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Corporate Social Responsibility, Cost of Debt, and the Moderating Effect of the Worldwide Governance Indicator (WGI).

CINTIA MEIRELES URBINA
UNIVERSIDADE DE SÃO PAULO (USP)

TATIANA ALBANEZ
FACULDADE DE ECONOMIA, ADMINISTRAÇÃO E CONTABILIDADE DA UNIVERSIDADE DE SÃO PAULO - FEA

XIAOHONG HUANG

LUCAS AYRES BARREIRA DE CAMPOS BARROS
FACULDADE DE ECONOMIA, ADMINISTRAÇÃO E CONTABILIDADE DA UNIVERSIDADE DE SÃO PAULO - FEA

LAURA SPIERDIJK

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Keywords: Corporate Social Responsibility, credit rating, interest expense ratio, Worldwide Governance Indicator (WGI).

1. Introduction

1.1. The Growing Emphasis on Corporate Social Responsibility (CSR)

The impacts of global warming, environmental degradation, and social concerns related to workforce rights and corruption have received considerable attention in the last decades. These issues have become particularly important in contemporary society and are contributing to regulatory changes to address adequate governance and sustainable business practices (Gracia & Siregar, 2021). Furthermore, managers face increasing pressures from activist groups, public protests, and the media to enhance Corporate Social Responsibility (CSR) (Luo & Tang, 2020; Shi & Veenstra, 2020) in their business.

After the global financial crisis in 2008, firms have been encouraged to expand their performance transparency through incentives and voluntary initiatives of the OECD, UN Global Compact, and International Finance Corporation (IFC), a member of the World Bank Group (Walls et al., 2012), to include social and environmental objectives on their agenda (Berkman et al., 2020; La Rosa et al., 2018). Moreover, signatories to the UN Principles for Responsible Investment understood the importance of incorporating environmental, social, and governance aspects into their portfolio investment analysis and ownership policies and practices (Amir & Serafeim, 2018). CSR refers to the approach companies take when considering environmental, social, and governance (ESG) factors in their business decisions and operations (Stellner et al., 2015) in order to impact the community positively and strengthen trust between various stakeholders of the firm (Albuquerque et al., 2020; Bae et al., 2021; Lins et al., 2017).

1.2. Debt Market and CSR: The Significance of Creditor Engagement

Much of the existing research concentrates on assessing the impact of CSR on the cost of equity capital, as the equity market is regarded as more efficient in pricing firms´ performance than the credit market (Erragragui, 2018). However, as Menz (2010) suggested, there may be more significant pressure for Corporate Social Responsibility (CSR) in the debt market than in the equity market, presenting an alternate perspective.

The shift in focus becomes particularly pertinent considering the escalating significance of the corporate debt market in global economies (Gracia & Siregar, 2021). The growing emphasis on the green bonds market, driven by the demand for environmentally sustainable investments from both governments and investors as part of CSR initiatives, further amplifies the financial relevance of the debt market (Gracia & Siregar, 2021; Banga, 2019; Hao & Renneboog, 2019). Furthermore, debt financing remains a fundamental funding source for firms, particularly in emerging markets (Gong et al., 2021).

The debt market is characterized by large institutional investors and banks equipped with high-quality information about firms. The sophistication of these market participants promotes them into active influencers (Salvi et al., 2020). Consequently, their ability to accurately consider CSR issues (Menz, 2010; Oikonomou et al., 2014; M. et al., 2018) becomes noteworthy. Although banks share similar financial motivations as institutional investors, their relevant role in the debt market enhances their effectiveness in monitoring ESG practices (Allen & Santomero, 1997; La Rosa, Liberatore, Mazzi, & Terzani, 2018). This effectiveness allows

them to influence firms, encouraging improvements in CSR engagement and strengthening ESG performance (Eliwa et al., 2021).

Compared to equity markets, lower levels of information asymmetry in debt markets might contribute to significant investment decisions to incorporate CSR activities (Ioannou & Serafeim, 2012). As a result, it is relevant to investigate how CSR measures, particularly the ESG index, influence the cost of debt. In this research field, still scarce literature explores the CSR engagement of borrowing firms and its impact on the cost of debt (Eliwa et al., 2021; Erragragui, 2018; Gracia & Siregar, 2021; Hoepner et al., 2016).

1.3. The Influence of Corporate Social Responsibility (CSR) on the Debt Market

Some studies posit that CSR activities reduce the cost of debt as CSR disclosure can enhance companies' reputations and decrease agency costs, diminishing information asymmetry between managers and stakeholders (Houqe et al., 2020; La Rosa et al., 2018). Nevertheless, controversial results about the impact of CSR activities on the cost of debt request more investigation into this topic (Eliwa et al., 2021; Gracia & Siregar, 2021). Hoepner et al. (2016) verify that the impact of CSR activities on the cost of debt has a modest positive association, evidencing that CSR engagement has no value creation. Therefore, corporate resources for social issues can be considered a misappropriation due to scarce corporate funds, as they are related to secondary stakeholders and not primary ones regarding investment targeting (Clarkson, 1995; Hillman & Keim, 2001).

Furthermore, the excessive costs of CSR activities driven by different stakeholders' demands have the adverse effects of diminishing profitability, increasing earnings volatility, and subsequently elevating default risk. This, in turn, leads to lenders demanding higher spreads (Goss & Roberts, 2011; Kim et al., 2011; Stellner et al., 2015). In contrast, some researchers report inconclusive findings, as banks do not consider their client's CSR scores when assessing interest rates (Girerd-Potin et al., 2014). Consequently, the outcomes consistently fail to disclose a clear direction in the relationship between CSR and the cost of debt. One of our central questions has been whether CSR proves advantageous or if the association of being a more responsible company represents a misuse of scarce resources.

1.4. Advancing Knowledge of Corporate Social Responsibility (CSR) Practices and the Moderation Effect of Worldwide Governance Indicator (WGI).

Limited attention has been devoted to investigating how a country´s governance influences the relationship between CSR and the cost of debt. This study employs the Worldwide Governance Indicator (WGI) as a proxy for a country´s governance. This approach remains essential as the concerns to political, legal, and ethical standards of the country can determine a firm´s CSR policies and strategies. For example, nations with stringent regulations and robust monitoring oversight (Gracia & Siregar, 2021) can mitigate deficiencies and uncertainties in CSR practices. This is driven by the necessity for companies to align their regulatory and monitoring practices with the governance standards of these countries, a step taken to avoid potential penalties or sanctions linked to non-compliance (Baldini et al., 2018; Hoepner et al., 2016).

A recent concern regarding CSR goals is the phenomenon of greenwashing, marked by an exaggerated representation of firms' environmental, social, and governance (ESG) strategies (Matos, 2020). This issue gains attention because firms have incentives to inflate ESG ratings and take some advantage, including reducing the cost of capital (Bams & van der Kroft, 2022). Consequently, greenwashing may influence the current decisions of debt market participants and consumers in a misleading direction, weakening the relationship between ESG engagement

and the cost of debt in the long run, caused by creditors' growing mistrust of sustainable practices based on unreliable ESG metrics (Escrig-Olmedo et al., 2019).

In this way, countries with more substantial governance structures can reduce the default risk of companies (Stellner et al., 2015). For instance, nations combatting corruption reduce a company's inclination towards harmful behavior, thus preventing greenwashing in ESG pillars (Yu et al., 2020). Therefore, this contributes to creditors' more informed decision-making. On the other hand, companies operating within countries characterized by weak governance frameworks may encounter difficulties in implementing comprehensive ESG regulations and monitoring practices at the organizational level. In such situations, the expenditures associated with sustainability initiatives may not translate into a competitive advantage or substantial benefits for stakeholders (Stellner et al., 2015). Additionally, greenwashing practices might go unchecked due to insufficient governance standards, exacerbating the credit risk associated with these companies and, consequently, higher borrowing costs demanded by creditors.

Investigating the interaction of WGI on the relationship between Corporate Social Responsibility (CSR) and the cost of debt, our study aims to address the following question: Do companies with superior CSR practices experience a greater reward in the form of a lower cost of debt when situated in countries with higher Worldwide Governance Indicator (WGI) rankings?

This study aims to develop the existing literature in three-fold. Firstly, it aims to provide insights into how CSR engagement impacts the cost of debt based on a broad international sample that includes developed and developing countries. Previous research has investigated the impact of CSR activities on the cost of debt in just one country (Attig et al., 2013; Ye & Zhang, 2011) or limited samples (Gracia & Siregar, 2021; Eliwa et al., 2021; La Rosa et al., 2018) demonstrating a consistent association with lower cost of debt. Recognizing the global prominence of CSR (Attig et al., 2013), our study addresses this gap by examining a diverse sample of developed and emerging markets.

Secondly, the research provides evidence on how the Worldwide Governance Indicator (WGI) moderates the relationship between CSR and the cost of debt. Following previous studies (Martins & Barros, 2020; Xie et al., 2017) that emphasize the role of country governance characteristics in shaping market dynamics, this research examines the linkages between CSR, WGI, and the cost of debt. It posits that favorable governance conditions encourage firms to prioritize CSR, with creditors placing higher value on ESG performance as a risk-mitigation measure. The potential impact on the cost of debt is expected to be more pronounced in developed countries due to the cost-effectiveness and rewards associated with an ESG-friendly stance.

Thirdly, the study investigates the relationship between CSR measures and the cost of debt using two different proxies: interest expense ratio calculated by an accounting estimation based on past company information, and credit rating, a scale of risk evaluated by credit rating agencies that estimates forward-looking information as a measure for future cost of debt. This approach remains essential to examine whether CSR engagement reduces the credit risk factor, postulating the significance of non-financial information in determining a firm's creditworthiness (Attig et al., 2013). While prior literature focuses on the impact of CSR on either interest expense ratios (Eliwa et al., 2021; Gracia & Siregar, 2021; Ye & Zhang, 2011) or credit rating (Attig et al., 2013), this study fills the gap by examining both, offering a more comprehensive perspective. Given that debt financing is relevant, particularly in developing countries, this research provides interesting insights into the effects of CSR on both study variables.

Finally, the study aims to offer valuable insights for firms, debt market participants, and investors, enhancing their understanding of the primary role played by CSR activities in influencing the cost of debt. This research contributes to informed decision-making in the corporate and financial spheres by guiding the complexities of CSR's impact on financial metrics.

To empirically test the impact of CSR on the cost of debt, our study utilizes a worldwide sample of non-financial listed companies in 50 countries from 2009 to 2019. We reveal compelling insights by employing two proxies for the cost of debt-credit rating and interest expense ratio. Our findings show that a firm´s CSR practices contribute to a reduction in the cost of debt. Notably, the impact is positively and statistically significant when examining credit rating. A negative relationship is also observed between the interest expense ratio and ESG_Score and Gov_Score. These outcomes corroborate previous studies (Attig et al., 2013; La Rosa et al., 2018), confirming the relevance of non-financial information in assessing firm creditworthiness. Moreover, our research provides valuable insights and awareness to managers, equipping them with tools to optimize CSR strategies for tangible benefits in reducing the cost of debt.

We also reveal newsworthy findings between World Governance Indicators (WGI) and the relationship between CSR and the cost of debt. Our results demonstrate that the interaction term influences the relationship between the ESG aggregated scores and credit rating and the interest expense ratio as proxies of the cost of debt. This confirmation of the moderator's influence emphasizes its importance in estimating the debt cost based on historical and forward-looking information. The Worldwide Governance Indicators (WGI) notably pronounced the positive relationship between ESG_Score, Social_Score, and Env_Score with the credit rating. Similarly, it moderates the relationship between ESG_Score, Social_Score, and ESGC_Score with the interest expense ratio. We check the robustness of our results through a broad set of control variables that have demonstrated their influence on the cost of debt. Our findings reinforce the argument that companies enhance the benefits from their CSR-related efforts within countries with higher WGI. Consequently, these benefits translate into economic advantages, effectively mitigating firms' credit risk.

This study is structured as follows: The next section provides a concise literature review on Corporate Social Responsibility (CSR), the Cost of Debt, and the Moderating Effect of Worldwide Governance Indicators (WGI). Section 3 details the Research Methodology, while Section 4 presents the Results. The study concludes with Section 5, offering Conclusions and Discussion, followed by Section 6, which includes Additional Tests.

2. Literature Review and hypothesis

2.1. Corporate Social Responsibility

Corporate social responsibility combines good corporate governance and social and environmental standards that contribute to sustainable economic development and a better quality of life (World Business Council for Sustainable Development, 2000). The practice of CSR can be understood through various theories, including institutional, legitimacy, stakeholder, and agency theories. The institutional theory applies that firms are influenced by institutional settings in which they operate, adapting their process to codified rules, norms, and laws. In contrast, legitimacy and stakeholder theory posits that firms operate under the bounds and norms of society, contributing to the increase of legitimacy and validating stakeholders' interests by incorporating appropriate practices (Eliwa et al., 2021; Gracia & Siregar, 2021). Agency theory verifies that more information can reduce agency costs and information

asymmetry as firms increase their communication with stakeholders with non-financial information (Houqe et al., 2020; Jensen & Meckling, 1976).

Martin & Moser (2016) suggest that if investors value the social benefits associated with CSR activities, they can respond positively to disclosures about the company's involvement in such activities, regardless of whether their expectations of these activities affect future earnings and cash. Such behavior can be explained by models that move away from the neoclassical perspective, which assumes a utility structure that considers a unilateral human being, strictly selfish, oriented towards homo economicus profit. Alternative characterizations of economic agents may consider social, emotional, and ethical aspects (Cornell & Shapiro, 1987).

High CSR engagement is associated with low systematic risk, lower cost of capital, and capital constraints motivating companies to pursue investments (Cai et al., 2016). Firms with higher ESG/CSR profiles may exhibit different systematic risk exposures due to a particular CSR risk factor or their resilience during times of uncertainty or crisis (Benabou & Tirole, 2010). However, CSR engagement does not increase corporate financial performance unlimited; there exists a threshold where the marginal benefits equate to the marginal costs (Cai et al., 2016). Corporations increase CSR engagement when it positively impacts financial performance, aligning with shareholders' interests. Nevertheless, their CSR commitment diminishes when CSR negatively impacts corporate performance (Kim & Statman, 2012). Moreover, due to the uncertainty surrounding the benefits outweighing the costs, firms predominantly increase CSR engagement in response to pressures from peer firms (Houqe et al., 2020).

However, there is no guarantee that the benefits of the disclosure will exceed its costs. According to socio-political theory, CSR disclosure emerges as a response to social and political pressures confronting the firm (Verbeeten et al., 2016). For instance, rather than opting for voluntary disclosure of ESG information (Cordazzo et al., 2020), companies may reveal non-financial information due to mandatory disclosure requirements imposed by new regulations, pressures from peer firms, or the prevailing business environment. Despite several studies affirming that non-financial disclosure mitigates information asymmetries and benefits stakeholders (Cuadrado-Ballesteros et al., 2016), the balance between the costs and benefits of such disclosure remains uncertain.

In this study, the terms Corporate Social Responsibility (CSR), environmental, social, and governance indicator (ESG), and corporate social performance (CSP) are used interchangeably (Gillan et al., 2021; Houqe et al., 2020; La Rosa et al., 2018). The ESG indicator explicitly includes governance, while CSR indirectly incorporates governance issues through its connections with environmental and social considerations (Gillan et al., 2021). Therefore, ESG tends to be a more comprehensive term than CSR. In addition, the definitions of CSR and CSP remain inconclusive, as both terms denote economic, legal, ethical, and charitable responsibilities. CSR is considered a broader concept than CSP, which can be defined as a metric for CSR.

2.2. CSR and the Cost of Debt

The literature suggests that companies with more information transparency obtain benefits such as a lower cost of debt capital (COD) (Houqe et al., 2020; Mazumdar & Sengupta, 2005). Disclosing financial statements can reduce firms' agency costs (Harvey et al., 2004; Jensen & Meckling, 1976) and information asymmetry (Healy & Palepu, 2001; Huang & Shang, 2019). However, there is still a lack of explanatory power about which information determines the credit evaluation (La Rosa et al., 2018), leaving space for omitted factors priced by market participants.

Menz (2010) demonstrates that "hard" financial indicators, which assess both business risks and financial risks of a company (debt indicator, interest rate, profitability), together with "soft" criteria, such as manager quality, are determinants of the cost of debt. Since rating agencies include CSR investments in their analysis, these "soft" activities can have the same relevance as traditional financial information, such as debt level and profitability, influencing the credit rating grade. Previous studies suggested that CSR activities related to social aspects are relevant for firm credit rating going beyond economic benefits but related to the primary stakeholders of the firm (Attig et al., 2013).

Non–financial disclosures such as ESG can reduce firms' agency costs and information asymmetry (El et al., 2011) because of their transparency in social and environmental impact and their governance structure to their stakeholders (Cheng & Serafeim, 2010). Moreover, civil society organizations and investors increasingly monitor these business practices (World Economic Forum, 2022). Therefore, environmental, social, and governance commitments can decrease firm-level risks and improve the firm´s reputation and creditworthiness (Gracia & Siregar, 2021), lowering capital constraints and the cost of debt (COD) (Cheng & Serafeim, 2010; Houqe et al., 2020).

The initiatives of the United Nations Environmental Programme Statement by Banks on the Environment and Sustainable Development (UNEP Statement) in 1992 and the UNEP Statement of Commitment by Financial Institutions on Sustainable Development (UNEP FI Statement) in 2010 (Weber et al., 2008) motivated financial institutions to integrate environmental and social concerns into their lending operations to supervise their exposure to sustainable risks. Although the integration of sustainability risks raises costs because of the credit rating expenses, it increments the quality of a firm´s credit risk, opening space to create new credit risk criteria (Jung et al., 2018; Weber, 2012).

2.2.1. Agency Costs

Agency costs arise when managers prioritize their interests at the expense of shareholders and firms' value. This conflict of interest also emerges when diversified shareholders opt for risky, high expected-return projects instead of considering the interests of bondholders (Jensen & Meckling, 1976). Consequently, bondholders demand higher returns, thus escalating both the cost of debt and agency costs in anticipation of shareholder behaviors (Anderson et al., 2003). Previous literature reveals that certain firms focus their activities and investments on primary stakeholders during decision-making processes, underscoring the heterogeneous attitudes toward stakeholders (Romito & Vurro, 2021).

Effective corporate governance, characterized by well-defined rules, practices, and incentives, aligns the interests of managers and shareholders, thereby fostering the firms' value creation. In addition, implementing Corporate Social Responsibility commitments produces better engagement of stakeholders in sustainable practices, contributing to better firms' transparency (Cheng et al., 2014). Moreover, its engagement is a powerful mechanism for reducing managers' short-term opportunistic behavior, as it reinforces the company's commitment to shareholder expectations (Benabou & Tirole, 2010; Cheng & Serafeim, 2010).

CSR activities have the potential to work as a trigger for managerial incentives toward social performance, showing competence and commitment to these topics (Stellner et al., 2015). This is evident when independent board directors actively align managerial incentives with CSR initiatives, maximizing the firm´s value (Hong et al., 2016). Furthermore, adopting such practices enhances public relations and communication with stakeholders (Houqe et al., 2020), reflecting an ethical commitment to responsible business conduct, solidified relationships and trust with the broader community, and thus mitigating agency conflicts. The outlined

mechanisms may lead to increased profitability and reduced default risk (Goss & Roberts, 2011; Stellner et al., 2015), lowering the debt cost.

2.2.2. Information Asymmetry and Signaling

More significant information asymmetry imposes higher efforts for investors seeking access to firm information. Consequently, the extent of information disclosed becomes intricately linked to information asymmetry levels. Disclosing non-financial information to stakeholders contributes to transparency and enhances firms' credibility (Cheng et al., 2014). This is relevant as such disclosures are pertinent to investors' perceptions of firms' objectives (Romito & Vurro, 2021). Hence, CSR measures work as a mitigating factor, diminishing information asymmetry and, in turn, reducing the cost of capital (Cuadrado-Ballesteros et al., 2016).

Corporate social responsibility, perceived as a combination of good corporate governance, environmental standards, and good relations between stakeholders, can be rationalized as a signaling device for companies' reliability and credibility (Cheng et al., 2014; Hao & Renneboog, 2019) in generating quality products or a means of smoothing out the competition. According to the signaling theory, entities seek to provide signals to reduce information asymmetry and, thus, facilitate the choice of stakeholders. In addition, CSR activities can affect the credit rating and increase the rating score by reducing the perceived risk concerning the company's financial standing. The signaling effect occurs through stakeholders' relationship improvement and the efficient use of internal resources (Attig et al., 2013).

Adopting sustainable business practices can indicate competency and reflect the trustworthiness of corporate managers (Hoepner et al., 2016). Companies anticipating robust future performance tend to allocate more resources to corporate social responsibility (CSR) expenses, recognizing that CSR engagement can serve as an informative signal about the prospects and potential of the company (Cheng et al., 2014).

2.2.3. Reputational Risk

Reputational risk (Houqe et al., 2020) causes damage to the trustworthiness of listed firms. Firms with lower CSR engagement can face higher financial distress as investors react to negative environmental news and labor protests (Houqe et al., 2020). Furthermore, it ruins the reputation of all stakeholders, including creditors (Gong et al., 2021), affecting their future operations, cash flows, and competitive market position (Jung et al., 2018). This risk is also related to the ability of the creditor to generate future customers and revenue streams that will impact the current loan portfolio (Jung et al., 2018; ~~O.~~ Weber, 2012).

Consolidating the agency costs, information asymmetry, signaling, and reputational risk assumptions, we argue that higher firms' CSR engagement could negatively impact the cost of debt (Gracia & Siregar, 2021; Houqe et al., 2020; La Rosa et al., 2018). Moreover, the relationship urges analyses based on a broad international sample that includes developed and emerging markets, so we evaluate the following hypothesis.

Hypothesis 1: CSR practices of a firm reduce the cost of debt.

2.3. Moderating effect of Institutional Environment - Worldwide Governance Indicators (WGI)

The company costs and benefits derived from CSR investments vary in terms of stages of economic development, values and beliefs of society, and institutional factors of the

country (Campbell, 2007), including public and private regulations and institutionalized norms that can enhance or inhibit CSR activities.

Kaufmann, Kraay, and Mastruzzi (2010) posit that effective resource allocation to implement policies and countries' regulations improves governance practices, such as a satisfactory level of accountability, respect for the rule of law, and low levels of corruption (Alsaleh et al., 2021). Therefore, companies are prone to have more CSR engagements when a strong and well-enforced state regulation guarantees these socially responsible attitudes (Cai et al., 2016; Campbell, 2007).

According to institutional theory, CSR reflects firms' rules and strategies to align with institutional goals (Jackson & Apostolakou, 2010) within a broader social context. This way, firms contextualize CSR by considering their approach through understanding prevalent norms, existing practices, emulation of competitors, and adherence to or avoidance of regulatory frameworks. Therefore, variations in firms' CSR ratings emerge, reflecting differences, often stemming from managerial incentives to foster social responsibility (Ioannou & Serafeim, 2012). Moreover, managers contend with internal and external pressures in CSR engagement initiatives (Aguilera et al., 2007). This dynamic interplay of influences shapes managers' strategic decisions and actions in fulfilling their CSR commitments.

In prior studies, country-level institutional heterogeneity can better explain CSR variance than firm characteristics such as R&D expenditures to sales ratios, market-to-book ratio, and rates of return on assets (Cai et al., 2016; Doidge et al., 2007). For instance, control of corruption and other countries' characteristics connected to political rights play a role in firms' implementation of CSR activities, as they determine the cost of circumvention of the regulatory CSR standards through lobbying and outright bribery in a country (Cai et al., 2016).

Companies in a country without good corporate governance are probably less committed to sustainable-related matters, and customers give less importance to and are less prone to pay a premium for companies with good ESG grades (Stellner et al., 2015). In addition, lenders will not reduce the cost of debt for CSR commitment companies located in countries with a low governmental capacity to implement policies and regulations that improve private sector development.

Nevertheless, CSR engagement better acts as a risk-reducing mechanism and adds value to shareholders if the external environment perceives and rewards it. Therefore, a company that invests in CSR practices should have the country's recognition and acknowledgment of the relevance of sustainable engagements to build a generation of moral capital that might function as insurance in a downturn (Stellner et al., 2015). Hence, a country that regulates, monitors, and penalizes companies for not complying with norms can enhance the negative impact between CSR efforts and the cost of debt.

This work intends to analyze the moderating effect of corporate governance at the country level on the relationship between CSR and risk, as determined by the cost of debt. Differences between countries as corporate governance measures can influence firms' strategy in diverse ways, including CSR engagement, as they can capture differences in local rules, regulations, governmental control, and enforcement mechanisms (Reimann et al., 2015). For this purpose, we include the average of the six World Bank indicators of governance perceptions – the Worldwide Governance Indicator (WGI) reported by survey respondents and non-governmental organizations obtained from 31 different data sources worldwide (Kaufmann et al., 2011) and their interactions with the appropriate right-hand-side variables.

These three areas of governance correspond to six dimensions: First, 'Voice and Accountability (VA)' measures the citizen's perceptions of government participation, freedom

of expression, and press freedom. Second, 'Political stability and absence of violence (PV)' captures perceptions of government instability, violence, and terrorism. Third, 'Government Effectiveness (GE)' estimates public and civil services perceptions, political independence, public policy formulation and implementation quality, and credibility. Fourth, 'Regulatory quality (RQ)' measures perceptions of the government´s capacity to implement policies and regulations that stimulate private sector development. Fifth, the rule of Law (RL)' reflects perceptions of trust in societal rules regarding crime and violence, property rights, and contract enforcement. Finally, 'Control of corruption (CC)' expresses perceptions about using public power for private gains, elite interests, and benefits (Bunyavejchewin & Sirichuanjun, 2021; Kaufmann et al., 2011).

Baldini et al. (2018) found that corruption, one of the dimensions of the WGI, is negatively correlated with each ESG in environmental, social, and governance scores. When the country's level of corruption is high, companies are more prone to unethical practices, as they have fewer benefits of being ethical, consequently enhancing information asymmetry, agency costs, and reputational risk as the firms are less committed to CSR disclosures (Baldini et al., 2018; Ioannou & Serafeim, 2012).

Reimann et al. (2015) posit that multinational enterprises (MNE) located in the host country with a substantial institutional environment difference compared to MNEs' home countries are less strategically committed to CSR. Using the WGI, the results showed that MNEs benefit from the differences in corporate governance and the isomorphic adaptation to the country's rules. They can face hindrances in implementing their CSR activities due to significant challenges in emerging markets (Campbell et al., 2012); thereby, we posit the following:

Hypothesis 2: The Worldwide Governance Indicator (WGI) moderates the relationship between CSR efforts and the cost of debt, so a higher WGI strengthens the negative relationship.

3. Research Method

3.1. Sample selection process and variables

We conducted this research by collecting data from 2009 through 2019 on how the main variables changed. Following the previous literature (La Rosa et al., 2018) to investigate the relationship between corporate social responsibility and the company's credit ratings and cost of debt, we use data from the following sources: The ESG indicator collected in the Thomson Reuters Asset-4 (Refinitiv-Eikon) database. Data can be collected in aggregate and separately (individual ESG performance): environmental (E), social (S), and governance (G). This source will collect credit ratings, interest expense ratios, control variables, and other essential information. Beta and market-to-book variables were collected in DataStream.

We selected the non-financial companies listed on the stock exchanges of fifty countries based on Morgan Stanley Capital International's (MSCI) classification of developed and emerging markets. Institutional contexts such as control of corruption, government effectiveness, political stability and absence of violence, rule of law, regulatory quality, and voice and accountability were collected from Worldwide Governance Indicators (WGI) (M. Baldini et al., 2018; Houqe et al., 2020).

To ensure firm-specific control in our regression models, we exclude financial firms and select firms with positive values for revenue, total equity, and total debt. We also exclude firms without ESG measures from the analysis. The initial sample consists of 28,835 non-financial

firms. We further eliminate firms without credit ratings for the ordered probit model analysis, resulting in a refined sample of 1.467 non-financial firms. The final dataset forms an unbalanced panel for the regression model, comprising 20.312 firm-year observations, representing 3.520 non-financial firms across 50 countries from 2009 to 2019.

Dependent Variables

Following previous studies (Ashbaugh-Skaife et al., 2006; Attig et al., 2013a; Jiraporn et al., 2014; Stellner et al., 2015), an ordinal scale is utilized for issuer credit ratings, with 'Rating' as the dependent variable. Credit rating agencies evaluate a risk scale that estimates forward-looking information as a measure of the future cost of debt. Moody's and Fitch's ratings were standardized as issuer credit ratings composed by S&P for short-term and long-term issuer credit ratings.

Therefore, we attribute eight if the company has an S&P rating of AAA, seven if AA, six if A, five if BBB, four if BB, three if B, two if CCC, and one if CC. We use the ordered probit regressions to investigate the relation between ESG and credit rating. The Thomson Reuters ASSET-4 (Refinitv-Eikon) database has a frequently scored publication, allowing us to examine the impact of CSR on credit rating yearly.

Interest expense ratio (IntRatio) calculated by an accounting estimation based on past company information is another proxy for cost of debt investigated in this research. Consistent with previous literature, this dependent variable is estimated as the firms' interest expense ratio for period t divided by the average of total debt of periods t-1 and t ($\frac{Interest\ Expense_t}{((Total\ Debt_{t-1} + Total\ Debt_t)/2)}$), (Bhojraj & Sengupta, 2003; Gracia & Siregar, 2021; Houqe et al., 2020; Jung et al., 2018). Interest Expense represents interest on debt, while total debt represents short-and long-term debt. We winzorized the dependent variable at 1% and 99 % levels.

Explanatory Variables

In this study, ESG serves as a proxy for CSR. The ESG index gained prominence in the 2000s due to a growing interest in evaluating social, environmental, and governance metrics. Numerous organizations now provide ESG data, and this proxy is more comprehensive than traditional CSR, explicitly incorporating governance issues (Gillan et al., 2021).

Following previous research (Ioannou & Serafeim, 2012; Stellner et al., 2015), the Thomson Reuters Asset-4 (Refinitiv-Eikon) database is chosen for its reputable commitment to delivering reliable, auditable, and systematically collected ESG data covering global companies annually. ESG scores in this database range from 0.1 (indicating minimal firm disclosure) to 100 (reflecting a superior level of disclosure), adjusted by a factor of 0.01 in line with previous literature (Houqe et al., 2020). The study employs an overall integrated ESG score (ESG_Score), calculated as the sum of three categories that vary by firm and year. Additionally, the analysis considers scores for the three pillars: Environmental (Env_Score), Social (Social_Score), Governance (Gov_Score), and a combined ESG score incorporating controversies (ESGC_Score). Esgc_Score overlays ESG_Score with ESG controversies, gauging a company's exposure to adverse events in global media related to environmental, social, and governance issues, thus providing a comprehensive sustainability assessment. Recognizing the inherent 12-month lag in the ESG measures sourced from the Thomson Reuters Asset-4 (Refinitiv-Eikon) database, this temporal aspect is considered in our analysis.

In parallel, the Worldwide Governance Indicators (WGI) constitute a research dataset that provides indicators across six dimensions of governance: control of corruption, government

effectiveness, political stability and absence of violence, rule of law, regulatory quality, and voice and accountability (Worldwide Governance Indicator, 2021). Following previous studies (Coluccia et al., 2018), these indicators are widely utilized in the literature, covering over 200 countries and receiving annual updates. The rankings assess how each country leverages its competencies for long-term value creation (Coluccia et al., 2018).

WGI scores are ranked from 0 to 100 and multiplied by 0.01, with higher values indicating a better outcome regarding country governance quality (Bunyavejchewin & Sirichuanjun, 2021). Our analysis adopted a lagging approach, acknowledging the 12-month lag in the WGI measures sourced from the World Bank dataset. Both the WGI variable and its corresponding interaction term were intentionally lagged by one year in our second model. Hence, this temporal aspect is taken into account in our analysis.

Control Variables

A set of company-specific control variables as independent variables that are expected to influence credit ratings, theoretically and empirically, that can prevent omitted variable bias from affecting the results, according to previous studies (Ashbaugh-Skaife et al., 2006; Attig et al., 2013b; Houqe et al., 2020; La Rosa et al., 2018).

The variables are '*Size'*, the natural logarithm of revenue; '*Coverage'*, proportion of earnings before interest and taxes (EBIT) divided by interest expenses; '*Margin'*, ratio of operating revenues to sales; '*Leverage'*, long-term debt ratio to total assets is associated with default risk and has a straight relation to critical variables such as ratings and cost of debt (Houqe et al., 2020; La Rosa et al., 2018); '*Capint'*, the proportion of total ownership, plant (installation) and equipment - PPE to total assets (Attig et al., 2013); *Market-to-Book 'MTB'*, metric used as a proxy for investments opportunities (Cai et al., 2016); '*Beta'*, an indicator of systematic risk measured during the fiscal year; return on assets '*ROA'*, income after taxes for the fiscal period divided by the average total assets at the beginning and the end of the year expressed in a percentage calculated by Thomson Reuters Asset 4 (Refinitiv-Eikon) dataset, as financial performance recurring control variable for the analyses, and sets of dummies variables capturing country, year, and industry.

3.2. Regression Models

Our empirical tests are based on two models and try to shed light on the relationship between CSP and the cost of debt. Specifically, we examine how our ESG metric, derived from the Thomson Reuters ASSET4 (Refinitiv-Eikon), influences credit ratings and interest expense ratio, our two measures of the cost of debt.

Following previous studies (Attig et al., 2013b; La Rosa et al., 2018), our analysis starts with estimating a panel regression model. This initial step aims to test the first hypothesis within the framework utilizing the interest expense ratio as a metric for the cost of debt:

$$COD_{it} = \beta_0 + \beta_1 ESG_{it-1} + \beta_2 Size_{it} + \beta_3 Leverage_{it} + \beta_4 ROA_{it} + \beta_5 Coverage_{it} + \beta_6 Margin_{it} + \beta_7 Beta_{it} + \beta_8 Capint_{it} + \beta_9 MTB_{it} + \delta_t + \gamma_s + \theta_j + \varepsilon_{it} \quad (1)$$

'i 'and 't' correspond to firm and year indices. According to the following notation, the dependent variable cost of debt, 'COD,' is denoted by the interest expense ratio (IntRatio) as a proxy. In our analysis, we employed the Least Squares Dummy Variable (LSDV)[1] approach controlled for time, industry, and country fixed effects by including time, industry, and country

[1] we used ***reghdfe*** (linear models with many levels of fixed effects) command in Stata. http://scorreia.com/research/hdfe.pdf

dummies: δ_t, γ_s, and θ_j, that represent the year ($t = 1, \dots, T$), industry ($s = 1, \dots, S$), and county ($j = 1$ Finally, $\varepsilon_{i,t}$ stands for the idiosyncratic error of the model. The estimation of standard errors is robust to heteroscedasticity and autocorrelation.

Considering the ordinal nature of the dependent variable (Rating), which acts as a proxy for the cost of debt, we employ an ordered probit model[2] with robust standard errors adjusted for clustering by firms. Dummy variables for the year, industry, and country are incorporated into the model, consistent with methodologies applied in previous studies (Attig et al., 2013b; Papadimitri et al., 2020; Safiullah et al., 2021).

The coefficient β_1 is our coefficient of interest. It captures the influence of ESG measures on the cost of debt. Our hypothesis posits that a negative coefficient would indicate that higher ESG measures would relate to better (lower) cost of debt. We incorporate the three pillars of Social, Environmental, and Governance to strengthen our prediction and the overall ESG combined score. Following previous studies, ESG metrics demonstrate the potential to enhance a company's reputation, mitigate agency costs, and consequently reduce information asymmetry (Houqe et al., 2020; La Rosa et al., 2018).

To evaluate our second hypothesis and verify the moderation effect of WGI on the relationship between ESG and the cost of debt, we estimate a panel regression model, specified as follows:

$$COD_{it} = \beta_{B0} + \beta_{B1}ESG_{it-1} + \beta_{B2}WGI_{it-1} + \beta_{B3}ESG_{it-1} * WGI_{it-1} + \beta_{B4}Size_{it} + \beta_{B5}Coverage_{it} + \beta_{B6}Margin_{it} + \beta_{B7}Leverage_{it} + \beta_{B8}Capint_{it} + \beta_{B9}Beta_{it} + \beta_{B10}ROA_{it} + \beta_{B11}MTB_{it} + \delta_{Ct} + \gamma_{Cs} + \theta_{Cj} + \varepsilon_{Cit} \quad (2)$$

Where the WGI variable represents the average of six individual components of Worldwide Governance Indicators (WGI) per year: governance voice and accountability (VA), political stability and absence of violence (PV), government effectiveness (GE), regulatory quality (RQ), the rule of law (RL) and control of corruption.

In line with the first hypothesis, we adopted the Least Squares Dummy Variable (LSDV) approach for our second hypothesis, which controlled for time, industry, and country fixed effects by including corresponding dummy variables. Furthermore, we utilized an ordered probit model for the variable 'Rating,' which functions as another proxy for the cost of debt. This analysis incorporates dummy variables for the year, industry, and country.

The coefficient β_{B3} is our coefficient of interest, where the Worldwide Governance Indicators (WGI) play a moderating role in shaping the relationship between ESG measures and the cost of debt. Our hypothesis proposes a negative coefficient indicating that the relationship is conditional on the external environment in which companies operate. According to a previous study (Cai et al., 2016), well-established corporate governance provides appropriate rules, regulations, and effective public policy implementation, reinforcing enhanced corporate disclosures and access to information. In this way, robust regulatory frameworks can contribute to reducing greenwashing, raising the trustworthiness of ESG information, and mitigating the company's risk. Therefore, we predict that the WGI pronounces the negative relationship between ESG measures and the cost of debt.

Acknowledging the inherent 12-month lag in the Worldwide Governance Indicators (WGI) sourced from the World Bank dataset, we deliberately lagged this variable and its

[2] we used ***oprobit*** (ordered probit regression) command in Stata.

corresponding interaction term by one year in our second model. This lagging approach was similarly applied to the ESG measure in our analysis, maintaining consistency in our methodology.

4. Results

Table 1 reports the number of observations per country and industry. The non-financial companies listed on the stock exchanges of 50 countries based on Morgan Stanley Capital International (MSCI) classification of 23 developed markets and 27 emerging markets in the Americas, Europe, the Middle East, Africa (EMEA), and Asia. Panel A shows that Australia, Japan, the USA, and the United Kingdom are the most represented countries in the sample, and 'consumer cyclical,' 'industrials, and 'technology' have the highest number of observations. Following previous studies, we used Refinitiv classification of the economic sectors into ten categories of industry (Stellner et al., 2015; Gracia & Siregar, 2021; Houqe et al., 2020; La Rosa et al., 2018; Safiullah et al., 2021). We deliberately excluded the 'Institutions, Associations & Organizations' and 'Government Activity' categories within our sample due to the absence of observed credit rating grades.

Table 1 - Tabulation of Country and Industry

Country/Industry	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	Total
Argentina	0	18	12	22	12	2	11	6	17	26	126
Australia	9	584	350	198	206	199	302	241	183	74	2346
Austria	0	35	2	0	13	0	48	16	15	13	142
Belgium	0	40	17	27	13	39	30	32	38	11	247
Brazil	14	84	62	93	42	35	81	60	41	139	651
Canada	0	71	13	11	11	0	22	0	22	22	172
Chile	0	35	21	50	18	0	11	6	16	80	237
China	0	161	141	83	122	53	270	54	108	73	1065
Colombia	0	20	0	14	13	0	7	0	4	20	78
Czech Republic	0	0	0	0	0	0	0	0	11	11	22
Denmark	0	22	21	28	11	71	59	0	18	5	235
Egypt	0	10	0	0	0	0	10	10	18	0	48
Finland	0	56	34	22	11	11	87	2	34	11	268
France	0	48	260	63	45	59	230	47	102	35	889
Germany	0	166	179	44	21	102	192	48	124	39	915
Greece	0	0	18	13	22	0	29	2	21	20	125
Hong Kong	2	65	174	86	30	22	116	224	69	132	920
Hungary	0	0	0	2	11	10	0	0	11	0	34
India	0	128	86	100	56	78	64	38	86	54	690
Indonesia	0	49	41	62	47	10	13	22	38	10	292
Ireland	0	8	15	17	0	0	11	4	0	0	55
Israel	0	22	0	0	11	11	11	6	31	0	92
Italy	0	15	90	14	44	13	64	2	22	80	344
Japan	11	490	748	421	45	222	991	164	468	143	3703
Korea (South)	0	95	165	133	63	58	251	0	172	21	958
Kuwait	0	5	0	0	0	0	5	9	16	0	35
Malaysia	0	32	70	83	40	16	56	29	43	40	409
Mexico	0	67	50	95	0	7	42	8	11	4	284
Netherlands	0	46	14	31	46	13	73	24	55	0	302
New Zealand	0	5	63	25	10	23	43	44	26	48	287
Norway	0	28	17	34	71	0	20	5	26	2	203
Pakistan	0	3	0	0	0	0	0	0	0	0	3
Peru	0	52	4	20	0	0	11	0	0	15	102
Philippines	0	0	16	45	9	0	9	42	21	47	189

Poland	0	26	25	14	42	0	14	10	20	33	184
Portugal	0	19	0	21	8	0	2	0	11	13	74
Qatar	0	0	0	11	12	0	0	12	12	6	53
Russia	0	91	2	11	87	0	0	9	40	57	297
Saudi Arabia	0	40	2	7	3	2	0	7	22	11	94
Singapore	0	0	33	66	0	23	90	88	42	11	353
South Africa	9	196	109	131	8	37	123	83	84	0	780
Spain	0	28	53	11	43	36	80	25	40	46	362
Sweden	0	74	111	29	0	52	179	67	70	0	582
Switzerland	0	63	61	61	0	100	162	42	77	3	569
Taiwan	0	130	171	31	11	18	195	20	527	0	1103
Thailand	0	19	40	38	50	14	26	12	25	18	242
Turkey	0	27	54	55	13	2	40	10	24	5	230
United Arab Emirates	0	0	4	3	0	0	5	22	16	0	50
United Kingdom	2	207	548	229	81	105	598	225	185	77	2257
United States	58	779	1762	684	728	1353	1766	1187	1714	514	10545
Total	105	4159	5658	3238	2129	2796	6449	2964	4776	1969	34243

This table presents total observations per country and industry. Number (1) corresponds to Academic & Educational services, (2) Basic Materials, (3) Consumer Cyclicals, (4) Consumer Non-Cyclicals, (5) Energy, (6) Healthcare, (7) Industrials, (8) Real Estate, (9) Technology, (10) Utilities. Source: Refinitiv-Eikon

Table 2. Descriptive statistics of regression variables

	Mean	p25	Median	p75	Std. Dev.
ESG_Score	0.440	0.268	0.430	0.605	0.211
Social_ Score	0.443	0.248	0.425	0.633	0.242
Env_Score	0.376	0.091	0.363	0.622	0.29
Gov_Score	0.491	0.311	0.494	0.672	0.226
ESGC_ Score	0.425	0.265	0.416	0.577	0.20
WGI	0.791	0.8	0.846	0.879	0.162
Rating	5.375	5.0	6.0	6.0	1.167
IntRatio	0.054	0.025	0.041	0.062	0.059
Size	21.603	20.602	21.691	22.737	1.723
Coverage	60.56	3.787	7.852	20.495	252.887
Margin	0.091	0.053	0.110	0.197	0.464
Leverage	0.216	0.099	0.198	0.31	0.152
ROA (%)	4.56	1.817	4.588	8.241	8.905
MTB	3.32	1.16	1.950	3.48	4.836
Beta	1.049	0.67	0.982	1.345	0.535
Capint	0.298	0.096	0.239	0.447	0.242

This table provides descriptive statistics (mean, p25, median, p75, and standard deviation) of Rating, IntRatio, and other control variables used in this study. These variables are *Size*, the natural logarithm of revenue; *Coverage*, the proportion of earnings before interest and taxes (EBIT) plus interest expenses divided by interest expenses; *Margin*, ratio of operating revenues to sales; *Leverage*, long-term debt ratio to total assets; *Capint*, the proportion of total ownership, plant (installation) and equipment - PPE to total assets (Attig et al., 2013); *Market-To-Book (MTB)*, metric used as a proxy for investments opportunities (Stellner et al., 2015); *Beta*, an indicator of systematic risk measured during the fiscal year; *ROA*, income after taxes for the fiscal period divided by the Average Total Assets at the beginning and the end of the year expressed in percentage. Control variables are winsorized at the 1% and 99% levels.

Table 2 shows the descriptive statistics for both dependent and independent variables. The data has been winsorized at the 1% and 99% percentiles to mitigate the impact of outliers. The mean value of IntRatio is (0.05), which is in line with the result reported by La Rosa et al. (2018). The Rating has a mean of (5.37), corresponding to the BBB rating. The mean values for ESG_Score, Social_Score, Env_Score, Gov_Score, and ESGC_Score are (0.44), (0.44),

(0.37), (0.49), and (0.42), respectively, aligning with observations in Houqe et al. (2020). The WGI has an average of 0.79. The median firm demonstrates a return on assets (ROA) of 4.6%, Leverage of 0.19, Size of 21.69, Coverage of 7.84, and Margin of 0.11. In addition, the average firm exhibits a market-to-book ratio (MTB) of 3.32, Beta of 1.04, and Capint of 0.29.

Table 3. Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
(1) Rating	1															
(2) IntRatio	-0.422	1														
(3) ESG_Score	0.133	-0.087	1													
(4) Social_Score	0.029	-0.052	0.9	1												
(5) Env_Score	0.247	-0.119	0.873	0.729	1											
(6) Gov_Score	0.047	-0.043	0.683	0.432	0.413	1										
(7) ESGC_Score	0.133	-0.082	0.961	0.863	0.839	0.658	1									
(8) WGI	0.282	-0.087	0.045	0.052	0.033	0.007	0.036	1								
(9) Size	0.3	-0.18	0.477	0.379	0.506	0.296	0.415	-0.094	1							
(10) Leverage	-0.314	-0.059	0.004	0.04	-0.035	0.017	0.006	0.05	-0.055	1						
(11) ROA (%)	0.193	-0.048	0.091	0.067	0.084	0.075	0.097	-0.104	0.236	-0.171	1					
(12) MTB	-0.094	0.06	-0.021	0.017	-0.074	-0.033	-0.022	-0.033	-0.063	0.073	0.145	1				
(13) Coverage	0.161	-0.004	-0.06	-0.066	-0.06	-0.034	-0.055	0.01	-0.044	-0.216	0.249	0.09	1			
(14) Margin	0.044	-0.093	0.121	0.084	0.13	0.095	0.123	-0.077	0.374	0.106	0.541	-0.03	0.08	1		
(15) Beta	-0.283	0.047	-0.067	-0.062	-0.064	-0.035	-0.07	0.069	-0.037	0.058	-0.203	-0.048	-0.065	-0.16	1	
(16) Capint	-0.045	-0.027	-0.003	-0.016	0.036	0.035	-0.009	-0.09	0.027	0.195	-0.051	-0.09	-0.066	0.021	0.01	1

This table presents pairwise correlation between the regression variables. The sample comprises firms from 50 countries over the 2009-2019 period.

Table 3 presents the results of pairwise correlations among firms' Credit Rating, Interest Ratio (IntRatio), ESG scores, World Governance Indicator (WGI), and control variables utilized in the models. The correlation matrix highlights positive correlations between Credit Rating and ESG_Score (0.133), Social_Score (0.029), Env_Score (0.247), Gov_Score (0.047), and ESGC_Score (0.133). Conversely, negative correlations exist between the interest expense ratio (IntRatio) and ESG_Score (-0.087), Social_Score (-0.052), Env_Score (-0.119), Gov_Score (-0.043), and ESGC_Score (-0.082).

4.1. Results on H1

The following section presents results from ordered probit and panel regressions, separated into tables (4 and 5) depending on the cost of debt measure: rating or interest expense ratio. As detailed in the methodology section, we employed ordered probit regressions to investigate whether higher ESG scores contribute to rating agencies' more favorable evaluation of a company's credit risk, resulting in consistently better ratings.

Table 4. Ordered probit results on the effect of ESG on credit ratings

VARIABLES	(1)	(2)	(3)	(4)	(5)
ESG_Score_{it-1}	0.455***				
	(0.164)				
$Social\_Score_{it-1}$		0.337**			
		(0.149)			
Env_Score_{it-1}			0.232**		
			(0.109)		
Gov_Score_{it-1}				0.241**	

				(0.115)	
$ESGC\_Score_{it-1}$					0.424***
					(0.152)
$Size_{it}$	0.322***	0.331***	0.335***	0.348***	0.335***
	(0.0290)	(0.0293)	(0.0280)	(0.0267)	(0.0275)
$Beta_{it}$	-0.579***	-0.575***	-0.574***	-0.571***	-0.577***
	(0.0494)	(0.0497)	(0.0497)	(0.0497)	(0.0495)
$Leverage_{it}$	-1.622***	-1.636***	-1.637***	-1.650***	-1.632***
	(0.231)	(0.232)	(0.230)	(0.232)	(0.232)
ROA_{it}	0.0243***	0.0241***	0.0242***	0.0240***	0.0239***
	(0.00508)	(0.00508)	(0.00507)	(0.00509)	(0.00507)
$Capint_{it}$	0.202	0.187	0.205	0.189	0.208
	(0.132)	(0.133)	(0.132)	(0.132)	(0.132)
MTB_{it}	0.00655	0.00640	0.00695	0.00751	0.00673
	(0.00735)	(0.00737)	(0.00734)	(0.00736)	(0.00736)
$Coverage_{it}$	0.000354**	0.000348**	0.000355**	0.000334*	0.000353**
	(0.000171)	(0.000172)	(0.000174)	(0.000171)	(0.000171)
$Margin_{it}$	2.066***	2.084***	2.085***	2.104***	2.087***
	(0.252)	(0.254)	(0.252)	(0.251)	(0.252)
Country Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Pseudo_R^2	0.2713	0.2709	0.2706	0.2706	0.2712
Observations	5,994	5,994	5,994	5,994	5,994

This table presents coefficients and standard errors results of ordered probit regressions of yearly issuer corporate ratings (Rating) on the prior year´s ESG_Score_{t-1} $(model\ 1)$, $Social_{Score_{t-1}}$ $(model\ 2)$, Env_Score_{t-1} $(model\ 3)$, $Gov_{Score_{t-1}}$ $(model\ 4)$, $ESGC_{Score_{t-1}}$ $(model\ 5)$, and a set of controls variables. The control variables encompass a set of company-specific and globally time-varying variables, along with industry and country dummy variables. They are winsorized at the 1%and 99% levels. We estimate the ordered probit model with industry, year and country dummies. Information is obtained from Thomson Reuters Asset 4 (Refinitiv-Eikon) and Data Stream. The sample comprises 5,994 firm-year observations of 50 countries and 10 industries over the 2009–2019 period. The z-statistics are based on robust standard errors adjusted for clustering. *, **, and *** indicate significance at the 10% percent, 5% percent, and 1% percent level, respectively.

Table 4 presents results for five distinct ESG measures with different dummy variables. Model I represents the baseline specification, incorporating ratings as the dependent variable and ESG_Score (aggregate score) and control variables as independent variables. A positive coefficient would suggest that superior ESG measures are associated with better (higher) credit ratings. We observe a statistically significant relationship between the five different ESG measures. With all the coefficients of interest being positive, rating agencies appear to incorporate ESG measures in their assessment of a company's credit quality, and non-financial ratios also play a significant role in reducing the cost of debt, as described by the viewpoint emphasizing risk reduction. These findings align with prior research (Ashbaugh-Skaife et al., 2006; Attig et al., 2013b), indicating that firms with higher ESG measures benefit from improved ratings.

The estimated coefficients on Size and Margin are positive and significant at the 1% level. This outcome implies that larger firms demonstrate lower susceptibility to default, and an increased operating margin decreases default risk, consequently enhancing firm credit

ratings. ROA and coverage are also positive and significant at 1% and 5%, respectively. These findings suggest that a higher return on assets (ROA) reflects greater efficiency in resource usage and competence to improve profit performance. Furthermore, a higher coverage ratio contributes to lower financial risk. Moreover, Beta and Leverage are negative and statistically significant at the 1 % level. This indicates that they act as a risk-increasing factor for firms, contributing to default risk (Attig et al., 2013; Safiullah et al., 2021).

Table 5. Regression: The relationship of ESG practices and the Interest Expense Ratio

VARIABLES	(1)	(2)	(3)	(4)	(5)
ESG_Score_{it-1}	-0.00266*				
	(0.00150)				
$Social\_Score_{it-1}$		-0.00170			
		(0.00129)			
Env_Score_{it-1}			-0.00117		
			(0.00113)		
Gov_Score_{it-1}				-0.00217*	
				(0.00125)	
$ESGC\_Score_{it-1}$					-0.000698
					(0.00149)
$Size_{it}$	-0.00325***	-0.00333***	-0.00335***	-0.00335***	-0.00342***
	(0.000251)	(0.000243)	(0.000250)	(0.000223)	(0.000235)
$Beta_{it}$	0.00415***	0.00415***	0.00416***	0.00415***	0.00416***
	(0.000589)	(0.000589)	(0.000590)	(0.000590)	(0.000589)
$Leverage_{it}$	-0.0448***	-0.0448***	-0.0448***	-0.0447***	-0.0447***
	(0.00274)	(0.00274)	(0.00274)	(0.00274)	(0.00274)
ROA_{it}	-0.000478***	-0.000475***	-0.000476***	-0.000478***	-0.000478***
	(6.40e-05)	(6.40e-05)	(6.40e-05)	(6.40e-05)	(6.40e-05)
$Capint_{it}$	-0.000904	-0.000885	-0.000920	-0.000879	-0.000929
	(0.00106)	(0.00106)	(0.00106)	(0.00107)	(0.00106)
MTB_{it}	0.000360***	0.000359***	0.000358***	0.000356***	0.000358***
	(6.95e-05)	(6.94e-05)	(6.94e-05)	(6.96e-05)	(6.94e-05)
$Coverage_{it}$	-2.59e-06	-2.61e-06	-2.64e-06	-2.54e-06	-2.58e-06
	(2.85e-06)	(2.85e-06)	(2.86e-06)	(2.85e-06)	(2.85e-06)
$Margin_{it}$	-0.00642**	-0.00647***	-0.00642**	-0.00635**	-0.00638**
	(0.00250)	(0.00250)	(0.00250)	(0.00251)	(0.00251)
Constant	0.128***	0.130***	0.130***	0.130***	0.131***
	(0.00549)	(0.00540)	(0.00557)	(0.00506)	(0.00524)
Country Dummies	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
Observations	23,663	23,662	23,662	23,663	23,663
R-squared	0.250	0.250	0.250	0.250	0.250

This table presents coefficients and standard errors results of Least Squares Dummy Variable (LSDV) of yearly is interest expense ratio (IntRatio) on the prior year´s ESG_Score_{t-1} $(model\ 1)$, $Social_{Score_{t-1}}$ $(model\ 2)$, Env_Score_{t-1}, $(model\ 3)$, $Gov_{Score_{t-1}}(model\ 4)$, $ESGC_{Score_{t-1}}(model\ 5)$ and controls variables. The control

variables encompass a set of company-specific and globally time-varying variables, along with industry and country dummy variables. They are winsorized at the 1%and 99% levels. We estimate the Least Squares Dummy Variable (LSDV) model controlled for time, industry and country fixed effects by including time, industry and country dummies. Information is obtained from Thomson Reuters Asset 4 (Refinitiv-Eikon) and Data Stream. The sample comprises 23,663 firm-year observations of 50 countries and 10 industries over the 2009–2019 period. The z-statistics are based on robust standard errors. *, **, and *** indicate significance at the 10% percent, 5% percent, and 1% percent level, respectively.

Table 5 provides the outcomes from the Least Squares Dummy Variable (LSDV) approach, incorporating interest expense ratio as the dependent variable and ESG_Score (aggregate score), control variables as independent variables, and several dummy variables as time, industry, and country. Models 1 and 4 reveal a negative relationship between ESG measures and interest expense ratio that is statistically significant at the ten percent level. Following the viewpoint of risk reduction, these are the expected results. These results align with the risk reduction perspective, indicating that higher ESG_Score (Model 1) and Gov_Score (Model 4) enhance the company's risk mitigation. Such measures improve the relationship between firms and key stakeholders by reducing information asymmetry, enhancing credibility, and decreasing reputational risk. While the statistical significance is relatively weak, these findings are consistent with those from Gracia and Siregar (2021) and Houqe et al. (2020). However, Models 2 and 3, representing the social and environmental pillars and the combined ESG model (Model 5), do not exhibit statistical significance. This suggests that they do not contribute to reducing the interest expense ratio.

Most control variables show the expected signs, with a substantial proportion demonstrating high statistical significance. Larger and more profitable firms tend to experience a lower interest expense ratio. However, leverage and market-to-book (MTB) ratios present the opposite expected sign. Increased leverage can be related to investments in profitable projects or signals of confidence in the company's future ability to generate cash flows. This can reduce the perceived risk to creditors. On the other hand, a high market-to-book ratio may suggest that the market is attributing a value substantially above the company's book value, signaling excessive optimism. This can increase the perceived risk by creditors, demanding higher interest rates to compensate for this additional risk.

4.2. Results on H2

Table 6. Ordered probit results on the effect of ESG on credit ratings and the moderating effect of the Worldwide Governance Indicator (WGI).

VARIABLES	(1)	(2)	(3)	(4)	(5)
ESG_Score_{it-1}	-1.075*				
	(0.625)				
WGI_{t-1}	-1.701	-1.806	-1.202	-0.769	-1.583
	(1.169)	(1.110)	(1.104)	(1.143)	(1.148)
$ESG\_Score_{t-1} * WGI_{t-1}$	1.854**				
	(0.792)				
$Social\_Score_{t-1}$		-1.236***			
		(0.471)			
$Social\_Score_{t-1} * WGI_{t-1}$		1.922***			
		(0.623)			
Env_Score_{t-1}			-0.598		
			(0.443)		

$Env\_Score_{t-1} * WGI_{t-1}$			1.003*		
			(0.553)		
Gov_Score_{t-1}				-0.149	
				(0.493)	
$Gov\_Score_{t-1} * WGI_{t-1}$				0.474	
				(0.627)	
$ESGC\_Score_{t-1}$					-1.121*
					(0.623)
$ESGC\_Score_{t-1} * WGI_{t-1}$					1.876**
					(0.787)
$Size_{it}$	0.322***	0.330***	0.335***	0.348***	0.334***
	(0.0290)	(0.0293)	(0.0280)	(0.0266)	(0.0275)
$Beta_{it}$	-0.584***	-0.580***	-0.577***	-0.572***	-0.581***
	(0.0493)	(0.0496)	(0.0496)	(0.0497)	(0.0495)
$Leverage_{it}$	-1.601***	-1.615***	-1.624***	-1.644***	-1.616***
	(0.232)	(0.233)	(0.230)	(0.232)	(0.232)
ROA_{it}	0.0250***	0.0250***	0.0247***	0.0242***	0.0246***
	(0.00510)	(0.00509)	(0.00509)	(0.00510)	(0.00509)
$Capint_{it}$	0.213	0.196	0.211	0.191	0.218*
	(0.132)	(0.133)	(0.132)	(0.132)	(0.132)
MTB_{it}	0.00610	0.00582	0.00672	0.00743	0.00634
	(0.00732)	(0.00734)	(0.00731)	(0.00735)	(0.00734)
$Coverage_{it}$	0.000364**	0.000360**	0.000366**	0.000336**	0.000361**
	(0.000171)	(0.000172)	(0.000174)	(0.000171)	(0.000171)
$Margin_{it}$	2.035***	2.054***	2.063***	2.097***	2.059***
	(0.254)	(0.255)	(0.253)	(0.252)	(0.253)
Country Dummies	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
Pseudo_R^2	0.2718	0.2717	0.2709	0.2706	0.2717
Observations	5,994	5,994	5,994	5,994	5,994

This table presents coefficients and standard errors results of ordered probit regressions of yearly issuer corporate ratings (Rating) on the prior year´s interaction term $ESG\_Score_{t-1} * WGI_{t-1}$ $(model\ 1)$, $Social_{Score_{t-1}} * WGI_{t-1}$ $(model\ 2)$, $Env\_Score_{t-1} * WGI_{t-1}$ $(model\ 3)$, $Gov_{Score_{t-1}} * WGI_{t-1}$ $(model\ 4)$, $ESGC_{Score_{t-1}} * WGI_{t-1}$ $(model\ 5)$ and controls variables. The control variables encompass a set of company-specific and globally time-varying variables, along with industry and country dummy variables. They are winsorized at the 1%and 99% levels. We estimate the ordered probit model with industry, year and country dummies. Information is obtained from Thomson Reuters Asset 4 (Refinitiv-Eikon) and Data Stream. The sample comprises 5,994 firm-year observations of 50 countries and 10 industries over the 2009–2019 period. The z-statistics are based on robust standard errors adjusted for clustering. *, **, and *** indicate significance at the 10% percent, 5% percent, and 1% percent level, respectively.

Table 6 introduces an interaction term between ESG-Scores and WGI. The interaction term is statistically significant with a positive sign at the one percent level for both Model 1 and 2, at the ten percent level for Model 3, and the five percent level for Model 5. These results suggest that credit ratings benefit from higher ESG measures, mainly when the WGI is higher. This supports our second hypothesis, illustrating that the relationship between credit rating and ESG is conditional on the corporate governance standards (WGI) of the countries where the firms are located, aligning with the findings of a previous study (Cai et al., 2016). Consequently, the creation of risk-reducing induced intangibles calls for both value and recognition from stakeholders for the CSR efforts undertaken by the companies.

However, the interaction between Gov_Score and WGI in Model 4 is not statistically significant. One plausible explanation is that companies in countries with weak WGI may adopt robust firm-level governance rules to compensate for this deficiency. Consequently, these firms substitute the country's regulations and norms to address the governance inefficiency gap, as Koch et al. proposed (2013). Consequently, WGI does not accentuate the impact of governance (Gov_Score) on the cost of debt for these companies

Table 7. Regression results on the effect of ESG on interest expense ratio and the moderating effect of the Worldwide Governance Indicator (WGI).

VARIABLES	(1)	(2)	(3)	(4)	(5)
ESG_Score_{t-1}	0.0148				
	(0.00945)				
WGI_{t-1}	0.0396**	0.0397**	0.0321*	0.0285	0.0388**
	(0.0188)	(0.0187)	(0.0191)	(0.0187)	(0.0188)
$ESG\_Score_{t-1} * WGI_{t-1}$	-0.0220*				
	(0.0114)				
$Social\_Score_{t-1}$		0.0160**			
		(0.00815)			
$Social\_Score_{t-1} * WGI_{t-1}$		-0.0224**			
		(0.00980)			
Env_Score_{t-1}			0.00424		
			(0.00744)		
$Env\_Score_{t-1} * WGI_{t-1}$			-0.00672		
			(0.00891)		
Gov_Score_{t-1}				-0.00303	
				(0.00803)	
$Gov\_Score_{t-1} * WGI_{t-1}$				0.00111	
				(0.00977)	
$ESGC\_Score_{t-1}$					0.0161
					(0.00991)
$ESGC\_Score_{t-1} * WGI_{t-1}$					-0.0212*
					(0.0119)
$Size_{it}$	-0.00320***	-0.00329***	-0.00335***	-0.00336***	-0.00339***
	(0.000252)	(0.000244)	(0.000250)	(0.000224)	(0.000235)
$Beta_{it}$	0.00418***	0.00417***	0.00417***	0.00414***	0.00418***
	(0.000590)	(0.000590)	(0.000590)	(0.000590)	(0.000590)
$Leverage_{it}$	-0.0449***	-0.0448***	-0.0448***	-0.0447***	-0.0448***
	(0.00275)	(0.00275)	(0.00275)	(0.00275)	(0.00275)
ROA_{it}	0.000480***	0.000478***	0.000478***	0.000479***	0.000480***
	(6.39e-05)	(6.39e-05)	(6.39e-05)	(6.39e-05)	(6.39e-05)
$Capint_{it}$	-0.000970	-0.000938	-0.000937	-0.000883	-0.000994
	(0.00106)	(0.00106)	(0.00106)	(0.00106)	(0.00106)
MTB_{it}	0.000365***	0.000365***	0.000360***	0.000356***	0.000362***
	(6.95e-05)	(6.95e-05)	(6.95e-05)	(6.96e-05)	(6.95e-05)

$Coverage_{it}$	-2.74e-06	-2.79e-06	-2.74e-06	-2.60e-06	-2.72e-06
	(2.85e-06)	(2.85e-06)	(2.85e-06)	(2.85e-06)	(2.85e-06)
$Margin_{it}$	-0.00630**	-0.00637**	-0.00636**	-0.00632**	-0.00626**
	(0.00250)	(0.00250)	(0.00251)	(0.00251)	(0.00251)
Constant	0.177***	0.191***	0.164***	0.187***	0.172***
	(0.00477)	(0.00444)	(0.00435)	(0.00454)	(0.00463)
Country Dummies	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes
Observations	23,663	23,662	23,662	23,663	23,663
R-squared	0.250	0.250	0.250	0.250	0.250

This table presents coefficients and standard errors results of Least Squares Dummy Variable (LSDV) regressions of yearly interest expense ratio (IntRatio) on the prior year´s interaction term $ESG\_Score_{t-1} * WGI_{t-1}$ $(model\ 1)$, $Social_{Score_{t-1}} * WGI_{t-1}$ $(model\ 2)$, $Env\_Score_{t-1} * WGI_{t-1}$ $(model\ 3)$, $Gov_{Score_{t-1}} * WGI_{t-1}(model\ 4)$, $ESGC_{Score_{t-1}} * WGI_{t-1}$ $(model\ 5)$ and controls variables.The control variables encompass a set of company-specific and globally time-varying variables, along with industry and country dummy variables. They are winsorized at the 1%and 99% levels. We estimate the Least Squares Dummy Variable (LSDV) model controlled for time, industry and country fixed effects by including time, industry and country dummies. Information is obtained from Thomson Reuters Asset 4 (Refinitiv-Eikon) and Data Stream. The sample comprises 23,663 firm-year observations of 50 countries and 10 industries over the 2009–2019 period. The z-statistics are based on robust standard errors. *, **, and *** indicate significance at the 10% percent, 5% percent, and 1% percent level, respectively.

Table 7 introduces the interaction term between ESG-Scores and WGI, similar to Table 6, with the interest expense ratio as the dependent variable. The interaction term is statistically significant, with a negative sign at the five percent level for both Model 2 and the ten percent level for Model 1 and Model 5. This implies that the interest expense ratio benefits from higher ESG measures, mainly when the WGI is higher. This further validates our second hypothesis, demonstrating that stakeholders reward the fact that value-creation investments in CSR activities are conducted in countries that also recognize these efforts (Stellner et al., 2015). Alternatively, they may penalize companies more severely for having low ESG measures due to better regulation, norms, and less corruption.

Our results indicate that firms boasting higher levels of ESG score, particularly social score, reflect prominent labor relations policies, foster strong relationships with unions, and actively engage in community initiatives (Baldini et al., 2018; Ioannou & Serafeim, 2012; Matten & Moon, 2008). These practices, in turn, decrease reputational risk, consequently reducing the cost of debt. These companies actively embrace responsible conduct that aligns with stakeholders' expectations.

However, Env_Score (Model 3) and Gov_Score (Model 4) are not statistically significant in our analysis. One plausible explanation for these findings is that companies situated in countries with weak corporate governance can institute strong firm-level rules as a compensatory measure. Therefore, these firms substitute the sustainable regulations and norms of the country to address the governance gap related to environmental and governance issues. Consequently, the WGI does not moderate the impact of the environmental score (Env_Score) and governance score (Gov_Score) on the cost of debt as companies establish their governance regulations and rules specific to these topics.

5. Conclusion and Discussion

The growing relevance of CSR practices in recent years and their visible impacts on the corporate debt market underscores the significance of researching this topic. This study contributes to the existing literature by empirically examining the influence of firms' CSR on the cost of debt. We extend the current literature by empirically investigating the impact of CSR on the cost of debt in a broad international sample of 50 countries from 2009 to 2019.

We employ two proxies to assess the cost of the debt: the interest expense ratio, calculated through accounting estimations based on historical company data, and credit ratings, which provide forward-looking insights into the anticipated future cost of debt evaluated by credit rating agencies. Moreover, to ensure the robustness of our findings, we incorporate a combination of Environmental, Social, Governance, and ESG combined scores in our analysis.

Secondly, this research sheds light on a relevant aspect by providing evidence on how the corporate governance characteristics of a country, as measured by the Worldwide Governance Indicators (WGI), influence the relationship between corporate social responsibility (CSR) and the cost of debt. We mainly analyze WGI as a moderating factor in this relationship. By exploring the quality of corporate governance within a country, we effectively uncover its contribution to CSR engagement and how it moderates the relationship between CSR and the cost of debt. This offers an understanding of the dynamics at play, enriching the discourse on these interconnected aspects.

The results confirm our first hypothesis, revealing a positive and statistically significant impact on firm credit rating for ESG aggregated scores and individual pillars. This suggests increased ESG commitments and activities contribute to higher credit rating rankings. Consistent with prior literature (Attig et al., 2013b), CSR practices mitigate credit risk, as non-financial information strengthens a firm's creditworthiness and enhances its overall value. It can be inferred that debtholders prioritize ESG practices that directly affect vital stakeholders, thereby rewarding sustainable engagement in a crucial role that shapes debtholders' decisions and diminishes their borrowing costs. Therefore, CSR activities have the potential to generate intangibles and create value (Stellner et al., 2015).

Furthermore, countries with higher WGI exert power in some ESG pillars due to better regulatory frameworks, efficient governance mechanisms, and effective public policy implementation. In these countries, businesses are under substantial pressure to adhere to these regulations, leading to enhanced accessibility to information and disclosure practices that align with stakeholders' expectations. This emphasizes the essential conclusion that the investment in CSR as a moral capital and risk mitigation requires not only effort by companies to create valuable resources and intangibles but also stakeholders that appreciate and reward sustainable initiatives based on countries that also recognize and acknowledge the relevance of this scope (Stellner et al., 2015).

Nonetheless, there are several limitations to this study. Firstly, it deals with the challenge of the endogeneity problem, which arises from potential influences between dependent variables and ESG measures. For instance, companies with ESG ratings might not solely result from a conscious effort in CSR practices. However, they could also be attributed to inherent competitive advantages, substantial market influence, and heightened profitability, enabling companies to possess greater capacities to invest in Corporate Social Responsibility (CSR) initiatives. Additionally, some companies might already exhibit higher credit ratings and a more favorable interest expense ratio, and this scenario contributes to better ESG scores. This interplay emphasizes the difficulty in establishing causality in such contexts, introducing the possibility of reverse causality. On the other hand, companies with lower ESG ratings may

experience reduced investor activity, potentially impeding their market accessibility. Secondly, we rely on secondary data provided by the Thomson Reuters Asset 4 dataset and Datastream. Therefore, other sources connected to ESG information could be explored.

Future research can explore various factors, including using different measures for assessing the cost of debt. This may involve investigating credit spreads, explicitly emphasizing the corporate bond market, and exploring alternative forms of accessing debt, such as leverage. Another compelling approach to consider is the various dimensions of credit risk, including the sovereign rating default spread at the country level. Additionally, researchers might investigate the opportunities presented by natural experiments, particularly those associated with regulatory changes in ESG disclosures or practices. It would encompass diverse aspects like air quality, labor practices, and human rights.

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