# Do Environmental, Social and Governance (ESG) Performance Scores Reduce the Cost of Debt? Evidence from Indian firms

Ankit Arora[1] and Dr. Dipasha Sharma[2]

## Abstract

This study aims to assess the impact of Environmental, Social, and Governance (ESG) ratings on the cost of debt of Indian firms from the year 2015 to 2020. One of the challenges that corporate India is going to face moving forward is that regulations with respect to environmental conservation, transparency, corporate social responsibility, and corporate governance will get stricter. This will undoubtedly push the companies to follow better ethical practices, adopt fair employee policies, and safeguard the environmental policies. So, this paper intends to evaluate the ESG lens of Indian companies concerning their financing decisions, viz the cost of debt. The firms under investigation are listed on the NIFTY 500, which reflects the top 500 companies in the eligible universe based on complete market capitalization. Data was sourced from the Bloomberg database. The paper uses cost of debt as the dependent variable; ESG score & individual E, S, G scores as independent variables; Market capitalization, net debt to equity ratio, and percentage of women on board and total debt to total asset ratio as control variables. Since the data was in a panel data format, we performed panel data regression from FY2015 to FY2020, and the method used was Least Squares Method (L.S. and A.R.).

Different models were considered and it was found that the cost of debt which is the dependent variable, had a negative coefficient i.e., higher the ESG score, lower the cost of debt component for the firm and according to our model, it could be significantly proven at 10% level.

---

[1] _ankit_arora@scmhrd.edu_, _Symbiosis Centre for Management & Human Resource Development, Symbiosis International (Deemed University) SIU, India_

[2] d_ipasha_sharma@scmhrd.edu_, _Symbiosis Centre for Management & Human Resource Development, Symbiosis International (Deemed University) SIU , India_

## Introduction

The paper examines the effect of environmental, social and governance (ESG) ratings on the performance of cost of debt of companies in India between 2015 and 2020. Previous research clearly demonstrates that sustainability considerations have an effect on the output of stocks and firm value. Financial sector trends show that ESG integration in equity investment has become very advanced and established. But on the other hand, ESG integration in fixed income is not as established (Allen et al., 2018) but it could possibly be in the future. Very less attention has been given to the influence of the ESG scores on the 'cost of the debt' component. It is important to assess how ESG variables impact the cost of debt of companies in the capital market at a time when sustainability is at the top of the global agenda but has not yet been standardized.

According to an impact series report by Barclay's - Sustainable Investing and Bond Returns studies (2018) , argued the impact of ESG needs not only to be on equity and it can be further applied on credit markets. The findings showed a positive ESG inclination resulted in a steady performance advantage. Ferrarese and Hanmer (2018) concentrated on worldwide corporate bonds for 5 years in their paper - The Impact of ESG Investing in Corporate Bonds and analysed the integration of ESG factors leading to an increase in investment returns and a decrease in variability. The conclusion of these reports appears to indicate that higher ESG ratings have a strong and positive effect on the performance of bonds by, for example, decreasing the yield spreads. Nonetheless, there is a need to continue the research in emerging economies like India and further investigate whether higher ESG ratings impact the corporate bond yield performance. This is an unprecedented opportunity to produce good studies that can add to established knowledge and extend the geographical regions under review, due to the less research in this area. So, the main objective of this study is to see how the ESG ratings affect the company's capital market cost of debt in an emerging economy like India.

If firms manage to create or acquire resources related to ESG factors with the characteristics mentioned above, they will achieve a competitive advantage with their ESG score. It is reasonable to assume that it will be appreciated by the investors and hence generate a lower cost of debt in the capital market. That an ESG score could become a strategic resource that is difficult for other firms to replicate is reasonable to believe as these factors needs to be implemented into practically every part of the business model which is different for every company. Therefore, successful implementation of a high ESG score can be seen a valuable and imperfectly imitable resource as it is impossible for two companies to incorporate ESG measures in the same way. Thus, it generates a sustained competitive advantage.

## Literature Review:

Several kinds of research have been performed to gauge the effect of environmental, social or governance performance of companies on their financials. Friede et al., (2015) in their research collated evidence empirically from more than 2000 studies and found that correlation between ESG performance and financial performance of companies remain fragmented however all of them found that a vast amount of the studies reported positive results between ESG investing and performance in financial terms of corporates. One of the major sources of capital for companies, along with equity, is the corporate bond (debt financing) issuance and they are issued to provide the company with the ready cash for their projects. Debt financing is sometimes preferable to issuing stocks and so it becomes imperative to study the effect on corporate bond performance by the ESG ratings. The association between ESG scores and

returns of bond in Korea during the period 2010 to 2015 was evaluated by Jang et al., (2020) and found that when environmental scores are high, they decreased debt funding costs for small businesses. They also indicated that ESG scores provide useful knowledge on firms' downside risk and that ESG scores should be incorporated into their credit rating process by credit rating agencies.

Companies share knowledge on social responsibilities in order to show a socially conscious picture so that they can legitimise their actions to the stakeholders. This is the basis for the legitimacy theory and the research undertaken by Eliwa et al., (2019), proposing a version of the theory of legitimacy, analysed a survey of 6,018 firm-year findings from 15 E.U. countries and found that businesses would benefit from an improved degree of efficiency and disclosure of ESGs. Firms with that of higher ESG results or scores have a lower cost of debt. It is also assumed that lending institutions, if they integrate ESG details into their lending decisions, could alleviate two forms of risks levied by these firms: **reputational risk** and **default risk** (Weber, Scholz, & Michalik (2010); Weber, Diaz, & Schwegler (2014)) and thus minimise the 'cost of debt' component paid to the companies by the various lending institutions.

In evaluating and examining the effect of organizational news on funding costs for major European and U.S. businesses from the years 2006 to 2016, Naumer and Yurtoglu (2020) presented a new viewpoint. They found that the amount of ESG-related news is linked to credit default swap (CDS) spreads significantly, which is why the refinancing costs for companies are relevant. News with a positive tonality is correlated with lower CDS spreads of about 4%. However, this trend of having a positive effect of ESG in the bond performance didn't tend to follow in the Nordic countries. The analysis by Kjerstensson and Nygren (2019) showed that the high ESG score does not mean a lower level of the required risk premium for bond holders and a lower or more secure debt expense for companies in the Nordic countries.

Li et al., (2020) in his analysis suggested that the default rate of bonds is positively associated with the energy consumption or usage of the business and are negatively correlated with social obligations and corporate governance. Slimane et al., (2019) argued that the effect of ESG on cost of capital was linked to the balance of supply and demand and that of investment flows. They emphasised that ESG investing and ESG finance are similar in nature and the fixed income business is the right way to build a social impact, according to many ESG investors. Social and green bonds can be seen as the right approach at a micro-level. Their review indicates that it can be complemented by adding ESG variables into the traditional fixed income market.

In emerging economies like India, Bhattacharya and Sharma (2019) in their paper considered 122 BSE 500 listed firms in India that have made ESG disclosures and gauged the influence of ESG disclosure on their credit ratings. The overall ESG performance was found to have substantial positive creditworthiness metrics, as calculated by the credit rating. For small and medium-sized firms in India, ESG had a major impact on credit ratings, but ESG had no influence on large firms that already had higher credit ratings.

By reviewing the previous literature of the authors, we can find there are multiple components and factors affected by the ESG ratings. It is evident that more emphasis should be given to the ESG scores and the role they play in corporate bond performance. It would be interesting to research the companies in an emerging economy like India which has such a diversified and different cultural and institutional setting from developed countries, to investigate and study a comprehensive set of factors and components with corporate bond performance which is affected by the ESG ratings.

## Research Design:

### Sample

The market index that this paper will be using for extracting the list of companies is NIFTY500. The reason that this paper is taking companies from NIFTY500 is that they It reflects the top 500 firms in the eligible universe based on complete market capitalization. The NIFTY 500 Index accounts for roughly 96.1 percent of the free float market capitalization of NSE-listed companies, and the total traded value of all Index components for the six months ending March 2019 is approximately 96.5 percent of the traded value of all NSE-listed equities. The NIFTY 500 firms are also broken down into industry indexes, making it simple to obtain information about certain industries.

Limitations of this research are acknowledged. Our theoretical and empirical conclusions are more likely to apply to publicly traded corporations which have disclosed their ESG Scores and are available on Bloomberg terminal which examines only publicly available information for public listed companies. In addition, the sample size contains 260 listed companies of NIFTY500. As a result, the findings of this study should not be generalized. Future studies are encouraged to use multiple data sources and larger sample sizes with different time frames. ESG scores impact on corporate bond performance can be expanded to include industry dynamics and segregation of companies on the basis of market capitalization could be performed for further analysis.

### Source of Data

The data would be collected for the years **FY2015 to F.Y. 2020** from the **Bloomberg terminal**. Below is the list of parameters that would be extracted for all the companies from Bloomberg Terminal – ESG Disclosure Score, Environmental Disclosure Score, Social Disclosure Score, Governance Disclosure Score, Cost of Debt, Market Capitalization, Debt to Equity, Debt to Assets and % of Women on Board

The companies from NIFTY500 were further segregated into Large, Mid & Small Cap companies according to their Market Capitalization given below –

| Category | Market Capitalization |
|---|---|
| Large Cap Companies | Greater than 35,000 crores |
| Mid Cap Companies | Between 7,500 crores to 35,000 crores |
| Small Cap Companies | Less than 7,500 crores |

**Table 1:** *Market Capitalization Criteria*

### Variables Measurement

| | |
|---|---|
| ESG Disclosure Score | |
| Environmental Disclosure Score | **Independent Variable** |
| Social Disclosure Score | |
| Governance Disclosure Score | |

| Cost of Debt | Dependent Variable |
|---|---|
| *Market Capitalization* | |
| *Debt to Equity* | |
| *Debt to Assets* | |
| *Percentage of Women on Board* | Control Variables |

**Table 2:** *Variables*

The independent variable which is the ESG disclosure score has been extracted from the Bloomberg database for the last five years on the basis of reporting and disclosure of the firm. In addition to the ESG disclosure score, the environmental disclosure score, the social disclosure score, and the governance disclosure score were all retrieved from the Bloomberg database and utilized as **independent variables**.

**The Cost of Debt** component of a company is the **dependent variable**. By establishing what affects the cost of bonds, companies will be given a deeper understanding of their cost of debt and thus also their general cost of capital. Another way to finance through debt is of course bank loans. Goss and Roberts (2011) found that companies performing good CSR activities were rewarded with around 7-18 basis points lower interest rates than companies with CSR concerns. As previous studies indicate, CSR measures may have an effect on cost of debt. Analyzing CSR's effect on the cost of debt is therefore highly relevant for companies' cost of capital and financial performance and thus there is also need for extending the research on what affects the performance and cost of bonds.
A significant and positive relationship has been found between the cost of debt and firms that fail to demonstrate an awareness of their carbon risk exposure (Clarkson et al., 2018).

**Analysis of Data collected**

| Market Capitalization analysis | | | |
|---|---|---|---|
| | **Mean** | **Median** | **Standard Deviation** |
| **Large Cap** | 808099.61 | 479404.91 | 1037672.21 |
| **Mid Cap** | 129922.05 | 100926.76 | 94625.71 |
| **Small Cap** | 37964.72 | 32231.65 | 26202.86 |

**Table 3:** *Market Capitalization Analysis*

| ESG ANALYSIS | | | | |
|---|---|---|---|---|
| | **ESG score** | **E score** | **S score** | **G score** |
| **Large Cap** | 35.33280915 | 24.85850587 | 37.15134836 | 56.24127418 |
| **Mid Cap** | 26.06361961 | 14.9999 | 30.19324755 | 50.58141324 |
| **Small Cap** | 20.4363387 | 9.189463027 | 26.52080211 | 46.01465307 |

**Table 4:** *ESG Analysis*
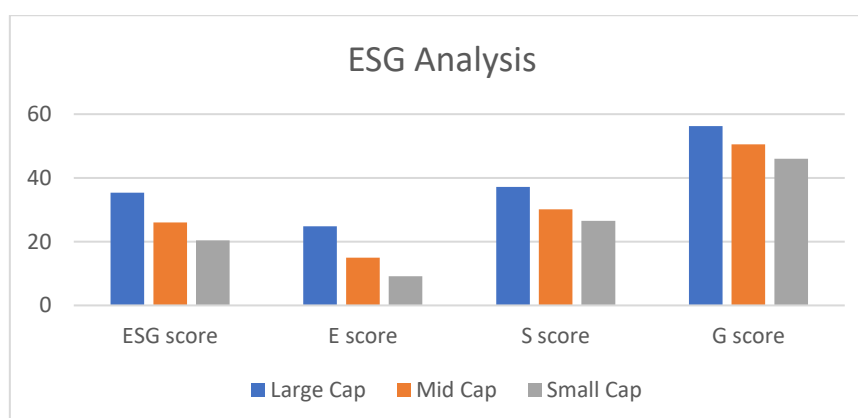


**Figure 1***: ESG Graph*

## Theoretical framework and Hypothesis Development:

Our conceptual framework is based on the **stakeholders' theory**. Stakeholder theory has been widely employed in management literature since 1984. Management should have a good relationship with its stakeholders, according to stakeholder theory. The Stakeholder Theory states that a company's success is influenced not just by its shareholders and management but also by its relationships with customers, suppliers, workers, and society at large. Not just in principle but also in practice, this makes sense. The long-term profitability of a corporation is contingent on maintaining a balance with various stakeholder groups. Stakeholder theory also provides an alternative perspective on business ethics and corporate governance. Corporate social responsibility (CSR) has become widely used because the changing business environment has incentivized corporations to realize their responsibilities to a larger public than their shareholders and address basic societal issues. The Stakeholder Theory is related to sustainability in the perspective that, for example, a higher ESG rating improves corporate bond performance, organizations will realize that there are more objectives to pursue than just profit maximization in interest of shareholders. This would imply that more stakeholders should be included in the company's operations, and that stakeholder relationships should be examined using ESG variables in order to lower the cost of debt, which would benefit not only shareholders but all stakeholders of the firm.

**Control Variables**

Market capitalization, net debt to equity ratio, total debt to total asset ratio and percentage of women on board, were also extracted from Bloomberg database and are used as **control variables** in our research paper.

Accounting ratios, business size, financial variables, and debt characteristics were all used as variables in Kaplan and Urwitz's (1979) bond rating model. One of the most accurate indicators of a company's size is its market capitalisation. **Market capitalization**, often known as market cap, is the entire market value of a company's outstanding shares. As a result, we anticipate that the greater a company's market capitalization, the greater its creditworthiness and lower would be the cost of debt.

The **debt-to-equity ratio** is a metric for determining a company's financial leverage. The debt-to-equity ratio shows how much debt a firm is utilizing to fund its assets in comparison to the value of its shareholders' equity. The cost of debt is projected to be lower if the debt-to-equity ratio is lower.

The **total debt to assets ratio** is a measure of how much of a company's assets are funded by loans or other financial commitments. As a result, the ratio serves as a broad indicator of the company's capacity to satisfy its financial obligations for outstanding loans. As a result, it is predicted that the debt-to-asset ratio and the cost of debt would have a positive connection.
**The percentage of women on board** is expected to create a positive image of the company for the investors. Hence it is expected that higher the percentage of women on board lower will be the cost of debt.
Hence, we assume:

*H1.* **Market capitalization, net debt to equity ratio, total debt to total asset ratio and percentage of women on board are significant indicators of cost of debt of a firm.**

The growing attention paid to ESG issues has led to an increase in lending institutions' awareness of reputational risk imposed by borrowing firms in addition to default risk. This acts as a key for institutions who are into lending to include ESG data into their assessment process of creditworthiness. Lending institutions consider carbon-related risk exposure of business before doing the lending, according to Jung, Herbohn, and Clarkson (2016), and the influence of that risk on rising firm's cost of debt is minimized when the organization demonstrates knowledge of the risk and is ready to reduce it. Hence, we assume:

*H2.* **The overall ESG reputation (measured through ESG score) has a significant impact on cost of debt of a firm.**

Mattingly (2017) emphasizes the significance of capturing the impact on cost of debt using specific elements of ESG practices rather than a holistic assessment. We show that specific elements of ESG performance and transparency are valued by lending institutions, with the environmental landscape having the greatest influence on cost of debt.

The factors covered by the 'E' (Environmental) in the ESG score is the company's resource use, emission reduction and innovation level. The resource part measures the capacity and ability to decrease their use of energy, water or other materials. It also includes the firm's ability to implement more environmentally friendly solutions and ability to improve supply chain management. The emission part of the score measures the company's effectiveness in implementing changes in their production and operational processes to reduce emissions that harm the environment. Innovation is reflecting how innovative the company is at creating new opportunities in the market and their capacity in reducing environment-related costs for its customers. This could be done by creating eco-friendly products or adapting new environmental technologies.

*H3.* **Environmental Reputation (measured through scores on environment component of ESG reporting) has a significant impact on cost of debt of a firm.**

The factors covered by the 'S' (Social) in the ESG score is the company's workforce conditions, human rights management, community involvement and their product responsibility. The score measures how well the firm manages to accomplish a workplace that is safe, healthy, with equal opportunities and equality. It also considers the employees' job satisfaction and development opportunities. The score also measures how well the company manages to respect conventions about fundamental human rights. The company's engagement toward protecting public health, respecting business ethics and being a good citizen is also covered by the social part of the ESG score. Another aspect of the social score is the firm's

ability to offer goods and services of quality that respects the customer's integrity, data privacy, health and safety. Hence, we assume:

**H4. Social Reputation (measured through scores on social component of ESG reporting) has a significant impact on cost of debt of a firm.**

The factors covered by the 'G' (Governance) in the ESG score is the company's management quality, shareholder rights and CSR strategy. This part measures the corporation's ability and effectiveness in following best practices regarding corporate governance principles including the efficacy of treating all shareholders equally and their usage of anti-takeover devices. The corporate CSR strategy is also accounted for. It measures how the firm manages to communicate how they integrate economic, environmental and social aspects into its day-to-day processes for decision-making. Hence, we assume:

**H5. Governance reputation (measured through ESG score) has a significant impact on cost of debt of a firm.**

Efficient businesses strive to deal with investors in a fair and open manner in order to secure lower yield requirements from creditors. Specific principal-agent conflicts have an impact on a company's creditors since risk or failure is typically transferred to them. As a result, creditors can put pressure on firms to act in a socially and environmentally responsible manner in order to increase the company's economic and moral worth. As a result, our next set of hypotheses is as follows:

**H6a. Cost of Debt is a significant positive indicator of ESG score.**

**H6b. Cost of Debt is a significant positive indicator of environmental disclosure score.**

**H6c. Cost of Debt is a significant positive indicator of social disclosure score.**

**H6d. Cost of Debt is a significant positive indicator of governance disclosure score.**

## Descriptive Statistics:

As an initial step in our regression analysis, we produced descriptive statistics for our original model with all initially chosen variables. This was to gain understanding of our model and its variables. In our analysis we use a sample of 260 companies from NIFTY500 Index whose ESG disclosure scores were available. The data was fetched from FY2015 to FY2020. We can see that the minimum ESG Score is 0.83 and the highest is 70.21 which represents a wide spread between the lowest and highest scoring companies. The mean ESG Score in 26.71. We can also see the maximum cost of debt is 12.19%.

Our model shares many characteristics with the model used by Oikonomou et al. (2014). However, our descriptive values are a bit different, this could possibly be explained by the differences in markets and time and probably due to our study being done on companies in an emerging economy like India while Oikonomou et al.'s study is on U.S. corporations with a larger sample and also larger corporate sizes.

| Descriptive Statistics | | | | | | | |
|---|---|---|---|---|---|---|---|
| | N | Mean | Median | Std. Deviation | Range | Minimum | Maximum |
| **ESG Score** | 1560 | 27 | 24 | 12.472 13 | 69 | 1 | 70 |
| **Environmental Score** | 1560 | 16 | 11 | 14 | 67 | 0 | 67 |
| **Social Score** | 1560 | 31 | 28 | 13 | 86 | 4 | 89 |
| **Governance Score** | 1560 | 51 | 48 | 10 | 96 | 4 | 99 |
| **Cost of Debt** | 1560 | 6 | 7 | 2 | 12 | 0 | 12 |
| **Market Capitalization** | 1560 | 284346 | 91293 | 634521 | 8077078 | 1363 | 8078441 |
| **Net Debt to Shareholder's Equity** | 1560 | 52 | 15 | 384 | 12804 | 282 | 12522 |
| **Total Debt to Total Assets** | 1560 | 20 | 16 | 18 | 125 | 0 | 125 |
| **Total Assets** | 1560 | 262092 | 53505 | 737023 | 11656863 | 2287 | 11659150 |
| **Percentage Women on Board** | 1560 | 14 | 13 | 7 | 50 | 0 | 50 |

**Table 5**: *Descriptive Statistics*

## Research Methodology:

The data was analyzed using IBM SPSS Statistics Version 26. The steps taken were as follows:

**Step 1:** To rule out any problem of multicollinearity (and to exclude factors that had no link with the predicted variable), correlations between all of the variables under consideration were conducted.

**Step 2:** In order to find a cause-and-effect relationship between the variables - ESG rating and cost of debt for the company, we have formed a panel data regression model based on what dependent and independent variables that should be used in estimating this relationship.
Using panel data regression model with cost of debt as dependent variable we tested if the control variables (such as Market capitalization, debt to equity ratio, total debt to total asset ratio and percentage of women on board) are significant predictors or not.
Our regression equation is:

$K_d = \alpha + \beta_1 \text{ MarCap} + \beta_2 \text{ DE} + \beta_3 \text{DA} + \beta_4 \text{ WOM}$

Where, $K_d$ = Cost of Debt
MarCap = Market Capitalization
DE = Net Debt to Shareholder's Equity Ratio
DA = Total Debt to Total Assets Ratio
WOM = % of Women on Board

**Step 3:** Then, as an independent variable, we utilized multivariate regression to test the hypothesis that **ESG disclosure score** has a substantial beneficial influence on cost of debt. Hence, our regression equation was:

$$K_d = \alpha + \beta_1 \text{ MarCap} + \beta_2 \text{ DE} + \beta_3 \text{DA} + \beta_4 \text{ WOM} + \beta_5 \text{ ESG\_Score}$$

**Step 4:** We utilized multivariate regression to test the hypothesis that **environmental disclosure score** has a substantial beneficial influence on cost of debt. As a result, our regression equation was as follows:

$$K_d = \alpha + \beta_1 \text{ MarCap} + \beta_2 \text{ DE} + \beta_3 \text{DA} + \beta_4 \text{ WOM} + \beta_5 \text{ EnvironmentalScore}$$

**Step 5:** The next step was to utilize multivariate regression to test the hypothesis that **social disclosure** score has a substantial beneficial influence on cost of debt. As a result, our regression equation looked like this:

$$K_d = \alpha + \beta_1 \text{ MarCap} + \beta_2 \text{ DE} + \beta_3 \text{DA} + \beta_4 \text{ WOM} + \beta_5 \text{ SocialScore}$$

**Step 6:** In the next step, we took **Governance Disclosure score** as the independent variable and used multivariate regression to test the hypothesis that governance disclosure has a significant positive impact on cost of debt. Hence, our regression equation was:

$$K_d = \alpha + \beta_1 \text{ MarCap} + \beta_2 \text{ DE} + \beta_3 \text{DA} + \beta_4 \text{ WOM} + \beta_5 \text{ GovernanceScore}$$

**Step 7:** Finally, in order to see if the cost of debt has an effect on the overall ESG score and its components, we ran the following set of models:

$$\text{ESG\_Score} = \alpha + \gamma_1 K_d + e_1$$
$$\text{EnvironmentalScore} = \alpha + \gamma_2 K_d + e_2$$
$$\text{SocialScore} = \alpha + \gamma_3 K_d + e_3$$
$$\text{GovernanceScore} = \alpha + \gamma_4 K_d + e_4$$

Where $e_1$, $e_2$, $e_3$, $e_4$ are error terms.

## Correlation Analysis:

| Correlations | | ESG Score | Environmental Score | Social Score | Governance Score | Cost of Debt | Percentage Women on Board | Total Debt to Total Assets | Market Capitalization | Net Debt to Shareholder's Equity |
|---|---|---|---|---|---|---|---|---|---|---|
| **ESG Score** | Pearson Correlation | 1 | .912** | .677** | .716** | .054* | -0.024 | .064* | .387** | -0.009 |
| | Sig. (2-tailed) | | 0.000 | 0.000 | 0.000 | 0.033 | 0.337 | 0.012 | 0.000 | 0.728 |
| **Environmental Score** | Pearson Correlation | .912** | 1 | .631** | .560** | .079** | -.054* | .062* | .388** | -0.010 |
| | Sig. (2-tailed) | 0.000 | | 0.000 | 0.000 | 0.002 | 0.032 | 0.014 | 0.000 | 0.696 |
| **Social Score** | Pearson Correlation | .677** | .631** | 1 | .254** | -0.025 | 0.022 | -0.021 | .275** | -0.031 |
| | Sig. (2-tailed) | 0.000 | 0.000 | | 0.000 | 0.324 | 0.379 | 0.409 | 0.000 | 0.226 |
| **Governance Score** | Pearson Correlation | .716** | .560** | .254** | 1 | .093** | -0.017 | .118** | .272** | 0.005 |
| | Sig. (2-tailed) | 0.000 | 0.000 | 0.000 | | 0.000 | 0.498 | 0.000 | 0.000 | 0.836 |
| **Cost of Debt** | Pearson Correlation | .054* | .079** | -0.025 | .093** | 1 | -.109** | .397** | 0.016 | .127** |
| | Sig. (2-tailed) | 0.033 | 0.002 | 0.324 | 0.000 | | 0.000 | 0.000 | 0.520 | 0.000 |
| **Percentage Women on Board** | Pearson Correlation | -0.024 | -.054* | 0.022 | -0.017 | -.109** | 1 | -0.046 | -0.019 | -.061* |
| | Sig. (2-tailed) | 0.337 | 0.032 | 0.379 | 0.498 | 0.000 | | 0.072 | 0.443 | 0.015 |
| **Total Debt to Total Assets** | Pearson Correlation | .064* | .062* | -0.021 | .118** | .397** | -0.046 | 1 | -.062* | .351** |
| | Sig. (2-tailed) | 0.012 | 0.014 | 0.409 | 0.000 | 0.000 | 0.072 | | 0.014 | 0.000 |
| **Market Capitalization** | Pearson Correlation | .387** | .388** | .275** | .272** | 0.016 | -0.019 | -.062* | 1 | -0.037 |
| | Sig. (2-tailed) | 0.000 | 0.000 | 0.000 | 0.000 | 0.520 | 0.443 | 0.014 | | 0.144 |
| **Net Debt to Shareholder's Equity** | Pearson Correlation | -0.009 | -0.010 | -0.031 | 0.005 | .127** | -.061* | .351** | -0.037 | 1 |
| | Sig. (2-tailed) | 0.728 | 0.696 | 0.226 | 0.836 | 0.000 | 0.015 | 0.000 | 0.144 | |

*Correlation is significant at the 0.05 level ** Correlation is significant at the (2-tailed). 0.01 level (2-tailed).*

**Table 6**: *Pearson correlation coefficients variables under study*

## Findings:

**Step 1:** We used IBM SPSS v26 to conduct a correlation analysis between the variables under investigation (**Table 6**). Since all the correlation coefficients were not highly correlated, no control variables were removed from the study.

The findings for several panel data regression models are presented in the stages below –

| Variables | Model 1-Control Variables Only | Model 2-Control Variables + ESG Score | Model 3 – Control Variables + Environmental Score | Model 4-Control Variable + Social Score | Model 5-Control Variable + Governance Score |
|---|---|---|---|---|---|
| **Control variables** | | | | | |
| **Total Debt to Total Assets** | 0.043927*** | 0.042041*** | 0.043362*** | 0.042338*** | 0.043767*** |
| **Market Capitalization** | -2.17E-07*** | -2.28E-07** | -2.29E-07** | -2.44E-07*** | -2.02E-07** |
| **Net Debt to Shareholder's Equity** | -4.39E-05 | - | - | - | - |
| **Percentage Women on Board** | -0.019506* | -0.013564* | -0.017520* | -0.014691* | -0.015481* |
| **Constant** | 5.849480 | 6.521471 | 6.073654 | 6.361431 | 6.795863 |
| **Independent variables * Log (Total Assets)** | | | | | |
| **ESG Score** | - | -0.0002329* | - | - | - |
| **Environmental Score** | - | - | -0.001286 | - | - |
| **Social Score** | - | - | - | -0.001541* | - |
| **Governance Score** | - | - | - | - | -0.001764* |
| **Effects Specification** | | | | | |
| **R-squared** | 0.562842 | 0.566469 | 0.563759 | 0.564814 | 0.564857 |
| **Adjusted R-squared** | 0.474129 | 0.478492 | 0.475231 | 0.476501 | 0.476552 |
| **Durbin-Watson stat** | 1.772347 | 1.791095 | 1.779550 | 1.782543 | 1.788122 |
| **F-statistic** | 6.344511*** | 6.438812*** | 6.368189*** | 6.395574*** | 6.396695*** |

Notes: ***Significant at 1% level of Significance, **Significant at 5% level of Significance, *Significant at 10% level of Significance

**Table 7**: Summary of Regression Analysis for five models

**Step 2:** In **Model 1**, we have regressed the cost of debt with the control variables using **EViews 11 Student Version Lite**. We performed **panel data regression** from FY2015 to FY2020 since the data was in panel format (time series & cross series data). The method used was **Least Squares (L.S. and A.R.)**.

We have considered the fixed effects model. In this, the individual-specific effect is a random variable that is allowed to be correlated with the explanatory variables.

The fixed effects model can be thought of as a pooled OLS model with individual specific intercepts.

Panel data models can exhibit heteroscedasticity and correlation both in the present and across time. To remove this issue, **White cross section** estimators was used as coefficient covariance method because they are robust to contemporary heteroscedasticity and cross section dependence.

Our model has an R-Squared of 0.5628 which we consider to be a good indication of our model's explanatory power. Results shows that an increase in total debt to total assets ratio (b

= 0.044, p=0.00) significantly increases the cost of debt component of a firm. Also, the company which have higher market capitalization has a lower cost of debt component (b= -2.17E-07 at p<0.01) which is true according to our variable study. The net debt to equity did not have a significant impact on our dependent variable hence it was not considered in our study for further analysis.

**Step 3:** In **Model 2**, the ESG disclosure score was included along with control variables. The interaction effect of ESG Score was taken with the log of total assets which is a proxy for size. The cost of debt which is the dependent variable had a negative coefficient (-0.0023) i.e., higher the ESG score, lower the cost of debt component for the firm although according to our model it cannot be significantly proven at 5% significance level (confidence level is 93.90% at p=0.0610). But it is significant at 10% level since p=0.0610.
**Step 4:** In **Model 3**, scores of the environment disclosures component along with the interaction effect of size were entered with the control variables. The relationship of cost of debt was negative with the environmental score but it could not be proven significantly (b = -0.0012, p=0.25).
**Step 5:** In **Model 4**, the scores of the social disclosure component along with the interaction effect of size were entered with the control variables. The relationship of cost of debt was negative with the social score but it could be proven significantly at 10% level (b = -0.0015, p=0.08).

**Step 6:** In **Model 5**, the scores of the governance disclosure component along with the interaction effect of size were entered with the control variables. The relationship of cost of debt was negative with the governance score but it could be proven significantly at 10% level (b = -0.0017, p=0.09).

**Step 7:** The next set of hypotheses was evaluated to see if the company's cost of debt influenced ESG ratings and individual components. We discovered that when a company's cost of debt increased, its total ESG disclosure score decreased significantly (b = -0.36, p<0.05) and governance disclosure scores (b = -0.198, p<0.05). See **Table 8** below.

| Variable | ESG Score | Environmental Score | Social Score | Governance Score |
|---|---|---|---|---|
| Cost of Debt Coefficient | -0.362734** | -0.144375 | -0.316681* | -0.198148** |
| Constant | 29.02288 | 16.66763 | 32.88211 | 51.86131 |

Notes: ***Significant at 1% level of Significance, **Significant at 5% level of Significance, *Significant at 10% level of Significance

**Table 8:** *Impact of Cost of Debt on ESG Scores*

## Discussion and Conclusion:

The impact of ESG disclosure scores on cost of debt component of a firm is the subject of this study, which is performed with the help of empirical analysis with the data extracted from Bloomberg database.

Today's business is interconnected globally and stakeholders recognize that the ESG responsibilities of an organization are critical to its efficiency. Responsible management of ESG issues fosters a business spirit and ecosystem that strengthens both a company's societal integrity and stakeholder trust. As a result, companies that disclose ESG practice are reported to have improved their reputation, increasing investor confidence, making better use of resources, and staying competitive. While ESG performance relates to the firm's actual ESG-related actions, ESG disclosure refers to how it channelizes these activities to its stakeholders.

The role of ESG disclosures of companies in determining corporate bond performance cannot be ruled out. Through our research, Market capitalization has a negative significant relationship with the cost of debt component, and the total debt to total assets had a significant direct relationship with cost of debt component. The relationship between cost of debt component and net debt to equity ratio, on the other hand, is insignificant. The impact of ESG Score does have an impact on cost of debt component i.e., higher the ESG score, lower the cost of debt component for the firm although according to our research, it is significant at 6% level. In our results, we found that social score was the component which had the highest significant level for the cost of debt component among environmental, social and governance scores. The ESG Disclosure Scores and the individual scores - Environmental score, Social Score & Governance score had an inverse relationship with the cost of debt component.

By using Stakeholder Theory, which specifies that all those affected by a company's operations should be taken into account in decision-making, it would seem reasonable to believe that bond investors should be a major concern for the company because they are such an important part of its ability to raise funds and create value (De Colle et.al, 2010, p. 405). In our research paper also , our findings suggests that sustainability measures should be adopted in order for the firm to secure its cost of debt or that they would gain from taking into account all stakeholders.

Due to the various problems addressed by ESG considerations, investing in ESG would be a means of addressing all stakeholders of the company. When we try to show advantages through cost of debt and corporate bond performance and we could prove that concerns for all stakeholders lead to any visible gain for the firm. We can show that some aspects of the firm have an impact on the cost of debt instruments. As a result, we believe it is critical for the firm to consider bond investors and bondholders in their operations, as a lower spread can result in significant financial gain and the ability to secure financing. ESG will always be a significant factor in developing markets such as India. Our findings, based on a sample of 260 business observations, show that firms can benefit from enhancing ESG performance and disclosure, which can lead to lower cost of debt.

The findings and results provide evidence on the impact of ESG practices on corporate bond performance of Indian Companies. The findings can be used as guidelines by policymakers, corporate management, and stakeholders to implement ESG practices and to gauge impact on corporate bond performance. Although this study adds to our understanding of the link between ESG practices and cost of debt, it contains a number of limitations that should be addressed in future research. Our theoretical and empirical conclusions are more likely to apply to publicly traded businesses that have published their ESG Scores and are available on Bloomberg, which only looks at publicly available data for publicly traded corporations. In addition, the sample size contains 260 listed companies of NIFTY500. As a result, the findings of this study should not be generalized. Future studies are encouraged to use multiple data sources and larger sample sizes with different time frames. ESG scores impact on corporate bond performance can be expanded to include industry dynamics and segregation of companies on the basis of market capitalization could be performed for further analysis. Finally, while our study focuses on non-financial listed companies in India, it would be interesting to expand the sample size in the future to include companies from other emerging economies, as well as companies from various cultural and institutional contexts, to see how these factors influence the relationship between ESG practices and debt cost.

## References:

Auer, B. R., & Schuhmacher, F. (2016). Do socially (ir) responsible investments pay? New evidence from international ESG data. *The Quarterly Review of Economics and Finance*, *59*, 51-62. https://doi.org/10.1016/j.qref.2015.07.002

Badía, G., Pina, V., & Torres, L. (2019). Financial performance of government bond portfolios based on environmental, social and governance criteria. *Sustainability*, *11*(9), 2514. https://doi.org/10.3390/su11092514

Bhattacharya, S., & Sharma, D. (2019). Do environment, social and governance performance impact credit ratings: a study from India. *International Journal of Ethics and Systems*. https://doi.org/10.1108/IJOES-09-2018-0130

Capelle-Blancard, G., Crifo, P., Diaye, M. A., Oueghlissi, R., & Scholtens, B. (2019). Sovereign bond yield spreads and sustainability: An empirical analysis of OECD countries. *Journal of Banking & Finance*, *98*, 156-169. https://doi.org/10.1016/j.jbankfin.2018.11.011

Capelle-Blancard, G., Crifo, P., Diaye, M. A., Scholtens, B., & OUEGHLISSI, R. (2016). Environmental, Social and Governance (ESG) performance and sovereign bond spreads: an empirical analysis of OECD countries. *Available at SSRN 2874262*. https://doi.org/10.2139/ssrn.2874262

Crifo, P., Diaye, M. A., & Oueghlissi, R. (2017). The effect of countries' ESG ratings on their sovereign borrowing costs. *The Quarterly Review of Economics and Finance*, *66*, 13-20. https://doi.org/10.1016/j.qref.2017.04.011

Drempetic, S., Klein, C., & Zwergel, B. (2019). The influence of firm size on the ESG score: Corporate sustainability ratings under review. *Journal of Business Ethics*, 1-28. https://doi.org/10.1007/s10551-019-04164-1

Duque-Grisales, E., & Aguilera-Caracuel, J. (2019). Environmental, social and governance (ESG) scores and financial performance of multilatinas: Moderating effects of geographic international diversification and financial slack. Journal of Business Ethics, 1-20. https://doi.org/10.1007/s10551-019-04177-w

Eliwa, Y., Aboud, A., & Saleh, A. (2019). ESG practices and the cost of debt: Evidence from E.U. countries. *Critical Perspectives on Accounting*, 102097. https://doi.org/10.1016/j.cpa.2019.102097

Fernandez, R., & Elfner, N. (2015). ESG integration in corporate fixed income. *Journal of Applied Corporate Finance*, *27*(2), 64-72. https://doi.org/10.1111/jacf.12119

Friede, G., Busch, T., & Bassen, A. (2015). ESG and financial performance: aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance & Investment*, *5*(4), 210-233. https://doi.org/10.1080/20430795.2015.1118917

Henisz, W. J., & McGlinch, J. (2019). ESG, Material Credit Events, and Credit Risk. *Journal of Applied Corporate Finance*, *31*(2), 105-117. https://doi.org/10.1111/jacf.12352

Henke, H. M. (2016). The effect of social screening on bond mutual fund performance. *Journal of Banking & Finance*, *67*, 69-84. https://doi.org/10.1016/j.jbankfin.2016.01.010

Jang, G. Y., Kang, H. G., Lee, J. Y., & Bae, K. (2020). ESG Scores and the Credit Market. *Sustainability*, *12*(8), 3456. https://doi.org/10.3390/su12083456

Kjerstensson, L., & Nygren, H. (2019). ESG Rating and Corporate Bond Performance: An analysis of the effect of ESG rating on yield spread. Umeå School of Business, Economics and Statistics, Umeå University, Sweden. https://www.diva-portal.org/smash/get/diva2:1333903/FULLTEXT01.pdf

Landi, G., & Sciarelli, M. (2019). Towards a more ethical market: The impact of ESG rating on corporate financial performance. Social Responsibility Journal. https://doi.org/10.1108/SRJ-11-2017-0254

Li, P., Zhou, R., & Xiong, Y. (2020). Can ESG Performance Affect Bond Default Rate? Evidence from China. *Sustainability*, *12*(7), 2954. https://doi.org/10.3390/su12072954

Maiti, M. (2020). Is ESG the succeeding risk factor?. *Journal of Sustainable Finance & Investment*, 1-15. https://doi.org/10.1080/20430795.2020.1723380

Minutolo, M. C., Kristjanpoller, W. D., & Stakeley, J. (2019). Exploring environmental, social, and governance disclosure effects on the S&P 500 financial performance. Business Strategy and the Environment, 28(6), 1083-1095. https://doi.org/10.1002/bse.2303

Naumer, H. J., & Yurtoglu, B. B. (2020). It is Not Only What You Say, But How You Say It: ESG, Corporate News, and the Impact on CDS Spreads. *But How You Say It: ESG, Corporate News, and the Impact on CDS Spreads (January 2, 2020)*. https://doi.org/10.2139/ssrn.3512923

Ortas, E., Álvarez, I., & Garayar, A. (2015). The environmental, social, governance, and financial performance effects on companies that adopt the United Nations Global Compact. Sustainability, 7(2), 1932-1956. https://doi.org/10.3390/su7021932

Pereira, P., Cortez, M. C., & Silva, F. (2019). Socially responsible investing and the performance of Eurozone corporate bond portfolios. *Corporate Social Responsibility and Environmental Management*, *26*(6), 1407-1422. https://doi.org/10.1002/csr.1756

Polbennikov, S., Desclée, A., Dynkin, L., & Maitra, A. (2016). ESG ratings and performance of corporate bonds. *The journal of fixed income*, *26*(1), 21-41. https://doi.org/10.3905/jfi.2016.26.1.021

Slimane, M. B., Brard, E., Le Guenedal, T., Roncalli, T., & Sekine, T. (2019). ESG Investing and Fixed Income: It's Time to Cross the Rubicon. Amundi Asset Management, Paris, http://thierry-roncalli.com/download/ESG_Investing_Bonds_DP.pdf

Vannoni, V., Ciotti, E., & Bank, F. (2020). ESG or Not ESG? A Benchmarking Analysis. *International Journal of Business and Management*, *15*(8). https://doi.org/10.5539/ijbm.v15n8p152

Weber, O., Diaz, M., & Schwegler, R. (2014). Corporate social responsibility of the financial sector–strengths, weaknesses and the impact on sustainable development. *Sustainable Development*, *22*(5), 321-335. https://doi.org/10.1002/sd.1543

Weber, O., Scholz, R. W., & Michalik, G. (2010). Incorporating sustainability criteria into credit risk management. *Business strategy and the environment*, *19*(1), 39-50. https://doi.org/10.1002/bse.636

Zhao, C., Guo, Y., Yuan, J., Wu, M., Li, D., Zhou, Y., & Kang, J. (2018). ESG and corporate financial performance: Empirical evidence from China's listed power generation companies. *Sustainability*, *10*(8), 2607. https://doi.org/10.3390/su10082607