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The Impacts of Environmental, Social and Governance Factors on Financial Performance

Panel Study of Indian Firms

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Name: Gandharv Arora

Student Number: 5652332

Contact Details: g.arora@students.uu.nl (Tel: +31628980012)

Supervisors: Dr. Maurizio Montone and Dr. Yilong Xu

Statement of Originality

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Abstract

The ESG score, consisting of environmental, social and governance factors, represents the non-financial performance of a firm. It is the quantitative measure of a firm's CSR initiatives. This paper presents the impact of ESG scores on a firm's financial performance in Indian companies. Utilising the Thomson Reuter ESG scores derived from the Refinitiv Eikon, this research aims to conduct a panel study of 168 publicly traded Indian firms, with data ranging from 2012 to 2021. It uses accounting- and market- based (ROA, ROE, DPS, Tobin'sQ, WACC and CR) ratios and measures to study firm performance. Using SEBI's recent direction mandating top 1000 companies listed on Bombay Stock Exchange to report their ESG activities using the new BRSR reporting standard, this paper intends to fill the lack of research between a firm's financial performance and CSR/ESG practices in India. With investment practices gradually orienting towards CSR, this paper advocates for a study on Indian companies as it is the fastest growing developing economy. This paper acknowledges the importance of examining this relationship as studies in other countries have presented conflicting results. The research is grounded in the three theories of studying ESG namely; Stakeholder, Slack Resource, and Principal-Agent Theories. As this is a new study on India, the findings of this study will be useful to investors, SRI analysts, policymakers, household investors and most importantly the common man. Based on the Fama-Macbeth estimation model, the results of this study show positive effect of ESG on the ROA and Tobin's Q to the firm with an increase in DPS to its investors. While ESG is being maximised as the slack resources increase in Indian companies.

Keywords: Environmental, Social, Governance, ESG factor, CSR, Accounting based, Market based, financial, performance, India, Firm value (Tobin'sQ), Cost of capital (WACC), Return on assets (ROA), Return on equity (ROE), Earnings per share (EPS), Current Ratio (CR), Stakeholder, Principal-Agent, Slack Resource

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1. Introduction

"Corporate managers' only moral obligation is to its shareholders and the only one social responsibility of business is to use its resources, and engage in activities designed to increase its profits, as long as it stays within the rules of the game, which is to say, engage in open and free competitions, without deception and fraud." (Friedman, 1962). If what Friedman says were true, would Tata Industries still work towards Vasundhara, Reliance launch its Education For All or Alphapbet's Google.org initiative?

In India, the culture of philanthropy is as old as India itself, which has a history spanning thousands of years. One who enjoys abundance without sharing with others is indeed a thief, says the Bhagavad Gita from Mahabharat. Corporate philanthropy may have become corporate social responsibility (CSR) now but from the vantage point of ancient Indian scriptures, it is an extension of the ideas of *dāāna*. Venkateswaran, chief at Tata Sustainability Group at Tata Sons Ltd said that there is evidence in history to show that "there were hardly any differences between the company and the owner, the promoters did not see themselves as different from the companies they founded. So the owner's philanthropic activities were typically done through the company" (Sanjai, 2014). While profits motivate businesses today, their commitment to societal benefit ensures their long-term sustainability. This is why despite the diverse nature of the population, culture and business practices, showing how CSR impacts the financial performance is vital and common for all companies in India, a country with a very big collective spiritual conscience.

Adding to the above view, Khanna (2022) postulates that if companies use corporate resources to engage in CSR and that increases financial performance, it is mutually beneficial to both the corporation and society at large. Furthermore, having a financially successful company engaging in CSR activities can drive profitability and foreign investment for both business and the country's economic growth.

While foreign direct investment has been steady in India, on June 7, 2022, Nirmala Sitharaman, Union Finance Minister of India claimed that when Foreign Portfolio Investors were selling their Indian assets, domestic retail investors acted as shock absorbers. This is evidenced in the fact that "in March, the Central Depository Services (India) Ltd said the number of active Demat accounts opened with it touched the six crore mark." (PTI The Hindu, 2022) In that context, whether or not the level of CSR activities has an impact on a firm's financial performance makes a good case study for the growing number of small

investors in India as also foreign investors who screen the investments for their sustainability. Furthermore, it is established that India is the world's largest democracy and is to "remain as it has the fastest-growing major economy in the world from 2021 to 2024, as per World Bank and IMF, says Economic Survey" (ANI News, 2022). India's geographical location not only makes it abundant with natural resources but also makes those very resources and their markets vulnerable to environment induced changes. Similarly, with India's current geopolitical standing, it can become vulnerable to socioeconomic and governance related concerns such as poverty, education and health care to name a few (Khanna, 2022). The urgency of addressing these vulnerabilities is also visible in India's commitment to timely achievement of SDGs ("North Eastern Region District SDG Index and Dashboard", 2021) as well as the push to greenfield projects under the current political dispensation (Nag, 2021).

What India lacked in, till now, was the formal adoption of CSR as a metric for measuring corporate performance which could also possibly be driving foreign portfolio investors out of India. To ensure that investment practices focus on sustainability just as they do in the developed economies, the Securities and Exchange Bureau of India (SEBI) has set forth the new regulations starting from April 1st, 2022 (Khanna, 2022) adopting environmental, social and governance (ESG) scores as a metric for measuring corporate performance. Top 1000 companies ranked by market cap will have to mandatorily include the Business Responsibility and Sustainability Report (BRSR) in their annual reports that are disclosed to the stock exchanges and since this is a first for India, it makes for a good case study. Therefore, this paper caters to senior management and hedge fund investors, academicians, policy makers and household investors that are planning for retirement and seeking a better understanding of Socially Responsible Investments (SRI).

Today, when companies integrate social and environmental concerns in their business operations and their interaction with stakeholders on a voluntary basis, we call it Corporate Social Responsibility (CSR) (European Commission, 2001). Companies demonstrate this by preparing sustainability reports. These reports could be standalone reports or a section within the annual reporting that cover social and environmental aspects. However, the definition of 'sustainability' lacks consensus (Pope et al., 2004). The attempt by various researchers to agree on an operational definition has yielded no success. Varying cultural differences exist within countries, industries and firms making the process of defining 'sustainability' difficult and ambiguous. The Triple Bottom Line definition by Elkington (1998) covering economic, social and environmental pillars seeks to solidify what sustainability can commonly mean.

Therefore, there has been an increase by institutional investors promoting SRIs in recent years in order to arrive at a working definition. This requires the use of ethical screening in their stock and investment target selection processes. Consequently, investors and analysts review not only the financial performance but also the firm's ESG performance. While firms in developed markets such as the US and EU have adopted this, firms in developing economies such as India are yet to catch up.

ESG compliance will become a significant metric to ascertain is regarded as successful. Data shows that companies adopting ESG standards are performing better than their peers. "In short, good governance is good business" (Khanna, 2022).

Before addressing the research gap, it is important to note that in this paper, we will use the term CSR and ESG somewhat interchangeably. As this paper is also for the domestic retail investor, some self-explanatory terms are also defined in detail so that we can clearly lay out the cultural differences in adoption of ESG and CSR between India and the US or Europe.

1.1 Research Gap

Research in the field of CSR, ESG and Corporate Financial Performance (CFP) has already taken place in the past. The five types of research carried out have either been; qualitative (Maier, 2007; Boston College Centre for Corporate Citizenship, 2009: Ernst and Young, 2002; KPMG, 2005), based on the individual pillars of ESG (Clarkson et al., 2008; Polloe, 2010; Benito and Benito, 2005), on the firms and industries of other developed or developing economies (Ahmad et al.,2021; Balatbat et al., 2012; Balatbat et al., 2010; Pickwick and Sewelen, 2021; Atan et al., 2018; Asamoah, 2019), or when the firm's performance tends to be narrowly defined (Abramson and Chung, 2009; Edmans, 2007; Oehri and Faush, 2008; Olsson, 2007).

The increase in ESG activities by firms has prompted SEBI to bring in appropriate regulations addressing investors' concerns. A SEBI press release from May 2021 stated that "BRSR is a notable departure from the existing Business Responsibility Report [BRR] and a significant step towards bringing sustainability reporting at par with financial reporting" introducing the new framework for listed entities (SEBI, 2021). It also added that BRSR reporting will be mandatory from fiscal year 2022-23 thus standardising the approach for reporting ESG initiatives that are otherwise in its nascent stage at the moment (Sarangi, 2021). Through such a move, SEBI is ensuring improvement in reporting while also giving a necessary revision to a firm's approach towards reporting its sustainability practices. This is

being done by mandating all firms to report on their ESG practices, risks associated with them and their countermeasures against such risks while also mandating all mutual funds to remain true to their SRI based services and products as well as maintain their screening processes (Narayanan, 2021).

This study is grounded in Stakeholder, Principal-Agent and Slack Resources theories which allows a review and comparison to other studies that assess the impact of ESG practices on firms' financial performance. As a precautionary mention, the evidence from existing literature indicates that different metrics, used to represent both ESG and CFP, can result in varying conclusions (Poelloe, 2010; Abramson and Chung, 2000; Derwall et al., 2004; Gompers et al, 2003; Orlitzky et al., 2003 and Bauer et al., 2007).

Motivated by the lack of academic research on the relation between CFP and ESG practices in India, this paper gives strong justifications for studying Indian companies especially because investment practices are gradually orienting towards ESG scores and SEBI has released its new reporting mandates. However, understanding the penetration of SRI in India must begin with an awareness of the Indians' wealth profile which ranges from farmers earning 1.2 lakh rupees per annum (The Hindu Business Line, 2021) to industrialists like Adani and Ambani (Forbes, 2022). In India, financial literacy which is defined as "a person's ability to understand and make use of financial concepts" (Servon and Kaestner, 2008) is still severely limited to banking the unbanked. Ensuring that SRI penetrates to the average Indian household, three aspects have been focused upon. This had begun with achieving Financial Inclusion through the introduction of the JAM trinity- Jan Dhan Accounts, Aadhaar Card and Mobile Phones (PTI, 2021) which built the habit of savings and investments. Now, the success of JAM can be used to make the domestic retail investor aware of SRIs. With that awareness, the evidence on the relationship between CSR and CFP presented by this paper comes into picture.

This paper can therefore help understand the Indian investment ecosystem where financial literacy has been found to have a strong link with savings and investment behaviour (Sivaramakrishnan et al., 2017) while also showing that CSR related initiatives can help boost firm performance and provide higher returns.

1.2 Research Question

In line with previous literature, the research question of this thesis is: What is the impact of ESG scores on the firm's financial performance in Indian companies? It is important to

examine this relationship given the new mandates set by SEBI, the lack of studies on the Indian market and the conflicting results of studies conducted in other countries.

To help tackle this broad research question, a panel study will be conducted using data from Indian firms with ESG and CFP data ranging from 2012 to 2021. Firstly, the influence of ESG scores on the accounting based measures will be addressed in order to assess the profitability of the firms (Balatbat et al., 2012; Balatbat et al., 2010). Then, we will proceed to analyse the effects of ESG scores on firm value using market based measures such as Tobin's Q and annual stock returns (Pickwick and Sewelen, 2021; Edmans, 2011; Balatbat et al., 2012). Following this, we will address the effects of ESG on the cost of capital using the WACC function (Atan et al., 2018). Post this analysis, we will proceed to see how slack resources affect ESG scores and can be better utilised to maximise CSR initiatives (Asamoah, 2019).

To help formulate the theoretical framework and hypotheses of this paper, the Stakeholder, Principal-Agent and Slack Resources theories will be used.

To tackle the research question, ten hypotheses have been drawn out. The primary data is extracted through Refinitive Eikon DATASTREAM in which the ESG scores are represented using the Thomson Reuter ESG scoring system and individual pillars calculated based on the category scores. The corresponding financial and market based secondary data will be extracted through Factset for each corresponding firm using their International Securities Identification Number (ISIN).

ESG scores are a numerical representation of the level of CSR initiatives of a firm. This study predicts that with a higher build-up of slack resources in a firm, there should also be an increase in the ESG scores, as firms will be using more of those resources towards CSR activities. Further, through this study, it is predicted to see better CFP through higher firm value, profitability, stock returns and lower cost of capital as ESG scores increase. Hence, the aim is to find a statistically significant relation between ESG scores and CFP. The literature review will demonstrate how there is a lack of consensus on the findings by previous studies on whether the level of CSR activities and therefore, ESG scores affect CFP. This study has primarily found that with an increase in ESG scores, there is also an increase in profitability when measured by Return on Assets as well as increase in the firm value represented by Tobin's Q. It has also been found that an increase in slack resources also increases the ESG score.

The literature review is covered in Section 2 outlining the varying definitions and theories of ESG and CSR followed by CSR implementation is culturally different in India as compared to other economies. Then, the theoretical framework is discussed along with prior literature to help construct the hypotheses. Once these theories have been discussed, Section 3 outlines the data to be used for conducting this panel study. Section 4 presents the methodology used to conduct this research. Section 5 contains the results of the regressions that were run through Stata along with additional robustness checks. Section 6 presents the conclusion and discussion. Lastly, the references are acknowledged and appendices attached.

2. Literature Review

2.1 Theoretical Background

In this section, we outline the theoretical background behind this study. It includes the definitions of terms like CSR, ESG and ESG Scores followed by outlining the ESG landscape in India and other economies. Then, the theories and perspectives that build the framework of CSR and ESG are discussed.

2.1.1 CSR and ESG

The European Commission (2011) defines CSR as "the responsibility of enterprises for their impacts on society". Similarly, the United Nations (2012) defines it as "a management concept whereby companies integrate social and environmental concerns in their business operations and interactions with their stakeholders".

Over the past few years, the terms CSR and ESG have been used interchangeably. Gerard (2019) states that the two are different, where CSR assesses the environmental and social conduct of the firm, ESG assesses the governance aspects as well. According to Inderst and Stewart (2018), the environmental pillar includes issues such as pollution, carbon emission, and climate change. The social pillar includes diversity, human rights, and labour conditions and the third pillar of governance accounts for corruption, transparency and the governing mechanisms of the firm.

2.1.2 CSR and ESG Scores

As mentioned earlier, ESG scores are a numerical representation of a firm's CSR activity. They are being constantly developed as increasing amounts of data and research is compiled to assess companies on their ESG performance (Kjellberg et al., 2019). At present, there are

three major rating companies and standards namely ASSET4, Thomson Reuters and Bloomberg. Furthermore, Thomson Reuter's Environmental pillar is composed of Emission and Resource Use scores while the Social pillar is composed of Human Rights and Workforce scores (Thomson Reuter User manual, 2018). Similarly, ASSET4's Environmental pillar comprises Emission Reduction and Product Innovation while the Social pillar includes Diversity and Community scores (ASSET4 User manual, 2010). Therefore, each of the three pillars have areas that classify under them on the basis of which the final scores are calculated.

2.1.3 Cultural and Historical Context of CSR in India

India, being a deeply religious country and also religiously diverse, draws on ideas of charity that have been long held as a part of its religious beliefs. According to Vidya Shah, CEO of EDELgive foundation, "Charity and philanthropy has been in the ethos of the Indian traditions. Individuals and religious institutions have been contributing to the welfare of the poor since antiquity. Alms giving, offering food, and giving zakat, the Muslim tradition of giving, are some of the forms of charity motivated by Indian religious beliefs." (Sanjai, 2014) Furthermore, corporate philanthropy and philanthropy, in general, is inspired from ideas of charity. Shah also adds that the business community has also been contributing to social and economic development since the 19th century. (Sanjai, 2014) The JN Tata Endowment Scheme, which was the first known Indian endowment, was founded in 1892 and remains the foundation for the Tata Group's philanthropic activities. Jamsetji Tata was considered at par with the UK's Joseph Rowntree and Scottish American industrialist Andrew Carnegie in pioneering the concept of building wealth for public good. Moreover, ancient Indian scriptures also mention the idea of Satvik charity which "is given out of social duty, without any expectation of repayment of any kind" (Sadri & Sharma, 2015) and is a concept that inspires CSR initiatives.

Similarly, local businesses are also not accustomed to SDG driven business practices. For example, the practice of stubble burning in farms after the harvesting season in India. Machinery for stubble removal is expensive and manual removal is time consuming. Therefore, in order to sow the next crop in time, stubble burning appears as the most convenient alternative to farmers. Due to this, there are severe environmental damages to the air quality, as well as depletion of ground water table, runoff of chemical fertilisers to the nearby water bodies and the accumulation of ash in the water and ground. In a developed

economy, such a practice would severely damage their environmental pillar of ESG scores and tarnish their reputation. In India, however, such a practice has been ongoing since the *"Green Revolution"* from the 1960s and excessive costs do not allow for the switch to modernised technologies to tackle stubble removal.
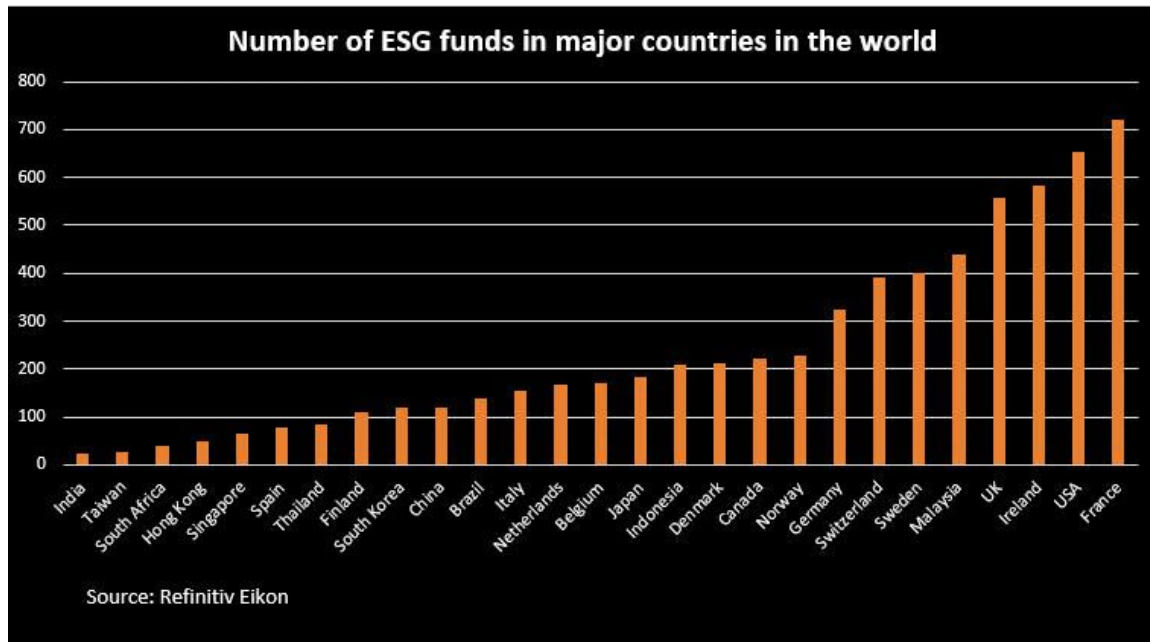
Diagram 1: ESG Funds in major countries around the world (Source: Refinitiv Eikon and Thoms Reuter Murugaboopathy and Dogra, 2021)

There exists a difference in the definition of what CSR means in a country like India and due to this difference, what classifies as an ESG fund in India is also limited. For example, we see in diagram 1 that India with a population of over one billion people in 2021 had 23 ESG related funds (Murugaboopathy and Dogra, 2021). Finland, with the lowest population (out of the countries in the diagram) of five million has over 100 ESG related funds. This significantly indicates a cultural difference between what Indian companies classify as CSR versus what other developed economies do. This is also possible because CSR reporting standards are more structured in developed economies as compared to a developing economy like India. (Sadri & Sharma, 2015)

2.1.4 Socially Responsible Investing in India Today

Given that CSR reporting standards are changing and becoming more structured in India and hence, the method of calculating ESG scores is also evolving, studying the impact of ESG scores on CFP for Indian companies can help our understanding of how Indian investments develop. As investors are rewarding companies that are looking at ESG factors, "if India is

going to focus on attracting large scale, long term institutional investors, then it needs to look at the ESG factors. Today India is around 130-133 on the ESG factors" (Aghi, 2020). This is true because as shown earlier, social responsibility is in the ethos of Indian people. Therefore, when companies report more on how their CSR initiatives and hence ESG scores affect CFP, it will possibly drive investors to look at these companies positively giving a fillip to the firm's own profitability as well as the country's economic growth. (Aghi, 2020)

Growth of developing economies like India is good for global growth in general. Using BRICS as an example, Jim O'Neill suggested that "Together, these countries would overtake the western economies by 2040 since the aggregated GDP of these four countries has quadrupled between 2000 and 2010 from 3 to 12 trillion US dollars" (O'Neill, 2012). Production is increasingly being outsourced to these developing economies giving a higher opportunity for productivity growth than developed countries showing that countries with a younger and growing labour force have higher potential to generate GDP growth (O'Neill, 2012).

In the interest of matching up to global standards, India has started adapting to the way developed economies measure CSR activities and ESG scores. Evidence of this lies in measures like SEBI creating sustainability related reporting standards and mandating them for fiscal year 2022-2023. This standardisation would give a fillip to creation of indexes in their respective stock markets, giving visibility to firms which are proactive towards CSR initiatives (Orsato et al., 2015) but whose CSR activities were not necessarily falling within the commonly accepted definitions. This will not only make data related to CSR activities available but also improve data quality which is likely to motivate researchers to conduct new studies thereby resulting in more definitive results and conclusions on ESG scores.

Following this move, we see a good start insofar as several asset management companies, such as Axis Mutual Fund, ICICI Prudential, and Aditya Birla Sun Life, have launched ESG integrated schemes and are increasingly integrating ESG based norms in their investment decision making. (Jethmalani, 2021).

Furthermore, investment policies in hedge funds and screening processes limit the possibilities to engage in SRIs in India. For example, Kaustubh Belapurkar, the director of Morningstar, opines that "Indian investors are not completely attuned to the concept of sustainable investing, unlike global markets led by Europe, where sustainable investing has been present for many years. Institutional investors and distribution partners often have

policies in place that do not allow them to invest in funds which are less than three, or in some cases five years in the market. The idea is to track the [financial] performance and consistency before investing." (Murugaboopathy & Dogra, 2021).

To bring various Indian industries at par with developed markets, the new mandates set by SEBI and sustainable development goals (SDGs) by the government are likely to attract foreign investors. Since various investors in Europe have ESG based practices at their core, the new reporting standards can also help Indian companies fall in the same category of reporting and adhere to globally accepted mandates and standards of ESG practices (Sarangi, 2021).

In the last decade, large Indian companies such as the Reliance, Adani and Tata group have grown their business exponentially by dovetailing their business strategies towards the SDGs, CSR initiatives and the government's nation building priorities (Sanjai, 2022). This has set an example for others in the market to also leverage these CSR initiatives for societal development and enhancing their own financial growth.

2.1.5 Why study the relationship between ESG and CFP for Indian Companies?

The interest in studying developing economies like India has been justified by various researchers. Given the lack of data and the slow evolution of ESG related literature, Wood (2010) suggested that studying the relationship between CSR and CFP does not add value to the CSR literature. However, Radhari (2016) argued that these suggestions might be of some validity in developed markets. However, in regards to developing countries, with limited number of studies conducted on the subject and lower level of understanding of the strengths and weaknesses, examining such a relationship might be of value towards understanding the relationship between CSR and CFP (Radhari, 2016).

ESG literature is even scarcer with emerging markets (Orsato et al., 2015). India's economic position makes it even more vital that companies engage more in CSR activities in order to drive ESG scores. This is in complete contrast to the situation in developed economies (Dobers and Halme, 2009). A lack of conceptual understanding on CSR and ESG combined with low financial literacy makes it difficult to study the ESG-CFP relationship in Indian companies (Sivaramakrishnan et al., 2017).

In the case for Indian firms, there could be a motivation to also include CSR related issues as to mitigate the risk. For example, climate change is expected to cause volatility in commodity prices stemming from drastic changes in weather patterns.

Therefore, companies that are able to demonstrate forward-looking strategies that factor in these conditions are more likely to have a competitive advantage and avoid suffering unanticipated costs. Thus, including ESG related metrics in investment decisions could also be considered good risk management (Briand et al., 2011).

2.1.6 Differing Theories and Perspectives of CSR and ESG

Preston and O'Bannon (1997), state that when considering the relationship between CSR and CFP it is important to consider the direction and sign of influence (is the effect positive, negative or neutral). Multiple theories have been put forward to conceptualise the idea of CSR and its relationship with CFP, presented in Table 1 below. (Asamoah, 2019).

Table 1: Theories and Assumptions Addressing the relationship between Corporate Social Responsibility [CSR] and Corporate Financial Performance [CFP] (Source: Preston and O'Bannon (1997) and Asamoah (2019)) The arrow indicates the direction of relationship and influence. The (+), (-) or (+/-) sign indicates the nature of the change, in which case the (+) indicates an increase, (-) a decrease and (+/-) to be either positive or negative

Theory	Description	Direction of Influence	Sign
Stakeholder	Stakeholder theory is rooted in the notion that firms maintain mutually beneficial relationships with all stakeholders through information disclosure and reducing information asymmetries (Jones, 1995) Satisfying all stakeholders is vital as firms benefit from high CSR performances by creating goodwill by satisfying non-financial ones or improving internal resources (McWilliams and Siegel, 2001)	CSR → CFP	+
Principal-Agent	The relationship with stakeholders provides monitoring and therefore, enforces management to keep to broad organisational goals not only financial (Orlitzky et al., 2003).	CSR → CFP	+
Slack Resource	Availability of financial resources (or higher CFP) is what allows for CSR; afterwhich, firms that are able to invest in CSR will also perform better (Waddock and Graves, 1997).	CFP → CSR	+
Management	CSR is a proxy for management skills resulting in	CSR → CFP	+

Skill	comparable performance in other domains (e.g. Alexander & Buchholz, 1978).		
Virtuous Cycle	Waddock and Graves (1997) argue that CSR leads to CFP and CFP leads to CSR (a combination of good management theory and slack resources theory).	CSR → CFP CFP → CSR	+
Trade-Off	Firms have to choose between investing in CSR or in CFP. Firms that invest in CSR are at a competitive disadvantage compared to firms that chose not to due to perceived monetary losses (Friedman, 1970; McGuire et al., 1988).	CSR → CFP	-
Managerial Opportunism Hypothesis	Managers with a short-term outlook, for example due to remuneration plans, will attempt to cash in when performing well financially. When not performing well, managers will attempt to disguise this by investing heavily in CSR (O'Bannon & Preston, 1997).	CFP → CSR	-
Negative Synergy	O'Bannon and Preston (1997) argue that the possibility exists that CSR negatively influences CFP, which in turn has a negative effect on CSR.	CSR → CFP CFP → CSR	-
Inverted "U" or Curvilinear Relationship	There is an optimal level of CSR, deviations from this level result in lower CFP (Arora, 2019; Salzmann, 2005; Barnett & Salomon, 2006).		+/-

To answer the research question and to understand the relationship of CSR activities on CFP of Indian firms, Stakeholder, Principal-Agent theory and Resource Slack theories have been used. Although these are varying perspectives on CSR, they can be used in combination to create the best theoretical framework to assess the relationship between ESG and CFP of Indian firms.

2.1.7 Stakeholder Theory

Stakeholder Theory is central to understanding CSR. As Freeman and McVea (2000) show, "companies should make decisions that are in the interest of groups or individuals who can be affected by the activities of the firm: the so-called stakeholders" (Freeman and Mcvea, 2000). Stakeholder theory states that the capacity of a firm to generate sustainable wealth is determined by its relationships with its various stakeholders, such as the investors and senior management representing financial stakeholders. Customers, employees and SRI based investment funds such as pension funds driven by CSR and goodwill initiative representing the non-financial stakeholders (Garcia et al., 2017). Although these hold in most situations the stakeholder classifications can change.

Based on this theory, the satisfaction of all stakeholders, both financial and non-financial is important to achieving high levels of CFP. Freeman and Evan (1990) claim that high firm performance is dependent on the prioritisation of multiple stakeholder interests implying that while similar interests may exist between stakeholders, conflicts of interest may arise between them. Therefore, coordination of differing interests may yield better firm performance (both financial and non-financial) leading to the Inverted curve-linear relationship theory between CSR and CFP showing that there is an ESG score at which all stakeholders, both financial and non-financial are satisfied (Arora, 2019).

To reduce information asymmetries with the general public, the firm should disclose financial and non-financial information to be as transparent as possible which is what the new BRSR mandates in India. This will raise the confidence levels of investors. As Cheng et al. (2014) stated, "High levels of transparency reduce informational asymmetries between the firm and investors, thus mitigating perceived risk". Orlitzky and Benjamin (2001) found that better CSR performance reduces the risk of the firm, mitigating exposure to future costs and losses.

Furthermore, Godfrey et al. (2009) found that CSR practices help mitigate the downward pressure on share price in case of negative environmental events announcements. This shows that being CSR conscious can be a beneficial tool in the long run in adverse situations.

2.1.8 Slack Resource Theory

Slack Resource Theory is developed based on the view that "a firm is able to carry out its activities because of excess resources available to the firm. The function of such resources is to enable the firm to adapt to internal or to external pressures for change" (Buchholtz et al., 1999). The resources needed by companies to adapt is "slack" in nature, which is defined as any available or free resource (financial or non-financial) used to reach a firm's goals (Bourgeois, 1981; Jensen, 1986).

According to Waddock and Grave (1997), when a firm's financial performance improves, slack resources will become available which will allow the firm to undertake CSR initiatives. These activities will help develop and enhance the firm's competitive advantage through image, reputation, and long term cost saving (Miles and Covin, 2000). This theory can also provide motivation to Indian firms to engage in CSR related activities as it may increase CFP, thereby increasing the amount of slack resources available not only for CSR initiative but also for other business activities.

2.1.9 The Principal-Agent Theory

Principal-Agent Theory advocates that individuals often act primarily in their own interests (Ross, 1973). Here, two key roles are identified; one as the agent and the other as the principal. In the firm's context, the agent's role is assigned to a manager, while the principal's is assigned to the shareholder (Ferell et al., 2016). Thus, it is the responsibility of the manager to act in the interest of the shareholder.

This perspective views ESG as a deviation from the maximisation of shareholder value (Ferell et al., 2016). For example, if the manager decides to engage in CSR initiatives, it will be attributed to the pursuit of their own "warm glow", since they are deviating from the role assigned to them by the principal which is the shareholders who have their own agendas (Friedman, 1970). Furthermore, Friedman (1970) claims that managers may pursue CSR initiatives for their own gains, such as for personal career progression (McWilliams and Siegel, 2001), or "socio-political" standing. Therefore, "In any such case, the manager is misallocating the firm's resources with an intention that deviates from maximising the firm's financial performance" (Friedman, 1970). Hence, from the principal-agent theory perspective, ESG is seen as value destroying.

According to this theory, there is a likelihood of a divergence in the aims of the Principal versus that of the Agent, especially in the context of a developing economy like India. This is because the Principal will be focussed on maximising profits whereas given the scope of social work that can be done in India, the Agent will have many CSR avenues to utilise their funds in. However, as the Stakeholder Theory also suggests, this may not be a bad thing as this could potentially lead to higher CFP as shown in prior studies. (Ahmad et al., 2021; Orlitzky et al., 2003)

This theory draws a parallel with the moral subset of Legitimacy Theory which postulates that the legitimacy that a company acquires within the society it functions is affected by how many activities it carries out to be in accordance with societal boundaries and norms. A company that actively interacts with society and takes actions for the benefit of its community is likely to be viewed as a "part of the community with the hope that the company gains legitimacy from the community around them." (Deegan et al., 2002). All this happens as the focus shifts away from the principal's goal of higher financial performance (Suchman, 1995).

2.2 Previous Literature on the Relationship between ESG and Financial Performance

Currently, there are three schools of thought on the relation between CSR practices and CFP. Some studies argue that there is no relation between a firm's CFP and their CSR practices, leading to no abnormal returns while some argue that there is a negative relation between CSR practices, CFP, and lower returns. The third type of studies argue that CSR practices have a positive impact on CFP, leading to higher returns attracting investors.

Poelloe (2010) found that ESG scores are negatively correlated with financial performance. Manescu (2011) found that the social pillar and its effects on risk adjusted stock returns was the only positive and statistically significant. However, he attributed this to mispricing rather than a compensation for risk (Manescu, 2011). This could show that ESG and CSR practices are artificially inflating prices due to the increased demand caused by the boost and promotion from governments to keep engaging in CSR initiatives (Evans and Peiris, 2010).

There is a converse view that CSR initiatives have a positive impact on the CFP of firms. Abramson and Chung (2000) argue that it is possible to create a diversified subset of value stocks and that SRI investors may not necessarily screen limited to socially responsible indices but may select other value stocks based on their own CSR related parameters. Orlitzky et al. (2003) found that there is a positive relationship between CSR practices and CFP. Similarly, Bnouni (2010) demonstrates the same, further extending this relationship to apply also to French small to medium enterprises (SME).

The third is the neutral view showing that undertaking CSR related investments yields no difference compared to not undertaking any (Hoepner et al., 2011; Gregory and Whitaker, 2007).

2.3 Development of Hypotheses

With the prior literature reviewed and introduced, this section will conceptualise the hypotheses of this research paper.

2.3.1 The Impact of ESG on Accounting-Based Firm Performance Measures

Ahmad et al. (2021) studied the effect ESG scores had on CFP on firms in the UK. They used earnings-per-share (EPS) and confirmed that ESG activities have a positive impact on accounting-based performance. Furthermore, Orlitzky et al. (2003), found that

accounting-based measures (ROA and ROE) were more significantly correlated with ESG performance than market-based firm performance. Therefore, it can be hypothesised that:

H1: ESG scores have a statistically significant impact on the accounting based measures of Indian firms.

H2: The three pillars of ESG will have a significant impact on the accounting based measures of Indian firms.

Hypotheses H1 and H2 are grounded in the principal-agent theory. Should it have a positive impact on performance, it would indicate ESG as being a performance enhancing activity, instead of an agency cost.

2.3.2 The Impact of ESG on Market-Based Firm Performance Measures

Stock Returns

As studied by Porter and Kramer (2011), "together with good operating financial performance, non-financial performance such as engaging in environmental and social initiatives should result in better valuations of publicly traded firms" (Porter and Kramer, 2011). Derwall et al. (2005) studied the relationship between share prices and CSR performance and found firms with higher environmental scores had higher returns. Similarly, Eccles et al. (2014) studied the performances of low- and high- sustainability portfolios and found the latter delivered higher returns. However, there are studies which find a negative relationship between stock price performance (Fisher-Vanden and Thorburn, 2011). Cormier and Magnan (2003) found that companies with indicators of high pollution had lower market value. Hamilton (1995) found that toxic release announcements of a firm would lead to significant negative reactions in the firm's share price. Therefore, it can be hypothesised that:

H3: Higher ESG scores will result in higher returns in Indian firms.

H4: The higher the scores of the three ESG pillars, the higher the returns in Indian firms.

Tobin's Q - Valuation

High ESG performance improves trust which in turn may improve firm performance due to a reduction in transaction costs since stakeholders place more trust in the firm (Ahmad et al, 2021). Although results of previous literature have been mixed, Ferell et al. (2016) found that ESG scores are positively associated with Tobin's Q (used to measure market based firm

performance). Conversely, Velte (2017) did not find a statistically significant relationship between the two. Therefore, it can be hypothesised that:

H5: There is a statistically significant positive relationship between ESG scores and firm value measured as Tobin's Q of Indian firms.

H6: The higher the scores of the three ESG pillars, the higher the firm value measured as Tobin's Q of Indian firms.

Hypotheses H3, H4, H5 and H6 are grounded in both the principal-agent and stakeholder theories. The higher ESG scores will lead to a higher market-based firm performance due to improved trust by stakeholders as a result of the increase in transparency in CSR initiatives. Thereby, perceiving ESG activities as value-creating.

2.3.3 The Impact of ESG on the Cost of Capital

"The cost of debt is the effective rate that a firm pays on all forms of its loans" (Atan et al., 2018). When the risk taken by investors and creditors is higher, the cost of capital increases. Therefore, when the perceived risk decreases, the cost of capital decreases as well (Witmer and Zorn, 2007). This is caused by creditors expecting higher returns for the increased level of risk they are engaging in with the firms. Therefore, as the risk deteriorates, so will the cost of debt (the interest rate on the loan), as a lower risk premium is expected. Investors are becoming sensitive and using screening methods to account for ESG metrics when looking for investment opportunities (Bassen et al., 2006).

It has been earlier found that the more ESG data and its relationship with ESG Ratings as well as cost of capital is disclosed, the more confidence it establishes in the firm thereby decreasing its cost of capital and improving its ESG ratings (Chen et al., 2021).

Therefore, the estimation risk taken by investors during the screening process followed on by the firm's cost of capital can be lowered if firms disclose both financial and non-financial practices (Easley and O'Hara, 2004). This reduces the information asymmetries and possible transaction costs (Graham et al., 2005) borne by all stakeholders.

Bauer and Hann (2010), studied the impact of CSR initiatives on a firm's cost of debt, and found that firms with higher ESG scores have lower credit spreads leading to lower cost of debt. Similarly, Goss and Robert (2011) found that firms with major CSR related issues had to pay higher interest rates on their loans. Therefore, it can be hypothesised that:

H7: There is a statistically significant negative relationship between ESG factors and cost of capital for Indian firms.

Bhojraj and Sengupta (2003) studied the effects of corporate governance on the cost of debt with relatively positive findings. Good corporate governance correlates with reduced cost of debt and smaller credit spreads. Therefore, it can be hypothesised that:

H8: There is a statistically significant negative relationship between the scores of the three ESG pillars and the cost of capital for Indian firms.

Hypothesis H7 and H8 are rooted in principal-agent and stakeholder theory, as stakeholders will have more information available to them thereby reducing information asymmetries in the capital market. This reduction in transaction costs may take the form of a lower cost of capital. As shown by Du and Yu (2020),"creditors may require less interest, whilst equity investors may be willing to pay a higher price for shares if they believe their respective risks are lower due to higher transparency" (Pickwick and Sewelen, 2021).

2.3.4 The Impact of Slack Resources on ESG

Given how CSR activities require financial resources, it can be argued that Slack Resource theory would be the prevailing logic to tackle the research on CSR and financial performance. Mcguire et al. (1990) has provided empirical support for the theory and found that there is a positive relationship between CSR and financial performance.

However, as shown in Table 1, contrary to the Stakeholder Theory, the Slack Resources Theory proposes the reverse direction of influence. Firms with better CFP will have slack resources at their disposal to invest in CSR initiatives. In other words, all firms may want to include CSR initiatives but only those with sufficient resources will be able to (O'Bannon and Preston, 1997) Therefore, both financial and non-financial resources are needed to improve CSR, hence a link between the two can be expected. With this line of reasoning, Waddock and Graves (1997) found that better CFP will result in better CSR related metrics. Therefore, it can be hypothesised that:

H9: There is a significant positive effect on ESG scores caused by higher financial slack resources.

H10: There is a significant positive effect on the three pillars of ESG caused by higher financial slack resources.

Hypotheses H9 and H10 are grounded in Slack Resource and Stakeholder theories, as financially well performing firms have a higher likelihood of engaging in CSR initiatives than less financially performing ones, thereby satisfying both financial and non-financial stakeholders (Arora, 2019).

3. Data

3.1 Sample Selection

Our sample comprises 168 firms (presented in Appendix D along with ISIN codes and their respective industries) trading on the Bombay Stock Exchange. The primary ESG data being extracted from the Refinitiv Eikon DATASTREAM. There have been studies conducted using this data from this database such as El Khouri et al. (2021). For this study, the data ranges 10 years from 2012 to 2021. The secondary financial data has been extracted from Factset corresponding to each firm's ISIN code extracted along with the ESG data.

3.2 ESG Scores

The independent variable, the ESG factors, are measured using the Thomson Reuter ESG score system extracted from Refinitiv Eikon. The data was published in April 2020 and replaced the Asset4 ESG database. For this study, we will be using the ESG score which is provided. However, the three pillars are not given or created by Thomson Reuter. They use the individual category scores as outlined along with their respective definitions in Appendix A. The pillar scores will be calculated manually on the basis of the category scores with the help of the instructions given by Thomson Reuter and Refintiv Eikon as shown in Appendix C. For example, the environmental pillar is composed of the "Resources Use" (32.35%), "Emissions" (35.29%) and "Innovation" (32.35%) scores with their respective weightage to calculate the pillar score (Thomson Reuter ESG manual, 2018).

Furthermore, the ESG variables will be lagged by one year as their propensities take effect from the future periods (McWilliams and Siegel, 2001; Waddock and Graves; 1997; El Khouri et al. (2021).

3.3 Variable Operationalization

To understand the effects of CSR on CFP, both accounting and market based measures will be used. Therefore, the dependent variable firm performance (CFP) is assessed using five criteria; profitability, firm value, cost of capital, slack resources and stock returns. These models are slightly modified and are an extension of prior research such as Balatbat et al.,

(2010), Balatbat et al., (2012), Atan et al., (2018), Simpson and Kohers (2002), Mishra and Suar (2010), El Khouri et al. (2021) and Jang et al. (2013).

3.3.1 Financial Performance Parameters

Starting with the accounting measures and based on previous literature to get a comprehensive understanding of the relationship between CSR and CFP, it is important to use various accounting and equity based parameters and ratios . Therefore, similar to Balatbat et al., (2010), Balatbat et al., (2012), El Khouri et al. (2021) and Atan et al., (2018), ten measures are going to be used with five to measure profitability; return on assets (ROA), Return on equity (ROE), return on invested capital (ROIC), earnings before interest, tax depreciation and amortisation margin (EBITDA) and net operating profit less the adjusted taxes margin (NOPAT). With another six for equity based valuations; earnings per share (EPS), dividend per share (DPS), dividend yield (DY), enterprise value to EBITDA (EV to EBITDA), price to earnings ratio (PE) and market capitalization to total sales ratio (MC/TS) (Wang et al., 2015; Balatbat et al., 2010; Balatbat et al., 2012; Atan et al., 2018; El Khouri et al., 2021). The accounting based parameters and equations are shown in Appendix B and glossary of their definition and what the variables indicate in Appendix E constructed using Investopedia and the CFA institute.

For example, ROA is indicative of the firm's ability to generate income relative to the total value of its assets, therefore uses accounting information to measure its scale performance such as its ability to generate profits, relative to the value of assets which it utilises to do so.

Another accounting based measure, the ROE, is "the single most important indicator for investors to measure a firm's management performance". (Scott, 2003) It measures net income earned by a firm as a percentage of the shareholders' investment.

In this study, all accounting based measures were extracted or the individual components of the functions extracted and then used to calculate (based on the equations in Appendix B) for each year and firm in the sample and study period, respectively.

3.3.2 Market Based Valuation

In this study, the market-based valuations are done using Tobin's Q and annual share price returns. Tobin's Q is the measure of firm value, and is defined as the ratio of the market value of a firm over the value of a firm's physical asset (Kim et al., 2013). It is indicative of how the market values a firm's existing assets. Meaning that higher valued firms will have higher

Tobin's Q values compared to lower valued firms. Factset database calculates Tobin's Q shown as equation 1.

$$Tobin's\ Q = \frac{(Market\ Capitalisation + Total\ Liabilities + Preferred\ Equity + Minority\ Interest)}{Total\ Assets} \textbf{(1)}$$

For the share prices, the data has been downloaded on a yearly basis ranging from January 2012 to December 2021 from Factset, and an arithmetic return formula (equation 2) will be used to calculate the returns.

$$D = 100 \times \frac{price_n - price_{n-1}}{price_{n-1}} \textbf{(27)}$$

Under the current circumstance an annualised approach is better as the ESG scores do not tend to fluctuate until the end of the year therefore taking anything less than that would not add further value to the research.

3.3.3 Cost of Capital Function

To tackle the hypotheses assessing the relationship between cost of capital and CSR similar to Atan et al., (2018), the Weighted Average Cost of Capital (WACC) is calculated using the WACC (equation 3) and CAPM equation (equation 4) with values extracted from Factset database.

$$WACC = \frac{E}{V} * R_E + \frac{D}{V} * R_D * (1 - t_c) \textbf{(3)}$$

Where, E is the market value of the firm's equity, D is the market value of the firm's debt, V is the equity plus the debt, R_E is the cost of equity, R_D is the cost of debt and t_c is the corporate tax rate. The cost of equity was calculated using the CAPM equation (formula 3).

$$R_E = R_f + \beta_i * (E(R_M) - R_f) \textbf{(4)}$$

Where R_f is the risk free rate of return, $E(R_M)$ is the average return on the capital market and the β is the beta value for the financial asset (Atan et al., 2018).

3.3.4 Slack Resources Function

Slack resources is not a given parameter as it varies based on the holdings of the firm and characteristics of the industry. Therefore, similar to Asamoah (2019) it will be calculated manually using the current ratio shown as equation 5, with the individual parameter extracted through Factset.

$$Current\ Ratio = \frac{Current\ assets}{Current\ Liabilities}\ \textbf{(5)}$$

As in previous studies, financial slack is studied using the available and potential slack (Gral, 2014). Slack resources are measured using the current ratio and level of working capital. Current ratio measures a firm's liquidity by comparing available liquid assets to short-term financial needs. Therefore, firms with higher current ratios will have higher levels of available financial slack (Bourgeois and Singh, 1983).

3.4 Control Variables

Some of the most common control variables in the literature are the leverage, size and R&D expenditure of a firm. Leverage being the debt or funding sourced by a firm from the outside for its business operations and is measured as the ratio of long term debt divided by the total assets. It is important to include debt in this study as firms tend to disclose more CSR information as their leverage increases as result of additional scrutiny from borrowers and other financial stakeholders (Atan et al., 2018; Lanis and Richardson, 2013) and to lower a firm's cost of capital (Francis et al., 2008; Healy and Palepu, 2001). Furthermore, debt may also comprise older loans which can also present an enterprise risk which could affect the financial performance in the future (Prior et al., 2008).

Size is included because previous studies show size has a positive relationship with CSR disclosure (Cho et al., 2010; Clarkson et al., 2008). Larger firms will be able to invest more in CSR initiatives increasing their ESG scores as compared to smaller one. Size of a firm in this study is measured by the natural logarithm of total assets (Atan et al., 2018).

R&D expenditure is also controlled for and is included in the regression models. High R&D investments result in knowledge improvement, which leads to more productivity and improved financial performance (McWilliams and Siegel, 2000). McWilliams and Siegel (2000) also found that CSR investments have the ability to boost R&D activities. Therefore to control R&D, the R&D expenditures are divided by the total assets and included in the model.

These control variables are not readily available therefore will be calculated based on the raw data available through Factset and extracted simultaneously as the secondary financial data using the corresponding ISIN codes of the firms.

Table 2: The variables, their classification, definition, and references.

Classification	Abbreviation	Variable	Definition	Reference
Independent Variables	TRESGS	ESG Score		
	TRESGEPS	Environmental Score	The relative sum of category weights for three dimensions: Resource Use, Emissions and Waste Reduction, and Innovation	
	TRESGSPS	Social Score	The relative sum of category weights for four dimensions: Workforce, Human Rights, Community, and Product Responsibility	
	TRESGGPS	Governance Score	The relative sum of category weights for three dimensions: Management and Oversight, Shareholders Right, and CSR Strategy	
Dependent Variables	ROA	Return on Assets	Net Income/Total assets	Orlitzky et al. (2003)
	ROE	Return on Equity	Net Income/Total Shareholders' Equity	Orlitzky et al. (2003)
	ROIC	Return on Invested Capital	Net Income/Total Invested Capital	Balatbat et al., (2012)
	EBITDA	EBITDA Margin	EBITDA/Net Sales	Balatbat et al., (2012)
	NOPAT	NOPAT Margin	NOPAT/Revenue	Balatbat et al., (2012)
	EPS	Earnings per Share		Ahmad et al. (2021)
	DPS	Dividend per Share		Balatbat et al., (2012)
	DY	Dividend Yield	Dividend per Share/Closing Price	Balatbat et al., (2012)
	PE	Price to Earnings Ratio	Share Price/Earnings Per Share	Balatbat et al., (2012)
	EVEBITDA	Enterprise Value	Enterprise Value/EBITDA	Balatbat et al., (2012)
	TOBINQ	Tobin's Q	Market Enterprise Value/Total Assets	Atan et al. (2018), Kim et al. (2013)
	WACC	WACC	Weighted Average Cost of Capital	Atan et al. (2018)
	CR	Current Ratio	Current Assets/Current Liabilities	Asamoah (2019)
	MCTS	Market Cap to Total Sales	Market Capitalization/Total Sales	Balatbat et al., (2012)
	ASPR	Annual Stock Return	Closing Price at end of t =1 – Closing Price at the end of t=0/ Closing Price at end of t=0	Derwall et al. (2005) and Miralles-Quirós et al. (2018)
Control Variables	LEV	Leverage ratio (Unsystematic firm risk)	Long term Debt/Total Assets	Atan et al. (2018)
	SIZE	Firm size	Natural log of Total Assets	Cho et al. (2010)
	REDEV	R&D Intensity	R&D expenses reported in the financial statement	McWilliams and Siegel (2000)

4. Methodology

This section will describe the research methods used to tackle the hypotheses.

4.1 Research Design

For this study, we will be conducting a panel data analysis using the financial and ESG data for Indian firms. The combined ESG score is extracted through Refinitive Eikon. However, the three pillars will be manually calculated based on the instructions in Appendix C.

Based on the research by Orlitzky et la., (2003), that found a positive correlation between CSR and CFP, some indication of a time lag was found between when CSR was reported and the financial benefits seen. Therefore, in this study, we will use time lags on the ESG scores and its pillars to assess its effects on the CFP measures. This time lag would also allow for the stakeholder and principal-agent theories to be used as the CFP measures would be taking into account the information asymmetry as firms have reported their CSR initiatives and its effects have been accounted for potentially in the CFP measures (McWilliams and Siegel, 2021; Waddock and Graves; 1997; El Khouri et al. 2021).

4.2 Regression Equations

A regression model is an equation which defines the relationship between a dependent and an independent variable and one or more explanatory variables. This is done to estimate the effects that an independent variable has on the dependent variable and this effect is captured by the $"\beta"$ and the intercept by the $"\alpha"$. (Gujarati, 2003)

4.2.1 Accounting Based Parameters Hypotheses

To tackle the hypotheses H1, regression equations from 6 to 16 will be regressed and investigated.

$$ROA_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t} \text{ (6)}$$

$$ROE_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t} \text{ (7)}$$

$$ROIC_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t} \text{ (8)}$$

$$EBITDA_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t} \text{ (9)}$$

$$NOPAT_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t} \text{ (10)}$$

$$EPS_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t} \text{ (11)}$$

$$DPS_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t} \text{ (12)}$$

$$DY_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t} \text{ (13)}$$

$$PE_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t} \text{ (14)}$$

$$EV\ to\ EBITDA_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t} \text{ (15)}$$

$$MC/TS_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t} \text{ (16)}$$

To tackle H2, the regression equations from 17 to 27 will be used.

$$ROA_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 RND_{i,t} \text{ (17)}$$

$$ROE_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 RND_{i,t} \text{ (18)}$$

$$ROIC_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 RND_{i,t} \text{ (19)}$$

$$EBITDA_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 RND_{i,t} \text{ (20)}$$

$$NOPAT_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 RND_{i,t} \text{ (21)}$$

$$EPS_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 RND_{i,t} \text{ (22)}$$

$$DPS_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 RND_{i,t} \text{ (23)}$$

$$DY_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 RND_{i,t} \text{ (24)}$$

$$PE_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 RND_{i,t} \text{ (25)}$$

$$EV\ to\ EBITDA_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 RND_{i,t} \text{ (26)}$$

$$MC/TS_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 RND_{i,t} \text{ (27)}$$

4.2.2 Market Based Valuation Hypotheses

Price Returns

The return will be calculated on an annual basis. To calculate the return, the Arithmetic return (AR) shown as equation 28 will be used.

$$D = 100 \times \frac{price_n - price_{n-1}}{price_{n-1}} \text{ (28)}$$

Where n= 2, 3, ….,n_x represents the nth data value of days, and n_x is the last trading day of the quarter (Balatbat et al., 2012). Regression equation 29 will be used to test for hypotheses H3 and equation 30 for H4.

$$Price\ Returns_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}\ \textbf{(29)}$$

$$Price\ Returns_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 RND_{i,t}\ \textbf{(30)}$$

Firm Value using Tobin's Q

To tackle the Hypothesis H5 and H6 regarding the firm value using Tobin's Q, regression equations 25 and 26 will be used.

$$Tobin'sQ_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}\ \textbf{(31)}$$

$$Tobin'sQ_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 RND_{i,t}\ \textbf{(31)}$$

4.2.3 Cost of Capital Hypotheses

To test for hypotheses H7 and H8 the regression equations 32 and 33 will be used.

$$WACC_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}\ \textbf{(32)}$$

$$WACC_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 RND_{i,t}\ \textbf{(33)}$$

4.2.4 Slack Resources Hypotheses

To test for the Hypotheses H9 and H10 the regression equations laid out as 34, 35, 36 and 37 will be used. While also testing the impact of ESG on the effect it has to generate slack resources using regression equations 38 and 39. CR represents the current ratio.

$$ESG_{i,t} = \alpha + \beta_1 CR_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 + LEV_{i,t} + \beta_4 RND_{i,t}\ \textbf{(34)}$$

$$ENV_{i,t} = \alpha + \beta_1 CR_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}\ \textbf{(35)}$$

$$SOC_{i,t} = \alpha + \beta_1 CR_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}\ \textbf{(36)}$$

$$GOV_{i,t} = \alpha + \beta_1 CR_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}\ \textbf{(37)}$$

$$CR_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}\ \textbf{(38)}$$

$$CR_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t} + \beta_5 LEV_{i,t} + \beta_6 RND_{i,t}\ \textbf{(39)}$$

4.3 Data Analysis

The regressions will be run in STATA, after which the data analysis will be conducted in which the statistical significance will be checked. Following this, the required robustness and additional checks will be conducted.

4.3.1 Fama-Macbeth

For this study we use panel data, and based on prior literature apply the Fama-Macbeth 1973 estimation model. This approach is used as it weighs all time periods and observations equally. This is important as we have missing or unchanging data points for ESG scores over the years. Further, it is a better choice than pooled OLS as in this setting, pooled OLS will produce biassed standard errors.

4.3.2 Robustness Checks

For the robustness checks, the control variables will be lagged by one period as some of these control variables may also have a delayed time effect on the dependent variables and the interaction between the independent and dependent variables. The regression equations of this test are presented in appendix G, while a sample regression equation is given as equation 40.

$$ROA_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1} \text{ (40)}$$

It is important to test these control variables as the logic behind this test is grounded in the Slack Resource, Stakeholder and Principal-Agent theories. If the expenses associated with the increasing firm size, debt and R&D expenditures are cleared and the announcements by the board made in advance, in the following time period the CFP measures would show higher returns as it can have a delayed time effect for financial return to manifest as the ESG scores increase (Bellemare, Masaki & Pepinsky, 2015).

4.3.3 Additional Checks

U-Shape relation between ESG and CFP

Similar to El Khouri et al. (2021) and Arora (2019), the check on the curvilinear relationship between financial variables and ESG scores can be conducted to show at which ESG score is financial performance being maximised, thereby at this point, both financial and non-financial stakeholders will be satisfied. This will be conducted using the predicted

functionality in Stata and only conducted for the statistically significant links between ESG and CFP based on the primary regression equations from 6 to 39.

Reverse Relation effect of CFP on ESG

It would also be worthwhile to check the reverse causality and effect of CFP measures on ESG as this could also be used to understand whether higher CFPs do give firms the ability to engage in CSR activities. While this would be a hindsight check, it can answer if Indian companies are already utilising increasing financial resources towards engagement in CSR initiatives. This is when we will check for the ninth and tenth hypothesis, as presented earlier based on equations 34 to 37.

Under this circumstance, ESG scores are treated as dependent variables. Under that circumstance, the CFP measure be lagged to account for information asymmetries and treated as the independent variables. While the control variables would remain the same. The regression equations are given in appendix H. A sample of the regression equations are given as equations 41 to 44.

$$ESG_{i,t} = \alpha + \beta_1 ROA_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t} \text{ (41)}$$

$$ENV_{i,t} = \alpha + \beta_1 ROA_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t} \text{ (42)}$$

$$SOC_{i,t} = \alpha + \beta_1 ROA_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t} \text{ (43)}$$

$$GOV_{i,t} = \alpha + \beta_1 ROA_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t} \text{ (44)}$$

Reverse Relation effect of CFP on ESG using lagged control variables

Similar to the methodology of the primary research in this study, the reverse relation would also be conducted using the lagged control variables as the ESG scores may show delayed time effect. This is important as these variables also have an effect on the ESG scores of Indian companies and can show evidence as to how there is an effect and if or not it is statistically significant. For example, when the primary question of firm size having an effect on CFP is answered, this can help answer how an increasing firm size affects ESG. This can give Indian companies an idea of how to proceed based on previous performance in pursuing their CSR initiatives and increasing their ESG scores. The regression equations are given in appendix I. The regression equations will look at equations 45 to 48.

$$ESG_{i,t} = \alpha + \beta_1 ROA_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1} \text{ (45)}$$

$$ENV_{i,t} = \alpha + \beta_1 ROA_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1} \text{ (46)}$$

$$SOC_{i,t} = \alpha + \beta_1 ROA_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1} \text{ (47)}$$

$$GOV_{i,t} = \alpha + \beta_1 ROA_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1} \text{ (48)}$$

5. Empirical Results

In this section, the descriptive statistics, correlation matrices, diagnostic tests, regression results, robustness and additional tests will be presented.

5.1 Descriptive Statistic and Correlation Matrices of CFP and ESG

The descriptive statistics of the variables used are presented in Table 3. Based on the results of the ESG score and the pillars, there is a high variability in the scores. With ESG scores showing a minimum of 9.52 and maximum of 92.44.

Table 3: Descriptive statistics of Financial Performance metrics, ESG Pillars and Control Variables.

Variable	Obs	Mean	Std. Dev.	Min	Max	Stationarity
ESG Score	1125	49.727	17.674	9.520	92.440	0.0019***
Environmental Score	1125	39.098	24.766	0.000	97.329	0.0000***
Social Score	1125	56.347	20.146	4.523	96.730	0.0000***
Governance Score	1125	49.705	21.543	0.460	96.150	0.0008***
Return on Assets	1637	6.879	7.989	-35.190	43.339	0.0000***
Return on Equity	1618	13.343	120.347	-4728.125	305.576	0.0000***
Return on Invested Capital	1630	12.600	16.387	-143.389	183.459	0.0000***
EBITDA Margin	1453	24.188	35.480	-1033.994	124.620	0.0000***
NOPAT Margin	1478	15.522	25.761	-128.868	852.014	0.0000***
Earnings per Share	1645	44.889	246.293	-374.499	5916.850	0.0000***
Dividend per Share	1586	8.620	18.863	0.000	250.000	0.0145***
Dividend Yield	1583	1.388	1.823	0.000	21.750	0.0000***
Price to Earnings Ratio	1430	43.487	239.505	0.238	8415.000	0.0000***
EV to EBITDA	1417	18.098	45.965	-827.314	871.704	0.0000***
Tobin's Q	1598	257.036	10172.991	0.004	406667.766	0.0000***
WACC	1303	10.506	11.715	-46.252	75.740	0.0000***
Current Ratio	1473	1.655	4.178	0.017	153.628	0.0000***
Market Cap to Total Sales	1531	3.667	3.823	0.035	53.395	0.0000***
Annual Stock Price Return	1584	24.324	52.033	-93.954	532.162	0.0000***
Leverage	1651	0.184	0.309	0.000	5.270	0.0000***
Firm Size	1651	12.428	1.725	-0.693	17.696	0.0000***
R&D Intensity	819	0.010	0.019	0.000	0.248	0.0000***

*** p<0.01, ** p<0.05, * p<0.1

Similarly, the environmental scores range from 0 to 97.329, social scores from 4.528 to 96.73 and the governance scores from 0.46 to 96.15 with the Social pillar score having the highest average among the three at 56.34. Furthermore, the correlation matrices of ESG scores and

CFP are presented in Tables 4 to 8 with the correlation matrix of the CFP measures presented in appendix F.

The CFP measures also show high variability as seen when the EPS shows companies with negative values of -374.499 rupees meaning that they are losing money all the way up to 5916.85 rupees in gains and the firm values going from 0.004 to 406667.77. Similarly the current ratio shows firms with high liquidity at 153.628 down to 0.017 with very low liquidity. With return on equity showing variance with returns ranging from -4728 to 305.

Table 4: Pairwise Correlation Matrix (1) for ESG Scores, Return on Assets, Return on Equity, Return on Invested Capital and Control Variables

Variables	(TRESGS)	(TRESGEPS)	(TRESGSPS)	(TRESGGPS)	(ROA)	(ROE)	(ROIC)	(LEV)	(SIZE)	(REDEV)
TRESGS	1.000									
TRESGEPS	0.824***	1.000								
TRESGSPS	0.869***	0.714***	1.000							
TRESGGPS	0.604***	0.288***	0.265***	1.000						
ROA	0.103***	0.076**	0.126***	0.120***	1.000					
ROE	0.022	0.033	0.017	0.014	0.159***	1.000				
ROIC	0.094***	0.070*	0.133***	0.075***	0.857***	0.179***	1.000			
LEV	-0.091***	-0.108***	-0.116***	-0.059**	-0.297***	-0.041*	-0.296***	1.000		
SIZE	0.166***	0.164***	0.256***	-0.130***	-0.436***	-0.064**	-0.368***	0.192***	1.000	
REDEV	-0.076*	-0.252***	-0.044	0.071*	0.039	0.011	-0.002	-0.046	-0.121***	1.000

*** p<0.01, ** p<0.05, * p<0.1

In Table 4, we see that accounting based CFP measures ROA, ROE and ROIC are highly correlated with each other. ROA and ROIC have been correlated with the ESG scores and the ESG Pillars along with the control variables except for R&D Intensity. ROE does not show a correlation with the ESG scores or the pillars. Simultaneously, the ESG scores and the pillars show a high correlation amongst themselves and the control variables of leverage size and R&D intensity. Furthermore, the CFP measures do not show a correlation with the control variable R&D intensity however, do show a statistically significant correlation with firm size and leverage.

Table 5: Pairwise Correlation Matrix (2) for ESG Scores, EBITDA Margin, NOPAT Margin, Earnings per Share and Control Variables

Variables	(TRESGS)	(TRESGEPS)	(TRESGSPS)	(TRESGGPS)	(EBITDA)	(NOPAT)	(EPS)	(LEV)	(SIZE)	(REDEV)
TRESGS	1.000									
TRESGEPS	0.824***	1.000								
TRESGSPS	0.869***	0.714***	1.000							
TRESGGPS	0.604***	0.288***	0.265***	1.000						
EBITDA	-0.098***	-0.169***	-0.113***	0.013	1.000					
NOPAT	-0.029	-0.063**	-0.044	0.005	0.159***	1.000				
EPS	-0.023	-0.026	0.006	-0.018	0.001	-0.016	1.000			
LEV	-0.091***	-0.108***	-0.116***	-0.059**	0.147***	0.048*	-0.043*	1.000		
SIZE	0.166***	0.164***	0.256***	-0.130***	0.114***	0.029	-0.030	0.192***	1.000	
REDEV	-0.076*	-0.252***	-0.044	0.071*	0.007	-0.003	-0.025	-0.046	-0.121***	1.000

*** p<0.01, ** p<0.05, * p<0.1

In Table 5, we see that the EBITDA margin is correlated with the ESG score and the pillars as well as the NOPAT margin, however, not with EPS. It is also correlated with the control variables except for the R&D intensity. The NOPAT margin is only correlated with the

environmental pillar score and not with the ESG, social or governance scores. It is also not correlated to the EPS, or the control variables for firm size and R&D intensity. EPS does not show correlation with any of the variables except for the leverage ratio in the control variables.

Table 6: Pairwise Correlation Matrix (3) for ESG Scores, Dividend Per Share, Dividend Yield, EV to EBITDA and Control Variables

Variables	(TRESGS)	(TRESGEPS)	(TRESGSPS)	(TRESGGPS)	(DPS)	(DY)	(EVEBITDA)	(LEV)	(SIZE)	(REDEV)
TRESGS	1.000									
TRESGEPS	0.824***	1.000								
TRESGSPS	0.869***	0.714***	1.000							
TRESGGPS	0.604***	0.288***	0.265***	1.000						
DPS	0.090***	0.072**	0.158***	-0.010	1.000					
DY	0.044	0.090***	0.157***	-0.215***	0.145***	1.000				
EVEBITDA	0.014	-0.031	0.019	0.038	0.040	-0.074***	1.000			
LEV	-0.091***	-0.108***	-0.116***	-0.059**	-0.122***	0.029	0.134***	1.000		
SIZE	0.166***	0.164***	0.256***	-0.130***	-0.105***	0.182***	-0.133***	0.192***	1.000	
REDEV	-0.076*	-0.252***	-0.044	0.071*	0.002	-0.158***	-0.015	-0.046	-0.121***	1.000

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

In Table 6, DPS shows a correlation with the ESG, environmental and social pillar scores as well as with DY. However, it does not show any correlation with the EV to EBITDA and the R&D intensity control variable. DY does not show a correlation with the ESG score however it does show a correlation with the individual pillar scores. DY also shows a correlation with EV to EBITDA and the control variables except for the leverage ratio. EV to EBITDA does not show any correlation with the ESG score or the pillars. It only shows a correlation with the dividend yield, firm size and leverage ratio. Interestingly, the rising dividend yield shows a positive correlation with growing size of the firm however is negatively correlated in R&D intensity meaning that companies are placing emphasis on R&D development than investors dividend yields. Furthermore, the negative correlation between dividend per share and leverage and firm size shows that as they grow and take higher leverage, they are not able to pay out dividends to its investors.

Table 7: Pairwise Correlation Matrix (4) for ESG Scores, Market Cap to Total Sales, Price to Earnings ratio, TOBIN's Q and Control Variables

Variables	(TRESGS)	(TRESGEPS)	(TRESGSPS)	(TRESGGPS)	(MCTS)	(PE)	(TOBINQ)	(LEV)	(SIZE)	(REDEV)
TRESGS	1.000									
TRESGEPS	0.824***	1.000								
TRESGSPS	0.869***	0.714***	1.000							
TRESGGPS	0.604***	0.288***	0.265***	1.000						
MCTS	0.006	-0.139***	-0.059*	0.156***	1.000					
PE	-0.015	-0.003	-0.038	0.015	-0.003	1.000				
TOBINQ	0.050*	-0.005	0.033	0.129***	0.110***	0.031	1.000			
LEV	-0.091***	-0.108***	-0.116***	-0.059**	-0.034	0.011	-0.015	1.000		
SIZE	0.166***	0.164***	0.256***	-0.130***	-0.134***	-0.026	-0.199***	0.192***	1.000	
REDEV	-0.076*	-0.252***	-0.044	0.071*	0.011	-0.031	-0.033	-0.046	-0.121***	1.000

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

In Table 7, the MCTS shows a correlation with the pillar scores, Tobin's Q and firm size. The PE ratio does not show any statistical significant correlation with any of the independent, control or other dependent variables. Tobin's Q shows a correlation with the ESG and

governance scores and firm size. Interestingly, results depict a positive correlation between size and leverage. Larger companies in India have more leverage as they grow. Moreover, an increasing valuation in the Tobin's Q shows a negative correlation with size showing that as their firms grow their value decreases.

Table 8: Pairwise Correlation Matrix (5) for ESG Scores, Weighted Average Cost of Capital, Current Ratio, Annual Stock Price Returns and Control Variables

Variables	(TRESGS)	(TRESGEPS)	(TRESGSPS)	(TRESGGPS)	(WACC)	(CR)	(ASPR)	(LEV)	(SIZE)	(REDEV)
TRESGS	1.000									
TRESGEPS	0.824***	1.000								
TRESGSPS	0.869***	0.714***	1.000							
TRESGGPS	0.604***	0.288***	0.265***	1.000						
WACC	-0.047	-0.017	-0.042	-0.033	1.000					
CR	0.052*	-0.019	0.045	0.092***	0.043	1.000				
ASPR	-0.050*	-0.047	-0.081***	0.030	0.307***	0.003	1.000			
LEV	-0.091***	-0.108***	-0.116***	-0.059***	-0.074***	-0.133***	0.059**	1.000		
SIZE	0.166***	0.164***	0.256***	-0.130***	-0.024	-0.130***	-0.172***	0.192***	1.000	
REDEV	-0.076*	-0.252***	-0.044	0.071*	-0.051	0.081**	-0.046	-0.046	-0.121***	1.000

*** p<0.01, ** p<0.05, * p<0.1

In Table 8, WACC shows a correlation with the leverage ratio and annualised stock price returns. CR shows a correlation with the ESG, governance score and the control variables. The ASPR shows a correlation with the ESG, governance score and also the leverage ratio and firm size. Interestingly, WACC only shows a positive correlation with ASPR indicating that Indian company's cost of capital rises with a rise in their annualised stock price returns. However, the more leverage they take, the cost of capital shows a negative correlation.

The correlation matrix for all the CFP measures is given in Appendix F.

5.2 Diagnostic Tests

Before running the regressions, diagnostic tests are performed, mainly stationary, serial correlation and multicollinearity. First, we test for stationarity using the Fisher type unit-root test based on the augmented Dicky Fuller test. This is best suited as we have a smaller time frame and larger sample size. In this test, the Null hypothesis assumes there is a unit-root present in all panels meaning no stationarity. Based on the last column in Table 3, we see that most of the variables reported a P-value of zero, therefore the null hypothesis can be rejected, indicating that there are no unit-roots present.

Second, serial correlation also known as autocorrelation in panel data is statistically tested using the Wooldridge test which is a robust test (El Khouri et al., 2021). Although serial correlation is only considered a problem for large time dimensions' panel data spanning 20 to 30 years (Brooks, 2008). Therefore does not affect this study as it is only conducted using data spanning 10 years.

Third, a multicollinearity test is run to check for a high correlation between all independent variables and control variables. Following the rule of thumb stated by Brooks (2008), coefficients between −0.8 and +0.8 indicate no multicollinearity problems. Therefore, results from Table 4 to 8 show no sign of multicollinearity issues between the variables.

5.3 Regression Results

Having run the regression equations laid out in section 4.2, the following results were created through Stata.

5.3.1 The Impact of ESG Score on Financial Performance

The models are estimated using the Fama-Macbeth estimation model. The results of the regressions and effects of ESG scores on CFP measures are presented in Table 9 to 11.

Table 9: ESG scores against Profitability Variables

	Return on Assets	Return on Equity	Return on Invested Capital	EBITDA Margin	NOPAT Margin
ESG Score$_{t-1}$	.059**	.111	.094*	-.237	-.002
	(3.148)	(1.791)	(2.221)	(-1.322)	(-.048)
Leverage Ratio	-31.453***	-49.031***	-59.078***	-7.013	-7.866
	(-10.882)	(-5.045)	(-5.615)	(-.346)	(-.838)
Firm Size	-.991*	-1.848*	-1.526	.327	-.497
	(-2.712)	(-2.713)	(-1.455)	(.276)	(-.892)
R&D Intensity	-11.592	-51.368	-72.129**	-24.366	-81.285
	(-.868)	(-2.085)	(-4.402)	(-.888)	(-.863)
cons	22.992***	42.16***	38.52**	26.951	24.087*
	(5.567)	(7.5)	(3.356)	(1.121)	(2.48)
Observations	521	512	516	522	498
R-squared	.425	.21	.338	.08	.034

t-values are in parentheses
*** p<.01, ** p<.05, * p<.1

Return on Assets

With the increasing ESG score by one point, return on assets increases by 0.059pp (percentage point) as Indian companies continue to participate in CSR initiatives, positively affecting their reputation attracting new stakeholders resulting in higher profitability. Economically, the effect is marginal and can generate a compounding effect with a consistent increase over the long run. Furthermore, a leverage ratio and R&D intensity increase shows a deterioration in ROA by 31.453pp and 11.592pp could be indicators of how Indian companies are affecting their profitability by taking large amounts of debt and spending on research and development.

Return on Equity

ESG scores do not have a statistically significant effect on the Return on Equity. It has been found that as the leverage ratio and firm size increase, it affects the ROE negatively by 49.031pp and 1.848pp respectively as the R&D intensity did not have an effect on the firm's ROE. However, the decline in ROE caused by the leverage ratio could be an indicator of inefficiency in the companys' allocation of shareholder investments (Lenka, 2017).

Return on Invested Capital

As the ESG scores increase by one point, there is a positive return on invested capital to the companies by 0.094pp. The increase in leverage ratio and R&D intensity decreases the returns by 59.078pp and 72.12pp in Indian companies with the size of the firm having no effect on the ROIC. Similar to ROA, this may have a marginal economic impact when viewed in isolation and it adds up in the long run. This may incentivise stakeholders to keep pursuing these initiatives as the returns increase.

EBITDA Margin

ESG scores have a statistically insignificant effect on the EBITDA margin. Simultaneously, the leverage ratio, firm size and R&D intensity also do not have an effect on the EBITDA margin of Indian companies.

NOPAT Margin

ESG scores have a statistically insignificant effect on the NOPAT margin. Simultaneously, the leverage ratio, firm size and R&D intensity also keep the EBITDA margin of Indian companies unchanged.

Table 10: ESG score scores against Equity Variables (Part 1)

	Earnings Per Share	Dividend Per Share	Dividend Yield	EV to EBITDA	Annual Stock Price Returns
ESG Score$_{t-1}$	-.653	.08**	-.015***	.039	.086
	(-1.123)	(2.979)	(-5.241)	(.372)	(.885)
Leverage Ratio	-132.404**	-31.72***	-2.746***	-.021	-.698
	(-2.98)	(-5.629)	(-9.394)	(-.002)	(-.049)
Firm Size	.803	-1.327**	.625***	-5.392***	-3.466
	(.186)	(-2.788)	(16.117)	(-7.242)	(-1.671)
R&D Intensity	80.225	-17.077	-14.54***	-182.539*	-112.737
	(.598)	(-1.08)	(-8.093)	(-2.746)	(-.557)
cons	90.476***	29.397***	-5.054***	86.913***	57.825*
	(4.671)	(5.331)	(-16.518)	(11.057)	(2.309)
Observations	520	521	521	522	522

| R-squared | .119 | .11 | .212 | .177 | .231 |

Earnings per Share

ESG scores have a statistically insignificant impact on the earnings per share and the same is true for the size of the firm and R&D intensity. However, with the increasing leverage ratio, Indian firms report a decrease in earnings per share by 132.404 Indian Rupees. This shows that an increasing leverage ratio takes away nearly 132 rupees in earnings from investors per share in India, in which case a balance needs to be found.

Dividend per Share

With an increasing ESG score by one point, the dividend per share increases by 0.08 rupees which is beneficial to the investors as they will get higher return on their investment. Although not economically significant when compared to the mean companies can still utilise it to attract future investors. With an increasing leverage ratio and R&D intensity, the dividend per share decreases by 31.72 and 1.327 rupees respectively.

Dividend Yield

In this case, the dividend yield decreases by 0.015pp as the ESG scores increase by one point. This could be caused by Indian companies choosing instead to reinvest the money towards their CSR initiatives by taking monetary resources reserved for dividend pay-outs to investors and financial stakeholders to satisfy non-financial stakeholders. Furthermore, the increase in R&D intensity and leverage has a negative effect on the dividend yield by 14.54pp and 2.74pp respectively. While an increasing firm size shows a positive effect of 0.625pp.

Given the mean 1.388 holds economic significance that in India, companies are re-investing in CSR initiative and taking stakeholder theory into consideration are taking dividend yields of financial stakeholders to satisfy non-financial stakeholders. This might explain the negative effect. Similarly companies are reinvesting in themselves as R&D increases, DY decreases significantly. However, as the Indian firms are growing in size their DY is increasing showing that growth results in higher dividend yields for inventors. And as leverage increases DY decreases as companies start paying off their debts and cannot payout dividends to investors.

EV to EBITDA

The ESG scores do not show a statistically significant impact on the enterprise value to earnings before interest, depreciation and amortisation ratio. However both the R&D intensity and the firm size decrease the EV to EBITDA multiple ratio of Indian companies by 5.392 and 182.539 respectively.

Annual Stock Price Returns

The ESG score does not cause a statistically significant impact on the annualised stock return of Indian companies. Neither did any of the other regressors. This means that the stock price of Indian companies is not affected by the changes in ESG score, firm size, leverage ratio and the R&D intensity.

Table 11: ESG score scores against Equity Variables (Part 2)

	Market Cap to Total Sales	Price to Earnings Ratio	Tobin's Q	Weighted Average Cost of Capital	Current Ratio
ESG Score$_{t-1}$	.013	.029	.02**	-.028	.011**
	(1.861)	(.236)	(3.26)	(-1.037)	(3.611)
Leverage Ratio	-3.693***	70.829	-6.603***	-10.347	-2.299***
	(-6.209)	(1.411)	(-14.076)	(-1.152)	(-14.135)
Firm Size	-.994***	-13.622**	-1.366***	.83	-.131*
	(-6.19)	(-4.482)	(-16.845)	(.849)	(-2.542)
R&D Intensity	-12.991	-217.186**	-26.851**	-44.472	3.678
	(-1.659)	(-3.672)	(-3.359)	(-1.095)	(1.838)
cons	15.859***	197.676***	20.692***	2.799	2.998***
	(8.432)	(5.626)	(19.404)	(.334)	(5.834)
Observations	506	470	522	388	522
R-squared	.442	.213	.461	.273	.289

t-values are in parentheses
*** p<.01, ** p<.05, * p<.1*

Market Cap to Total Sales

The ESG scores have a statistically insignificant impact on the market capitalization to total sales. With an increasing leverage ratio showing a negative effect attributing to the higher amount of loans Indian companies may take, deteriorating their market caps. And increasing firm size may be attributing to higher sales which can increase the denominator and make the ratio smaller.

Price to Earnings Ratio

The PE ratios are not affected by the increasing ESG scores. However, as the firm size and R&D intensity increases, the PE ratio decreases. This is beneficial for Indian companies as

they may get undervalued and attract investors, thereby expanding their activities and creating growth for their businesses.

Tobin's Q

The ESG scores show a statistically significant effect on Tobin's Q, which means that the overall value of Indian companies tends to rise as they engage in CSR initiatives and increase their ESG scores. Economically as Tobin's Q has a mean of 257 an effect of +0.02 does not show a major economic effect on the value. However, the opposite is true of the Leverage Ratio, firm size and R&D intensity showing a negative effect on Tobin's Q hence, the value of the firm.

Weighted Average Cost of Capital

There is a statistically insignificant effect of ESG or any of the other control variables on the cost of capital of Indian firms. This could reflect that engaging in ESG initiative does not help Indian companies' cost of taking loans.

Current Ratio

The ESG scores of Indian companies show a positive effect on the Current ratio. This could be because firms with increasing ESG scorese are able to either lower their short term debt or increase the short term asset holding through their CSR initiatives. This means that firms with higher ESG scores tend to have higher short term liquidity to cover the expenses of ESG initiatives. Simultaneously, the leverage ratio and firm size show a decrease in current ratio, which could be caused by the increase in debt taken by the firms in order to expand their business practices. To confirm and test for the ninth hypothesis (H9), the reverse causality regressions need to be run as well.

Based on the results of the regressions presented in tables 9 to 11, we can find evidence to support our hypotheses. For the first hypothesis H1, we can reject the null hypothesis in the case of return on assets, return on invested capital, dividend per share and dividend yield. Similarly, we find evidence to support the fifth hypothesis H5, with ESG showing a positive effect on the value of the company and can reject the null hypothesis.

However, there is insufficient evidence to reject the null hypothesis in the case of the third (H3) and seventh (H7) regarding the annual stock price returns and weighted average cost of capital. Since the results were statistically insignificant, we cannot reject the null hypothesis.

5.3.2 The Impact of ESG Pillar Scores on Financial Performance

To analyse the effect of individual ESG pillars on the CFP, the environmental, social and governance scores are regressed against the CFP measures (profitability, equity, firm value and cost of capital). The Control Variables were kept the same as ESG score regressions conducted in the previous section. The results are presented in tables 12 to 14.

Table 12: Profitability Variables against Environmental, Social and Governance score

	Return on Assets	Return on Equity	Return on Invested Capital	EBITDA Margin	NOPAT Margin
Environmental Score$_{t-1}$	.023	-.019	-.004	-.087	-.167
	(1.301)	(-.221)	(-.075)	(-1.279)	(-2.176)
Social Score$_{t-1}$	.039	.199	.179*	-.085	.04
	(2.551)	(2.796)	(3.078)	(-.738)	(1.279)
Governance Score$_{t-1}$	.021	-.021	-.042	-.035	.151
	(2.546)	(-.654)	(-1.768)	(-.278)	(1.502)
Leverage Ratio	-30.293***	-45.256*	-53.819**	-3.825	-12.482
	(-10.458)	(-4.152)	(-5.369)	(-.221)	(-.908)
Firm Size	-1.256*	-2.846	-2.848*	.017	1.554
	(-3.213)	(-2.73)	(-3.152)	(.006)	(1.851)
R&D Intensity	-10.936	-79.036	-82.527	-34.36	-144.273
	(-.632)	(-1.64)	(-2.516)	(-1.384)	(-1.112)
cons	24.922**	50.442**	51.08**	28.767	-3.471
	(5.473)	(4.664)	(4.926)	(.68)	(-.427)
Observations	521	512	516	522	498
R-squared	.44	.237	.367	.117	.069

t-values are in parentheses
*** $p<.01$, ** $p<.05$, * $p<.1$

Based on the results of table 12, the effects of environmental and governance scores on the CFP measures are also statistically insignificant. However, as the social scores increase by one point the return on invested capital increases by 0.179 pp.

Table 13: Equity Variables against Environmental, Social and Governance score (Part 1)

	Earnings Per Share	Dividend Per Share	Dividend Yield	EVEBITDA Margin	Annual Stock Price Returns
Environmental Score$_{t-1}$	-.243	-.03	-.01	-.133	-.017
	(-.715)	(-.69)	(-1.626)	(-1.452)	(-.219)
Social Score$_{t-1}$	-.014	.249**	.017**	.092	-.03
	(-.051)	(4.32)	(5.312)	(1.286)	(-.194)
Governance Score$_{t-1}$	-.424*	-.132*	-.024**	.066	.159
	(-3.526)	(-3.113)	(-6.032)	(.551)	(1.92)
Leverage Ratio	-132.841	-29.453**	-2.588**	-3.961	-2.504
	(-2.739)	(-4.518)	(-7.884)	(-.55)	(-.174)
Firm Size	-2.413	-2.858**	.466**	-4.233**	-2.437
	(-.409)	(-5.516)	(8.671)	(-4.334)	(-.968)
R&D Intensity	42.849	-24.837	-16.316**	-217.303	-100.333
	(.225)	(-.952)	(-4.685)	(-2.813)	(-.535)

cons	131.585*	45.855**	-3.242**	71.861**	43.93
	(3.367)	(6.195)	(-5.888)	(5.322)	(1.451)
Observations	520	521	521	522	522
R-squared	.148	.163	.304	.213	.262

t-values are in parentheses
*** p<.01, ** p<.05, * p<.1

Based on the results of Table 13, the effects of environmental and governance scores on the CFP measures are also statistically insignificant. The social scores show that as they increase by one point the dividend per share increases by 0.249 rupees while the dividend yield increases by 0.017pp. Similarly, as the governance scores increase by one point the earnings per share, dividends per share and dividend yield decrease by 0.424 rupees, 0.132 rupees and 0.024pp respectively.

Table 14: Equity Variables against Environmental, Social and Governance score (Part 2)

	Market Cap to Total Sales	Price to Earnings Ratio	Tobin's Q	Weighted Average Cost of Capital	Current Ratio
Environmental Score$_{t-1}$	-.018**	.021	-.014	-.005	.004
	(-5.297)	(.095)	(-1.714)	(-.25)	(1.741)
Social Score$_{t-1}$	.019	-.185	.034*	-.026	0
	(2.326)	(-.912)	(3.887)	(-1.509)	(.178)
Governance Score$_{t-1}$	.014**	.113	.006	.001	.008**
	(7.167)	(1.339)	(1.616)	(.217)	(6.619)
Leverage Ratio	-3.627**	58.93	-6.097***	-10.886	-2.349***
	(-5.596)	(1.31)	(-11.076)	(-1.179)	(-11.979)
Firm Size	-.876**	-10.76*	-1.416***	.962	-.096
	(-5.087)	(-3.686)	(-19.329)	(.869)	(-1.391)
R&D Intensity	-19.114	-202.157*	-31.981	-46.554	3.542
	(-2.133)	(-3.673)	(-2.848)	(-1.056)	(1.712)
cons	14.033**	168.993**	20.657***	1.508	2.539*
	(7.112)	(4.381)	(29.517)	(.15)	(3.459)
Observations	506	470	522	388	522
R-squared	.464	.24	.482	.301	.312

t-values are in parentheses
*** p<.01, ** p<.05, * p<.1

Based on the results of Table 14, as the environmental scores increase, the market cap to total sale decreases by 0.018. Similarly, as the social scores increase by one point, the value of the company represented by Tobin's Q increases by 0.034. While the governance score increases by one point, the market cap to total sales and current ratio also increase by 0.014 and 0.008 respectively.

The results of the regressions presented in Tables 12 to 14 show that there is some evidence for the second hypothesis (H2) in regards to the statistically significant relation between environmental score and market cap to total sales. The social scores do show an effect on the

return on invested capital, dividends per share and dividend yield. The governance scores show an effect on the earnings per share, dividends per share, dividend yield and market cap to total sales. In these cases, the null hypothesis can be rejected. In the other CFP measures and ESG pillar scores, the results are inconclusive therefore the null hypothesis cannot be rejected.

For the fourth hypothesis (H4), the null hypothesis cannot be rejected as the annual share price changes do not show a statistically significant change. In the case of the sixth hypothesis (H6), Tobin's Q only shows a statistically significant positive relation with the social pillar scores in which case the null hypothesis can be rejected but not in the case of the other two pillars. For the eighth hypothesis (H8), we do not find sufficient evidence for the relation between the weighted average cost of capital and therefore cannot reject the null hypothesis against any of the pillars. To test for the tenth hypothesis (H10), the reverse causality needs to be run for current ratios effect on the pillar score (shown later).

5.4 Additional and Robustness Checks

Having run the preliminary regression, additional tests and robustness tests are carried out. First, we test the effect of lagging the control variables (regression equation presented in Appendix G). Second, we use the predict functionality to find the shape of the curvilinear relation between the ESG and CFP for the statistically significant variables and scores (the graphs presented in Appendix J). Third, to test for the ninth and tenth hypotheses the reverse effect of CFP measures on the ESG scores was carried out followed by using lagged control variables (regressions equations are presented in the Appendices H and I).

It is important to test if the control variables time lag used in this study had an effect on the outcome of the effect of ESG scores on the CFP measures. Similarly, it is important to know the shape of the linear relationship between ESG scores and financial performance for companies as it can give a better understanding to Indian companies on how to and also how intensely to engage in CSR based initiatives to create the most financially beneficial outcome that satisfies all stakeholders. Similarly, it is important to understand what effect financial performance has on ESG especially in the case of the current ratio and find evidence for H9 and H10. This can help understand how financial performance in Indian companies has affected their ESG scores.

5.4.1 Lagged Control Variables

Table 15: Profitability Variables against ESG score with lagged control variables

	Return on Assets	Return on Equity	Return on Invested Capital	EBITDA Margin	NOPAT Margin
ESG Score$_{t-1}$	.068**	.141*	.115**	-.218	.006
	(3.825)	(2.39)	(2.875)	(-1.283)	(.14)
Leverage Ratio$_{t-1}$	-30.404***	-36.984***	-55.645***	-11.837	-4.979
	(-10.804)	(-7.2)	(-8.232)	(-.534)	(-.596)
Firm Size$_{t-1}$	-1.399**	-2.968**	-2.379**	-.419	-1.289
	(-3.574)	(-3.935)	(-3.141)	(-.268)	(-1.389)
R&D Intensity$_{t-1}$	3.263	-23.321	-36.564	-44.074	-123.493
	(.164)	(-.588)	(-1.302)	(-.873)	(-.946)
cons	27.319***	53.049***	47.172***	35.862	33.428*
	(6.091)	(6.778)	(5.405)	(1.255)	(2.34)
Observations	509	500	504	509	489
R-squared	.432	.205	.332	.061	.034

t-values are in parentheses
*** p<.01, ** p<.05, * p<.1*

Compared to the results presented in table 9, in table 15 both return on assets and return on invested capital remain statistically significant and show positive returns to the company. However, when the control variables are lagged, the return on equity is also showing positive return to the investors and as the ESG score increases by one point, the returns increase by 0.141pp. This means that when the firm's leverage, R&D intensity and size are not taken into account in the current time period, the increasing ESG score does result in increasing returns to investors.

Table 16: Equity Variables against ESG score with lagged control variables (Part 1)

	Earnings Per Share	Dividend Per Share	Dividend Yield	EV to EBITDA	Annual Stock Price Returns
ESG Score$_{t-1}$	-.707	.078*	-.018**	.011	.184
	(-1.079)	(2.233)	(-4.348)	(.114)	(1.656)
Leverage Ratio$_{t-1}$	-137.637**	-32.915***	-2.915***	-13.736	16.739
	(-3.598)	(-6.918)	(-8.212)	(-1.883)	(.917)
Firm Size$_{t-1}$	.206	-1.512*	.675***	-4.156**	-4.485
	(.04)	(-2.35)	(9.972)	(-2.81)	(-1.952)
R&D Intensity$_{t-1}$	121.356	-31.187	-12.994***	-78.046	26.951
	(.872)	(-1.806)	(-8.462)	(-.518)	(.148)
cons	103.36**	32.37**	-5.459***	72.55***	60.114*
	(4.212)	(4.548)	(-9.006)	(4.791)	(2.222)
Observations	507	508	508	509	509
R-squared	.132	.114	.221	.197	.242

t-values are in parentheses
*** p<.01, ** p<.05, * p<.1*

The results of table 16 when compared to table 10 show no change in dividend per share and dividend yield in terms of statistical significance with both slightly decreasing to 0.078 rupees and 0.018pp respectively.

Table 17: Equity Variables against ESG score with lagged control variables (Part 2)

	Market Cap to Total Sales	Price to Earnings Ratio	Tobin's Q	Weighted Average Cost of Capital	Current Ratio
ESG Score$_{t-1}$	.015*	.016	.024***	-.028	.01**
	(2.504)	(.138)	(7.438)	(-1.053)	(3.671)
Leverage Ratio$_{t-1}$	-3.563***	15.811	-6.445***	-11.074	-2.455***
	(-7.808)	(.627)	(-11.247)	(-1.367)	(-23.084)
Firm Size$_{t-1}$	-1.059***	-10.478***	-1.439***	.927	-.116**
	(-8.121)	(-7.098)	(-24.098)	(1.079)	(-2.792)
R&D Intensity$_{t-1}$	-10.841	-202.479***	-25.575**	-38.143	5.042*
	(-1.454)	(-5.748)	(-3.126)	(-.971)	(2.286)
cons	16.422***	163.161***	21.253***	1.555	2.836***
	(10.558)	(9.401)	(23.135)	(.22)	(6.828)
Observations	495	457	509	385	509
R-squared	.454	.205	.454	.23	.308

t-values are in parentheses
*** $p<.01$, ** $p<.05$, * $p<.1$

The results of table 17 show similar results as previously seen with both market cap to total sales ratio, Tobin's Q and current ratio all showing positive statistically significant results. This shows that as ESG scores increase when regressing the CFPs against the lagged control variables, the results have no effect on the firm's valuation. Therefore, regardless of the other attributes, increasing ESG scores does affect the valuation of Indian companies positively.

Table 18: Profitability Variables against Environmental, Social and Governance score with lagged control variables

	Return on Assets	Return on Equity	Return on Invested Capital	EBITDA Margin	NOPAT Margin
Environmental Score$_{t-1}$	.031	.018	.015	-.146**	-.145*
	(1.358)	(.243)	(.222)	(-6.834)	(-3.372)
Social Score$_{t-1}$	.044	.201*	.188	-.035	.033
	(1.912)	(3.141)	(2.417)	(-.357)	(1.929)
Governance Score$_{t-1}$	.016	-.039	-.051	.007	.137
	(1.729)	(-1.272)	(-2.081)	(.087)	(1.598)
Leverage Ratio$_{t-1}$	-28.995***	-32.803**	-49.501**	-9.345	-9.126
	(-9.962)	(-5.801)	(-8.773)	(-.465)	(-.749)
Firm Size$_{t-1}$	-1.762*	-4.343**	-3.945**	-.162	.29
	(-3.558)	(-4.418)	(-4.671)	(-.07)	(.8)
R&D Intensity$_{t-1}$	7.591	-34.283	-40.13	-77.963	-177.508
	(.311)	(-.637)	(-.846)	(-1.888)	(-1.147)
cons	30.467**	66.428**	62.748**	29.422	12.22
	(5.396)	(5.907)	(6.212)	(.779)	(2.289)
Observations	509	500	504	509	489

| R-squared | .457 | .242 | .369 | .1 | .071 |

When results of the regressions presented in table 18 are compared to table 12, we see that environmental scores do affect the EBITDA and NOPAT margin of Indian firms both showing a decrease and as the ESG scores increase by one point, the margins decrease by 0.146pp and 0.145pp respectively. Further, the social score shows that the return on invested capital becomes statistically insignificant while the return on equity shows positive returns to investors when social scores increase by one point and therefore, show 0.201pp increase towards investors.

Table 19: Equity Variables against Environmental, Social and Governance score with lagged control variables (Part 1)

	Earnings Per Share	Dividend Per Share	Dividend Yield	EV to EBITDA	Annual Stock Price Returns
Environmental Score$_{t-1}$	-.328	-.034	-.009	-.121	-.031
	(-.806)	(-.716)	(-1.609)	(-1.774)	(-.288)
Social Score$_{t-1}$	.019	.255**	.015**	.066	.117
	(.051)	(4.571)	(4.979)	(.944)	(.941)
Governance Score$_{t-1}$	-.395*	-.13	-.025**	.044	.134
	(-3.076)	(-2.863)	(-4.941)	(.288)	(1.663)
Leverage Ratio$_{t-1}$	-135.181*	-31.101**	-2.724**	-19.284	18.479
	(-3.253)	(-5.886)	(-6.797)	(-2.599)	(.985)
Firm Size$_{t-1}$	-3.217	-3.061*	.518**	-3.212*	-4.114
	(-.424)	(-3.842)	(6.799)	(-3.038)	(-1.542)
R&D Intensity$_{t-1}$	86.803	-35.808	-14.107**	-118.193	2.967
	(.483)	(-2.14)	(-4.847)	(-.729)	(.017)
cons	144.245	48.56**	-3.692**	61.516**	52.603
	(2.62)	(4.562)	(-4.721)	(5.466)	(1.561)
Observations	507	508	508	509	509
R-squared	.167	.166	.303	.241	.278

The results in table 19, show that neither dividend per share nor the dividend yield are affected by the lagged variables and remain statistically significant by the increasing social scores. Similarly, the earnings per share and dividend yield also remain significant whereas the dividend per share becomes insignificant with the increasing governance scores. Showing that despite the time effect of Indian companies on their leverage ratio, size and R&D intensity there is a negative effect on the EPS and DY for the investors.

Table 20: Equity Variables against Environmental, Social and Governance score with lagged control variables (Part 2)

	Market Cap to Total Sales	Price to Earnings Ratio	Tobin's Q	Weighted Average Cost of Capital	Current Ratio
Environmental Score$_{t-1}$	-.018**	-.207	-.014	-.006	.004
	(-5.124)	(-1.995)	(-1.497)	(-.404)	(1.697)
Social Score$_{t-1}$	.021	.026	.036*	-.028	-.001
	(2.491)	(.266)	(3.395)	(-1.051)	(-.493)
Governance Score$_{t-1}$	.014**	.203*	.009	.006	.008**
	(6.167)	(4.143)	(1.852)	(.979)	(9.673)
Leverage Ratio$_{t-1}$	-3.555**	11.2	-5.926***	-11.279	-2.574***
	(-6.373)	(.462)	(-10.172)	(-1.366)	(-18.852)
Firm Size$_{t-1}$	-.949**	-7.776**	-1.486***	1.049	-.073
	(-6.607)	(-5.924)	(-23.951)	(1.074)	(-1.249)
R&D Intensity$_{t-1}$	-17.461	-271.947***	-31.305	-43.39	5.083
	(-2)	(-11.774)	(-2.641)	(-1.027)	(2.639)
cons	14.68**	128.913**	21.141***	.29	2.304*
	(8.974)	(8.58)	(31.677)	(.035)	(3.678)
Observations	495	457	509	385	509
R-squared	.48	.239	.48	.253	.332

t-values are in parentheses

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

When the results are compared against the regressions earlier, it is observed that market cap to total sales, remains statistically significant against the environmental score. Similarly, Tobin's Q increases as social scores increase. However, the market cap to total sales shows a negative relationship with an increasing governance score. However, we also observe that the PE ratio becomes statistically significant when the control variables are lagged and show a positive effect relationship with an increasing governance score.

5.4.2 Curvilinear Relationship Between ESG Scores and CFP Measures

The shapes of the graphs are given in the appendix and were developed based on the predict function in Stata. The relationship has been built for the statistically significant results only, which means there is a statistically significant link between these variables.

Table 21: Summary of the relationship between CFP and ESG with turning points

	Return on Assets	Return on Equity	Return on Invested Capital	EBITDA Margin	NOPAT Margin
	Link	Link	Link	Link	Link
ESG Score	Convex	None	Convex	None	None
Environmental score	None	None	None	None	None
Social Score	None	None	Convex	None	None
Governance Score	None	None	None	None	None

Return on Assets and Return on Invested Capital show a convex link against the ESG score, meaning that as the ESG scores increase, the returns decrease for Indian companies only up

to a point after which the returns increase as the scores continue to increase. There is a similar convex link between ROIC and an increasing social score. This means that companies need to either not take part in CSR initiatives or fully commit to take part and increase their ESG scores. The latter however leads to higher equilibrium CFP results. Whereas, the others do not show a statistically significant effect indicating no link.

Table 22: Summary of the relationship between CFP and ESG with turning points

	Earnings Per share	Dividends Per Share	Dividend Yield	EV to EBITDA	Annual Stock Price Returns
	Link	Link	Link	Link	Link
ESG Score	None	Linear	Concave	None	None
Environmental score	None	None	None	None	None
Social Score	None	Convex	Concave	None	None
Governance Score	Concave	Concave	Convex	None	None

The earnings per share show a concave relationship with the governance score. Showing that there is an optimum threshold at which the EPS is maximised against the increasing governance score in which financial and non-financial stakeholders can be satisfied. Moving beyond the threshold value of governance score will decrease the EPS as companies would be taking the excess liquidity and investing it towards governance initiatives, which may deter some financial stakeholders.

Dividend per share shows a linear link with an increasing ESG score meaning that in Indian firms the dividends per share tend to increase for investors as they engage in more CSR initiatives. It shows a convex link with the increasing social score and concave with the governance. This shows that as the social scores increase, the DPS will decrease after a certain bottoming out threshold it will start to increase with rising social scores. However, governance scores show a concave link with DPS meaning that there is an optimal threshold at which financial stakeholders are satisfied after which an increasing governance score decreases the DPS for investors satisfying the non-financial stakeholders.

The dividend yield shows a concave link with the increasing ESG and social pillar score. This shows an optimal threshold at which investors can be satisfied after which point an increasing score satisfies the non-financial stakeholders and resources are taken away from dividends and invested towards CSR initiatives. With the increasing governance scores showing a convex relationship with DY.

Table 23: Summary of the relationship between CFP and ESG with turning points

	Market Cap to Total Sales	Price To Earnings Ratio	Tobin's Q	Weighted Average Cost of Capital	Current Ratio
	Link	Link	Link	Link	Link
ESG Score	None	None	Convex	None	Convex
Environmental score	Negative-linear	None	None	None	None
Social Score	None	None	Convex	None	None
Governance Score	Concave	None	None	None	Concave

Market cap to total sales shows a negative linear link with the environmental score showing that as companies continue to increase their environmental initiatives, their market cap to total sales seems to decrease while the governance score shows a concave link.

Tobin's Q shows a convex link with the ESG and social score meaning that a firm's value decreases as their ESG and social scores increase. However, after a point when they continue to rise, the firm value also rises. This could be because companies which start investing towards CSR initiatives see a deterioration in financial health as they are spending resources, but after they start getting recognised, they draw new investors and customers thereby increasing their firm value. Therefore, companies should continue to pursue CSR initiatives because over time, their firm value rises.

Current ratio shows a convex link with ESG score meaning that as companies keep engaging in CSR activities their ESG scores will grow and deteriorate the Current ratio based on slack resource theory. Which means companies utilise their short term assets to engage in CSR initiatives. However, as the ESG scores increase as well, their current assets will increase or current liabilities will decrease. An increasing governance score shows a concave link meaning that as companies increase their governance measures, the current liabilities might be increasing or the current assets decreasing. However, as they keep improving their governance pillar scores the current ratio in Indian companies improves.

5.4.3 Reverse Relation Regression

To test for the reverse relationship effect of financial performance on ESG scores and its pillars, shows how an increase in CFP can affect ESG performance. Furthermore, the evidence for the current ratio hypotheses H9 and H10 are also presented.

Table 24: Return on Assets effect on ESG, Environmental, Social and Governance Score

	ESG Score	Environmental Score	Social Score	Governance Score
Return on Assets$_{t-1}$	.306**	.382**	.408**	.41***
	(3.605)	(3.671)	(4.588)	(5.029)
Leverage Ratio	-17.465***	-13.435*	-22.423***	-5.075
	(-4.635)	(-2.763)	(-5.88)	(-.894)
Firm Size	7.217***	10.324***	9.943***	-.792*
	(8.696)	(8.492)	(12.575)	(-2.661)
R&D Intensity	22.906	-188.181**	69.417	76.861**
	(.56)	(-4.594)	(1.054)	(3.343)
cons	-38.579**	-84.594***	-65.507***	56.143***
	(-3.407)	(-5.099)	(-5.996)	(13.084)
Observations	539	539	539	539
R-squared	.25	.333	.355	.072

t-values are in parentheses
*** p<.01, ** p<.05, * p<.1

Based on the results above we can see that as the return on assets increase by one percentage point, the ESG and the three pillars scores also increase respectively. Therefore, as Indian companies increase their return on assets their ESG measures have increased as well.

Table 25: Return on Equity effect on ESG, Environmental, Social and Governance Score

	ESG Score	Environmental Score	Social Score	Governance Score
Return on Equity$_{t-1}$	.052	.075	.125**	.015
	(1.698)	(1.896)	(4.562)	(.404)
Leverage Ratio	-35.445***	-33.656***	-42.466***	-21.779**
	(-8.137)	(-6.072)	(-12.612)	(-3.591)
Firm Size	8.03***	11.197***	10.96***	-.538
	(9.197)	(9.05)	(15.097)	(-1.392)
R&D Intensity	36.318	-171.61**	88.138	80.386**
	(.948)	(-4.502)	(1.373)	(3.81)
cons	-44.96**	-91.199***	-74.635***	58.62***
	(-3.976)	(-5.607)	(-7.883)	(11.638)
Observations	532	532	532	532
R-squared	.266	.342	.38	.055

t-values are in parentheses
*** p<.01, ** p<.05, * p<.1

With an increasing return on equity, the only statistically significant effect is on the social scores which are increasing. Therefore, income generated from shareholder investments are being used towards the CSR initiatives geared towards social causes.

Table 26: Return on Invested Capital effect on ESG, Environmental, Social and Governance Score

	ESG Score	Environmental Score	Social Score	Governance Score
Return on Invested Capital$_{t-1}$	.057	.046	.154**	.028
	(1.632)	(.832)	(4.1)	(.73)
Leverage Ratio	-29.99***	-29.565***	-34.739***	-18.32**
	(-8.679)	(-6.704)	(-9.685)	(-3.29)
Firm Size	7.719***	10.849***	10.621***	-.675
	(9.881)	(9.36)	(15.691)	(-2.054)
R&D Intensity	34.35	-175.438***	88.023	80.323**
	(.893)	(-4.864)	(1.339)	(3.694)
cons	-41.549**	-86.599***	-71.299***	59.765***
	(-4.017)	(-5.486)	(-7.997)	(12.894)
Observations	535	535	535	535
R-squared	.254	.335	.368	.054

t-values are in parentheses

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

With an increasing return on invested capital, the social scores are increasing. whereas the others show statistically insignificant results.

Table 27: EITDA Margin effect on ESG, Environmental, Social and Governance Score

	ESG Score	Environmental Score	Social Score	Governance Score
EBITDA Margin$_{t-1}$	-.093**	-.171**	-.074*	-.008
	(-3.024)	(-4.044)	(-2.427)	(-.219)
Leverage Ratio	-27.901***	-25.536**	-36.633***	-19.258**
	(-6.162)	(-4.046)	(-8.214)	(-3.854)
Firm Size	7.392***	10.623***	10.058***	-.726*
	(8.401)	(8.225)	(12.239)	(-2.365)
R&D Intensity	23.546	-185.154***	69.543	75.516**
	(.631)	(-4.818)	(1.14)	(3.789)
cons	-34.576**	-79.589***	-59.658***	61.365***
	(-3.138)	(-4.847)	(-5.787)	(14.585)
Observations	540	540	540	540
R-squared	.244	.332	.342	.055

t-values are in parentheses

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

With an increasing EBITDA margin, the ESG, environmental and social scores are decreasing. This could be because the companies are repurposing the usage into the fields within the business other than CSR initiatives. In this case, a bigger amount of operating cash generated through operating revenue is being used elsewhere.

Table 28: NOPAT Margin effect on ESG, Environmental, Social and Governance Score

	ESG Score	Environmental Score	Social Score	Governance Score
NOPAT Margin$_{t-1}$	-.108	-.225**	-.094	.032
	(-1.559)	(-3.023)	(-1.699)	(.474)
Leverage Ratio	-30.73***	-29.579***	-39.365***	-18.386**
	(-7.449)	(-5.132)	(-11.602)	(-3.882)
Firm Size	7.784***	11.109***	10.55***	-.859*
	(9.418)	(9.324)	(13.209)	(-2.299)
R&D Intensity	40.324	-171.841***	83.033	95.329**

	(1.071)	(-4.634)	(1.366)	(4.58)
cons	-39.565**	-85.331***	-65.674***	62.217***
	(-3.856)	(-5.676)	(-6.444)	(13.041)
Observations	517	517	517	517
R-squared	.256	.345	.356	.062

t-values are in parentheses

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

The increasing NOPAT margin only affects the environmental scores based on the results showing a decrease in environmental score showing that net operating profits are being generated at the cost of their environmental initiatives, hence showing a negative effect.

Table 29: Earnings Per Share effect on ESG, Environmental, Social and Governance Score

	ESG Score	Environmental Score	Social Score	Governance Score
Earnings Per Share$_{t-1}$	.028	.033	.039	.007
	(1.116)	(1.487)	(1.263)	(.411)
Leverage Ratio	-28.2***	-26.028***	-36.091***	-20.176**
	(-6.814)	(-4.707)	(-9.259)	(-3.697)
Firm Size	7.364***	10.758***	10.148***	-1.123**
	(7.741)	(7.892)	(11.013)	(-3.29)
R&D Intensity	15.908	-195.267***	59.639	75.207**
	(.398)	(-4.83)	(.922)	(3.664)
cons	-36.56**	-85.193***	-63.217***	66.162***
	(-3.039)	(-4.827)	(-5.355)	(14.095)
Observations	537	537	537	537
R-squared	.245	.332	.345	.066

t-values are in parentheses

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

An increasing earnings per share does not show a statistically significant effect on the ESG or any of the constituent pillar scores.

Table 30: Dividends Per Share effect on ESG, Environmental, Social and Governance Score

	ESG Score	Environmental Score	Social Score	Governance Score
Dividend Per Share$_{t-1}$	.12	.128*	.21*	-.025
	(1.777)	(2.253)	(2.749)	(-.411)
Leverage Ratio	-26.038***	-23.204**	-31.852***	-21.883**
	(-6.203)	(-3.94)	(-9.574)	(-3.543)
Firm Size	7.468***	10.614***	10.184***	-.761*
	(7.793)	(7.71)	(10.694)	(-2.567)
R&D Intensity	29.785	-183.4***	77.775	80.371**
	(.819)	(-4.77)	(1.336)	(4.148)
cons	-38.671**	-84.228***	-65.411***	62.391***
	(-3.206)	(-4.841)	(-5.341)	(15.494)
Observations	541	541	541	541
R-squared	.251	.331	.363	.065

t-values are in parentheses

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

With an increasing dividend per share, the environmental and social scores show a statistically significant positive effect.

Table 31: Dividend Yield effect on ESG, Environmental, Social and Governance Score

	ESG Score	Environmental Score	Social Score	Governance Score
Dividend Yield$_{t-1}$	-1.403***	-1.042*	.445	-4.823***
	(-6.998)	(-2.406)	(1.594)	(-7.83)
Leverage Ratio	-32.052***	-29.205**	-36.327***	-31.592***
	(-6.579)	(-4.357)	(-8.102)	(-5.69)
Firm Size	7.995***	11.018***	9.84***	1.43*
	(8.16)	(7.328)	(10.628)	(2.667)
R&D Intensity	5.298	-201.452***	73.073	20.518
	(.132)	(-4.76)	(1.142)	(1.007)
cons	-41.192**	-85.516***	-59.032***	43.062***
	(-3.502)	(-4.705)	(-5.279)	(6.95)
Observations	541	541	541	541
R-squared	.247	.328	.338	.146

t-values are in parentheses

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

The increasing dividend yield, however, shows a decreasing ESG, environmental and governance score. This could be caused by the company's preference to reinvest its resources in paying out dividends towards its financial stakeholder thereby helping attract new investors rather than engaging in CSR based initiatives.

Table 32: EV to EBITDA effect on ESG, Environmental, Social and Governance Score

	ESG Score	Environmental Score	Social Score	Governance Score
EV to EBITDA$_{t-1}$	-.047	-.143**	-.094	.077*
	(-1.518)	(-3.51)	(-2.001)	(2.589)
Leverage Ratio	-28.731***	-27.832**	-38.024***	-18.336**
	(-6.522)	(-4.481)	(-9.37)	(-3.392)
Firm Size	7.048***	9.818***	9.524***	-.463
	(7.672)	(7.74)	(9.897)	(-1.391)
R&D Intensity	23.495	-194.823***	63.829	92.069**
	(.572)	(-4.942)	(.997)	(4.092)
cons	-30.924*	-69.677**	-52.324**	56.383***
	(-2.701)	(-4.409)	(-4.198)	(13.35)
Observations	540	540	540	540
R-squared	.244	.337	.346	.064

t-values are in parentheses

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

With an increased EV to EBITDA, the environmental score is decreasing while the governance score is increasing.Which means that as the enterprise value multiple rises the governance scores increase, however at the expense of an increased EV or decreasing EBITDA the environmental scores decrease.

Table 33: Annual Stock Price Returns effect on ESG, Environmental, Social and Governance Score

	ESG Score	Environmental Score	Social Score	Governance Score
Annual Stock Price Returns$_{t-1}$	-.026	-.025	-.039	.026

	(-1.091)	(-1.149)	(-1.541)	(.781)
Leverage Ratio	-27.043***	-26.094***	-35.464***	-16.519**
	(-7.799)	(-5.223)	(-10.312)	(-3.034)
Firm Size	6.734***	10.002***	9.304***	-1.063*
	(10.204)	(8.819)	(14.355)	(-2.394)
R&D Intensity	22.846	-195.805***	74.194	74.474**
	(.668)	(-4.701)	(1.356)	(3.064)
cons	-26.869**	-73.685***	-50.399***	65.788***
	(-3.344)	(-5.156)	(-6.175)	(10.761)
Observations	540	540	540	540
R-squared	.259	.332	.359	.074

t-values are in parentheses

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

The annualised stock price changes do not have an effect on the fluctuations of the ESG and its constituent pillar scores.

Table 34: Market Cap to Total Sales effect on ESG, Environmental, Social and Governance Score

	ESG Score	Environmental Score	Social Score	Governance Score
Market Cap to Total Sales$_{t-1}$	.561	-.687	.717*	1.106**
	(1.666)	(-1.893)	(2.424)	(3.767)
Leverage Ratio	-28.545***	-32.362***	-37.424***	-14.322*
	(-8.215)	(-6.918)	(-11.267)	(-2.56)
Firm Size	8.158***	10.636***	11.039***	-.043
	(11.052)	(8.924)	(14.759)	(-.107)
R&D Intensity	41.146	-181.931**	83.967	103.19***
	(.914)	(-4.515)	(1.232)	(4.651)
cons	-47.864***	-79.957***	-75.766***	48.274***
	(-4.956)	(-5.041)	(-7.647)	(8.842)
Observations	526	526	526	526
R-squared	.261	.334	.364	.066

t-values are in parentheses

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

The increasing market capitalization to total sales shows an increase in the social and governance scores. The social score could be attributed to the increasing benefits provided to the company's employees gaining from the higher market cap. Similarly, the increasing governance score could be attributed to the management and shareholder satisfaction of market cap increase as opposed to a decrease in total sales.

Table 35: Price to Earnings Ratio effect on ESG, Environmental, Social and Governance Score

	ESG Score	Environmental Score	Social Score	Governance Score
Price to Earnings Ratio$_{t-1}$	.026	-.057	.016	.051*
	(.848)	(-1.258)	(.394)	(2.25)
Leverage Ratio	-38.47***	-37.016***	-47.336***	-24.541**
	(-8.964)	(-6.81)	(-15.173)	(-3.786)
Firm Size	7.631***	10.621***	10.344***	-1.067*
	(8.702)	(8.92)	(12.369)	(-2.728)
R&D Intensity	32.675	-187.823**	80.687	89.177**

	(.81)	(-4.532)	(1.208)	(3.876)
cons	-38.78**	-79.512***	-63.658***	64.344***
	(-3.509)	(-5.169)	(-5.693)	(13.102)
Observations	490	490	490	490
R-squared	.254	.347	.36	.078

The increasing PE ratio only having an effect on the governance score could be attributed to the shareholder satisfaction metric. The others remain statistically insignificant.

Table 36: Tobin's Q effect on ESG, Environmental, Social and Governance Score

	ESG Score	Environmental Score	Social Score	Governance Score
Tobin's Q_{t-1}	1.086*	.568	1.399**	1.237**
	(2.362)	(1.069)	(3.023)	(2.806)
Leverage Ratio	-21.108***	-22.735**	-27.145***	-11.625
	(-5.338)	(-4.425)	(-6.906)	(-1.843)
Firm Size	8.101***	10.665***	11.093***	.274
	(7.116)	(6.442)	(10.161)	(.622)
R&D Intensity	27.764	-195.355***	77.459	90.803***
	(.704)	(-4.972)	(1.24)	(4.879)
cons	-49.289**	-85.025**	-79.525***	43.839***
	(-3.135)	(-3.725)	(-5.201)	(6.988)
Observations	540	540	540	540
R-squared	.26	.335	.359	.08

An increase in the firm value has a positive effect on the ESG, social and governance scores. This could be caused by one, the companies allocating more financial resources to the CSR initiatives; two, satisfying the various stakeholders as represented in the increasing governance score; three, taking care of other ESG initiatives to give the company wider appeal and attracting new stakeholders. Therefore, Indian companies show a trend of increasing the CSR practices as their firm value rises. Evidence to substantiate this is also given in the growth of firm size having a positive and statistically significant effect on the ESG, environmental and social score by 8.101, 10.3665 and 11.093 points respectively.

Table 37: Weighted Average Cost of Capital effect on ESG, Environmental, Social and Governance Score

	ESG Score	Environmental Score	Social Score	Governance Score
Weighted Average Cost of Capital$_{t-1}$	.324	.233	.625	-.091
	(.936)	(.505)	(1.39)	(-.212)
Leverage Ratio	-42.169***	-34.686**	-55.173***	-29.589**
	(-7.302)	(-3.885)	(-9.712)	(-4.581)
Firm Size	8.012***	11.169***	10.984***	-.785

	(8.24)	(7.922)	(13.102)	(-1.522)
R&D Intensity	15.683	-185.662**	65.098	55.305
	(.321)	(-4.089)	(.906)	(1.716)
cons	-41.593**	-89.362***	-69.626***	66.579***
	(-3.513)	(-5.508)	(-6.518)	(9.981)
Observations	496	496	496	496
R-squared	.262	.343	.376	.088

t-values are in parentheses

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

The WACC does not have a statistically significant effect on the ESG score or any of its constituent pillar scores.

Table 38: Current Ratio effect on ESG, Environmental, Social and Governance Score

	ESG Score	Environmental Score	Social Score	Governance Score
Current Ratio$_{t-1}$	3.344**	3.208**	2.809*	3.578**
	(3.225)	(2.78)	(2.768)	(3.94)
Leverage Ratio	-20.62**	-19.388*	-30.751***	-9.84
	(-3.754)	(-2.476)	(-5.508)	(-2.037)
Firm Size	7.392***	10.564***	10.11***	-.778*
	(9.011)	(8.535)	(12.384)	(-2.225)
R&D Intensity	11.626	-197.334***	60.809	62.16**
	(.288)	(-4.701)	(.956)	(3.402)
cons	-42.6**	-87.993***	-66.948***	54.902***
	(-4.283)	(-5.911)	(-6.992)	(9.498)
Observations	540	540	540	540
R-squared	.27	.341	.356	.076

t-values are in parentheses

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

To provide evidence for the ninth and tenth hypothesis, we see that a rising current ratio has a statistically and economically significant positive effect on the ESG and its constituent pillar scores representing that the more the short term liquidity of the firm rises, the more engagement Indian companies have with the CSR initiatives. Therefore, the null hypothesis can be rejected for the effect of current ratio on the ESG, environmental, social and governance scores.

A noted trend throughout these tables is that an increasing leverage ratio has a decreasing effect on all the scores which could be attributed to companies paying more for their loans as opposed to investing in CSR initiatives. The firm size shows a largely positive effect on the scores reflecting that as companies grow, they have more funds and resources to engage in CSR initiatives and conduct socially conscious investments. However, the governance scores show a negative relation which could be attributed to stakeholders having less visibility into the activities of the management team and thereby giving lower management and shareholder scores.

The increasing research and development conducted by firms shows a decreasing environmental score which can be attributed to companies conducting R&D that is detrimental to the environment. However, the governance scores all show positive effects with increased R&D. This could be attributed to the increase in shareholder and management team satisfaction due to business growth and development.

5.4.4 Reverse Relation using Lagged Control Variables

The results of the reverse causality using lagged control variables are almost the same as the one presented above. The result of these regressions equations are presented in Appendix I and the result tables are presented in Appendix K. Based on those outputs, the results of return on invested capital are the results which become statistically significant showing that the ESG score and governance score show a positive effect. This could be attributed to the fact that as the ROIC increases and as long as the firm size, leverage ratio and R&D intensity are not considered in the same time period, the ESG scores increase along with the governance scores.

As the EBITDA margin increases, the social scores become statistically insignificant. Similarly, the governance scores become insignificant for the EV to EBITDA margin. For the increasing market cap to total sales.

6. Conclusion and Discussion

The primary research question of this paper was to study the impact of Environmental, Social and Governance (ESG) scores on the Corporate Financial Performance (CFP) of Indian companies. In this study, CFP was measured using profitability, equity, cost of capital, firm value and slack resources. Based on the findings, we observe that in terms of profitability, there is a positive effect of ESG on Return on Assets and Return on Invested Capital; in terms of equity, an increasing ESG score increases the Dividend per Share and decreases the Dividend Yield and in terms of firm value, an increase in ESG score has a positive effect on the firm value represented by Tobin's Q. Furthermore, there is a strong statistical and therefore, economic significance in the idea that if slack resources increase, firms will have more resources at their disposal to utilise in CSR initiatives and hence, ESG scores are sure to increase. Additional tests that were undertaken to check for a curvilinear relationship show that there does exist one between ESG scores and one, Return on Assets which is convex; two, Tobin's Q which is convex; three, Dividend Yield which is concave and four, current ratio which is convex.

These findings indicate that:

Firstly, the level of community engagement and hence a firm's CSR initiatives lie on opposite ends of the spectrum. This is to say that firms either undertake a lot of CSR initiatives or partake in lesser CSR initiatives as reflected in the convex shape of the graph that plots ESG scores and Return on Assets which is true for the graphs of Tobin's Q and Current Ratio also. This finding is reflective of the Slack Resource Theory as when Return on Assets increases, it means that there will be a potential build-up of slack resources thereby increasing the Current Ratio. Due to an increase in these variables, the firm value will also increase and therefore show as an increase in Tobin's Q. The inference drawn is that an increase in ESG scores has a definite positive effect on the firm value.

Secondly, there might be a solution to the issues that are demonstrated in the Principal-Agent theory, on the question of whether firms should prioritise increasing ESG scores or not, and if they do, how much should they prioritise it. This study shows that a rise in ESG scores is a performance enhancing activity rather than being an agency cost. This is because CSR activities improve the firm's image thereby driving its financial growth and increasing firm value. Due to such effects, the divergent aims of a Principal and an Agent in a firm could be harmonised.

Thirdly, there exists an optimum threshold at which both the financial and non-financial stakeholder can be satisfied. This is because, over time, firms have managed to acquire enough financial resources to partake in CSR activities, which increases their ESG scores as well as Dividend Yields to its financial stakeholders. However, beyond the optimum threshold, if firms intend on undertaking more CSR activities in order to increase their ESG scores, they stand to disappoint their financial stakeholders as Dividend Yields will decrease. This finding is reflective of the Stakeholder Theory.

Lastly, a change in ESG scores will have no significant effect either on the Cost of Capital incurred by Indian companies or on their Annual Stock Price Returns.

These findings are relevant for many reasons, chief among them being one, the increase in the number of domestic retail investors in Indian markets and how they are absorbing the shock of foreign portfolio investors going away; two, the growing importance being given to Socially Responsible Investing (SRI) in India due to India's natural resources as well as the markets for those resources which are vulnerable due to India's geographical location and it being a catalyst for climate change induced effects; three, how India is one of the largest

growing economies in terms of population and economic measures like Purchasing Power Parity; four and possibly the most relevant, the introduction of a mandate by SEBI for companies to release a Business Responsibility and Sustainability Report (BRSR) effective from April 1, 2022. Together, these reasons make India an interesting case to study given the lack of research in this field.

The above findings can be considered valid and reliable as the ESG data used in this study was taken from Thomson Reuter which is the most updated and widely used data available in the public domain. Furthermore, this data is very comprehensive as it uses many subcategories under the main pillars of Environmental, Social and Governance thereby giving a holistic individual pillar as well as combined ESG score. The financial data, being extracted through FACTSET, makes it reliable as it is used by hedge funds, senior investors and the like. The fact that this financial data spans across the last ten years also makes it relevant for a study in today's time.

Furthermore, the methodology used in this study was the Fama Macbeth 1973 model which is a widely used and tested method for panel data and regression. This makes it a better choice than pooled OLS as it is likely to produce less biassed standard errors thereby making it more reliable.

Based on the findings of the additional tests conducted in this study to check for reverse effect, we see that in the last ten years, firms that have increased their Return on Assets, EBITDA, Tobin's Q, Current Ratio and hence, Slack Resources show an increase in ESG scores and hence, should continue to do so. An example of this is Gautam Adani group which has recently pledged to use 60000 cr rupees (7.7b $) towards CSR initiatives for healthcare, education and skill development across India (Sanjai, 2022).

While these findings are relevant for the domestic retail investor in India, the foreign portfolio investor and institutional investor alike, a few amendments can be made to the method when undertaking research on this topic. As SEBI mandate has come into effect from April 1, 2022 about firms releasing the Business Responsibility and Sustainability Report, when the same study is conducted next year, there will be more reliable and extensive data by SEBI itself for over a thousand companies which can be used for a more in-depth research. This research simply provides a starting point to that endeavour.

7. References

Abramson L and Chung D (2000), Socially Responsible Investing: Viable For Value Investors? The Journal of Investing, Vol. 9, No. 3, pp. 65-72. Abramson and Chung, 2009;

Aghi, M. (2020). India needs to look at ESG factors to attract major FDI investment: Mukesh Aghi. Retrieved 29 June 2022, from https://economictimes.indiatimes.com/news/economy/foreign-trade/india-needs-to-look-at-esg-factors-to-attract-major-fdi-investment-mukesh-aghi/articleshow/77687631.cms?from=mdr

Ahmad, N., Mobarek, A. & Roni, N.N. 2021. "Revisiting the Impact of ESG on Financial Performance of FTSE350 UK Firms: Static and Dynamic panel data analysis". Cogent Business & Management, vol. 8, no. 1.

Alexander, G.J., & Buchholz, R.A. (1978). Corporate Social Responsibility and Stock Market Performance. Academy of Management Journal, 21(3), 479-486. http://dx.doi.org/10.1016/0304- 405X(88)90053-0

Angel J and Rivoli P (1997), Does Ethical Investing Impose a Cost Upon a Firm? A Theoretical Examination, The Journal of Investing, Vol. 6, No. 4, pp. 57-61. ANI News, 2022

ANI News. (2022), India to remain fastest-growing major economy in the world during 2021-24, as per World Bank, IMF, says Economic Survey. Retrieved 31 March 2022, from https://www.aninews.in/news/national/general-news/india-to-remain-fastest-growing-major-economy-in-the-world-during-2021-24-as-per-world-bank-imf-says-economic-survey20220201011933/.

Arora, G. (2019). Do Increasing Dividend Pay-outs Have Adverse Effects on CSR Policies and Firm Value?. Retrieved 8 April 2022, from.

Asamoah, G. O. D. F. R. I. E. D. (2019). Relationship between corporate social responsibility and financial performance under slack resources theory: evidence from Ghanaian listed firms. Grasag E-Journal, 1(1), 23-49.

ASSET4 ESG User Manual. My.refinitiv.com. (2010). Retrieved 8 April 2022, from https://my.refinitiv.com/content/dam/myrefinitiv/productdoc/Asset4ESGProfessional_Guide.pdf.

Atan, R., Alam, M., Said, J., & Zamri, M. (2018). The impacts of environmental, social, and governance factors on firm performance. Management Of Environmental Quality: An International Journal, 29(2), 182-194. https://doi.org/10.1108/meq-03-2017-0033

Balatbat, M., Siew, R., & Carmichael, D. (2012). ESG scores and its influence on firm performance: Australian evidence. In Australian School of Business School of Accounting, School of Accounting Seminar Series Semester (Vol. 2, pp. 1-30). Australia: University of New South Wales, India.

Balatbat, MCA, Lin, CY and Carmichael, DG (2010), Comparative Performance of Publicly-listed Construction Companies: Australian Evidence, Construction Management and Economics, Vol. 28, No. 9, pp. 919-932.

Bassen, A., Meyer, K. and Schlange, J. (2006), "The influence of corporate responsibility on the cost of capital", November, available at: https://ssrn.com/abstract=984406; https://dx.doi.org/10.2139/ ssrn.984406

Barnett, M., & Solomon, R.M. (2006). Beyond Dichotomy: The Curvilinear Relationship Between Social Responsibility and Financial Performance. Strategic Management Journal, 27(11), 1101- 1122. http://dx.doi.org/10.1111/1467-6486.00252

Bauer, R., Gunster, N. and Otten, R. (2004), "Empirical evidence on corporate governance in Europe: the effect on stock returns, firm value and performance", Journal of Asset Management, Vol. 5 No. 2, pp. 91-104.

Bauer R, Derwall J and Otten, R (2007), The Ethical Mutual Fund Performance Debate: New Evidence from Canada, Journal of Business Ethics, Vol. 70, pp. 111-124.

Bauer, R. and Hann, D. (2010), "Corporate environmental management and credit risk", available at: https://ssrn.com/abstract=1660470; http://dx.doi.org/10.2139/ssrn.1660470

Bebchuk, L., Cohen, A. and Ferrell, A. (2010), "What matters in corporate governance?", The Review of Financial Studies, Vol. 22 No. 2, pp. 783-827.

Bellemare, M., Masaki, T., & Pepinsky, T. (2015). Lagged Explanatory Variables and the Estimation of Causal Effects. Retrieved 29 June 2022, from https://mpra.ub.uni-muenchen.de/62350/1/MPRA_paper_62350.pdf

Bhojraj, S. and Sengupta, P. (2003), "Effect of corporate governance on bond ratings and yields: the role of institutional investors and outside directors", Journal of Business, Vol. 76 No. 3, pp. 455-475.

Bnouni, I. (2010), "Corporate social responsibility (CSR) and financial performance (FP): case of french SMEs", PhD thesis, Sciences Management, University of Valenciennes and Hainaut Cambresis, Valenciennes.

Boston College Centre for Corporate Citizenship, 2009

Bourgeois, L. J. (1981). On the Measurement of Organizational Slack. Academy of Management Review 6: 29-39. http://dx.doi.org/10.1111/j.1467-6486.1992.tb00672.x

Bourgeois III, L. J., & Singh, J. V. (1983, August). Organizational Slack and Political Behavior Among Top Management Teams. In Academy of management proceedings (Vol. 1983, No. 1, pp. 43-47). Briarcliff Manor, NY 10510: Academy of Management.

Briand, R., Urwin, R. and Chia, C.P. (2011), "Integrating ESG into the investment process", MSCI ESG Research, New York, NY, available at: www.msci.com/resources/research_papers/ integrating_esg_into_the_investment_process_2.html (accessed 20 April 2013).

Brooks, Chris. 2008. Introductory Econometrics for Finance (2nd ed.).Cambridge. Cambridge University Press.

Buchholtz, A.K., Amason, A.C. and Rutherford, M.A. (1999), "Beyond resources: the mediating effect of top management discretion and values on corporate philanthropy", Business Society, Vol. 38 No. 2, pp. 167-87.

Capelle-Blancard, G. & Petit, A. 2017. "The Weighting of CSR Dimensions: One Size Does Not Fit All", Business & Society, vol. 56, no. 6, pp. 919-943.

Chen, M., von Behren, R., & Mussalli, G. (2021). The Unreasonable Attractiveness of More ESG Data. Retrieved 30 June 2022

Cheng, B., Ioannou, I., & Serafeim, G. (2014). Corporate social responsibility and access to finance. Strategic management journal, 35(1), 1-23.

Cho, C.H., Roberts, R.W. and Patten, D.M. (2010), "The language of US corporate environmental disclosure", Accounting, Organizations and Society, Vol. 35 No. 4, pp. 431-443.

Clarkson, P.M., Li, Y., Richardson, G.D. and Vasvari, F.P. (2008), "Revisiting the relation between environmental performance and environmental disclosure: an empirical analysis", Accounting, Organisations and Society, Vol. 33 No. 4, pp. 303-327.

Cormier, D. and Magnan, M. (2003), "Environmental reporting management: a continental European perspective", Journal of Accounting and public Policy, Vol. 22 No. 1, pp. 43-62.

De Bondt, G., & Diron, M. (2008). Investment, financing constraints and profit expectations: new macro evidence. Applied Economics Letters, 15(8), 577-581.

Deegan, C. (2002). Introduction: The legitimising effect of social and environmental disclosures–a theoretical foundation. Accounting, auditing & accountability journal.

Derwall, J., Gunster, N., Bauer, R. and Koedijk, K. (2004), "The eco-efficiency premium puzzle", ERIM Report Series Research in Management, Reference Number: ERS-2004-043-22 SASBE 2,1 Downloaded by 1.9.34.10 At 21:22 20 August 2015 (PT) FandA, Erasmus University, Netherlands, available at: http://papers.ssrn.com/sol3/papers. cfm?abstract_id¼551590 (accessed 20 April 2013).

Derwall, J., Guenster, N., Bauer, R. and Koedijk, K.C.G. (2005), "The eco-efficiency premium puzzle", Financial Analysts Journal, Vol. 61 No. 2, pp. 51-63.

Dobers, P., Halme, M., 2009. Corporate social responsibility and developing countries. Corp. Soc. Responsib. Environ. Manag. 16 (5), 237e249.

Du, S. & Yu, K. 2020. "Do Corporate Social Responsibility Reports Convey Value Relevant Information? Evidence from Report Readability and Tone". Journal of Business Ethics, 1-22.

Easley, D. and O'Hara, M. (2004), "Information and the cost of capital", Journal of Finance, Vol. 59 No. 4, pp. 1553-1583.

Eccles, R.G., Ioannou, I. and Serafeim, G. (2014), "The impact of corporate sustainability on organisational processes and performance", Management Science, Vol. 60 No. 11, pp. 2835-2857.

Edmans, A. (2007), "Does the stock market fully value intangibles? Employee satisfaction and equity prices", MIT working paper, MIT Sloan School of Management, Cambridge, MA.

Edmans, A. (2011). Does the stock market fully value intangibles? Employee satisfaction and equity prices. Journal of Financial economics, 101(3), 621-640.

El Khoury, R., Nasrallah, N., & Alareeni, B. (2021). ESG and financial performance of banks in the MENAT region: concavity–convexity patterns. Journal of Sustainable Finance & Investment, 1-25.

Elkington, J. (1998). Accounting for the triple bottom line. Measuring business excellence.

Ernst and Young (2002), "Global survey on corporate social responsibility", available at: www.ey.com/Global/content.nsf/Australia/News_Release_-Corporate_Social_Responsibility _ 26Aug02. (accessed 10 September 2011).

European Commission. 2021a. "Corporate Sustainability Reporting". Retrieved May 26, 2021, from https://ec.europa.eu/info/business-economy-euro/company-reporting-andauditing/company-reporting/corporate-sustainability-reporting_en

European Commission. 2021b. "Initiative on Substantiating Green Claims". Retrieved May 26, 2021, from https://ec.europa.eu/environment/eussd/smgp/initiative_on_green_claims.htm

European Commission. 2011. "Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and Committee of the Regions - A renewed EU strategy 2011-14 for Corporate Social Responsibility". Retrieved April 14, 2021, from https://eur-lex.europa.eu/legalcontent/EN/TXT/PDF/?uri=CELEX:52011DC0681&from=EN https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52011DC0681

Evans, J.R. and Peiris, D. (2010), "The relationship between environmental social governance factors and stock returns", UNSW Australian School of Business Research Paper No.2010ACTL02, The University of New South Wales, Sydney.

Ferell, A., Hao, L., & Renneboog, L. 2016. "Socially Responsible Firms", Journal of Financial Economics, vol. 122, no. 3, pp. 585-606.

Fisher-Vanden, K., & Thorburn, K. S. (2011). Voluntary corporate environmental initiatives and shareholder wealth. Journal of Environmental Economics and management, 62(3), 430-445.

Francis, J., Nanda, D. and Olsson, P. (2008), "Voluntary disclosure, earnings quality, and cost of capital", Journal of Accounting Research, Vol. 46 No. 1, pp. 53-88.

Freeman, R. E., & Evan, W. M. (1990). Corporate governance: A stakeholder interpretation. Journal of behavioral economics, 19(4), 337-359.

Freeman, R.E., McVea, J., 2000. A stakeholder approach to strategic management. In: Hitt, M., Freeman, E., Harrison, J. (Eds.), Handbook of Strategic Management. Blackwell Publishing, Oxford. Available at: http://papers.ssrn.com/paper.taf? abstract_id¼263511.

Friedman, M. (1962). Capitalism and Freedom. Chicago: University of Chicago Press.

Friedman, M. 1970. "The Social Responsibility of Business is to Increase its Profits". The New York Times Magazine, September 13, 1970. Retrieved April 20, 2021, from: http://faculty.wwu.edu/dunnc3/rprnts.friedman.dunn.pd

Forbes. (2022). Retrieved 29 June 2022, from https://www.forbes.com/billionaires/

Garcia, A. S., Mendes-Da-Silva, W., & Orsato, R. J. (2017). Sensitive industries produce better ESG performance: Evidence from emerging markets. Journal of cleaner production, 150, 135-147.

Gentry, R.J. and Shen, W. (2010), "The relationship between accounting and market measures of firm financial performance: how strong is it?", Journal of Managerial Issues, Vol. 22 No. 4, pp. 514-530.

Gerard, B. 2019. "ESG and Socially Responsible Investment: A Critical Review". Beta, vol. 33, no. 1, pp. 61-83.

González-Benito, J., & González-Benito, Ó. (2005). Environmental proactivity and business performance: an empirical analysis. Omega, 33(1), 1-15.

Godfrey, P.C., Merrill, C.B. and Hansen, J.M. (2009), "The relationship between corporate social responsibility and shareholder value: an empirical test of the risk management hypothesis", Strategic Management Journal, Vol. 30 No. 4, pp. 425-445.

Gompers, P.A., Ishii, J.L. and Metrick, A. (2003), "Corporate governance and equity prices", Quarterly Journal of Economics, Vol. 118 No. 1, pp. 107-155.

Goss, A. and Roberts, G.S. (2011), "The impact of corporate social responsibility on the cost of bank loans", Journal of Banking and Finance, Vol. 35 No. 7, pp. 1794-1810.

Graham, J.R., Harvey, C.R. and Rajgopal, S. (2005), "The economic implications of corporate financial reporting", Journal of Accounting and Economics, Vol. 40 Nos 1-3, pp. 3-37.

Gregory, A. and Whitaker, J. (2007), "Performance and performance persistence of ethical unit trusts in the UK", Journal of Business Finance and Accounting, Vol. 34 No. 7, pp. 1327-1344.

Gral, B. (2014). How Financial Slack Affects Corporate Performance. Wiesbaden: Springer Gabler.

Gujarati, D. N. 2003. Basic Econometrics. Fourth Edition. New York: McGraw-Hill Higher Education.

Hamilton, J. (1995), "Pollution as news: media and stock market reactions to the toxic release inventory data", Journal of Environmental Economics and Management, Vol. 28 No. 1, pp. 98-113.

Healy, P.M. and Palepu, K.G. (2001), "Information asymmetry, corporate disclosure, and the capital markets: a review of the empirical disclosure literature", Journal of Accounting and Economics, Vol. 31 Nos 1-3, pp. 405-440.

Hoepner, A.G.F., Rezec, M. and Siegl, K.S. (2011), "Does pension funds fiduciary duty prohibit the integration of environmental responsibility criteria in investment processes?: a realistic prudent investment test", available at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id ¼ 1930189. (accessed 25 November 2011).

Hsiao, Y. J., & Tsai, W. C. (2018). Financial literacy and participation in the derivatives markets. Journal of Banking & Finance, 88, 15-29.

Inderst, G. & Stewart, F. 2018. Incorporating Environmental, Social and Governance (ESG) Factors into Fixed Income Investment. The World Bank Group.

Jang, J.I., Lee, K. and Choi, H.S. (2013), "The relation between corporate social responsibility and financial performance: evidence from Korean firms", Pan-Pacific Journal of Business Research, Vol. 4 No. 2, pp. 3-17.

Jensen, M. (1986). Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. American Economic Review, 76(2), 323-329.

Jethmalani, H. 2021. "Covid was a Booster Shot for ESG Theme as Funds Saw High Inflows."   Mint. https://www.livemint.com/market/mark-to-market/covid-was-abooster-shot-for-esg-theme-as-funds-saw-high-inflows-11609868273888.html

Jones, T. M. (1995). Instrumental Stakeholder Theory: A Synthesis of Ethics and Economics. Academy of Management Review, 20(2), 404-437.

Joshi, P. (2021). The India ESG story is gradually beginning to unfold | The Financial Express. Financialexpress.com. Retrieved 7 April 2022, from https://www.financialexpress.com/brandwagon/the-india-esg-story-is-gradually-beginning-to-unfold/2390093/

Khanna, A. (2022). New Sebi rules set the stage for formal adoption of ESG from April 1. The Economic Times. Retrieved 4 April 2022, from https://economictimes.indiatimes.com/markets/stocks/news/new-sebi-rules-set-the-stage-for-formal-adoption-of-esg-from-april-1/articleshow/90510524.cms.

Kim, J., Chung, S. and Park, C. (2013), "Corporate social responsibility and financial performance: the impact of the MSCI ESG ratings on Korean firms", Journal of the Korea Academia – Industrial Cooperation Society, Vol. 14 No. 11, pp. 5586-5593.

Kjellberg, S., Pradhan, T., & Kuh, T. 2019. "An Evolution in ESG Indexing. BlackRock". Retrieved May 10, 2021, from: https://www.ishares.com/us/literature/whitepaper/an-evolution-in-esg-indexing.pdf

Klement, J. (2021). How to lower your cost of capital using ESG. Retrieved 30 June 2022, from https://klementoninvesting.substack.com/p/how-to-lower-your-cost-of-capital#:~:text=A%20team%20of%20researchers%20from,and%20improve%20its%20ESG%20ratings

KPMG (2005), "KPMG international survey of corporate responsibility reporting", KPMG International, available at: www.kpmg.com.au/Portals/0/KPMG%20Survey%202005_3.pdf . (accessed 7 April 2022).

Lamb, N. H. & Butler, F. C. 2018. "The Influence of Family Firms and Institutional Owners on Corporate Social Responsibility Performance". Business and Society, vol. 57, no. 7, pp. 1374-1406.

Lanis, R. and Richardson, G. (2013), "Corporate social responsibility and tax aggressiveness: a test of legitimacy theory", Accounting, Auditing & Accountability Journal, Vol. 26 No. 1, pp. 75-100.

Lenka, S. (2017). The relationship between company returns and leverage depending on the business sector: Empirical evidence from the Czech Republic. Journal of Competitiveness, 9(3), 98-110.

Li, S. & Lu, J. W. 2020. "A Dual-Agency Model of Firm CSR in Response to Institutional Pressure: Evidence from Chinese Publicly Listed Firms". Academy of Management Journal, vol. 63, no. 6, pp. 2004-2032.

Maier, S. (2007). Valuing ESG issues–a survey of investors. EIRIS Survey Briefing, 1-6.

Manescu, C. (2011), "Economic implications of corporate social responsibility and responsible investments", Masters thesis, Department of Economics School of Business, Economics and Law, University of Gothenburg, Gothenburg.

McGuire, J. B., Scheneeweiss, T., & Branch, B. (1990). Perception of Firm Quality: A Cause or Result of Firm Performance. Journal of Management, 16(1), 167-180.

McWilliams, A., & Siegel, D. (2000). Corporate social responsibility and financial performance: correlation or misspecification? Strategic Management Journal, 21, 603-609.

McWilliams, A. & Siegel, D. 2001. "Corporate Social Responsibility: A Theory of the Firm Perspective". The Academy of Management Review, vol. 26, no. 1, pp. 117-127.

McWilliams, A., Siegel, D. S., & Wright, P. M. (2006). Corporate social responsibility: Strategic implications. Journal of management studies, 43(1), 1-18.

Miles, M.P. and Covin, J.G. (2000) "Environmental marketing: A source of reputational, competitive, and financial Advantage" Journal of Business Ethics; 23, 3: 299 - 311

Mishra, S. and Suar, D. (2010), "Does corporate social responsibility influence firm performance of Indian companies?", Journal of Business Ethics, Vol. 95 No. 4, pp. 571-601.

Miralles-Quirós, M. M., J. L. Miralles-Quirós, and L. M. Valente Gonçalves. (2018). "The Value Relevance of Environmental, Social, and Governance Performance: The Brazilian Case." Sustainability 10 (3): 574. doi:10.3390/su10030574.

Murugaboopathy, P., & Dogra, G. (2021). India has fewer ESG funds than other top 10 economies. Reuters. Retrieved 2 April 2022, from https://www.reuters.com/business/sustainable-business/india-has-fewer-esg-funds-than-other-top-10-economies-2021-08-26/.

Nag, D. (2021). Massive infra boost! Check these 22 upcoming Greenfield projects under Bharatmala Pariyojana Phase 1 | The Financial Express. Retrieved 29 June 2022, from https://www.financialexpress.com/infrastructure/roadways/massive-infra-boost-check-these-22-upcoming-greenfield-projects-under-bharatmala-pariyojana-phase-1/2356336/

Narayanan, B. (2021). ESG investment: SEBI paper gives clarity on the concept. Thehindubusinessline.com. Retrieved 30 March 2022, from https://www.thehindubusinessline.com/markets/stock-markets/esg-investment-sebi-paper-gives-clarity-on-the-concept/article37234402.ece.

North Eastern Region District SDG Index and Dashboard. (2021). NITI Ayog, 2021-22. Retrieved from https://www.niti.gov.in/sites/default/files/2021-08/NER_SDG_Index_NITI_26082021.pdf

O" Bannon, D. P. & Preston, L. E. (1997). The Corporate Social-Financial Performance Relationship: A Typology and Analysis, Business and Society, 36 (4), 419-429.

Oehri O and Faush J (2008), Microfinance Investment Funds - Analysis of Portfolio Impact, World MicroFinance Forum, Geneva, No. 6, viewed 22 November 2011

Olsson, R. (2007), "Portfolio performance and environmental risk", Sustainable Investment Research Platform Working Papers, available at: http://web.abo.fi/fak/esf/fei/redovisa/ 24 SASBE 2,1 Downloaded by 1.9.34.10 At 21:22 20 August 2015 (PT) kurser/Lasse/Mistra%20wp/sirp%20wp%2007-04%20-%20olsson.pdf. (accessed 7 April 2022).

O'Neill, J. (2012). O mapa do crescimento: oportunidades econômicas nos BRICs e além deles. Globo Livros.

Orlitzky, M., Schmidt, F.M. and Reynes, S.L. (2003), "Corporate social and financial performance: a meta-analysis", Organization Studies, Vol. 24 No. 3, pp. 403-441.

Orlitzky, M., & Benjamin, J. D. (2001). Corporate social performance and firm risk: A meta-analytic review. Business & Society, 40(4), 369-396.

Orsato, R. J., Garcia, A., Mendes-Da-Silva, W., Simonetti, R., & Monzoni, M. (2015). Sustainability indexes: why join in? A study of the 'Corporate Sustainability Index (ISE)'in Brazil. Journal of Cleaner Production, 96, 161-170.

Pandya, D. (2022). Implementing Sebi's ESG framework tough for Indian companies: Rating agency. Business-standard.com. Retrieved 8 April 2022, from https://www.business-standard.com/article/companies/implementing-sebi-s-esg-framework-to ugh-for-indian-companies-rating-agency-122021000471_1.html.

Penman, S. H., Richardson, S. A., & Tuna, I. (2007). The book‑to‑price effect in stock returns: accounting for leverage. Journal of accounting research, 45(2), 427-467.

Pickwick, A., & Sewelén, J. (2021). The Impact of ESG Scores on Firm Performance: A Comparison of the European Market Before and After the 2008 Financial Crisis.

Poelloe, A. (2010), "Is there a trade-off between social responsibility and financial performance", Masters thesis in Economics and Business, Erasmus University Rotterdam, Rotterdam.

Pope J, Annandale D and Morrison-Saunders A (2004), Conceptualising Sustainability Assessment, Environmental Impact Assessment Review, Vol. 24, No. 6, pp. 595-616.

Porter, M. and Kramer, M.R. (2011), "The big idea: creating shared value", Harvard Business Review, Vol. 89 Nos 1/2, pp. 62-77.

Preston, L. E., & O" Bannon, D. P. (1997). The Corporate Social-Financial Performance Relationship: A Typology and Analysis, Business and Society, 36 (4), 419-429.

Prior, D., Surroca, J. and Tribó, J.A. (2008), "Are socially responsible managers really ethical? Exploring the relationship between earnings management and corporate social responsibility", Corporate Governance: An International Review, Vol. 16 No. 3, pp. 160-177.

PTI. (2021). JAM trinity proved to be game-changer, helped reach out to people during pandemic: FM Nirmala Sitharaman. The Economic Times. Retrieved 7 April 2022, from https://economictimes.indiatimes.com/news/economy/policy/jam-trinity-proved-to-be-game-changer-helped-reach-out-to-people-during-pandemic-fm-nirmala-sitharaman/articleshow/86259816.cms

PTI. (2022b). India, fastest-growing major economy, projected to grow 6.4% in 2022: UN. Retrieved 29 June 2022, from https://www.business-standard.com/article/current-affairs/india-retains-top-spot-as-fastest-growing-major-economy-un-report-122051900021_1.html#:~:text=India%2C%20fastest%2Dgrowing%20major%20economy,2022%3A%20UN%20%7C%20Business%20Standard%20News

Rahdari, A.H., 2016. Developing a fuzzy corporate performance rating system: a petrochemical industry case study. J. Clean. Prod. 131, 42-434.

Robert, M.A., & Goss 2011. BP and the Gulf of Mexico Oil Spill. Harvard Cases, Product #W11366-PDF-ENG.

Ross, S. 1973. "The Economic Theory of Agency: The Principal's Problem". American Economic Review vol. 63, no. 2, pp. 134-39.

Raynard, P., Forstater, M., 2002. Corporate Social Responsibility: Implications for Small and Medium Enterprises in Developing Countries. United Nations Industrial Development Organization. Retrieved on August 11, 2016 from. www. unido.org/userfiles/BethkeK/csr.pdf.

Sadri, J., & Sharma, R. (2015). Showing the Mirror to Indian Business and Actualizing CSR Initiatives - ProQuest. Retrieved 30 June 2022, from https://www.proquest.com/openview/db3def0739e619bc7c9c9c70bad19eb1/1?pq-origsite=gscholar&cbl=1796425

Sanjai, P. (2014). Philanthropy in India, an age-old tradition. Retrieved 29 June 2022, from https://www.livemint.com/Specials/91k22CWjd0CU36or3ezHoN/Philanthropy-in-India-an-ageold-tradition.html

Sanjai, P. (2022). Richest Asian Adani Pledges $7.7 Billion for Social Causes. Retrieved 28 June 2022, from

https://www.bloomberg.com/news/articles/2022-06-23/adani-richest-asian-pledges-7-7-billion-for-social-causes

Sarangi, G. K. (2021). Resurgence of ESG Investments in India: Toward a Sustainable Economy.

Scott, D.L. (2003), Wall Street Words: An A to Z Guide to Investment Terms for Today's Investor, Houghton Mifflin Company, Boston, MA.

SEBI. (2021). SEBI issues Circular on "Business Responsibility and Sustainability Reporting by listed entities". Retrieved 8 April 2022, from https://www.sebi.gov.in/media/press-releases/may-2021/sebi-issues-circular-on-business-responsibility-and-sustainability-reporting-by-listed-entities-_50097.html.

Servon, L. J., & Kaestner, R. (2008). Consumer financial literacy and the impact of online banking on the financial behavior of lower‑income bank customers. Journal of Consumer Affairs, 42(2), 271-305.

Simpson, W.G. and Kohers, T. (2002), "The link between corporate social and financial performance: evidence from the banking industry", Journal of Business Ethics, Vol. 35 No. 2, pp. 97-109.

Sivaramakrishnan, S., Srivastava, M., & Rastogi, A. (2017). Attitudinal factors, financial literacy, and stock market participation. International Journal of Bank Marketing.

Suchman, M. 1995. Managing Legitimacy: Strategic and Institutional Approaches. Academy of Management Review, vol. 20, no. 3, pp. 571-611

The Hindu Business Line. (2021). Why farm income in India is so low. Retrieved 29 June 2022, from https://www.thehindubusinessline.com/opinion/why-farm-income-in-india-is-so-low/article37075687.ece#:~:text=The%20all%2DIndia%20scene,%2C22%2C616%20in%202018%2D19.

The Hindu, (2022). Retail investors acting like shock absorbers in stock market: Nirmala Sitharaman. Retrieved 29 June 2022, from https://www.thehindu.com/business/markets/retail-investors-acting-like-shock-absorbers-in-stock-market-nirmala-sitharaman/article65503076.ece

The World Bank. (2022). As Global Growth Slows, Developing Economies Face Risk of 'Hard Landing'. Retrieved 30 June 2022, from

https://www.worldbank.org/en/news/feature/2022/01/11/developing-economies-face-risk-of-hard-landing-as-global-growth-slows

Thomson Reuters ESG Scores User Manual. (2018). Retrieved 8 April 2022, from http://zeerovery.nl/blogfiles/esg-scores-methodology.pdf.

United Nations. 2021. What is CSR? Retrieved April 14, 2021, from https://www.unido.org/our-focus/advancing-economic-competitiveness/competitive-tradecapacities-and-corporate-responsibility/corporate-social-responsibility-marketintegration/what-csr

Waddock, S. and Graves, S. (1997), "The corporate social performance-financial performance link", Strategic Management Journal, Vol. 18 No. 4, pp. 303-319.

Wang, Q., Dou, J., & Jia, S. 2015. "A Meta-Analytic Review of Corporate Social Responsibility and Corporate Financial Performance: The Moderating Effect of Contextual Factors". Business & Society, vol. 55, no. 8, pp. 1083-1121.

Why ESG is here to stay. McKinsey and Company. (2020). Retrieved 6 April 2022, from https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/why-esg-is-here-to-stay.

Wood, D.J. (2010), "Measuring corporate social performance: a review", International Journal of Management Reviews, Vol. 12 No. 1, pp. 50-84.

Appendix A - Thomson Reuter ESG Score Pillars

Pillar	Category Score	Definition
Environmental	Resource Use Score	The Resource Use Score reflects a firm's performance and capacity to reduce the use of materials, energy or water, and to find more eco-efficient solutions by improving supply chain management.
	Emissions Score	The Emission Reduction Score measures a firm's commitment and effectiveness towards reducing environmental emission in the production and operational processes.
	Innovation Score	The Innovation Score reflects a firm's capacity to reduce the environmental costs and burdens for its customers, and thereby creating new market opportunities through new environmental technologies and processes or eco-designed products.
Social	Workforce Score	The Workforce Score measures a firm's effectiveness towards job satisfaction, a healthy and safe workplace, maintaining diversity and equal opportunities, and development opportunities for its workforce.
	Human Rights Score	The Human rights category score measures a firm's effectiveness towards respecting the fundamental human rights conventions.
	Community Score	The Community Score measures the firm's commitment towards being a good citizen, protecting public health and respecting business ethics.
	Product Responsibility Score	The Product Responsibility Score reflects a firm's capacity to produce quality goods and services integrating the customer's health and safety, integrity and data privacy.
Governance	Management Score	The Management Score measures a firm's commitment and effectiveness towards following best practice corporate governance principles.
	Shareholders Score	The Shareholders Score measures a firm's effectiveness towards equal treatment of the shareholders and the use of anti-takeover devices.
	CSR Strategy Score	The CSR Strategy Score reflects a firm's practices to communicate that it integrates the economic (financial), social and environmental dimensions into its day-to-day decision-making processes.

Source: Thomson Reuter User Manual (2018)

Appendix B: Accounting Based Ratios and Formulas

Measure	Formula
Return on equity (ROE)	$\dfrac{Net\ profit\ after\ tax}{Shareholders\ Equity-Outside\ equity\ interest}$
Return on assets (ROA)	$\dfrac{Net\ profit\ after\ tax}{Total\ assets-Outside\ equity\ interest}$
Return on Invested Capital (ROIC)	$\dfrac{Net\ operating\ profit\ less\ adjusted\ taxes}{Operating\ invested\ capital\ before\ goodwill}$
Earnings before interest tax depreciation and amortisation (EBITDA) margin	$\dfrac{EBITDA}{Operating\ Revenue}$
Net Operating profit less adjusted taxes (NOPAT) margin	$\dfrac{NOPAT}{Operating\ Revenue}$
Earnings per share (EPS)	$\dfrac{Net\ profit\ after\ tax-Preference\ dividends}{Average\ number\ of\ ordinary\ shares}$
Dividend per share (DPS)	$\dfrac{Ordinary\ dividends}{Number\ of\ ordinary\ shares}$
Dividend yield (DY)	$\dfrac{Dividend\ per\ share}{Market\ price\ per\ share}$
Price to earnings ratio (PE)	$\dfrac{Market\ price\ per\ share}{Earnings\ per\ share}$
Market Capitalization to total sales ratio (MC/TS)	$\dfrac{Market\ Capitalisation}{Total\ Sales}$
Enterprise value (EV to EBITDA)	$\dfrac{Common\ equity+Debt+Minority\ interest+Preferred\ equity-cash}{EBITDA}$

Source: Investopedia and CFA Institute

Appendix C Instructions for Calculating ESG Pillar Scores

Thomson Reuters Pillar Scores Calculations

ESG Pillar scores are calculated based on the ten category scores. Calculations to derive pillar scores are illustrated below:

Pillar	Category Score	Category Scores*	Category Weights	Sum of Category Weights	Formula: Sum of Category Weights	New Category Weights*	Formula: New Category Weights	Pillar Scores	Formula: Pillar Scores
Environmental	Resource Use	72.57	11%		(11%+12%+11%)	32.35%	(11%/34%)		72.56637*0.3235 294+86.504425* 0.3529412+73.67 256*0.3235294
Environmental	Emissions	86.50	12%	34%		35.29%	(12%/34%)	77.84	
Environmental	Innovation	73.67	11%			32.35%	(11%/34%)		
Social	Workforce	90.93	16%		(16%+4.5%+8%+7%)	45.07%	(16%/35.5%)		90.9292*0.450 7042+78.09735 *0.1267606+77. 65487*0.22535 21+35.61947*0.1 971831
Social	Human Rights	78.10	4.50%			12.68%	(4.5%/35.5%)		
Social	Community	77.65	8%	35.50%		22.54%	(8%/35.5%)	75.41	
Social	Product Responsibility	35.62	7%			19.72%	(7%/35.5%)		
Corporate Governance	Management	47.25	19%		(19%+7%+4.5%)	62.30%	(19%/30.5%)		47.24774*62.295 08+32.87462*22. 95082+90.67278 *14.7541
Corporate Governance	Shareholders	32.87	7%	30.50%		22.95%	(7%/30.5%)	50.36	
Corporate Governance	CSR Strategy	90.67	4.50%			14.75%	(4.5%/30.5%)		

* 5 decimal places to be considered

Detailed calculations are available here.

Steps:

o   Sum of Category Weights: Sum each category weight of respective pillars.

Calculation to derive sum of category weights is illustrated below:

– Environmental Pillar Categories = Resource use (11%) + Emissions (12%) + Innovation (11%) = 34%

– Social Pillar Categories = Workforce (16%) + Human Rights (4.50%) + Community (8%) + Product Responsibility (7%) = 35.50%.

– Corporate Governance Categories = Management (19%) + Shareholders (7%) + CSR Strategy (4.50%) = 30.50%.

o   New Category Weights: New category weights are calculated based on the sum of category weights calculated above.

New category weights = Category Weights divided by Sum of category weights of respective pillar.

Calculation of new category weights for Environmental Pillar is as below:

– Resource use new category weight = 11% divided by 34% = 32%

– Emission new category weight = 12% divided by 34% = 35%

– Innovation new category weight = 11% divided by 34% = 32% (Similarly Social and Corporate Governance new category weights are calculated).

o   Pillar Score Calculation: Category Scores multiplied by new category weights = Pillar Scores.

Calculation of Environmental Pillar Score is as below:

– Resource Use Score*32% + Emission Score*35% + Innovation Score*32% = 77.84357106 (Environmental Pillar Score). (Similarly Social and Corporate Governance Pillar Scores are calculated).

*Note: Pillar scores are available only on desktop products.

Appendix D List of Companies

NAME	ISIN CODE	Industry
ACC	INE012A01025	Construction Materials
ADANI ENTERPRISES	INE423A01024	Wholesale Distributors
ADANI GREEN ENERGY	INE364U01010	Electric Utilities
ADANI PORTS AND SEZ.	INE742F01042	Other Transportation
ADANI TOTAL GAS	INE399L01023	Gas Distributors
ADANI TRANSMISSIONS LTD	INE931S01010	Electric Utilities
ADITYA FASH.& RETAIL	INE647O01011	Apparel/Footwear Retail
AIA ENGINEERING	INE212H01026	Industrial Machinery
AMBUJA CEMENTS	INE079A01024	Construction Materials
APOLLO HOSPS.ENTERPRISE	INE437A01024	Hospital/Nursing Management
APOLLO TYRES	INE438A01022	Automotive Aftermarket
ASHOK LEYLAND	INE208A01029	Trucks/Construction/Farm Machinery
ASIAN PAINTS	INE021A01026	Industrial Specialties
AUROBINDO PHARMA	INE406A01037	Pharmaceuticals: Other
AVENUE SUPERMARTS	INE192R01011	Specialty Stores
AXIS BANK	INE238A01034	Regional Banks
BAJAJ AUTO	INE917I01010	Motor Vehicles
BAJAJ FINANCE	INE296A01024	Finance/Rental/Leasing
BAJAJ FINSERV	INE918I01018	Life/Health Insurance
BALKRISHNA INDUSTRIES	INE787D01026	Auto Parts: OEM
BANDHAN BANK	INE545U01014	Major Banks
BANK OF BARODA	INE028A01039	Major Banks
BANK OF INDIA	INE084A01016	Major Banks
BATA INDIA	INE176A01028	Apparel/Footwear
BERGER PAINTS INDIA	INE463A01038	Industrial Specialties
BHARAT ELECTRONICS	INE263A01024	Aerospace & Defense
BHARAT FORGE	INE465A01025	Metal Fabrication
BHARAT HEAVY ELS.	INE257A01026	Electrical Products
BHARAT PETROLEUM	INE029A01011	Oil Refining/Marketing
BHARTI AIRTEL	INE397D01024	Wireless Telecommunications
BIOCON	INE376G01013	Pharmaceuticals: Major
BLUE STAR	INE472A01039	Industrial Machinery
BOSCH	INE323A01026	Auto Parts: OEM
BRITANNIA INDS.	INE216A01030	Food: Specialty/Candy
CANARA BANK	INE476A01014	Regional Banks
CESC	INE486A01021	Electric Utilities
CHOLAMANDALAM INV.& FIN.	INE121A01024	Finance/Rental/Leasing
CIPLA	INE059A01026	Pharmaceuticals: Other
CITY UNION BANK	INE491A01021	Regional Banks
COAL INDIA	INE522F01014	Coal
COFORGE	INE591G01017	Information Technology Services

COLGATE-PALMOLIVE INDIA	INE259A01022	Household/Personal Care
CONTAINER CORP.OF INDIA	INE111A01025	Railroads
CRMPTN.GREAVES CSM.ELEC	INE299U01018	Electronics/Appliances
CUMMINS INDIA	INE298A01020	Trucks/Construction/Farm Machinery
DABUR INDIA	INE016A01026	Household/Personal Care
DALMIA BHARAT	INE00R701025	Miscellaneous Manufacturing
DIVIS LABORATORIES	INE361B01024	Pharmaceuticals: Major
DLF	INE271C01023	Real Estate Development
DR REDDYS LABORATORIES	INE089A01023	Pharmaceuticals: Major
EICHER MOTORS	INE066A01021	Trucks/Construction/Farm Machinery
EXIDE INDUSTRIES	INE302A01020	Auto Parts: OEM
FEDERAL BANK	INE171A01029	Regional Banks
GAIL (INDIA)	INE129A01019	Gas Distributors
GLENMARK PHARMACEUTICALS	INE935A01035	Pharmaceuticals: Major
GMR INFRASTRUCTURE	INE776C01039	Other Transportation
GODREJ CONSUMER PRODUCTS	INE102D01028	Household/Personal Care
GRASIM INDUSTRIES	INE047A01021	Construction Materials
GUJARAT STATE PETRONET	INE246F01010	Gas Distributors
HAVELL'S INDIA	INE176B01034	Electrical Products
HCL TECHNOLOGIES	INE860A01027	Information Technology Services
HDFC ASSET MANAGEMENT COMPANY	INE127D01025	Investment Managers
HDFC BANK	INE040A01034	Regional Banks
HDFC LIFE INSURANCE COMPANY	INE795G01014	Multi-Line Insurance
HERO MOTOCORP	INE158A01026	Motor Vehicles
HINDALCO INDUSTRIES	INE038A01020	Other Metals/Minerals
HINDUSTAN PETROLEUM	INE094A01015	Oil Refining/Marketing
HINDUSTAN UNILEVER	INE030A01027	Household/Personal Care
HOUSING DEV.&.INFR.	INE191I01012	Real Estate Development
HOUSING DEVELOPMENT FINANCE CORPORATION	INE001A01036	Finance/Rental/Leasing
ICICI BANK	INE090A01021	Regional Banks
ICICI LMD.GEN.INCM.	INE765G01017	Specialty Insurance
ICICI PRUDENTIAL LIFE INSURANCE COMPANY	INE726G01019	Life/Health Insurance
IDFC	INE043D01016	Finance/Rental/Leasing
IDFC FIRST BANK	INE092T01019	Regional Banks
INDIABULLS HOUSING FIN	INE148I01020	Finance/Rental/Leasing
INDIABULLS REAL ESTATE	INE069I01010	Real Estate Development
INDIAN HOTELS	INE053A01029	Hotels/Resorts/Cruiselines
INDIAN OIL	INE242A01010	Oil Refining/Marketing
INDRAPRASTHA GAS	INE203G01027	Oil & Gas Pipelines
INDUS TOWERS	INE121J01017	Specialty Telecommunications
INDUSIND BANK	INE095A01012	Regional Banks
INEOS STYROLUTION INDIA	INE189B01011	Chemicals: Specialty
INFO EDGE (INDIA)	INE663F01024	Internet Software/Services
INFOSYS	INE009A01021	Information Technology Services

INTERGLOBE AVIATION	INE646L01027	Airlines
IPCA LABORATORIES	INE571A01038	Pharmaceuticals: Major
ITC	INE154A01025	Tobacco
JAIPRAKASH ASSOCIATES	INE455F01025	Industrial Conglomerates
JINDAL STEEL & POWER	INE749A01030	Steel
JK CEMENT	INE823G01014	Construction Materials
JSW STEEL	INE019A01038	Steel
JUBILANT FOODWORKS	INE797F01012	Restaurants
KOTAK MAHINDRA BANK	INE237A01028	Financial Conglomerates
LARSEN & TOUBRO	INE018A01030	Engineering & Construction
LARSEN & TOUBRO INFOTECH	INE214T01019	Information Technology Services
LIC HOUSING FINANCE	INE115A01026	Finance/Rental/Leasing
LUPIN	INE326A01037	Pharmaceuticals: Other
MAHA.& MAHA.FINL.SVS.	INE774D01024	Finance/Rental/Leasing
MAHINDRA & MAHINDRA	INE101A01026	Motor Vehicles
MANAPPURAM FINANCE	INE522D01027	Finance/Rental/Leasing
MARICO	INE196A01026	Household/Personal Care
MARUTI SUZUKI INDIA	INE585B01010	Motor Vehicles
MOTHERSON SUMI SYS.	INE775A01035	Auto Parts: OEM
MPHASIS	INE356A01018	Information Technology Services
MRF	INE883A01011	Automotive Aftermarket
MUTHOOT FINANCE	INE414G01012	Finance/Rental/Leasing
NATIONAL ALUMINIUM	INE139A01034	Aluminum
NCC	INE868B01028	Engineering & Construction
NESTLE INDIA	INE239A01016	Food: Major Diversified
NTPC	INE733E01010	Electric Utilities
OBEROI REALTY	INE093I01010	Real Estate Development
OIL & NATURAL GAS	INE213A01029	Integrated Oil
OIL INDIA	INE274J01014	Oil & Gas Production
PAGE INDUSTRIES	INE761H01022	Apparel/Footwear
PETRONET L N G	INE347G01014	Oil & Gas Pipelines
PHOENIX MILLS	INE211B01039	Engineering & Construction
PI INDUSTRIES	INE603J01030	Chemicals: Specialty
PIDILITE INDUSTRIES	INE318A01026	Industrial Specialties
PIRAMAL ENTERPRISES	INE140A01024	Investment Managers
POWER FINANCE	INE134E01011	Finance/Rental/Leasing
POWER GRID CORPORATION OF INDIA	INE752E01010	Alternative Power Generation
PRESTIGE ESTATES PRJS.	INE811K01011	Homebuilding
PVR	INE191H01014	Movies/Entertainment
RBL BANK	INE976G01028	Major Banks
REC	INE020B01018	Finance/Rental/Leasing
RELIANCE CAPITAL	INE013A01015	Investment Banks/Brokers
RELIANCE COMMUNICATIONS	INE330H01018	Major Telecommunications
RELIANCE INDUSTRIES	INE002A01018	Oil Refining/Marketing

RELIANCE INFRASTRUCTURE	INE036A01016	Electric Utilities
RELIANCE POWER	INE614G01033	Electric Utilities
SBI CARDS & PAYMENT SERVICES	INE018E01016	Major Banks
SBI LIFE INSURANCE COMPANY	INE123W01016	Life/Health Insurance
SHREE CEMENT	INE070A01015	Construction Materials
SHRIRAM TRANSPORT FINANCE COMPANY	INE721A01013	Finance/Rental/Leasing
SIEMENS	INE003A01024	Electrical Products
STATE BANK OF INDIA	INE062A01020	Regional Banks
STEEL AUTHORITY OF INDIA	INE114A01011	Steel
SUN PHARM.INDUSTRIES	INE044A01036	Pharmaceuticals: Major
SUZLON ENERGY	INE040H01021	Alternative Power Generation
TATA CHEMICALS	INE092A01019	Chemicals: Agricultural
TATA COMMUNICATIONS	INE151A01013	Major Telecommunications
TATA CONSULTANCY SVS.	INE467B01029	Information Technology Services
TATA CONSUMER PRODUCTS	INE192A01025	Food: Specialty/Candy
TATA MOTORS	INE155A01022	Motor Vehicles
TATA POWER	INE245A01021	Electric Utilities
TATA STEEL	INE081A01012	Steel
TECH MAHINDRA	INE669C01036	Information Technology Services
THE RAMCO CEMENTS	INE331A01037	Construction Materials
THERMAX	INE152A01029	Industrial Machinery
TITAN COMPANY	INE280A01028	Other Consumer Specialties
TORRENT PHARMACEUTICALS	INE685A01028	Pharmaceuticals: Major
TRENT	INE849A01020	Apparel/Footwear Retail
ULTRATECH CEMENT	INE481G01011	Construction Materials
UNITECH	INE694A01020	Homebuilding
UNITED BREWERIES	INE686F01025	Beverages: Alcoholic
UNITED SPIRITS	INE854D01024	Beverages: Alcoholic
UPL	INE628A01036	Chemicals: Agricultural
VAKRANGEE	INE051B01021	Internet Retail
VARDHMAN TEXTILES	INE825A01020	Textiles
VEDANTA	INE205A01025	Aluminum
VODAFONE IDEA	INE669E01016	Wireless Telecommunications
VOLTAS	INE226A01021	Engineering & Construction
WIPRO	INE075A01022	Information Technology Services
WOCKHARDT	INE049B01025	Pharmaceuticals: Major
YES BANK	INE528G01035	Regional Banks
ZEE ENTERTAINMENT ENTS.	INE256A01028	Movies/Entertainment
ZYDUS LIFESCIENCES	INE010B01027	Pharmaceuticals: Major

Appendix E Glossary of Financial Variables and Metrics

Acronym	Name	Definition
ROA	Return on Assets	Measures the profitability and the effectiveness of companies in utilising their assets to generate profits.
ROE	Return on Equity	Gives the real return on shareholder's invested capital.
ROIC	Return on Invested Capital	Reflects the effectiveness of a company in allocating its money and investing in its operations.
EBITDA	EBITDA Margin	Provides an indication of cash flows in a company and is normally used by Analysts to assess corporate performance.
NOPAT	NOPAT Margin	Provides an indication of how healthy a business is in generating profit without too much reliance on borrowing to fund its profit generating activities.
EPS	Earnings Per Share	Is perceived to be an important indicator in determining the share price of a company.
DPS	Dividends Per Share	As profit is generated by companies, they can either make the choice of retaining them in pursuit of future profitable opportunities or choose to distribute them to their shareholders. Effectively, DPS is the total sum of dividends paid annually for every ordinary share issued.
DY	Dividend Yield	Is given as dividend per share over market price per share.
EVEBITDA	EV to EBITDA	EV represents the total value of a business debt free. This measure is used by analysts in evaluating the worth of a company typically in mergers and acquisitions.
ASPR	Annual Stock Price Returns	The difference in stock return year to year and looking at the percentage change in share price.
MCTS	Market Cap to Total Sales	Investors are always seeking ways to compare the value of stocks. The price-to-sales ratio utilizes a company's market capitalization and revenue to determine whether the stock is valued properly. The lower the P/S ratio, the more attractive the investment.
PE	Price to Earnings Ratio	Is used to depict whether the share price of a company is overvalued as given by a higher PE ratio, or undervalued as given by a lower PE ratio.
TOBINQ	Tobin's Q	Measures whether a firm or an aggregate market is relatively overvalued or undervalued. It is the measure of a firms valuation.
WACC	Weighted average cost of capital	Is a formula that gives insight into how much interest a company owes for each dollar it finances.

		Analysts use WACC to assess the value of an investment.
CR	Current Ratio	The current ratio is a liquidity ratio that measures a company's ability to pay short-term obligations or those due within one year. It tells investors and analysts how a company can maximise the current assets on its balance sheet to satisfy its current debt and other payables.

Source: Investopedia and CFA Institute (These are glossary definitions and have been copied from Investopedia and CFA as this acts as a glossary/dictionary)

Appendix F Pairwise Correlation Matrix for the CFP Measures

Variables	ROA	ROE	ROIC	EBITDA	NOPAT	EPS	DPS	DY	EVEBITDA	MCTS	PE	TOBINQ	WACC	CR	ASPR
ROA	1.000														
ROE	0.159***	1.000													
ROIC	0.857***	0.179***	1.000												
EBITDA	0.034	0.009	0.002	1.000											
NOPAT	0.064**	0.059**	0.015	0.159***	1.000										
EPS	0.115***	0.025	0.088***	0.001	-0.016	1.000									
DPS	0.367***	0.053***	0.320***	-0.014	-0.020	0.395***	1.000								
DY	0.065***	0.041*	0.082***	0.098***	0.002	-0.044*	0.145***	1.000							
EVEBITDA	0.079***	0.016	0.040	0.000	0.059**	-0.005	0.040	-0.074***	1.000						
MCTS	0.270***	0.173***	0.204***	0.170***	0.124***	-0.006	0.147***	-0.169***	0.314***	1.000					
PE	-0.058**	-0.029	-0.048*	-0.038	-0.032	-0.016	-0.012	-0.056**	0.078***	-0.003	1.000				
TOBINQ	0.641***	0.088***	0.578***	-0.042	0.008	-0.005	0.352***	-0.133***	0.193***	0.110***	0.031	1.000			
WACC	0.014	-0.011	-0.004	-0.020	-0.023	-0.001	-0.004	0.041	-0.052*	-0.033	-0.022	-0.059**	1.000		
CR	0.312***	0.114***	0.202***	0.036	0.012	0.003	0.089***	0.022	0.007	0.181***	-0.027	-0.031	0.043	1.000	
ASPR	0.006	0.064***	0.016	-0.013	0.014	-0.002	-0.038	-0.079***	0.016	0.130***	0.008	0.194***	0.307***	0.003	1.000

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

Appendix G Regression Equations for Lagged Control Variables

Profitability Based Measures

$$ROA_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$ROE_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$ROIC_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$EBITDA_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$NOPAT_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$ROA_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 LEV_{i,t-1} + \beta_5 DEBT_{i,t-1} + \beta_6 RND_{i,t-1}$$

$$ROE_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 LEV_{i,t-1} + \beta_5 DEBT_{i,t-1} + \beta_6 RND_{i,t-1}$$

$$ROIC_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 LEV_{i,t-1} + \beta_5 DEBT_{i,t-1} + \beta_6 RND_{i,t-1}$$

$$EBITDA_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 LEV_{i,t-1} + \beta_5 DEBT_{i,t-1} + \beta_6 RND_{i,t-1}$$

$$NOPAT_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 LEV_{i,t-1} + \beta_5 DEBT_{i,t-1} + \beta_6 RND_{i,t-1}$$

Equity Based Measures

$$EPS_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$DPS_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$DY_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$PE_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$EV_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$MC/TS_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$EPS_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t-1} + \beta_5 LEV_{i,t-1} + \beta_6 RND_{i,t-1}$$

$$DPS_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t-1} + \beta_5 LEV_{i,t-1} + \beta_6 RND_{i,t-1}$$

$$DY_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t-1} + \beta_5 LEV_{i,t-1} + \beta_6 RND_{i,t-1}$$

$$PE_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t-1} + \beta_5 LEV_{i,t-1} + \beta_6 RND_{i,t-1}$$

$$EV_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t-1} + \beta_5 LEV_{i,t-1} + \beta_6 RND_{i,t-1}$$

$$MC/TS_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t-1} + \beta_5 LEV_{i,t-1} + \beta_6 RND_{i,t-1}$$

Firm Value using Tobin's Q

$$Tobin'sQ_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$Tobin'sQ_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t-1} + \beta_5 LEV_{i,t-1} + \beta_6 RND_{i,t-1}$$

Price Returns.

$$Price\ Returns_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$Price\ Returns_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t-1} + \beta_5 LEV_{i,t-1} + \beta_6 RND_{i,t-1}$$

Cost of Capital

$$WACC_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$WACC_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t-1} + \beta_5 LEV_{i,t-1} + \beta_6 RND_{i,t-1}$$

Current Ratio

$$CR_{i,t} = \alpha + \beta_1 ESG_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$CR_{i,t} = \alpha + \beta_1 ENV_{i,t-1} + \beta_2 SOC_{i,t-1} + \beta_3 GOV_{i,t-1} + \beta_4 SIZE_{i,t-1} + \beta_5 LEV_{i,t-1} + \beta_6 RND_{i,t-1}$$

Appendix H Reverse Relation Regression Equation

Return on Assets

$$ESG_{i,t} = \alpha + \beta_1 ROA_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$ENV_{i,t} = \alpha + \beta_1 ROA_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$SOC_{i,t} = \alpha + \beta_1 ROA_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$GOV_{i,t} = \alpha + \beta_1 ROA_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

Return on Equity

$$ESG_{i,t} = \alpha + \beta_1 ROE_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$ENV_{i,t} = \alpha + \beta_1 ROE_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$SOC_{i,t} = \alpha + \beta_1 ROE_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$GOV_{i,t} = \alpha + \beta_1 ROE_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

Return on Invested Capital

$$ESG_{i,t} = \alpha + \beta_1 ROIC_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$ENV_{i,t} = \alpha + \beta_1 ROIC_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$SOC_{i,t} = \alpha + \beta_1 ROIC_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$GOV_{i,t} = \alpha + \beta_1 ROIC_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

EBITDA Margin

$$ESG_{i,t} = \alpha + \beta_1 EBITDA_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$ENV_{i,t} = \alpha + \beta_1 EBITDA_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$SOC_{i,t} = \alpha + \beta_1 EBITDA_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$GOV_{i,t} = \alpha + \beta_1 EBITDA_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

NOPAT Margin

$$ESG_{i,t} = \alpha + \beta_1 NOPAT_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$ENV_{i,t} = \alpha + \beta_1 NOPAT_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$SOC_{i,t} = \alpha + \beta_1 NOPAT_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$GOV_{i,t} = \alpha + \beta_1 NOPAT_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

Earnings Per Share

$$ESG_{i,t} = \alpha + \beta_1 EPS_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$ENV_{i,t} = \alpha + \beta_1 EPS_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$SOC_{i,t} = \alpha + \beta_1 EPS_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$GOV_{i,t} = \alpha + \beta_1 EPS_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

Dividend Per Share

$$ESG_{i,t} = \alpha + \beta_1 DPS_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$ENV_{i,t} = \alpha + \beta_1 DPS_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$SOC_{i,t} = \alpha + \beta_1 DPS_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$GOV_{i,t} = \alpha + \beta_1 DPS_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

Dividend Yield

$$ESG_{i,t} = \alpha + \beta_1 DY_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$ENV_{i,t} = \alpha + \beta_1 DY_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$SOC_{i,t} = \alpha + \beta_1 DY_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$GOV_{i,t} = \alpha + \beta_1 DY_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

EV to EBITDA

$$ESG_{i,t} = \alpha + \beta_1 EVEBITDA_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$ENV_{i,t} = \alpha + \beta_1 EVEBITDA_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$SOC_{i,t} = \alpha + \beta_1 EVEBITDA_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$GOV_{i,t} = \alpha + \beta_1 EVEBITDA_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

Annual Stock Price Return

$$ESG_{i,t} = \alpha + \beta_1 ASPR_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$ENV_{i,t} = \alpha + \beta_1 ASPR_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$SOC_{i,t} = \alpha + \beta_1 ASPR_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$GOV_{i,t} = \alpha + \beta_1 ASPR_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

Market Cap to Total Sales

$$ESG_{i,t} = \alpha + \beta_1 MCTS_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$ENV_{i,t} = \alpha + \beta_1 MCTS_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$SOC_{i,t} = \alpha + \beta_1 MCTS_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$GOV_{i,t} = \alpha + \beta_1 MCTS_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

Price to Earnings Ratio

$$ESG_{i,t} = \alpha + \beta_1 PE_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$ENV_{i,t} = \alpha + \beta_1 PE_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$SOC_{i,t} = \alpha + \beta_1 PE_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$GOV_{i,t} = \alpha + \beta_1 PE_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

Tobin's Q

$$ESG_{i,t} = \alpha + \beta_1 TOBINQ_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$ENV_{i,t} = \alpha + \beta_1 TOBINQ_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$SOC_{i,t} = \alpha + \beta_1 TOBINQ_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$GOV_{i,t} = \alpha + \beta_1 TOBINQ_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

Weighted Average Cost of Capital

$$ESG_{i,t} = \alpha + \beta_1 WACC_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$ENV_{i,t} = \alpha + \beta_1 WACC_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$SOC_{i,t} = \alpha + \beta_1 WACC_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$GOV_{i,t} = \alpha + \beta_1 WACC_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

Current Ratio

$$ESG_{i,t} = \alpha + \beta_1 CR_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$ENV_{i,t} = \alpha + \beta_1 CR_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$SOC_{i,t} = \alpha + \beta_1 CR_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

$$GOV_{i,t} = \alpha + \beta_1 CR_{i,t-1} + \beta_2 SIZE_{i,t} + \beta_3 LEV_{i,t} + \beta_4 RND_{i,t}$$

Appendix I Reverse Relation Lagged Control Variable Regression Equations

Return on Assets

$$ESG_{i,t} = \alpha + \beta_1 ROA_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$ENV_{i,t} = \alpha + \beta_1 ROA_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$SOC_{i,t} = \alpha + \beta_1 ROA_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$GOV_{i,t} = \alpha + \beta_1 ROA_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

Return on Equity

$$ESG_{i,t} = \alpha + \beta_1 ROE_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$ENV_{i,t} = \alpha + \beta_1 ROE_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$SOC_{i,t} = \alpha + \beta_1 ROE_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$GOV_{i,t} = \alpha + \beta_1 ROE_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

Return on Invested Capital

$$ESG_{i,t} = \alpha + \beta_1 ROIC_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$ENV_{i,t} = \alpha + \beta_1 ROIC_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$SOC_{i,t} = \alpha + \beta_1 ROIC_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$GOV_{i,t} = \alpha + \beta_1 ROIC_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

EBITDA Margin

$$ESG_{i,t} = \alpha + \beta_1 EBITDA_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$ENV_{i,t} = \alpha + \beta_1 EBITDA_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$SOC_{i,t} = \alpha + \beta_1 EBITDA_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$GOV_{i,t} = \alpha + \beta_1 EBITDA_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

NOPAT Margin

$$ESG_{i,t} = \alpha + \beta_1 NOPAT_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$ENV_{i,t} = \alpha + \beta_1 NOPAT_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$SOC_{i,t} = \alpha + \beta_1 NOPAT_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$GOV_{i,t} = \alpha + \beta_1 NOPAT_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

Earnings Per Share

$$ESG_{i,t} = \alpha + \beta_1 EPS_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$ENV_{i,t} = \alpha + \beta_1 EPS_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$SOC_{i,t} = \alpha + \beta_1 EPS_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$GOV_{i,t} = \alpha + \beta_1 EPS_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

Dividend Per Share

$$ESG_{i,t} = \alpha + \beta_1 DPS_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$ENV_{i,t} = \alpha + \beta_1 DPS_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$SOC_{i,t} = \alpha + \beta_1 DPS_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$GOV_{i,t} = \alpha + \beta_1 DPS_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

Dividend Yield

$$ESG_{i,t} = \alpha + \beta_1 DY_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$ENV_{i,t} = \alpha + \beta_1 DY_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$SOC_{i,t} = \alpha + \beta_1 DY_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$GOV_{i,t} = \alpha + \beta_1 DY_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

EV to EBITDA

$$ESG_{i,t} = \alpha + \beta_1 EVEBITDA_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$ENV_{i,t} = \alpha + \beta_1 EVEBITDA_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$SOC_{i,t} = \alpha + \beta_1 EVEBITDA_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$GOV_{i,t} = \alpha + \beta_1 EVEBITDA_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

Annual Stock Price Return

$$ESG_{i,t} = \alpha + \beta_1 ASPR_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$ENV_{i,t} = \alpha + \beta_1 ASPR_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$SOC_{i,t} = \alpha + \beta_1 ASPR_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$GOV_{i,t} = \alpha + \beta_1 ASPR_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

Market Cap to Total Sales

$$ESG_{i,t} = \alpha + \beta_1 MCTS_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$ENV_{i,t} = \alpha + \beta_1 MCTS_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$SOC_{i,t} = \alpha + \beta_1 MCTS_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$GOV_{i,t} = \alpha + \beta_1 MCTS_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

Price to Earnings Ratio

$$ESG_{i,t} = \alpha + \beta_1 PE_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$ENV_{i,t} = \alpha + \beta_1 PE_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$SOC_{i,t} = \alpha + \beta_1 PE_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$GOV_{i,t} = \alpha + \beta_1 PE_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

Tobin's Q

$$ESG_{i,t} = \alpha + \beta_1 TOBINQ_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$ENV_{i,t} = \alpha + \beta_1 TOBINQ_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$SOC_{i,t} = \alpha + \beta_1 TOBINQ_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$GOV_{i,t} = \alpha + \beta_1 TOBINQ_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

Weighted Average Cost of Capital

$$ESG_{i,t} = \alpha + \beta_1 WACC_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$ENV_{i,t} = \alpha + \beta_1 WACC_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$SOC_{i,t} = \alpha + \beta_1 WACC_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$GOV_{i,t} = \alpha + \beta_1 WACC_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

Current Ratio

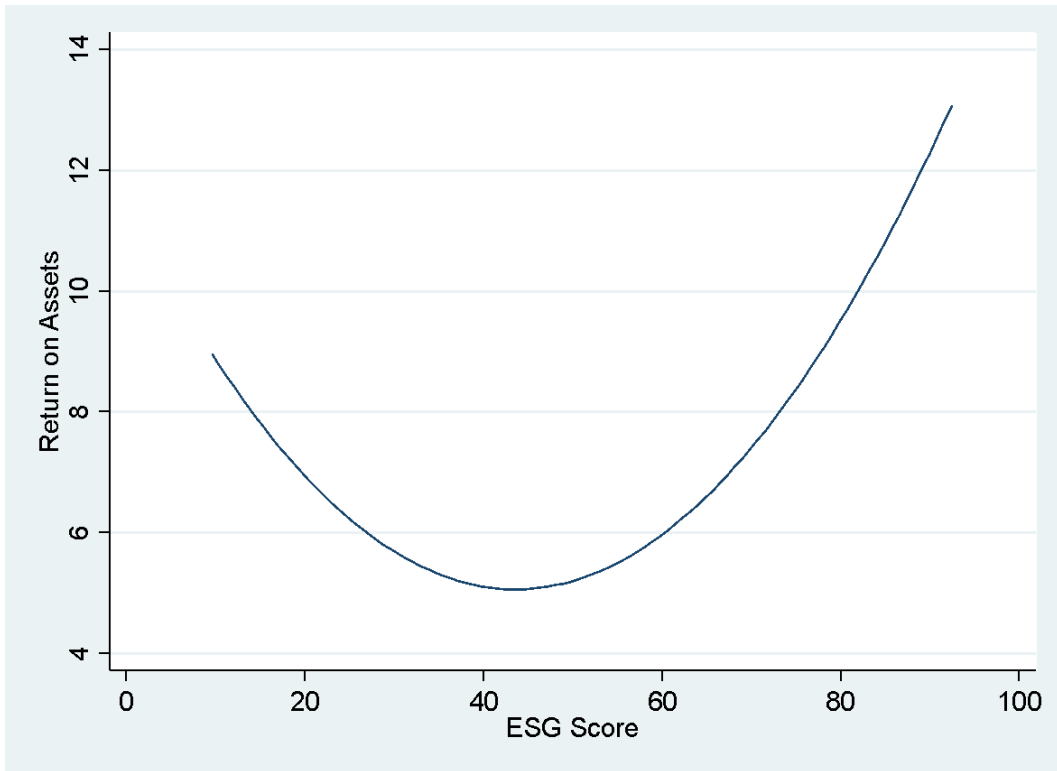$$ESG_{i,t} = \alpha + \beta_1 CR_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$ENV_{i,t} = \alpha + \beta_1 CR_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

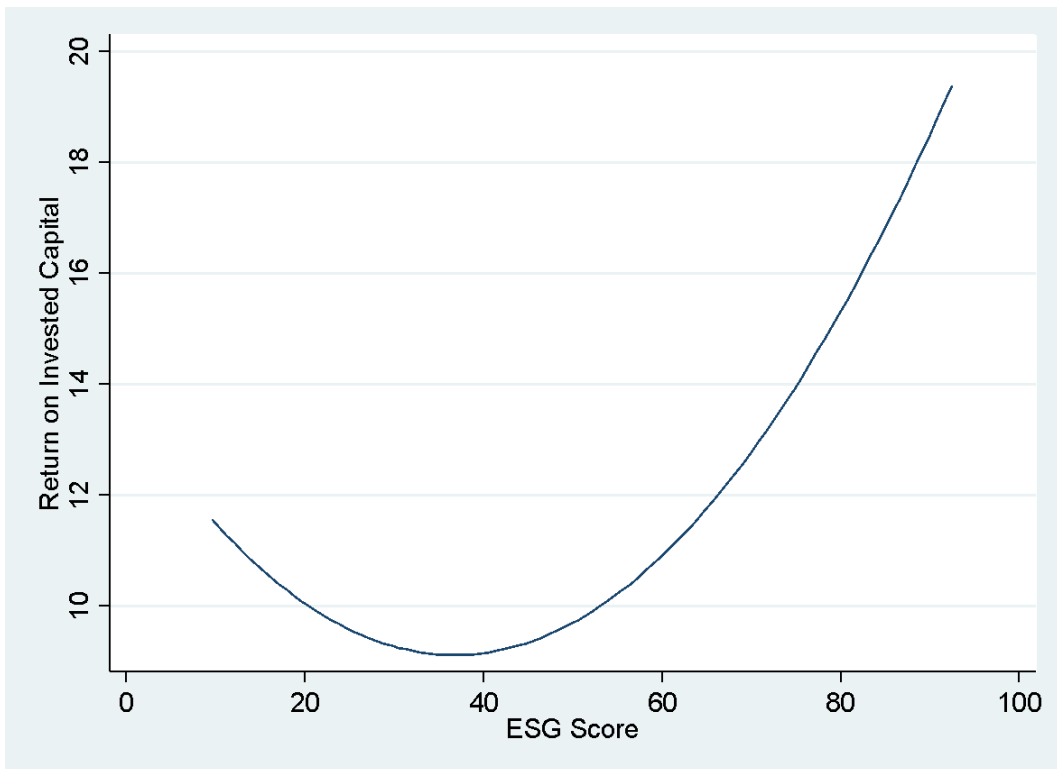$$SOC_{i,t} = \alpha + \beta_1 CR_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

$$GOV_{i,t} = \alpha + \beta_1 CR_{i,t-1} + \beta_2 SIZE_{i,t-1} + \beta_3 LEV_{i,t-1} + \beta_4 RND_{i,t-1}$$

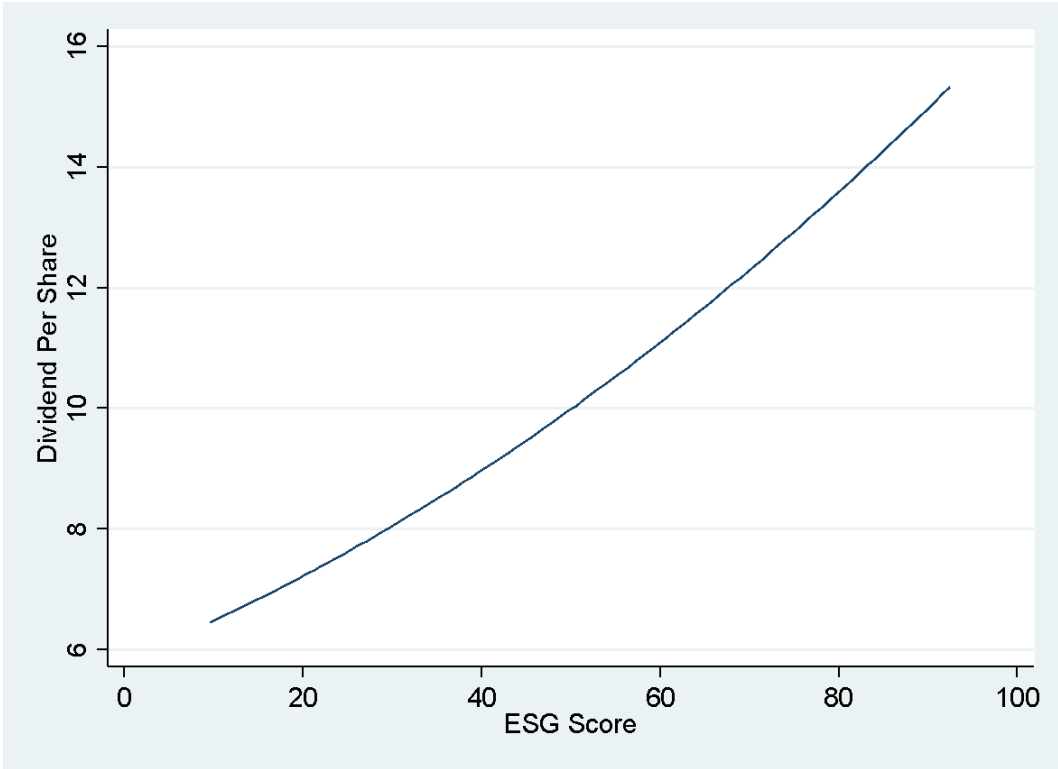# Appendix J Curve linear relation graphs for CFP and ESG
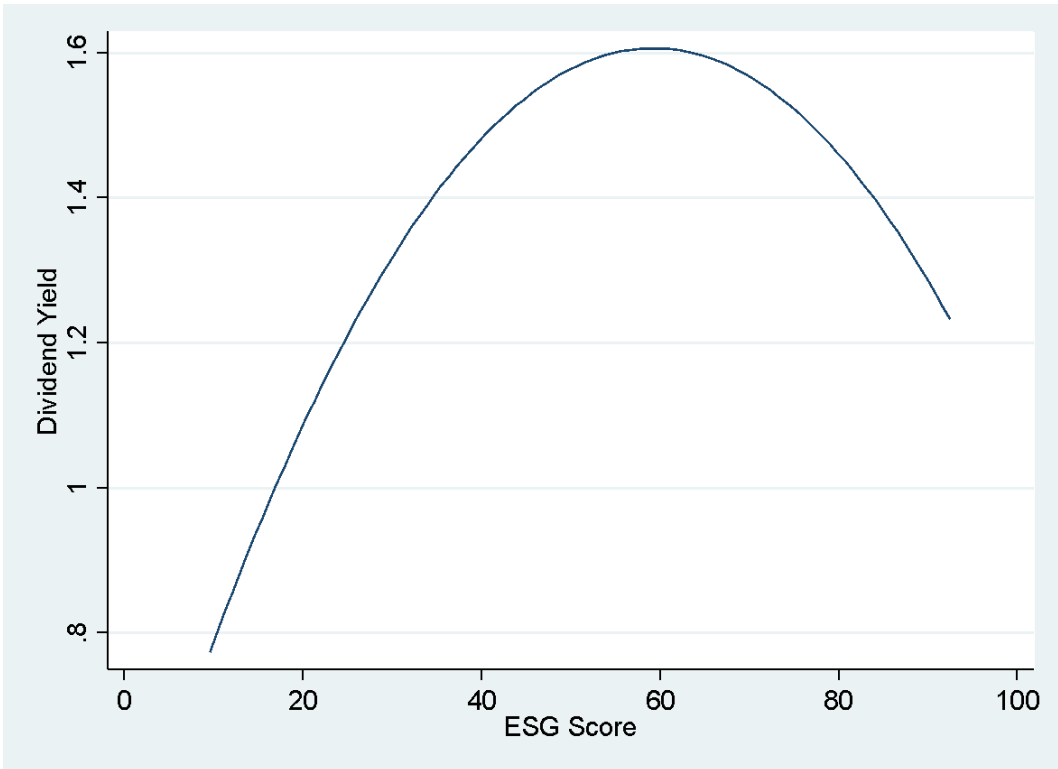
Graph 1: Return on Assets and ESG Score

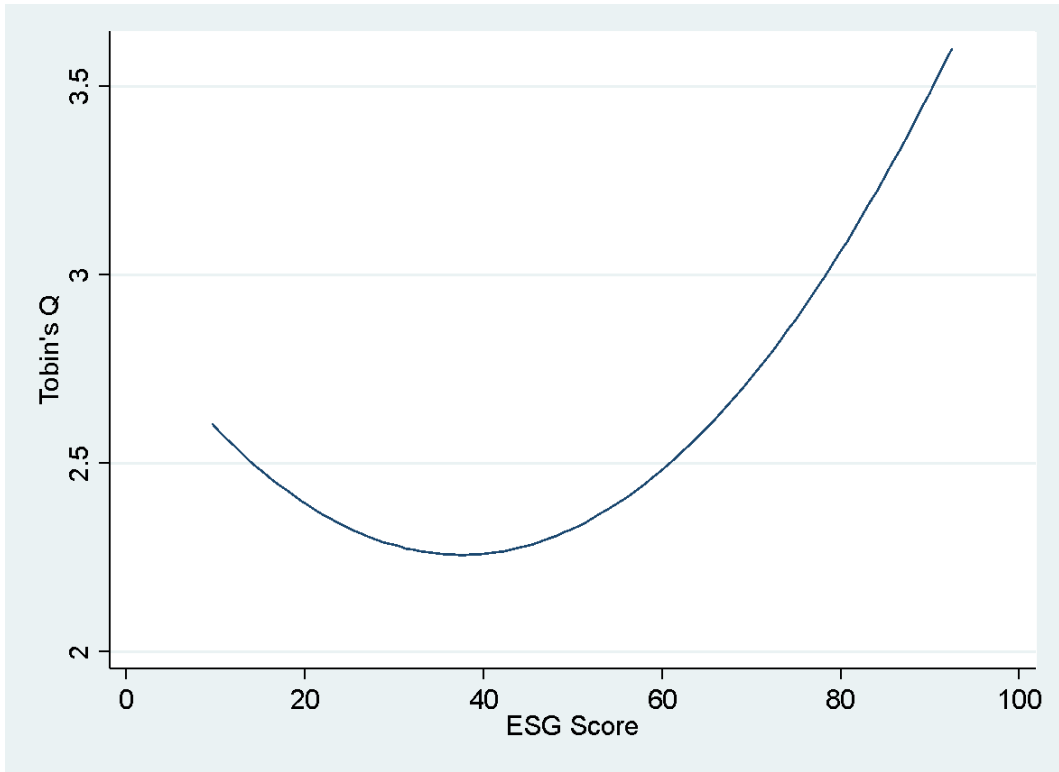Graph 2: Return on Invested Capital and ESG Score
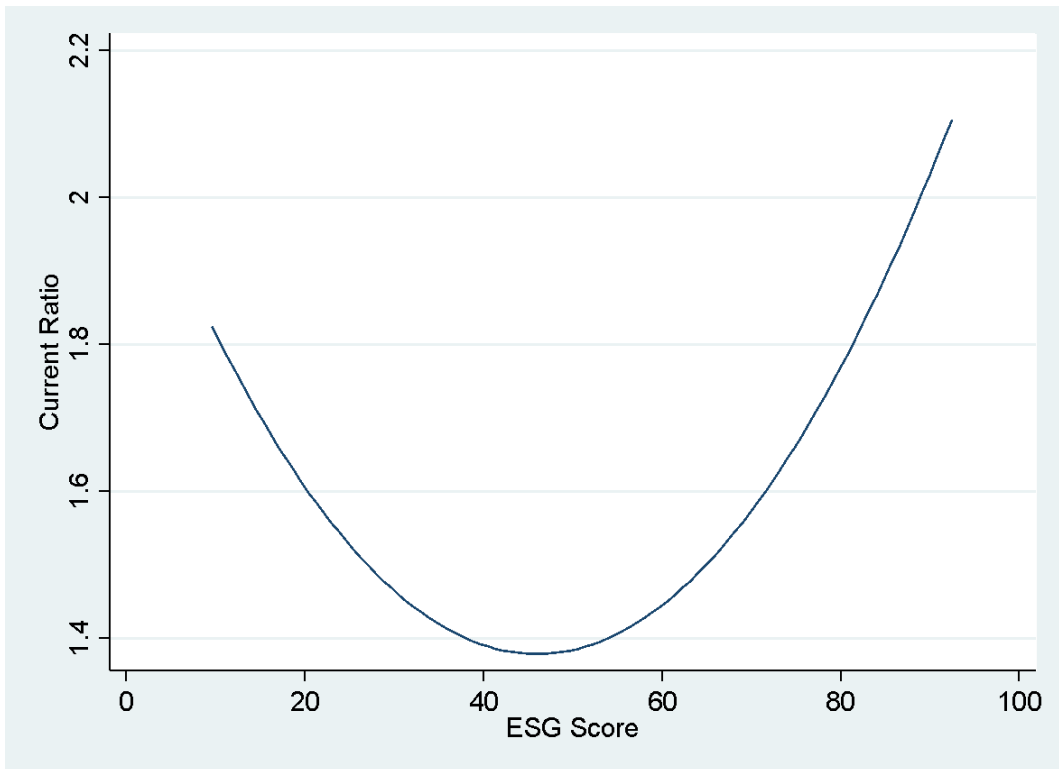
Graph 3: Dividend per Share and ESG Score

Graph 4: Dividend Yield and ESG Score

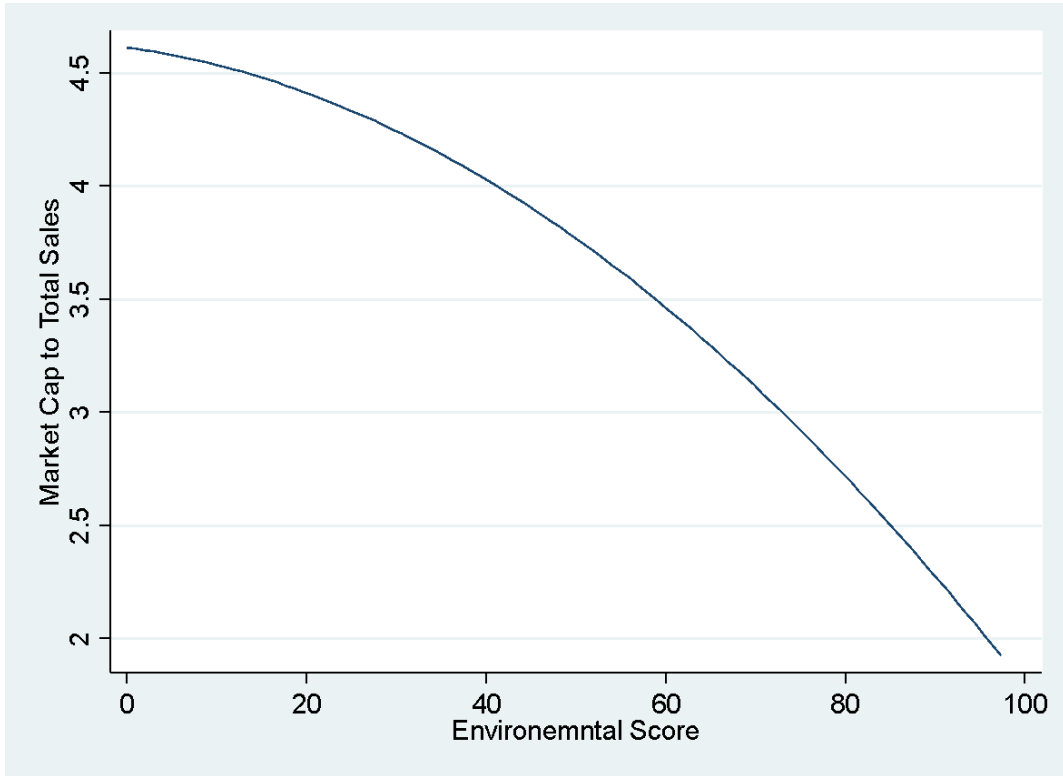Graph 5: Tobin's Q and ESG Score

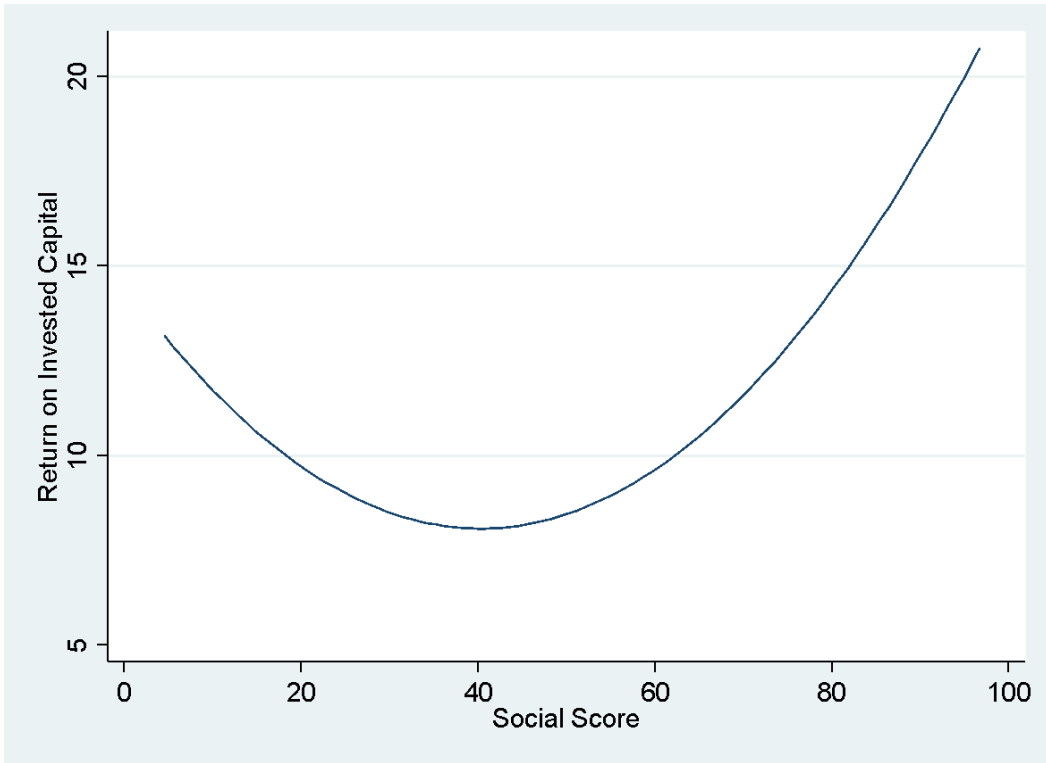Graph 6: Current Ratio and ESG Score

Graph 7: Market Cap to Total Sales and Environmental Score

Graph 8: Return on Invested Capital and Social Score

Graph 9: Dividend Per Share and Social Score
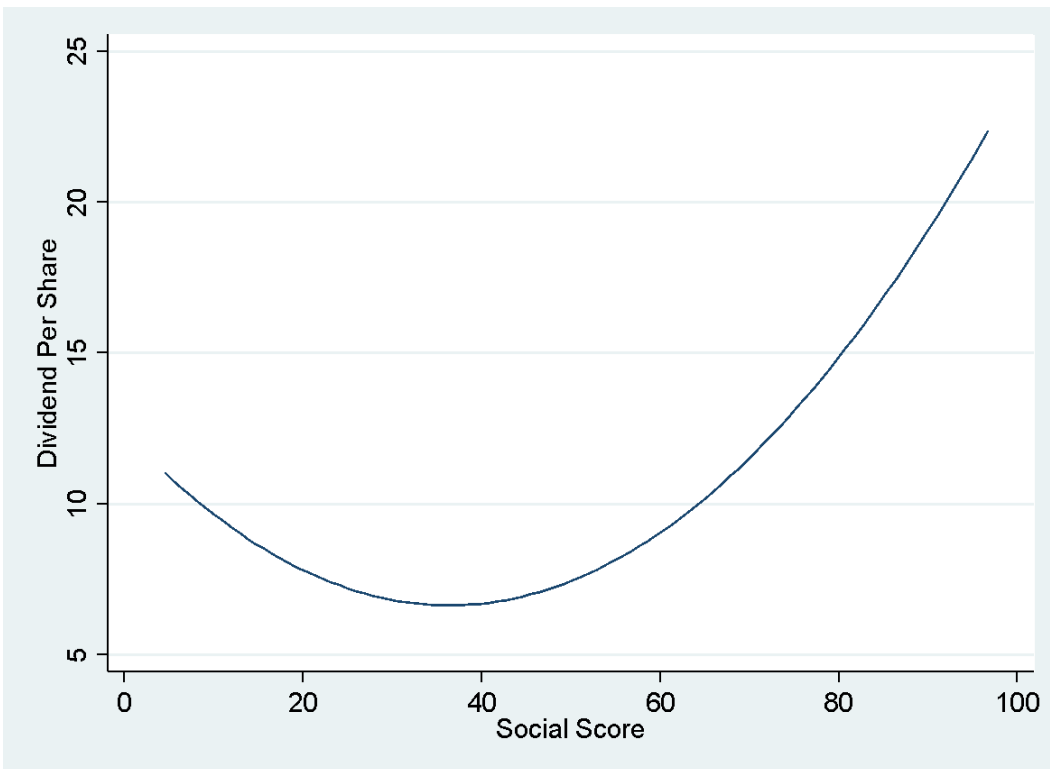
Graph 10: Dividend Yield and Social Score
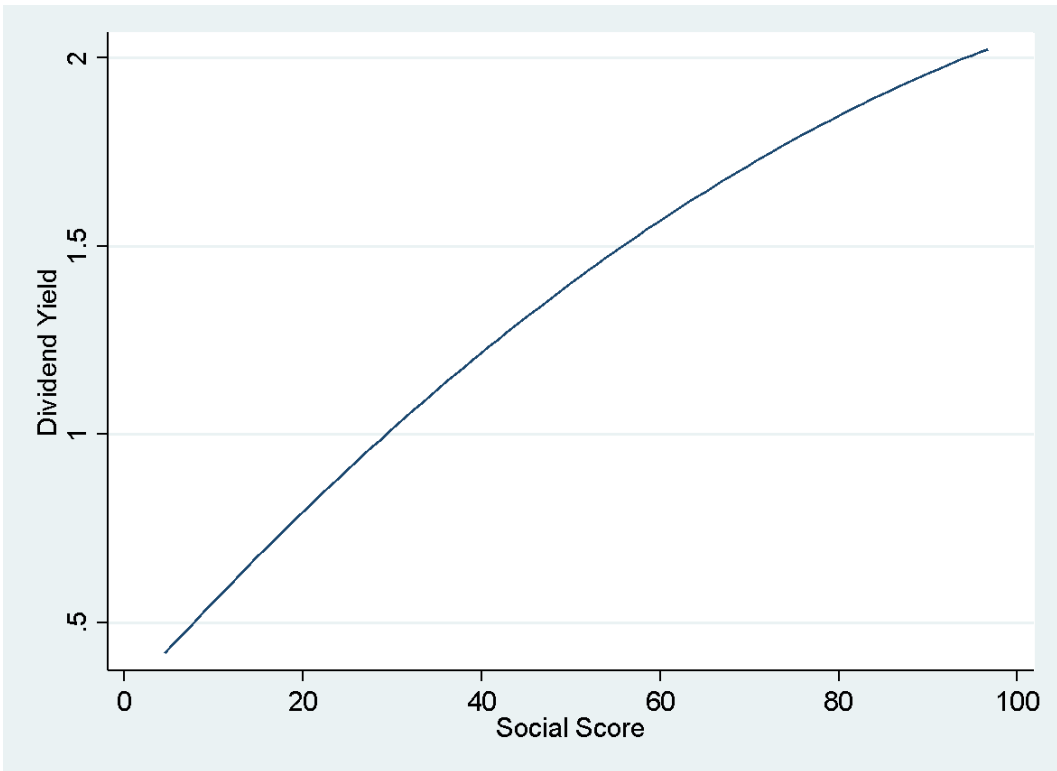
Graph 11: Tobin's Q and Social Score

Graph 12: Earnings Per Share and Governance Score

Graph 13: Dividend Per Share and Governance Score

Graph 14: Dividend Yield and Governance Score

Graph 15: Market Cap to Total Sales and Governance Score

Graph 16: Current Ratio and Governance Score

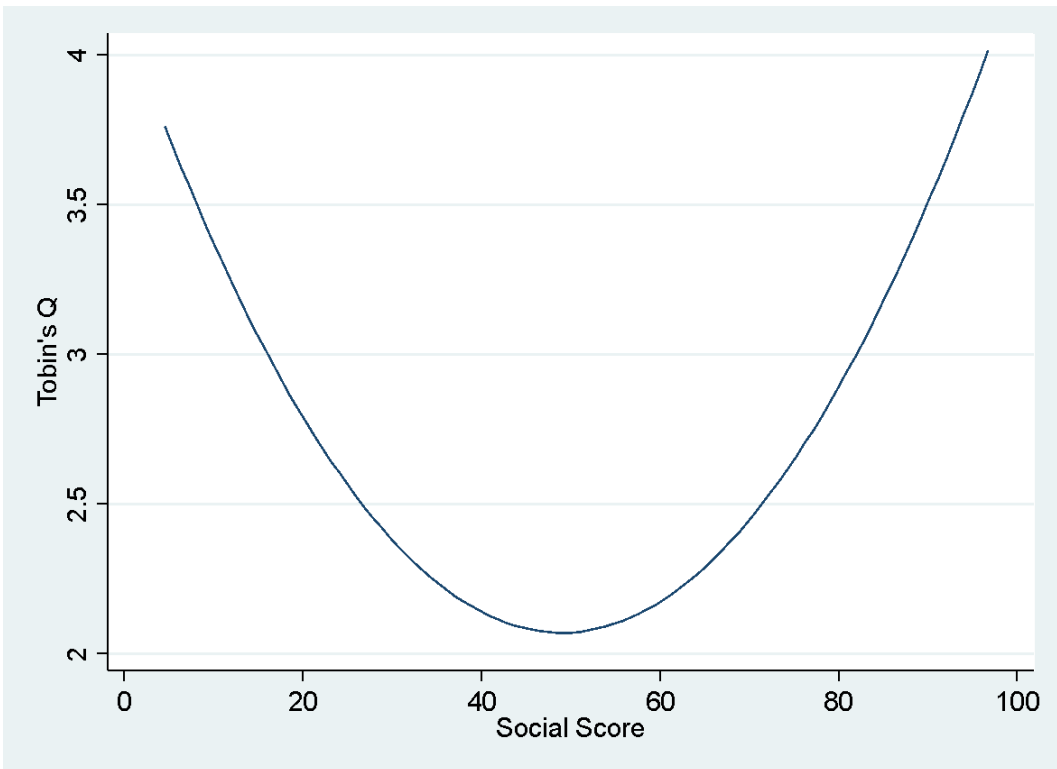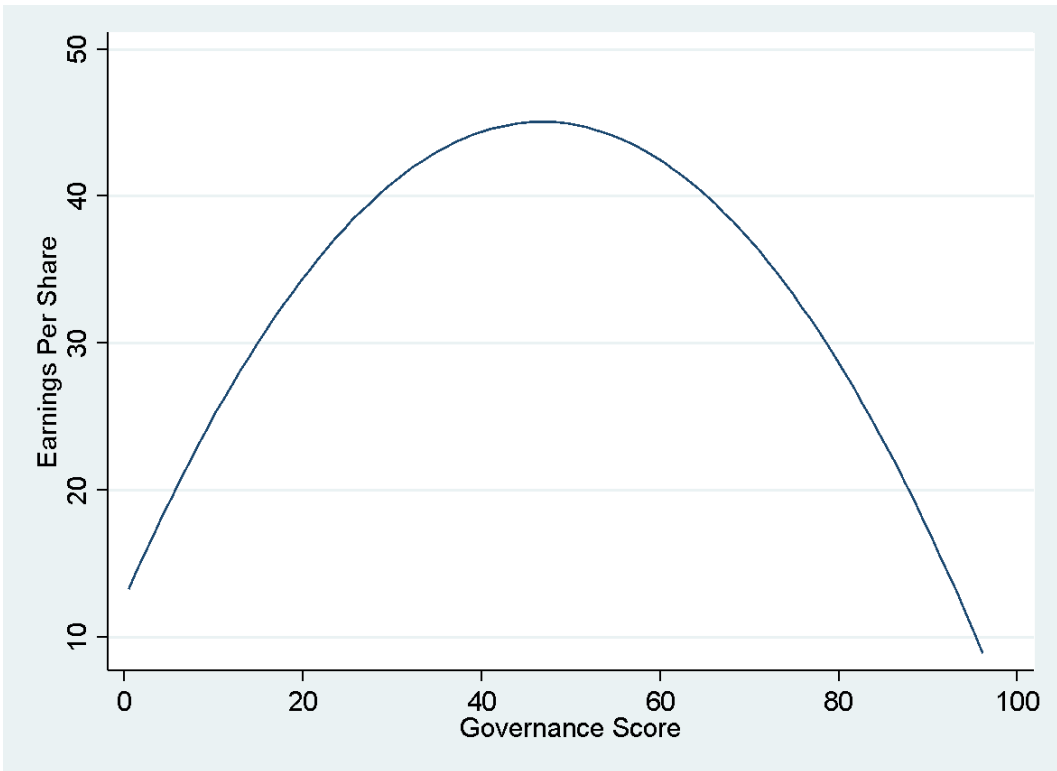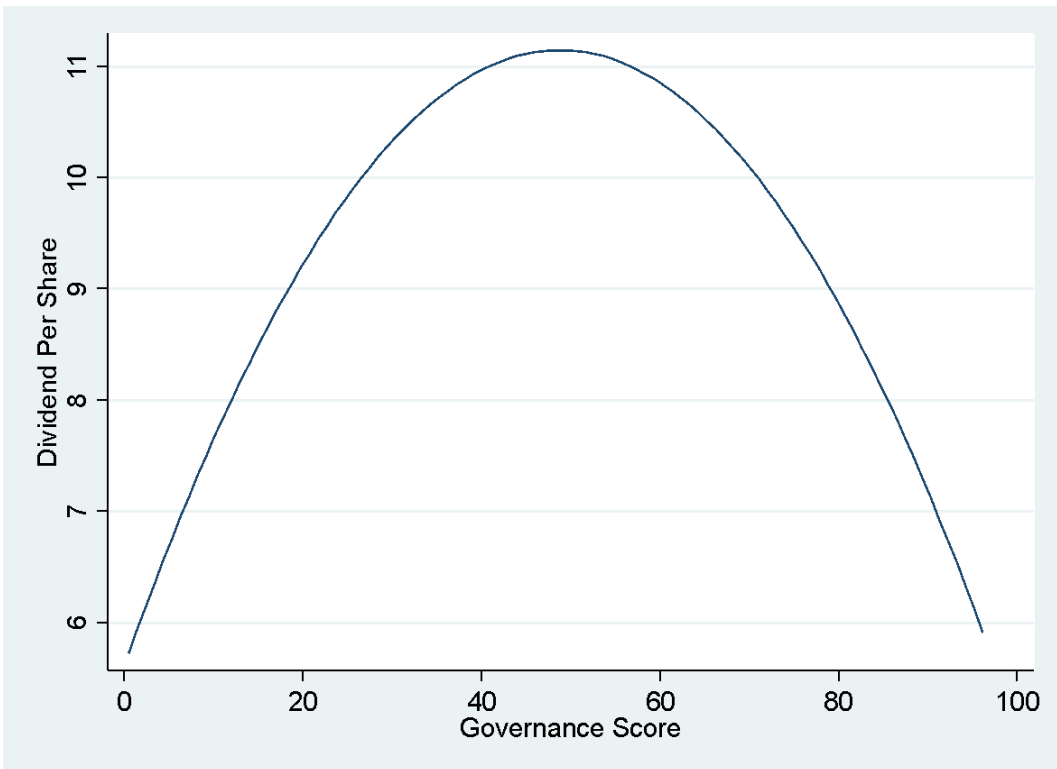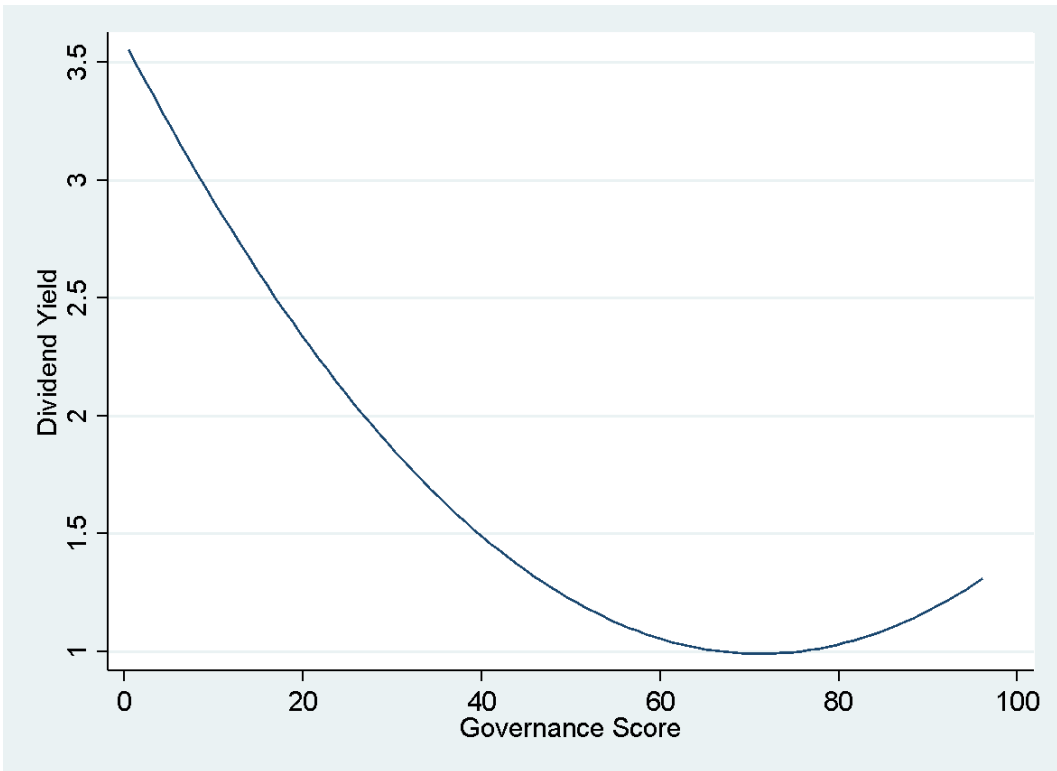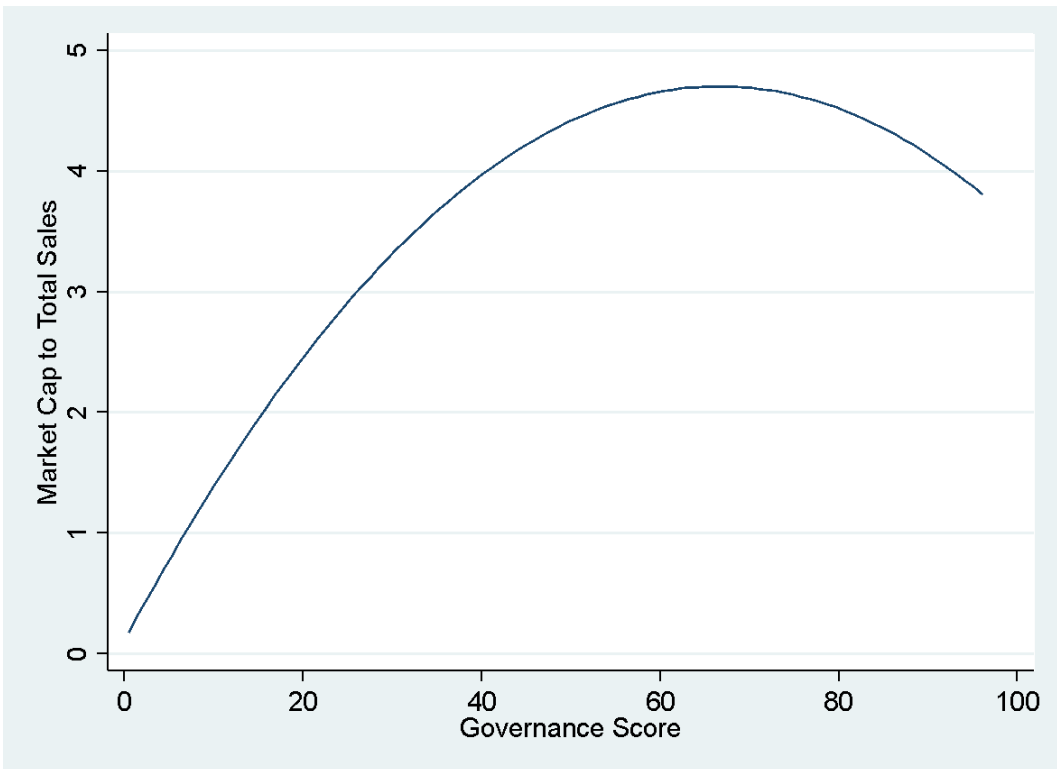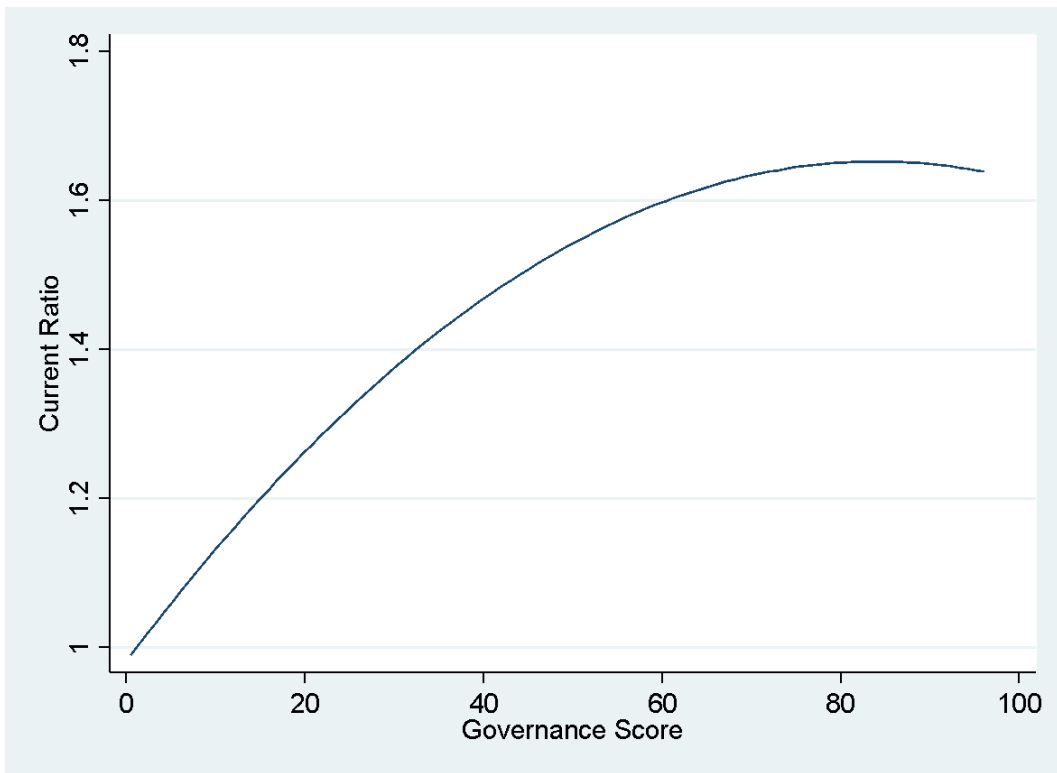## Appendix K Reverse relation using lagged control variables result tables

Table 1: Return on Assets effect on ESG, Environmental, Social and Governance Score including lagged control variables

	ESG Score	Environmental Score	Social Score	Governance Score
Return on Assets$_{t-1}$	.361**	.447**	.427**	.46***
	(3.303)	(2.818)	(3.82)	(6.265)
Leverage Ratio$_{t-1}$	-18.579***	-15.502**	-25.999***	-1.127
	(-5.892)	(-4.349)	(-6.649)	(-.18)
Firm Size$_{t-1}$	7.492***	10.706***	10.358***	-1.028
	(9.653)	(8.86)	(14.908)	(-2.023)
R&D Intensity$_{t-1}$	10.216	-208.605***	49.681	80.341*
	(.227)	(-4.754)	(.728)	(2.398)
Cons	-41.693**	-88.542***	-69.341***	57.635***
	(-3.879)	(-5.175)	(-7.151)	(8.913)
Observations	522	522	522	522
R-squared	.265	.35	.381	.084

t-values are in parentheses
*** p<.01, ** p<.05, * p<.1*

Table 2: Return on Equity effect on ESG, Environmental, Social and Governance Score including lagged control variables

	ESG Score	Environmental Score	Social Score	Governance Score
Return on Equity$_{t-1}$	.071	.104	.132**	.034
	(1.935)	(2.13)	(3.478)	(.996)
Leverage Ratio$_{t-1}$	-34.775***	-33.237***	-42.888***	-16.819**
	(-13.089)	(-13.036)	(-35.222)	(-2.862)
Firm Size$_{t-1}$	7.928***	11.142***	10.906***	-1.014
	(10.832)	(9.799)	(17.953)	(-1.964)
R&D Intensity$_{t-1}$	29.154	-187.004**	72.948	89.838**
	(.667)	(-4.398)	(1.061)	(2.879)
cons	-43.318**	-89.756***	-72.81***	63.088***
	(-4.48)	(-5.88)	(-8.925)	(9.422)
Observations	515	515	515	515
R-squared	.272	.35	.398	.061

t-values are in parentheses
*** p<.01, ** p<.05, * p<.1*

Table 3: Return on Invested Capital effect on ESG, Environmental, Social and Governance Score lagged control variables

	ESG Score	Environmental Score	Social Score	Governance Score
Return on Invested Capital$_{t-1}$	.087*	.076	.17***	.068*
	(2.314)	(1.04)	(6.17)	(2.297)
Leverage Ratio$_{t-1}$	-29.448***	-30.282***	-34.998***	-13.777*
	(-8.527)	(-7.399)	(-10.005)	(-2.244)
Firm Size$_{t-1}$	7.748***	10.954***	10.685***	-1.03

	(10.822)	(9.797)	(17.121)	(-2.054)
R&D Intensity$_{t-1}$	27.681	-190.691***	74.034	90.759**
	(.647)	(-4.805)	(1.094)	(2.956)
cons	-41.775**	-87.08***	-71.267***	62.449***
	(-4.416)	(-5.584)	(-8.972)	(9.901)
Observations	518	518	518	518
R-squared	.262	.347	.384	.063

t-values are in parentheses

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

Table 4: EITDA Margin effect on ESG, Environmental, Social and Governance Score including lagged control variables

	ESG Score	Environmental Score	Social Score	Governance Score
EBITDA Margin$_{t-1}$	-.092**	-.204**	-.066	.006
	(-2.853)	(-4.592)	(-1.891)	(.142)
Leverage Ratio$_{t-1}$	-29.359***	-27.14***	-39.51***	-16.148**
	(-7.299)	(-5.345)	(-9.844)	(-3.12)
Firm Size$_{t-1}$	7.347***	10.608***	10.132***	-1.281*
	(10.028)	(9.116)	(15.13)	(-2.47)
R&D Intensity$_{t-1}$	17.965	-197.901***	58.812	83.362**
	(.448)	(-4.797)	(.941)	(2.79)
cons	-33.11**	-77.219***	-59.315***	67.112***
	(-3.491)	(-5.002)	(-6.931)	(10.405)
Observations	523	523	523	523
R-squared	.248	.339	.361	.064

t-values are in parentheses

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

Table 5: NOPAT Margin effect on ESG, Environmental, Social and Governance Score including lagged control variables

	ESG Score	Environmental Score	Social Score	Governance Score
NOPAT Margin$_{t-1}$	-.091	-.268***	-.06	.07
	(-1.559)	(-5.357)	(-1.347)	(.718)
Leverage Ratio$_{t-1}$	-31.762***	-30.83***	-41.723***	-16.119**
	(-7.847)	(-5.766)	(-8.937)	(-3.346)
Firm Size$_{t-1}$	7.586***	10.692***	10.464***	-1.205*
	(11.086)	(9.702)	(14.762)	(-2.399)
R&D Intensity$_{t-1}$	40.632	-180.826**	79.546	106.507**
	(.951)	(-3.951)	(1.194)	(3.654)
cons	-36.486**	-78.166***	-63.759***	65.297***
	(-4.351)	(-5.554)	(-7.251)	(11)
Observations	503	503	503	503
R-squared	.256	.343	.372	.076

t-values are in parentheses

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

Table 6: Earnings Per Share effect on ESG, Environmental, Social and Governance Score including lagged control variables

	ESG Score	Environmental Score	Social Score	Governance Score
Earnings Per Share$_{t-1}$	.032	.041	.043	.007
	(1.241)	(1.701)	(1.399)	(.382)
Leverage Ratio$_{t-1}$	-29.843***	-27.721***	-39.098***	-17.664**
	(-8.619)	(-6.603)	(-10.54)	(-3.181)
Firm Size$_{t-1}$	7.378***	10.772***	10.338***	-1.675**
	(8.813)	(8.294)	(13.076)	(-3.412)
R&D Intensity$_{t-1}$	9.518	-207.735**	48.463	80.295*
	(.222)	(-4.601)	(.735)	(2.585)
cons	-35.926**	-84.109***	-64.224***	72.242***
	(-3.389)	(-4.953)	(-6.414)	(11.117)
Observations	520	520	520	520
R-squared	.251	.339	.367	.075

t-values are in parentheses
*** p<.01, ** p<.05, * p<.1*

Table 7: Dividends Per Share effect on ESG, Environmental, Social and Governance Score including lagged control variables

	ESG Score	Environmental Score	Social Score	Governance Score
Dividend Per Share$_{t-1}$	.122	.119*	.205*	-.011
	(1.86)	(2.416)	(2.772)	(-.18)
Leverage Ratio$_{t-1}$	-27.877***	-25.918***	-35.036***	-18.782**
	(-7.824)	(-5.526)	(-9.724)	(-3.147)
Firm Size$_{t-1}$	7.496***	10.554***	10.383***	-1.244*
	(8.775)	(8.109)	(12.8)	(-2.344)
R&D Intensity$_{t-1}$	30.967	-187.049***	75.129	88.42**
	(.811)	(-4.654)	(1.293)	(2.836)
cons	-38.098**	-81.87***	-66.375***	67.424***
	(-3.531)	(-4.937)	(-6.455)	(9.462)
Observations	523	523	523	523
R-squared	.251	.33	.378	.071

t-values are in parentheses
*** p<.01, ** p<.05, * p<.1*

Table 8: Dividend Yield effect on ESG, Environmental, Social and Governance Score including lagged control variables

	ESG Score	Environmental Score	Social Score	Governance Score
Dividend Yield$_{t-1}$	-1.59***	-1.389**	.052	-4.558***
	(-7.241)	(-3.231)	(.181)	(-7.983)
Leverage Ratio$_{t-1}$	-34.391***	-32.607***	-40.053***	-28.533***
	(-8.41)	(-5.965)	(-9.908)	(-4.904)
Firm Size$_{t-1}$	8.088***	11.116***	10.151***	.887
	(9.819)	(7.867)	(13.263)	(1.322)
R&D Intensity$_{t-1}$	.273	-214.876***	62.219	27.584

	(.006)	(-4.832)	(.983)	(.804)
cons	-40.968**	-84.49***	-60.768***	48.869***
	(-4.126)	(-4.927)	(-6.621)	(6.082)
Observations	523	523	523	523
R-squared	.255	.331	.356	.148

t-values are in parentheses

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

Table 9: EV to EBITDA effect on ESG, Environmental, Social and Governance Score including lagged control variables

	ESG Score	Environmental Score	Social Score	Governance Score
EV to EBITDA $_{t-1}$	-.052	-.14**	-.089	.057
	(-1.548)	(-3.418)	(-1.92)	(1.691)
Leverage Ratio$_{t-1}$	-30.24***	-29.464***	-40.511***	-15.649**
	(-7.636)	(-5.736)	(-10.158)	(-3.1)
Firm Size$_{t-1}$	6.989***	9.727***	9.604***	-1.052*
	(9.104)	(8.232)	(12.639)	(-2.32)
R&D Intensity$_{t-1}$	22.764	-200.782***	58.619	100.881**
	(.522)	(-4.685)	(.891)	(3.208)
cons	-29.258**	-67.216**	-52.109***	63.28***
	(-3.1)	(-4.525)	(-5.316)	(10.937)
Observations	523	523	523	523
R-squared	.249	.341	.365	.07

t-values are in parentheses

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

Table 10: Annual Stock Price Returns effect on ESG, Environmental, Social and Governance Score including lagged control variables

	ESG Score	Environmental Score	Social Score	Governance Score
Annual Stock Price Returns$_{t-1}$	-.012	-.017	-.021	.027
	(-.434)	(-.83)	(-.687)	(.752)
Leverage Ratio$_{t-1}$	-26.413***	-25.435***	-35.93***	-13.128*
	(-7.644)	(-6.254)	(-9.657)	(-2.223)
Firm Size$_{t-1}$	6.713***	9.915***	9.462***	-1.55*
	(11.555)	(8.921)	(16.034)	(-2.273)
R&D Intensity$_{t-1}$	11.354	-206.21***	51.339	82.252
	(.283)	(-4.625)	(.829)	(2.024)
cons	-26.155**	-71.391***	-51.367***	70.42***
	(-3.66)	(-5.066)	(-6.767)	(7.634)
Observations	523	523	523	523
R-squared	.265	.332	.381	.087

t-values are in parentheses

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

Table 11: Market Cap to Total Sales effect on ESG, Environmental, Social and Governance Score including lagged control variables

	ESG Score	Environmental Score	Social Score	Governance Score
Market Cap to Total Sales$_{t-1}$	.755*	-.543	.979**	1.176**
	(2.671)	(-1.797)	(3.68)	(4.085)
Leverage Ratio$_{t-1}$	-29.089***	-33.472***	-38.458***	-11.701*
	(-8.648)	(-8.026)	(-8.813)	(-2.478)
Firm Size$_{t-1}$	8.206***	10.34***	11.244***	-.3
	(13.108)	(8.852)	(15.989)	(-.515)
R&D Intensity$_{t-1}$	39.788	-187.926**	80.157	106.675**
	(.783)	(-4.022)	(1.095)	(2.868)
cons	-48.3***	-75.351***	-77.979***	50.433***
	(-6.194)	(-4.908)	(-8.779)	(6.299)
Observations	512	512	512	512
R-squared	.264	.333	.38	.075

t-values are in parentheses
*** p<.01, ** p<.05, * p<.1*

Table 12: Price to Earnings Ratio effect on ESG, Environmental, Social and Governance Score including lagged control variables

	ESG Score	Environmental Score	Social Score	Governance Score
Price to Earnings Ratio$_{t-1}$	.024	-.061	.025	.055*
	(.823)	(-1.229)	(.701)	(2.586)
Leverage Ratio$_{t-1}$	-37.271***	-35.819***	-47.101***	-21.281**
	(-8.947)	(-6.534)	(-9.858)	(-3.664)
Firm Size$_{t-1}$	7.428***	10.369***	10.405***	-1.53**
	(9.617)	(8.953)	(12.397)	(-3.305)
R&D Intensity$_{t-1}$	29.528	-197.295**	72.394	97.275**
	(.617)	(-4.024)	(.976)	(2.902)
cons	-35.653**	-75.062***	-63.732***	68.997***
	(-3.663)	(-4.96)	(-5.869)	(11.492)
Observations	477	477	477	477
R-squared	.253	.354	.371	.085

t-values are in parentheses
*** p<.01, ** p<.05, * p<.1*

Table 13: Tobin's Q effect on ESG, Environmental, Social and Governance Score including lagged control variables

	ESG Score	Environmental Score	Social Score	Governance Score
Tobin's Q$_{t-1}$	1.239*	.775	1.548**	1.249**
	(2.653)	(1.346)	(3.23)	(3.28)
Leverage Ratio$_{t-1}$	-21.927***	-24.416***	-29.476***	-7.91
	(-10.001)	(-13.1)	(-9.353)	(-1.223)
Firm Size$_{t-1}$	8.382***	10.964***	11.533***	-.098
	(7.409)	(6.425)	(10.948)	(-.196)

R&D Intensity$_{t-1}$	26.479	-203.796***	71.051	101.401**
	(.632)	(-5.121)	(1.13)	(3.142)
cons	-52.37**	-87.791**	-84.014***	47.46***
	(-3.382)	(-3.727)	(-5.736)	(6.979)
Observations	523	523	523	523
R-squared	.267	.343	.384	.089

t-values are in parentheses

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

Table 14: Weighted Average Cost of Capital effect on ESG, Environmental, Social and Governance Score including lagged control variables

	ESG Score	Environmental Score	Social Score	Governance Score
Weighted Average Cost of Capital$_{t-1}$	.163	-.014	.442	-.194
	(.651)	(-.037)	(1.294)	(-.509)
Leverage Ratio$_{t-1}$	-41.92***	-35.607**	-54.924***	-26.244**
	(-6.446)	(-4.314)	(-8.545)	(-3.585)
Firm Size$_{t-1}$	8.025***	11.173***	11.043***	-1.03
	(8.994)	(8.092)	(13.182)	(-1.91)
R&D Intensity$_{t-1}$	10.345	-213.421**	49.659	84.989*
	(.195)	(-4.318)	(.648)	(2.136)
cons	-39.976**	-85.667***	-68.287***	68.544***
	(-3.769)	(-5.135)	(-6.936)	(10.337)
Observations	479	479	479	479
R-squared	.263	.344	.392	.092

t-values are in parentheses

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

Table 15: Current Ratio effect on ESG, Environmental, Social and Governance Score including lagged control variables

	ESG Score	Environmental Score	Social Score	Governance Score
Current Ratio$_{t-1}$	3.144**	3.159**	2.135**	4.117**
	(3.607)	(3.015)	(2.986)	(4.515)
Leverage Ratio$_{t-1}$	-21.749**	-20.329**	-34.434***	-5.261
	(-4.285)	(-2.959)	(-6.798)	(-1.075)
Firm Size$_{t-1}$	7.365***	10.508***	10.198***	-1.287*
	(10.193)	(8.924)	(15.199)	(-2.214)
R&D Intensity$_{t-1}$	11.512	-202.906***	56.478	67.655*
	(.288)	(-4.864)	(.917)	(2.239)
cons	-41.185***	-85.941***	-65.559***	59.356***
	(-4.819)	(-5.993)	(-8.457)	(7.716)
Observations	523	523	523	523
R-squared	.272	.345	.369	.084

t-values are in parentheses

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