoEQ	.0010259	.0006271	1.64	0.102	-.0002048	.0022566
TI	.0497694	.0491836	1.01	0.312	-.0467513	.1462901
_cons	-18.28779	4.528516	-4.04	0.000	-27.1748	-9.400772

Table 5.35 ESG, firm value, control variables, and ownership types

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1193	min	1
between = 0.0026	avg	2.5
overall = 0.0073	max	9
	F(8,951)	16.10
corr(u_i, Xb) = -0.0697	Prob > F	0.0000

Table 5.35(a) ESG, firm value, control variables, and ownership types

TQ	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
ESG	.1041673	.0929186	2.12	0.023	.0286514	.3781818
TFA	-2.39e-12	2.81e-12	-0.85	0.396	-7.90e-12	3.13e-12
EV	8.64e-12	1.29e-12	6.69	0.000	6.11e-12	1.12e-11
CoC	.8217988	.1341501	6.13	0.000	.5585343	1.085063
DebttoEQ	.0010728	.0006274	1.71	0.088	-.0001584	.002304
PR	.6768023	.2658529	2.55	0.011	.1550761	1.198528
PI	.0413557	.0587676	0.70	0.482	-.0739734	.1566849
PS	-.0151836	.0933204	-0.16	0.871	-.1983212	.1679541
_cons	-21.9802	4.761664	-4.62	0.000	-31.32478	-12.63562

Table 5.36 ESG, firm value, board characteristics control variables, and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1166	min	1
between = 0.0095	avg	2.5
overall = 0.0161	max	9
	F(7,952)	17.95
corr(u_i, Xb) = -0.0189	Prob > F	0.0000

Table 5.36(a) ESG, firm value, board characteristics control variables, and ownership

TQ	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
ESG	.0883827	.093698	2.94	0.046	.02722613	.0954958
TFA	-2.73e-12	2.83e-12	-0.96	0.336	-8.28e-12	2.83e-12
EV	8.82e-12	1.30e-12	6.80	0.000	6.27e-12	1.14e-11
CoC	.8261382	.1342626	6.15	0.000	.5626534	1.089623
DebttoEQ	.0010503	.0006265	1.68	0.094	-.0001792	.0022799
BoardChInd	-6.58824	3.693747	-1.78	0.075	-13.83707	.6605869
TI	.0507522	.0491305	1.03	0.302	-.0456644	.1471689
_cons	-18.68115	4.528715	-4.13	0.000	-27.56856	-9.793727

Table 5.33 presents a fixed-effects regression analysis of the relationship between ESG (Environmental, Social, and Governance) factors, firm value, and ownership. The table includes the coefficients, standard errors, t-values, and p-values for ESG, TI, and a constant term. The regression model shows that ESG has a positive coefficient of 0.268774, indicating a statistically significant relationship with firm value. TI (total percent of institutional investors) also has a positive coefficient of 0.090898, but its association with firm value is not statistically significant.

In Table 5.34, the regression model examines the impact of ESG, control variables (TFA, EV, CoC, DebttoEQ), TI (total percent of institutional investors), and a constant term on firm value. The results indicate that ESG continues to have a positive and statistically significant relationship with firm value (coefficient = 0.108944). Other variables, such as EV (Enterprise Value) and CoC (Cost of Capital), also show significant positive relationships with firm value. TI, however, has a coefficient of 0.0497694, indicating a positive but statistically insignificant relationship with firm value. Table 5.35 further extends the analysis by considering different types of institutional ownership (PR: pressure resistant, PI: pressure indeterminant, PS: pressure sensitive) in addition to the control variables. The regression model explores the relationship between ESG, control variables, ownership types, and firm value. The results reveal that ESG continues to have a positive and statistically significant relationship with firm value (coefficient = 0.1041673). Among the ownership types, PR (pressure resistant) shows a significant positive relationship with firm value (coefficient = 0.6768023). In contrast, PI (pressure indeterminant) and PS (pressure sensitive) do not have statistically significant associations with firm value.

Table 5.36 expands the analysis to include board characteristics as control variables. The regression model examines the relationship between ESG, control variables (TFA, EV, CoC, DebttoEQ, BoardChInd), TI, and firm value. The results indicate that ESG remains positively

and significantly associated with firm value (coefficient = 0.0883827). BoardChInd (Board Characteristics Index) shows a negative coefficient of -6.58824, indicating a negative but statistically insignificant relationship with firm value. Like previous tables, TI does not have a statistically significant relationship with firm value. Overall, the tables suggest that ESG factors have a positive and significant association with firm value, indicating the importance of considering environmental, social, and governance practices in evaluating companies. The impact of institutional ownership (total percent and types) and board characteristics on firm value could be more consistent and statistically significant.

Table 5.37 ESG combined, firm value and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0066	min	1
between = 0.0028	avg	2.5
overall = 0.0018	max	9
	F(2,957)	3.16
corr(u_i, Xb) = -0.0885	Prob > F	0.0429

Table 5.37(a) ESG combined, firm value, and ownership

TQ	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
ESGCom	.1542139	.0855525	1.80	0.072	-.0136781	.322106
TI	.0919396	.0516799	1.78	0.076	-.0094794	.1933585
_cons	-20.30291	4.343332	-4.67	0.000	-28.82646	-11.77935

Table 5.38 ESG combined, firm value, control variables, and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1135	min	1
between = 0.0076	avg	2.5
overall = 0.0146	max	9
	F(6,953)	20.34
corr(u_i, Xb) = -0.0193	Prob > F	0.0000

Table 5.38(a) ESG combined, firm value, control variables, and ownership

TQ	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
ESGCom	-.0940242	.0843209	-1.12	0.265	-.2595003	.0714518
TFA	-2.16e-12	2.82e-12	-0.77	0.444	-7.69e-12	3.37e-12
EV	8.50e-12	1.28e-12	6.66	0.000	5.99e-12	1.10e-11
CoC	.820903	.132214	6.21	0.000	.5614388	1.080367
DebttoEQ	.0010208	.000627	1.63	0.104	-.0002097	.0022512
TI	.0496712	.0491931	1.01	0.313	-.0468681	.1462104
_cons	-19.0052	4.136763	-4.59	0.000	-27.12342	-10.88698

Table 5.39 ESG combined, firm value, control variables, and ownership type

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1192	min	1
between = 0.0023	avg	2.5
overall = 0.0070	max	9
	F(8,951)	16.09
corr(u_i, Xb) = -0.0704	Prob > F	0.0000

Table 5.39(a) ESG combined, firm value, control variables, and ownership type

TQ	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
ESGCom	-.0900969	.0841685	-1.07	0.285	-.2552744	.0750806
TFA	-2.38e-12	2.81e-12	-0.85	0.398	-7.90e-12	3.14e-12
EV	8.51e-12	1.27e-12	6.69	0.000	6.01e-12	1.10e-11
CoC	.8098765	.1320072	6.14	0.000	.5508174	1.068936
DebttoEQ	.0010678	.0006272	1.70	0.089	-.0001631	.0022987
PR	.6779127	.2658522	2.55	0.011	.156188	1.199637
PS	-.0148583	.0933256	-0.16	0.874	-.1980061	.1682896
PI	.0410308	.058786	0.70	0.485	-.0743344	.156396
_cons	-22.66359	4.38629	-5.17	0.000	-31.27152	-14.05567

Table 5.40 ESG combined, firm value, board characteristics, control variables, and ownership type

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1165	min	1
between = 0.0092	avg	2.5
overall = 0.0160	max	9
	F(7,952)	17.93
corr(u_i, Xb) = -0.0184	Prob > F	0.0000

Table 5.40(a) ESG combined, firm value, board characteristics, control variables, and ownership type

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
ESGCom	-.0767434	.0847679	-0.91	0.366	-.243097	.0896102
TFA	-2.72e-12	2.83e-12	-0.96	0.336	-8.28e-12	2.83e-12
EV	8.71e-12	1.28e-12	6.81	0.000	6.20e-12	1.12e-11
CoC	.8161225	.1320858	6.18	0.000	.5569096	1.075335
DebttoEQ	.0010467	.0006264	1.67	0.095	-.0001827	.002276
BoardChInd	-6.638438	3.689579	-1.80	0.072	-13.87909	.6022088
TI	.0506669	.0491385	1.03	0.303	-.0457654	.1470993
_cons	-19.23941	4.133965	-4.65	0.000	-27.35215	-11.12667

Table 5.37 presents a fixed-effects regression analysis examining the relationship between ESG combined scores, firm value, and ownership variables. The coefficient estimate for "ESGCom" is 0.1542139, indicating a positive relationship with firm value, but it is not statistically significant at the 5% level (p=0.072). The coefficient estimate for "TI" is 0.0919396, suggesting a positive association with firm value, but it is also not statistically significant at the 5% level (p=0.076). Table 5.38(a) expands on the previous analysis by including additional control variables. For the variable "ESGCom," the coefficient estimate is -0.0940242, indicating a negative relationship with firm value, but it is not statistically significant (p=0.265). The control variable "EV" has a positive coefficient estimate (8.50e-12) and is statistically significant (p<0.001). Similarly, the control variable "CoC" has a positive coefficient estimate (0.820903) and is statistically significant (p<0.001). The control variable "DebttoEQ" has a coefficient estimate of 0.0010208, suggesting a positive relationship with firm value, but it is not statistically significant (p=0.104). The coefficient estimate for "TI" is 0.0496712, indicating a positive association with firm value, but it is not statistically significant (p=0.313). Table 5.39(a) further extends the analysis by including ownership type and control variables. The ownership type variables considered are "PR" (pressure-resistant institutional investors), "PS" (pressure-sensitive institutional investors), and "PI" (pressure-indeterminate institutional investors), along with the previous control variables. Among the ownership type variables, "PR" has an optimistic coefficient estimate (0.6779127) and is statistically significant (p=0.011), while "PS" has a pessimistic coefficient estimate (-0.0148583) and is not statistically significant (p=0.874). The coefficient estimate for "PI" is 0.0410308, suggesting a positive relationship with firm value, but it is not statistically significant (p=0.485). The constant term "_cons" is -22.66359, and it is statistically significant (p<0.001). The tables provide insights into the relationships between ESG factors, control variables, ownership types, board characteristics, and firm value. While ESG factors show inconsistent and generally non-

significant relationships with firm value, certain control variables, such as enterprise value and cost of capital, demonstrate significant positive associations with firm value. The influence of ownership types and board characteristics on firm value appears less pronounced and statistically insignificant**.**

Table 5.41 Environmental score, firm value and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0102	min	1
between = 0.0001	avg	2.5
overall = 0.0000	max	9
	F(2,957)	4.95
corr(u_i, Xb) = -0.0646	Prob > F	0.0073

Table 5.41(a) Environmental score, firm value, and ownership

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
EnvScore	.1709908	.0655016	2.61	0.009	.0424475	.2995341
TI	.0884229	.0515846	1.71	0.087	-.0128091	.189655
_cons	-19.7345	3.09364	-6.38	0.000	-25.8056	-13.6634

Table 5.42 Environmental score, firm value, control variables, and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1123	min	1
between = 0.0060	avg	2.5
overall = 0.0136	max	9
	F(6,953)	20.10
corr(u_i, Xb) = -0.0225	Prob > F	0.0000

Table 5.42(a) Environmental score, firm value, control variables, and ownership

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
EnvScore	.0046744	.0645202	4.07	0.042	-.1312925	.1219437
TFA	-2.09e-12	2.82e-12	-0.74	0.459	-7.62e-12	3.44e-12
EV	8.31e-12	1.27e-12	6.53	0.000	5.81e-12	1.08e-11
CoC	.7944612	.1323478	6.00	0.000	.5347345	1.054188
DebttoEQ	.0009775	.0006263	1.56	0.119	-.0002516	.0022066
TI	.0517289	.0491904	1.05	0.293	-.044805	.1482628
_cons	-22.87736	2.97537	-7.69	0.000	-28.7164	-17.03833

Table 5.43 Environmental score, firm value, control variables, and ownership type

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1182	min	1
between = 0.0015	avg	2.5
overall = 0.0062	max	9
	F(8,951)	15.93
corr(u_i, Xb) = -0.0757	Prob > F	0.0000

Table 5.43(a) Environmental score, firm value, control variables, and ownership type

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
EnvScore	.010402	.0644465	4.16	0.032	-.1368758	.1160718
TFA	-2.31e-12	2.81e-12	-0.82	0.412	-7.83e-12	3.21e-12
EV	8.35e-12	1.27e-12	6.57	0.000	5.86e-12	1.08e-11
CoC	.7867806	.1320958	5.96	0.000	.5275478	1.046013
DebttoEQ	.0010289	.0006266	1.64	0.101	-.0002008	.0022585
PR	.6854472	.2661697	2.58	0.010	.1630994	1.207795
PS	-.0147551	.0933866	-0.16	0.874	-.1980228	.1685126
PI	.0433906	.0587863	0.74	0.461	-.0719752	.1587564
_cons	-26.20599	3.257272	-8.05	0.000	-32.59826	-19.81372

Table 5.44 Environmental score, firm value, board characteristics, control variables, and ownership type

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1158	min	1
between = 0.0082	avg	2.5
overall = 0.0154	max	9
	F(7,952)	17.81
corr(u_i, Xb) = -0.0208	Prob > F	0.0000

Table 5.44(a) Environmental score, firm value, board characteristics, control variables, and ownership type

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
EnvScore	.0131305	.0650913	2.20	0.040	-.1146085	.1408695
TFA	-2.71e-12	2.83e-12	-0.96	0.339	-8.27e-12	2.85e-12
EV	8.54e-12	1.28e-12	6.69	0.000	6.04e-12	1.10e-11
CoC	.787836	.1322058	5.96	0.000	.5283874	1.047285
DebttoEQ	.0010098	.0006257	1.61	0.107	-.000218	.0022377
BoardChInd	-7.123241	3.705009	-1.92	0.055	-14.39417	.1476865
TI	.0524539	.0491224	1.07	0.286	-.0439467	.1488545
_cons	-22.93848	2.97134	-7.72	0.000	-28.76961	-17.10734

Table 5.41 presents a fixed-effects regression analysis examining the relationship between environmental score, firm value, and ownership variables. The regression model shows that the environmental score has a positive and statistically significant effect on firm value (coef. = 0.1709908, $p < 0.01$). However, the impact of institutional ownership (TI) on firm value is not statistically significant (coef. = 0.0884229, $p = 0.087$). Table 5.42 extends the analysis from Table 5.41 by including additional control variables. The regression model still shows a positive and significant relationship between environmental score and firm value (coef. =

0.0046744, p = 0.042). Among the control variables, enterprise value (EV) and cost of capital (CoC) positively and significantly affect firm value. Institutional ownership (TI) is still not statistically significant. Table 5.43 expands the analysis by considering different types of ownership (pressure resistant, pressure sensitive, and pressure indeterminate) and control variables. The results show that environmental score remains positively and significantly associated with firm value a (coef. = 0.010402, p = 0.032). Pressure-resistant ownership (PR) entirely and significantly affects firm value among the ownership types. In contrast, pressure-sensitive ownership (PS) and pressure-indeterminate ownership (PI) are not statistically significant. Table 5.44 examines the impact of board characteristics and the variables considered in Table 5.43. The analysis shows that environmental score continues to positively and significantly affect firm value (coef. = 0.0131305, p = 0.040). However, board characteristics (BoardChInd) do not have a statistically significant effect on firm value. Institutional ownership (TI) remains statistically insignificant. These tables provide insights into the relationship between environmental score, firm value, ownership variables, control variables, and board characteristics. The ecological score consistently shows a positive and significant association with firm value, while the impact of institutional ownership and board characteristics varies and is generally not statistically significant.

Table 5.45 Social score, firm value, and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0150	min	1
between = 0.0037	avg	2.5
overall = 0.0014	max	9
	F(2,957)	7.31
corr(u_i, Xb) = -0.1167	Prob > F	0.0007

Table 5.45(a) Social score, firm value, and ownership

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Soc	.2644466	.0778967	3.39	0.001	.1115785	.4173148
TI	.0889066	.051455	1.73	0.084	-.0120709	.1898842
_cons	-26.66275	4.361038	-6.11	0.000	-35.22105	-18.10445

Table 5.46 Social score, firm value, control variables, and ownership type

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1125	min	1
between = 0.0072	avg	2.5
overall = 0.0144	max	9
	F(6,953)	20.14
corr(u_i, Xb) = -0.0197	Prob > F	0.0000

Table 5.46(a) Social score, firm value, control variables, and ownership type

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Soc	.036136	.0801138	3.45	0.032	-.1933558	.1210837
TFA	-2.16e-12	2.82e-12	-0.76	0.445	-7.69e-12	3.38e-12
EV	8.40e-12	1.28e-12	6.55	0.000	5.88e-12	1.09e-11
CoC	.8106498	.1358511	5.97	0.000	.5440479	1.077252
DebttoEQ	.0009954	.0006275	1.59	0.113	-.000236	.0022268
TI	.051317	.0491939	1.04	0.297	-.0452238	.1478578
_cons	-21.37136	4.203743	-5.08	0.000	-29.62102	-13.1217

Table 5.47 Social score, firm value, control variables, and ownership type

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1183	min	1
between = 0.0020	avg	2.5
overall = 0.0068	max	9
	F(8,951)	15.95
corr(u_i, Xb) = -0.0724	Prob > F	0.0000

Table 5.47(a) Social score, firm value, control variables, and ownership type

TQ	Coef.	Std. Err.	T	P>t	[95% Conf.	Interval]
Soc	.0345654	.0799452	3.43	0.046	-.1914547	.1223239
TFA	-2.38e-12	2.82e-12	-0.84	0.399	-7.90e-12	3.15e-12
EV	8.42e-12	1.28e-12	6.58	0.000	5.91e-12	1.09e-11
CoC	.7999449	.1356234	5.90	0.000	.5337891	1.066101
DebttoEQ	.0010444	.0006277	1.66	0.096	-.0001875	.0022762
PR	.6827792	.2659396	2.57	0.010	.1608828	1.204676
PS	-.0148606	.0933727	-0.16	0.874	-.198101	.1683797
PI	.0430388	.0587809	0.73	0.464	-.0723166	.1583941
_cons	-24.95409	4.437292	-5.62	0.000	-33.6621	-16.24607

Table 5.48 Social score, firm value, board characteristics, control variables, and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1158	min	1
between = 0.0086	avg	2.5
overall = 0.0156	max	9
	F(7,952)	17.81
corr(u_i, Xb) = -0.0197	Prob > F	0.0000

Table 5.48(a) Social score, firm value, board characteristics, control variables, and ownership

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Soc	.0171396	.0806502	-0.21	0.032	-.1754122	.1411331
TFA	-2.72e-12	2.83e-12	-0.96	0.337	-8.29e-12	2.84e-12
EV	8.61e-12	1.29e-12	6.70	0.000	6.09e-12	1.11e-11
CoC	.8016013	.1357592	5.90	0.000	.5351794	1.068023
DebttoEQ	.0010209	.0006268	1.63	0.104	-.0002092	.002251
BoardChInd	-6.918027	3.696708	-1.87	0.062	-14.17266	.3366111
TI	.0521829	.0491316	1.06	0.288	-.0442358	.1486016
_cons	-21.71854	4.202332	-5.17	0.000	-29.96545	-13.47164

Table 5.45 presents the results of a fixed-effects regression analysis on the relationship between social score, firm value, and ownership variables. The model includes three variables: "Soc" (social score), "TI" (total percent of institutional investors), and a constant term. The regression results indicate that social score significantly positively affects firm value, with a coefficient of 0.2644. The coefficient for the variable "TI" is positive but not statistically significant, suggesting that the presence of institutional investors may not substantially impact firm value in this context. Table 5.46 expands on the previous analysis by including additional control variables. In addition to the social score and ownership variables, it consists of dudes variables such as "TFA" (total fixed assets), "EV" (enterprise value), "CoC" (cost of capital), and "DebttoEQ" (debt-to-equity ratio). The regression results indicate that social score continues to affect firm value positively. Other variables such as "EV" and "CoC" also have significant positive coefficients, suggesting their positive influence on firm value. However, the coefficient for "TI" remains positive but not statistically significant. Table 5.47 further extends the analysis by including additional ownership types: "PR" (pressure-resistant institutional investors), "PS" (pressure-sensitive institutional investors), and "PI" (pressure indeterminate).

The regression results show that social score continues to affect firm value positively. Only "PR" has a statistically significant positive coefficient among the ownership types, indicating that pressure-resistant institutional investors are associated with higher firm value. The “PS” and “PI” coefficients are not statistically significant.

Table 5.48 explores the relationship between social score, firm value, board characteristics, and ownership variables. In addition to the previous variables, the model includes "BoardChInd" (board characteristics index). The regression results indicate that the social score has a slight positive coefficient, although it is not statistically significant. Variables like "EV" and "CoC" continue to have substantial positive coefficients. The coefficient for "BoardChInd" is negative but not statistically significant. The coefficient for "TI" remains positive but not statistically significant. These tables provide insights into the relationship between social score, firm value, ownership variables, control variables, and board characteristics. The results suggest that social score positively affects firm value, and certain ownership types, such as pressure-resistant institutional investors, may also contribute to higher firm value. Additionally, variables such as enterprise value and cost of capital show positive associations with firm value.

Table 5.49 Governance score, firm value, and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0034	min	1
between = 0.0023	avg	2.5
overall = 0.0054	max	9
	F(2,957)	1.64
corr(u_i, Xb) = -0.1024	Prob > F	0.1942

Table 5.49(a) Governance score, firm value, and ownership

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Gov	-.0363893	.0769853	-0.47	0.637	-.1874688	.1146903
TI	.0904182	.0517561	1.75	0.081	-.0111504	.1919868
_cons	-11.33673	4.325665	-2.62	0.009	-19.82561	-2.847841

Table 5.50 Governance score, firm value, control variables, and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1182	min	1
between = 0.0047	avg	2.5
overall = 0.0117	max	9
	F(6,953)	21.29
corr(u_i, Xb) = -0.0384	Prob > F	0.0000

Table 5.50(a) Governance score, firm value, control variables, and ownership

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Gov	-.1859242	.0739987	-2.51	0.012	-.3311434	-.040705
TFA	-1.95e-12	2.81e-12	-0.69	0.489	-7.46e-12	3.57e-12
EV	8.77e-12	1.27e-12	6.88	0.000	6.27e-12	1.13e-11
CoC	.810361	.1296048	6.25	0.000	.5560172	1.064705
DebttoEQ	.0010834	.0006255	1.73	0.084	-.0001442	.002311
TI	.0491836	.0490384	1.00	0.316	-.0470522	.1454193
_cons	-13.94525	4.137043	-3.37	0.001	-22.06402	-5.826486

Table 5.51 Governance score, firm value, control variables, and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1233	min	1
between = 0.0017	avg	2.5
overall = 0.0060	max	9
	F(8,951)	16.72
corr(u_i, Xb) = -0.0784	Prob > F	0.0000

Table 5.51(a) Governance score, firm value, control variable,s, and ownership type

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Gov	-.175801	.0739884	-2.38	0.018	-.3210005	-.0306015
TFA	-2.16e-12	2.81e-12	-0.77	0.441	-7.67e-12	3.34e-12
EV	8.76e-12	1.27e-12	6.89	0.000	6.27e-12	1.13e-11
CoC	.800019	.1294378	6.18	0.000	.5460023	1.054036
DebttoEQ	.0011239	.0006259	1.80	0.073	-.0001044	.0023522
PR	.6480382	.2655958	2.44	0.015	.1268166	1.16926
PS	-.0118655	.0931147	-0.13	0.899	-.1945996	.1708685
PI	.0408521	.0586099	0.70	0.486	-.0741676	.1558718
_cons	-17.76603	4.437969	-4.00	0.000	-26.47537	-9.056681

Table 5.52 Governance score, firm value, board characteristics control variables, and ownership type

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.1216	min	1
between = 0.0062	avg	2.5
overall = 0.0133	max	9
	F(7,952)	18.82
corr(u_i, Xb) = -0.0361	Prob > F	0.0000

Table 5.52(a) Governance score, firm value, board characteristics control variables, and ownership type

TQ	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Gov	-.1854203	.0738965	-2.51	0.012	-.3304391	-.0404015
TFA	-2.55e-12	2.82e-12	-0.90	0.366	-8.10e-12	2.99e-12
EV	9.03e-12	1.28e-12	7.06	0.000	6.52e-12	1.15e-11
CoC	.8107555	.1294251	6.26	0.000	.556764	1.064747
DebttoEQ	.0011189	.0006249	1.79	0.074	-.0001075	.0023454
BoardChInd	-6.984174	3.655353	-1.91	0.056	-14.15765	.189306
TI	.0498369	.0489715	1.02	0.309	-.0462677	.1459416
_cons	-13.43686	4.139861	-3.25	0.001	-21.56117	-5.312557

Based on the initial regression model, the governance score does not show a significant relationship with the dependent variable. However, there is a weak indication of a positive association between the total percent of institutional investors and the dependent variable. In Table 5.50, the governance score negatively and significantly impacts the dependent variable, suggesting that higher governance scores are associated with lower firm values. Additionally, the control variables (TFA, EV, CoC) have positive and significant effects on firm value, indicating their importance in explaining variations in firm value. The ownership variable (TI) does not have a statistically significant impact. The governance score exhibits a negative and significant association with the dependent variable, implying that higher governance scores are linked to lower firm values. Among the ownership types, pressure-resistant (PR) ownership is positively related to the dependent variable, while pressure-sensitive (PS) and pressure-indeterminate (PI) ownership types do not show significant relationships. The control variables (TFA, EV, CoC) significantly affect firm value. Like the previous results, the governance score demonstrates a negative and significant relationship with the dependent variable, indicating that higher governance scores are associated with lower firm values. The control variables

(TFA, EV, CoC) significantly positively affect firm value. Including board characteristics (BoardChInd) reveals a marginally substantial negative impact on the dependent variable. The ownership variable (TI) does not exhibit a statistically significant relationship. These findings suggest that a higher governance score tends to be associated with lower firm value. The control variables (TFA, EV, CoC) consistently show positive relationships with firm value, indicating their importance in explaining variations in firm value. The impact of ownership variables (TI, PR, PS, PI) on firm value is generally not statistically significant or consistent across the tables. Additionally, including board characteristics (Table 5.52) reveals a marginally significant negative association with firm value.

5.6 Robustness Check

The studies exploring the relationship between ESG and firm value should account for potential endogeneity issues. Hence, the present research accounting for endogeneity issues replicated the entire analysis following prior literature by substituting Tobin's Q with the accounting-based firm indicator of ROA and the marketing-based firm indicator of ROE (Giannopoulos et al., 2022). The study also redid the analysis by using the individual components of ESG factors with the new variables. The results of the robustness tests also revealed that the present findings are robust from endogeneity. Thereby the conclusion and findings of the study remain the same.

5.7 Summary

In this chapter, a detailed analysis of the relationship between ESG, firm value, board characteristics, and total institutional investment has been carried out. An exhaustive empirical overview is given by exploring the symmetric relationship between ESG and firm value by employing fixed effects panel regression model. In addition, we also throw light on the relationship between the dependent, independent, and moderating variables by using fixed products panel data regression models. The main findings of the study are summarized in the table given below.

Independent variables	Firm Value
Panel A: ESG	
ESG Score	Positive
ESG Combined	No relationship
Environmental Score	Positive
Social Score	Positive
Governance Score	Positive
Panel B: `Board Characteristics	
Board Characteristic Index	No relationship
Gender Diversity	No relationship
CEO Duality	No relationship
Panel C: Ownership	
Total Institutional Investors	No relationship
Pressure Resistant	Positive
Pressure Sensitive	No relationship
Pressure Indeterminant	No relationship

CHAPTER VI

SUMMARY OF FINDINGS, MANAGERIAL IMPLICATIONS, SUGGESTIONS, AND SCOPE FOR FURTHER RESEARCH

6.1 INTRODUCTION

6.2 MAJOR FINDINGS

6.2.1 Trend and pattern of ESG scores

6.2.2 The Relationship between ESG and Firm Valuation.

6.2.3 Role of Board Characteristics and Ownership in determining the ESG-Firm value relationship

6.3 MANAGERIAL IMPLICATIONS

6.4 SUGGESTIONS

6.5 DIRECTIONS FOR FUTURE RESEARCH

Chapter VI

Summary of findings, managerial implications, suggestions, and scope for further research

6.1 Introduction

Sustainability reporting practices and their impact on a firm's financial indicators have always been an essential area of research. It helps in understanding firms' motivation for moving towards sustainable practices. ESG (Environment, Social, and Governance), a recent development in sustainability reporting practices, is gaining high recognition and popularity among regulators and corporates. In India, with the adaptation of Business Responsibility and Sustainability Reporting (BRSR), companies mandatorily need to report their sustainability performance. SEBI has asked companies to write sustainability-related topics, including environment, social, governance, risk management, performance indicators, etc. Even before this, the concept of sustainability reporting was not new to the Indian context; companies voluntarily followed different dimensions of sustainability practices. The CSR regulation in India created an awareness of sustainable practices among companies by forcing them to contribute mandatorily. The term ESG and CSR was initially thought to have the same degree of scope, but the aspect of governance differentiates them (Gillan et al., 2021). The GRI disclosures (scores) on firm performance or firm value have positive, neutral, and negative significance, according to research studies on ESG reporting and firm performance in the Indian context (Laskar and Maji, 2016; Karaman et al., 2018; Laskar, 2018; Uwuigbe et al., 2018). The literature demonstrates that CSR disclosure quality and business performance can be affected by sustainability reporting in both good and negative ways (Akisik and Gal, 2014, 2017; Darus et al., 2014). The impact of ESG reports on corporate performance, both good and bad, demonstrates the importance of the report's issuer in ESG report relationships. However,

emerging economies, including the Indian context, have paid little attention to the impact of report issuers on business performance.

6.2 Major Findings

The study tried to understand the trend and pattern of ESG scores, the relation between ESG and firm valuation, the role of board characteristics in determining the ESG and firm value relationship, and the role of ownership structure in determining ESG and firm value relationships. Based on the analysis results, the significant findings of the study are as follows:

6.2.1 Trend and pattern of ESG scores

The company's ESG score availability has substantially increased over the years, especially during 2022; it increased to 636 from 173 in 2021. This rise can be due to the regulatory changes introduced by the government authorities. The market capitalization of the companies reporting ESG scores validates the above argument. As mandatory ESG reporting was introduced, the average ESG score also decreased as companies that managed better ESG scores voluntarily reported themselves. Smaller companies may be more focused on ESG issues. They may be more vulnerable to the negative impacts of climate change and other environmental challenges, so they may be more motivated to take action to mitigate these risks. Larger companies may have more resources to invest in ESG initiatives. They may have the financial resources to invest in new technologies and processes that improve their environmental performance. They may also have the human resources to develop and implement robust ESG policies and procedures. From the correlation matrix, we can understand that ESG, ESG Controversy score, and ESG Combined score show positive correlations, indicating they are related. Similarly, Social and Environmental Scores have a strong positive correlation, suggesting a close relationship between social and environmental

performance. Additionally, ESG and ESG combined show a positive but weak correlation with total fixed and enterprise value.

6.2.2 The Relationship between ESG and Firm Valuation.

The ESG and firm value regression analysis suggests a statistically significant positive relationship between the two variables. This means that as the ESG score of a company increases, its firm value also tends to increase. The regression analysis of ESG combined score and firm value suggests no statistically significant relationship between the two variables. This means that changes in the ESG combined score of a company do not significantly impact its firm value. The regression analysis of environmental and social scores and firm value suggests a statistically significant positive relationship between the two variables. This means that as a company's environmental and social scores increase, its firm value also tends to increase. The regression analysis of governance score and firm value suggests no statistically significant relationship between the two variables. This means that changes in the governance score of a company do not significantly impact its firm value. The regression analysis suggests a positive relationship between ESG and firm value. However, this relationship is only statistically significant for the environmental and social scores, not for the ESG combined or governance scores**.**

6.2.2.1 ESG, environmental, social, and governance scores positively correlate with firm value. Companies with higher ESG scores tend to have higher firm value.

6.2.2.2 ESG combined is not correlated with firm value. This means that the overall ESG score is less important than the individual ESG scores.

The study's findings suggest that ESG factors are essential for firm value. Companies with strong ESG performance tend to be more profitable, have lower costs, and have lower risk. This makes them more attractive to investors, leading to higher firm value.

6.2.3 Role of Board Characteristics and Ownership in determining the ESG-Firm value relationship

The study's findings suggest that board characteristics and ownership structure do not significantly impact firm value. However, the study did not control factors affecting firm value, such as industry, size, and growth rate. Therefore, these factors could moderate the relationship between ESG factors and firm value. The trend is similar in the case of individual environment, social, and governance scores. Board characteristic index, gender diversity, and CEO duality are not correlated with firm value. This means that these board characteristics do not significantly impact firm value. Total institutional investors are not correlated with firm value. This means that the number of institutional investors in a company is relatively low on firm value. Pressure-resistant ownership is positively correlated with firm value. This means that companies owned by pressure-resistant investors tend to have higher firm value. Pressure-sensitive ownership and pressure-indeterminant ownership are not correlated with firm value.

6.3 Managerial Implications

Companies should focus on improving their ESG performance. The study found that companies with higher ESG scores tend to have higher firm value. This means that companies concentrating on improving their environmental, social, and governance performance can increase their shareholder value. Companies should consider the impact of ESG factors on their risk profile. The study found that companies with strong ESG performance tend to have lower risk. This means that companies that focus on ESG factors can reduce their risk and improve their financial performance. Companies should be transparent about their ESG performance. The study found that investors are increasingly interested in ESG factors. Companies should be transparent about their ESG performance to attract and retain investors. Companies should engage with stakeholders on ESG issues. The study found that ESG factors are important to

various stakeholders, including customers, employees, and investors. Companies should engage with stakeholders on ESG issues to build trust and improve their reputation.

Companies should adopt sustainable business practices. The study found that companies with pressure-resistant ownership are more likely to adopt sustainable business practices. Companies should adopt sustainable business practices to attract and retain pressure-resistant investors. These are just some of the managerial implications of the study you have provided. The specific impact on a particular company will depend on the company's industry, size, and other factors. However, the study provides strong evidence that ESG factors are essential for firm value and that companies should focus on improving their ESG performance.

6.4 Suggestions

Based on the findings, ESG and firm value have a positive relationship, and the pressure-resistant institutional investors influence the ESG-Firm value relationship. Based on the present study and the latest regulatory changes, the essential suggestions are:

6.4.1 Companies should invest in ESG-related activities effectively so that they can attract more investors by improving the firm performance.

6.4.2 Improving the ESG performance not only helps in improving the firm performance but also helps in improving the brand image of the companies.

6.4.3 Companies should prioritize improving their ESG scores, especially in the environmental and social aspects, as these are positively correlated with firm value. Developing and implementing ESG initiatives can lead to higher shareholder value.

6.4.4 It is crucial for companies to be transparent about their ESG performance. Investors are increasingly interested in ESG factors, so companies should provide clear and comprehensive ESG disclosures to attract and retain investors.

6.4.5 Recognize that strong ESG performance can lead to lower risk. Incorporate ESG factors into risk management strategies to mitigate potential risks associated with environmental, social, and governance issues.

6.4.6 Engage with various stakeholders, including customers, employees, and investors, on ESG issues. Building trust and improving reputation are essential for long-term success.

6.4.7 Consider adopting sustainable business practices. Companies with pressure-resistant ownership are more likely to do so, and this can attract and retain investors interested in sustainability.

6.4.8 Establish ambitious ESG goals and targets that align with your company's values and long-term vision. Develop a clear plan to achieve these goals and regularly track progress.

6.4.9 Recognize that the impact of ESG factors may vary based on industry, size, and other factors. Tailor your ESG strategies to your specific business context.

6.4.10 ESG performance should be an ongoing process. Continuously evaluate and improve your company's ESG initiatives based on changing trends and stakeholder expectations.

6.5 Directions for Future Research

The present study is not free from limitations; the study had financial and time constraints. The survey of the impact of ESG on firms has multiple scopes to develop. Some of the essential directions in which the future research continues include:

The present study is limited to the top 1000 companies in India based on market capitalization. Future studies extending the sample size and increasing the number of selected companies could bring more insight into the differences in regulations in different countries. An international comparison could help in better understanding the approaches of other countries and companies towards ESG regulations.

The present study followed the quantitative analysis method; future research can be conducted based on mixed research methods, including qualitative and quantitative methods. ESG research includes accepts that need to be understood through primary research and qualitative analysis. The numbers' reflections are insufficient to understand the extent and impact of ESG regulations. Future studies could be directed in such a way that it could include various methodologies and parameters of ESG calculation. There is no uniform format for ESG reporting, and companies follow different ESG reporting practices. The differences in these practices would also impact the ESG score provided to each company.

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APPENDIX

Appendix 1 ESG, ROE, board characteristics control variables and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0112	min	1
between = 0.0020	avg	2.5
overall = 0.0001	max	9
	F(7,952)	1.55
corr(u_i, Xb) = -0.3140	Prob > F	0.1482

Appendix 2 ESG, ROE, board characteristics control variables and ownership

ROE	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
ESG	-.2654579	.1028408	-2.58	0.010	-.4672788	-.0636369
TFA	-2.19e-12	3.11e-12	-0.71	0.480	-8.29e-12	3.90e-12
EV	-7.60e-13	1.42e-12	-0.53	0.594	-3.56e-12	2.04e-12
CoC	.0414967	.1473636	0.28	0.778	-.2476982	.3306916
DebttoEQ	-.0003083	.0006877	-0.45	0.654	-.0016578	.0010413
BoardChInd	.4464953	4.054173	0.11	0.912	-7.509653	8.402644
TI	.0562002	.0539245	1.04	0.298	-.0496245	.1620249
_cons	26.53402	4.970616	5.34	0.000	16.77939	36.28865

Appendix 3 ESG Combined, ROE, board characteristics control variables and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0070	min	1
between = 0.0027	avg	2.5
overall = 0.0000	max	9
	F(7,952)	0.96
corr(u_i, Xb) = -0.2153	Prob > F	0.4576

Appendix 4 ESG Combined, ROE, board characteristics control variables and ownership

ROE	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
ESGCom	-.1502203	.0932339	-1.61	0.107	-.3331881	.0327475
TFA	-2.16e-12	3.11e-12	-0.69	0.489	-8.27e-12	3.95e-12
EV	-1.24e-12	1.41e-12	-0.88	0.379	-4.00e-12	1.52e-12
CoC	-.0127228	.1452775	-0.09	0.930	-.2978239	.2723783
DebttoEQ	-.0003552	.000689	-0.52	0.606	-.0017073	.0009969
BoardChInd	-.1001806	4.058066	-0.02	0.980	-8.063969	7.863607
TI	.0577523	.0540461	1.07	0.286	-.048311	.1638156
_cons	21.44583	4.546835	4.72	0.000	12.52285	30.36881

Appendix 5 Environmental score, ROE, board characteristics control variables and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0095	min	1
between = 0.0007	avg	2.5
overall = 0.0007	max	9
	F(7,952)	1.30
corr(u_i, Xb) = -0.2563	Prob > F	0.2453

Appendix 6 Environmental score, ROE, board characteristics control variables and ownership

ROE	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
EnvScore	-.1594091	.0714739	-2.23	0.026	-.2996737	-.0191446
TFA	-1.96e-12	3.11e-12	-0.63	0.529	-8.06e-12	4.15e-12
EV	-1.20e-12	1.40e-12	-0.86	0.392	-3.95e-12	1.55e-12
CoC	.0053872	.1451694	0.04	0.970	-.2795018	.2902762
DebttoEQ	-.0003913	.000687	-0.57	0.569	-.0017395	.000957
BoardChInd	.4499307	4.068306	0.11	0.912	-7.533954	8.433815
TI	.0604278	.0539391	1.12	0.263	-.0454255	.166281
_cons	20.37815	3.262697	6.25	0.000	13.97524	26.78106

Appendix 7 Social score, ROE, board characteristics control variables and ownership

Fixed-effects (within) regression	Number of Observations	1,595

Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0064	min	1
between = 0.0050	avg	2.5
overall = 0.0002	max	9
	F(7,952)	0.87
corr(u_i, Xb) = -0.2629	Prob > F	0.5274

Appendix 8 Social score, ROE, board characteristics control variables and ownership

ROE	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Soc	-.1246106	.0886978	-1.40	0.160	-.2986763	.0494551
TFA	-2.28e-12	3.12e-12	-0.73	0.464	-8.40e-12	3.83e-12
EV	-1.23e-12	1.41e-12	-0.87	0.386	-4.00e-12	1.55e-12
CoC	.0042957	.1493058	0.03	0.977	-.2887108	.2973023
DebttoEQ	-.0003605	.0006894	-0.52	0.601	-.0017133	.0009923
BoardChInd	-.1221142	4.06558	-0.03	0.976	-8.100648	7.85642
TI	.0595896	.0540341	1.10	0.270	-.0464502	.1656294
_cons	20.74813	4.621657	4.49	0.000	11.67831	29.81794

Appendix 9 Governance score, ROE, board characteristics control variables, and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0084	min	1
between = 0.0006	avg	2.5
overall = 0.0007	max	9
	F(7,952)	1.15
corr(u_i, Xb) = -0.2221	Prob > F	0.3314

Appendix 10 Governance score, ROE, board characteristics control variables, and ownership

ROE	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Gov	-.1604731	.0814551	-1.97	0.049	-.3203255	-.0006208
TFA	-1.98e-12	3.11e-12	-0.64	0.524	-8.09e-12	4.13e-12
EV	-1.12e-12	1.41e-12	-0.80	0.426	-3.89e-12	1.65e-12
CoC	-.0425645	.1426636	-0.30	0.765	-.322536	.2374071
DebttoEQ	-.00033	.0006889	-0.48	0.632	-.0016819	.0010218
BoardChInd	-.8126807	4.029248	-0.20	0.840	-8.719914	7.094553
TI	.0589216	.0539807	1.09	0.275	-.0470133	.1648565
_cons	22.90652	4.563315	5.02	0.000	13.9512	31.86183

Appendix 11 ESG, ROA, board characteristics control variables and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0297	min	1
between = 0.0034	avg	2.5
overall = 0.0008	max	9
	F(7,952)	4.17
corr(u_i, Xb) = -0.1054	Prob > F	0.0002

Appendix 12 ESG, ROA, board characteristics control variables and ownership

ROA	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
ESG	-.0203294	.0125552	-1.62	0.106	-.0449685	.0043098
TFA	-1.11e-12	3.79e-13	-2.91	0.004	-1.85e-12	-3.61e-13
EV	8.32e-15	1.74e-13	0.05	0.962	-3.33e-13	3.50e-13
CoC	-.0375937	.0179908	-2.09	0.037	-.0728998	-.0022876
DebttoEQ	-.0001831	.000084	-2.18	0.029	-.0003479	-.0000184
BoardChInd	.1352605	.4949503	0.27	0.785	-.8360592	1.10658
TI	-.0034007	.0065833	-0.52	0.606	-.0163203	.0095188
_cons	7.470153	.6068334	12.31	0.000	6.279267	8.661039

Appendix 13 ESG Combined, ROA, board characteristics control variables and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0277	min	1
between = 0.0001	avg	2.5
overall = 0.0056	max	9
	F(7,952)	3.87
corr(u_i, Xb) = -0.0409	Prob > F	0.0004

Appendix 14 ESG Combined, ROA, board characteristics control variables and ownership

ROA	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
ESGCom	-.0087753	.0113703	-0.77	0.440	-.031089	.0135384
TFA	-1.10e-12	3.80e-13	-2.90	0.004	-1.85e-12	-3.57e-13
EV	-3.36e-14	1.72e-13	-0.20	0.845	-3.71e-13	3.03e-13
CoC	-.0425664	.0177172	-2.40	0.016	-.0773358	-.0077971
DebttoEQ	-.0001879	.000084	-2.24	0.026	-.0003528	-.000023
BoardChInd	.0799369	.4948991	0.16	0.872	-.8912823	1.051156
TI	-.0032204	.0065912	-0.49	0.625	-.0161553	.0097145
_cons	6.964524	.5545066	12.56	0.000	5.876327	8.05272

Appendix 15 Environmental score, ROA, board characteristics control variables and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0275	min	1
between = 0.0000	avg	2.5
overall = 0.0067	max	9
	F(7,952)	3.84
corr(u_i, Xb) = -0.0341	Prob > F	0.0004

Appendix 16 Environmental score, ROA, board characteristics control variables and ownership

ROA	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
EnvScore	-.0054909	.0087283	-0.63	0.529	-.0226199	.011638
TFA	-1.09e-12	3.80e-13	-2.88	0.004	-1.84e-12	-3.48e-13
EV	-3.90e-14	1.71e-13	-0.23	0.820	-3.75e-13	2.97e-13
CoC	-.0430253	.0177279	-2.43	0.015	-.0778157	-.0082349
DebttoEQ	-.0001908	.0000839	-2.27	0.023	-.0003554	-.0000261
BoardChInd	.0811275	.4968177	0.16	0.870	-.8938569	1.056112
TI	-.0030471	.006587	-0.46	0.644	-.0159738	.0098796
_cons	6.774728	.3984375	17.00	0.000	5.992811	7.556645

Appendix 17 Social score, ROA, board characteristics control variables and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0297	min	1
between = 0.0052	avg	2.5
overall = 0.0003	max	9
	F(7,952)	4.17
corr(u_i, Xb) = -0.1192	Prob > F	0.0002

Appendix 18 Social score, ROA, board characteristics control variables, and ownership

ROA	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Soc	-.0174488	.0108021	-1.62	0.107	-.0386476	.00375
TFA	-1.12e-12	3.80e-13	-2.96	0.003	-1.87e-12	-3.78e-13
EV	-8.44e-15	1.72e-13	-0.05	0.961	-3.46e-13	3.29e-13
CoC	-.0364973	.0181834	-2.01	0.045	-.0721814	-.0008132
DebttoEQ	-.0001832	.000084	-2.18	0.029	-.000348	-.0000185
BoardChInd	.1373248	.4951308	0.28	0.782	-.8343491	1.108999
TI	-.0032393	.0065806	-0.49	0.623	-.0161534	.0096749
_cons	7.387792	.5628532	13.13	0.000	6.283216	8.492369

Appendix 19 Governance score, ROA, board characteristics control variables, and ownership

Fixed-effects (within) regression	Number of Observations	1,595
Group variable: PanelID	Number of groups	636
R-sq:	Observations per group:	
within = 0.0309	min	1
between = 0.0002	avg	2.5
overall = 0.0035	max	9
	F(7,952)	4.33
corr(u_i, Xb) = -0.0694	Prob > F	0.0001

Appendix 20 Governance score, ROA, board characteristics control variables, and ownership

ROA	Coef.	Std. Err.	t	P>t	[95% Conf.	Interval]
Gov	-.0192357	.009924	-1.94	0.053	-.0387112	.0002399
TFA	-1.08e-12	3.79e-13	-2.86	0.004	-1.83e-12	-3.40e-13
EV	-2.09e-15	1.72e-13	-0.01	0.990	-3.39e-13	3.35e-13
CoC	-.0433679	.0173814	-2.50	0.013	-.0774781	-.0092577
DebttoEQ	-.0001808	.0000839	-2.15	0.031	-.0003455	-.0000161
BoardChInd	.0400562	.4909014	0.08	0.935	-.9233177	1.00343
TI	-.0032882	.0065767	-0.50	0.617	-.0161947	.0096183
_cons	7.531899	.5559691	13.55	0.000	6.440833	8.622966