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Corporate Social Responsibility and Capital Structure

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Abstract

Objetivo: We analyze the effects of capital structure influence on corporate social responsibility (CSR) performance, represented by the ESG score. Prior studies have investigated distinct factors to settle CSR adoption. Nonetheless, corporate social responsibility literature has not yet achieved common consent.

Method: This study uses a quantitative research approach. We used a sample of listed companies from the United States of America, China, Japan, Germany, India, the United Kingdom, France, Italy, Brazil, and Canada. Three estimators were applied in the regression model: OLS pooled, IV 2SLS, and GMM 2SLS.

Results: Our findings indicate a positive and significant relationship between Capital Structure and CSR. This study empirically assesses the impact of a company's capital structure on the ESG ratings of listed companies in the world's ten largest economies. Our results are compatible with model predictions in confirming that a higher investment in capital structure affects ESG performance. We find that the variations found between countries, especially companies from nations with higher GDP, need a more significant capital structure than smaller ones to obtain a positive CSR index. This contrast could be due to the companies' size and Nation culture.

Contributions: The paper argues that the capital structure can be introduced related to adopting corporate social responsibility. Our paper contributes to the literature examining the effects of capital structure on CSR practices. While there is a rich body of theoretical work on the impact of capital structure on profitability, investment returns, firm value, our study adds to a relatively recent literature strand that tests the theoretical predictions of capital structure on CSR practices, represented by ESG scores. Specifically, it contributes to two strands of the empirical literature. First, our study contributes to empirical work investigating how investments through the capital structure in CSR practices affect corporate ESG rating. Second, our study contributes to the literature examining the effects of capital structure on the ESG scores of different countries.

Keywords: Corporate Social Responsibility; Capital Structure; Gross Domestic Product; ESG Score.

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Introduction

We investigate the effects of capital structure on the corporate social responsibility (CSR) of listed companies related to the world's ten largest economies in 2019-2020. This proposal stems from our restlessness regarding the consensus need for more in the literature about the determinants that lead companies to adopt CSR practices. In this paper, we consider the terms CSR and ESG as commutable and use the terminology CSR practices and ESG scores. Prior work has provided various reasons for companies to implement social responsibility practices. These include reducing risk (Teixeira, Nossa & Funchal, 2011); adding value (Servaes & Tamayo, 2013); minimizing information asymmetry (Cho, Lee & Pfeiffer Jr., 2013); and enhancing corporate reputation and image (Baraibar-Diez & Sotorrío, 2018; Le, 2022).

Even though different topics have been researched, most studies seek to relate CSR to corporate financial performance (CFP) (McWilliams & Siegel, 2000; Campbell, 2007; Carroll, 2008; Scholtens, 2008; Revelli & Viviani, 2015; Saeidi et al., 2015; Cantino et al., 2017; Xiao et al., 2018; Yang, He, Zhu & Li, 2018; Ben Saad & Belkacem, 2022). However, the results of these investigations differ from one another.

On the one hand, studies investigate whether CSR practices affect the CFP (McWilliams & Siegel, 2000; Saeidi et al., 2015). For example, while analyzing Spanish companies listed on the Madrid Stock Exchange, Rodriguez-Fernandes (2016) found a positive and significant correlation between CSR and CFP. Furthermore, he verified that corporate policies focused on responsible social actions improve positive financial returns, being the organizations that most invest, those with the highest financial returns. Meanwhile, Wang and Sarkis (2017), looking at Newsweek's top 500 US green companies, found that implementing CSR-based management renders more excellent financial results.

On the other hand, positive and significant results of the relationship between CSR and financial performance are only sometimes confirmed in empirical studies (Cochran & Wood, 1984; McWilliams & Siegel, 2000; Saeidi et al., 2015). Nollet, Filis, and Mitrokostas (2016), while analyzing the companies that compose the S&P 500 index, inferred that even CSR has a positive coefficient on corporate financial performance, nevertheless insignificant. Chen, Hung, and Wang (2018) found a negative association in Chinese companies, denoting that companies with spending on CSR decreased profitability.

As already pointed out by McWilliams and Siegel (2000), these divergences in results are not surprising. Part of the problem lies in the econometric models' specifications used. The other part resides in the fact that the theoretical omission of CSR creates intangible attributes for the firm, such as reputation, legitimacy, and reliability. Therefore, these other elements suggest that the relationship between CSR and CFP is more complex than usually addressed in studies and does not occur directly (Saeidi et al., 2015).

In this point of view, a group of researchers argues that CFP would only be a consequence of the association between CSR and corporate capital structure (Teixeira et al., 2011; Almeida & Santos, 2016; Yang et al., 2018; Bae et al., 2019; Hamrouni, Boussaada & Toumi, 2019), which we also support in this research. This linkage results from a change of thoughts, in which political and community forces seek convergence between financial and social goals (Campbell, 2007; Carroll, 2008; Prado-Lorenzo, Gallego--Alvarez & Garcia-Sanchez, 2009; Chen, Hung & Wang, 2018). The worldwide logic is that companies should not only maximize the returns and defend shareholders but also consider all stakeholders. (Al-Dah, Dah & Jazi, 2018; Baraibar-Diez & Sotorrío, 2018; Yang et al., 2018).

Accordingly, the availability of funding for organizations through shareholders' equity or debt would impact organizations' involvement in socially responsible actions (Almeida & Santos, 2016; Yang et al., 2018; Hamrouni et al., 2019). From a shareholders' equity perspective, current shareholders search for organizations with CSR practices and, thus, invest more resources in these companies (Prado-Lorenzo et al., 2009; Teixeira et al., 2011). Regarding debt, CSR actions lead to greater ease of access to debt contraction since this behavior increases third-party reliability in the company (Almeida & Santos, 2016; Hamrouni et al., 2019).

The existing contradictions in the CSR literature still allow research, such as ours, regarding the reasons surrounding responsible social practices and the effect of capital structure on companies. Our research examines how a company's capital structure affects its ESG ratings in the top ten global economies. The findings align with our predicted model, indicating that more significant investment in capital structure leads to better ESG performance. Notably, we observed that companies in countries with higher GDPs require a more substantial capital structure than those in nations with smaller GDPs to achieve a positive CSR rating. This difference may be attributed to company size and national culture (Cai, Pan & Statman, 2016).

Our paper contributes to the literature exploring the impact of capital structure on CSR practices, represented explicitly by ESG scores. While existing theoretical work has focused on the link between capital structure and profitability, investment returns, and firm value (Ghardallou, 2022; Sari & Sedana, 2020), our study builds upon recent empirical literature examining the relationship between capital structure and CSR practices. Our research contributes to two

strands of this literature. Firstly, we investigate how capital structure investments in CSR practices influence corporate ESG ratings. Secondly, we examine the impact of capital structure on ESG scores across different countries.

Based on the findings, it is recommended that managers invest in the company's capital structure to enhance their Corporate Social Responsibility (CSR) practices. This involves implementing procedures such as minimizing carbon footprints, enhancing labor policies, participating in fair trade, promoting diversity, equity, and inclusion, engaging in charitable global giving, practicing community and virtual volunteering, implementing corporate procedures that benefit the environment, and making socially and environmentally conscious investments. These low-risk practices can significantly boost the company's reputation and value. Moreover, the government and regulators should actively encourage companies to prioritize using internally generated and externally issued capital. One way to achieve this is by introducing differentiated taxes for income when the company reaches and maintains a certain level of ESG score.

1. Literature review and hypothesis development

Corporate Social Responsibility has theoretically flourished in Europe since the 1950s; nonetheless, it can be identified as a long process that originated in the early twentieth century in the United States of America (Carroll, 2008). Although there is no unanimity on its definition in literature, we understand how commitment made by the companies implies social and environmental issues beyond the financial aspect (Gössling & Vocht, 2007).

The term CSR has been subjected to changes over time, and from the outset demonstrates the responsibility companies have for the community since these organizations are considered social agents. They take responsibility for affecting society while pursuing their financial goals (Low, 2016). Due to their economic-local impact, companies succeed in carrying intrinsic responsibilities with the place and environment where they are located (Cosenza et al., 2018).

According to Gillan, Koch, and Starks (2021), ESG is an acronym that originated from a request made by Kofi Anon, Secretary-General of the United Nations, to 20 financial institutions in 2004. It stands for environmental, social, and governance and involves integrating these concerns into a company's business models by corporations and investors. On the other hand, CSR has traditionally referred to a company's efforts to be more socially responsible and a better corporate citizen. However, ESG explicitly includes governance, while CSR indirectly addresses governance issues related to environmental and social considerations. ESG, therefore, is a more comprehensive concept than CSR. To understand the connections between a company's governance structure and its environmental and social initiatives, we focus on the environmental and social aspects of CSR practices and ESG ratings without delving into the vast literature on corporate governance.

For Ullmann (1985), three aspects lead firms to engage in socially responsible actions: the stakeholders' power, the company's strategic stance, and economic performance. The first aspect interferes with the company's assimilation due to the importance given by its stakeholders to social and environmental factors, which, depending on the exercise power, leads to a greater or not adoption of CSR practices (Prado-Lorenzo et al., 2009; Hamrouni et al., 2019). The second is used to promote a good company image, reputation, and credibility, thereby gaining acceptance of its activities towards society (McWilliams & Siegel, 2000; Al-Dah et al., 2018; Hamrouni et al., 2019; Le, 2022). Lastly, the third aspect allows the organization to instigate socially oriented actions to achieve its objectives (Al-Dah et al., 2018).

Campbell (2007) attaches relevance to company stakeholders since corporate behavior is considered socially responsible when it meets the actors' expectations about what would be appropriate and acceptable. While opinions on what is acceptable may vary (Cho et al. 2013), it is generally accepted that entrepreneurial actions fall under the community's umbrella of Corporate Social Responsibility.

As a global phenomenon, CSR marks a shift in thinking about what interests companies should address (Carroll, 2008; Pfajfar et al., 2022). It occurs because management focused exclusively on the interests of shareholders presents problems, as other company stakeholders that are important to its operation may need to be noticed, such as the Government, Suppliers, and Customers (Teixeira et al., 2011). Consequently, the perspective shift from shareholders to stakeholders reinforces CSR's widespread view that all parts of the organization are essential and should have their expectations met (Baraibar-Diez & Sotorrío, 2018; Yang et al., 2018; Garcia, Mendes-da-Silva & Orsato, 2019; Lu et al., 2021).

The duality between the shareholders' and stakeholders' objectives does not cease. Because of its importance, conscious companies avoid actions that could harm their stakeholders. If it does, they try to correct the incident and recover the damage (Campbell, 2007) due to other parties' impact on the entity. Nevertheless, firms' goal remains to maximize shareholder wealth (Carroll & Shabana, 2010), even when facing increasing external pressures to meet social expectations (Al-Dah et al., 2018).

However, only some companies are on the same level of behavior and assimilation of responsible social practices. Carroll (1979) pointed out differences in CSR levels from sector to sector as responsibilities change. In McWilliams,

Siegel, and Wright's (2006) view, CSR demands vary by country, region, and industry. Similarly, Garcia et al. (2019) consider that these differences depend on the economic characteristics in which companies are inserted and the different stages of economic development.

In addition, Hamrouni et al. (2019) emphasize that implementing CSR policies in organizations involves ethical, legal, sustainability, and reputation aspects. Because of this, and following McWilliams, Siegel and Wright (2006), the top management of companies ponders the implementation of CSR, considering the distinct aspects and consequences of adopting this practice.

Under this line of argument and considering diverse stakeholders in companies, Almeida and Santos (2016) argue that responsible social practices are considered by companies choosing the capital structure. Since the financing of operating activities comes from contracting external debts, the organizations decide between third parties or shareholders' equity. According to Yang et al. (2018), the capital structure affects decision-making about CSR strategies because adopting that corporate practice improves the environment and reduces part of the inherent business risks.

In this context, Krištofík, Medzihorský, and Musawe (2022) researched the relationship between capital structure and its determinants and the mediating role of Corporate Social Responsibility (CSR) in this context. They examined a sample of large European companies and found that CSR companies have higher leverage than non-CSR companies. Additionally, the influence of corporate income tax rate, depreciation, and amortization on leverage was not significantly different between CSR and non-CSR companies. Furthermore, tax shields did not significantly impact either CSR or non-CSR companies.

Moreover, Madison and Schiehll (2021) studied the impact of considering the financial materiality of Environmental, Social, and Governance (ESG) issues on firms' ESG performance scores. Their findings revealed that incorporating financial materiality significantly changes firms' ESG performance scores. Based on their results, the authors argue that considering financial materiality can better guide investment decisions based on ESG performance.

Given the funding relevance to a company's business, Alakent, Goktanb, and Khouryc (2020) investigated the corporate social responsibility practices of companies with different ownership histories, specifically those receiving venture capital funding. Their study showed that venture capital-backed companies have poorer CSR records, but these improve over time, albeit slower than non-venture capital-backed companies. When these companies receive funding from venture capital firms with a responsible investment orientation and a broader stakeholder perspective, their CSR practices improve significantly.

On the other hand, Yeh et al. (2020) investigated the relationship between corporate social responsibility (CSR) and Chinese companies' equity and debt capital costs. It may show that firms with high CSR performance would not experience significant reductions in their cost of equity capital compared to developed countries. However, they discovered that companies with better CSR performance could rapidly lower their cost of debt capital. Interestingly, their results show that the capital structure (CS) does not moderate the relationship between CSR and the cost of capital. This study suggests that Chinese firms invest in CSR at the legal and complacent levels. However, this may lead to more information asymmetry and less market efficiency. Overall, these findings underscore the importance of CSR investments for firms and contribute to our understanding of the CSR-capital structure relationship in the country.

Companies use CSR strategies to reduce risks and ensure future success. Shareholders view CSR disclosures as a signal that the company is behaving as expected (Cho et al., 2013), which can attract new investors and maintain current ones (Dhaliwal, Li, Tsang & Yang, 2011; Lopatta, Jaeschke & Chen, 2017). Additionally, CSR practices are valued by investors as a way to reduce risk (Lu et al., 2021). From lenders' perspective, CSR increases trust between the company and stakeholders, making it easier to access capital. Higher levels of CSR may also lead to greater rewards for companies seeking third-party investments (Hamrouni et al., 2019).

A company's survival relies on making long-term investments that involve socially responsible actions to ensure a successful and productive future. This is why a company's capital structure impacts socially responsible practices that can be planned and carried out with the support of third-party resources or shareholders. Moreover, the capital structure impacts ESG performance, particularly its disclosure. A transparent disclosure of ESG information can enhance a company's reputation and stakeholder satisfaction. This could lead to the more active involvement of stakeholders, as they recognize the company's commitment to society and the environment (Al Amosh et al., 2022).

Although scarcely investigated in the literature, researchers from different countries found significance in the relationship between CSR and the capital structure of companies. A study conducted by Teixeira et al. (2011) in Brazil revealed that organizations that primarily rely on shareholders' equity for financing tend to negatively associate with Corporate Social Responsibility (CSR) due to their high debt levels. On the other hand, Campos-Rasera, Passos, and Colauto (2021) discovered a positive correlation between CSR practices and shareholders' equity while confirming the negative relationship between CSR and debt highlighted by Teixeira et al. (2011). Yang et al. (2018) analyzed companies listed on the Shanghai and Shenzhen stock exchanges and observed that firms with CSR strategies

employment have greater leverage in capital structure. The French case, investigated by Hamrouni et al. (2019), has shown a positive and significant relationship between CSR disclosure and access to short- and long-term debt. From their point of view, companies that disclose a high volume of CSR information provide positive signals for risk assessment and corporate valuation, which are not covered by the financial statements. Hence, given the above, we formulate the following research hypothesis:

$H_{(1)}$: *The corporate Capital Structure positively influences the Corporate Social Responsibility of a firm.*

2. Sample and Data

Listed corporations of the ten highest GDP countries in 2019, with CSR index represented by the ESG score (environment, social & governance) provided by the Thomson Reuters® database for the 2010-2018 period, represent our sample for the study. According to the list released by the International Monetary Funds (IMF, 2019), the ten countries ranked globally with the highest GDP are the United States of America (US $ 21,439 billion), China (US $ 14,140 billion), Japan ($ 5,154 billion), Germany ($ 3,863 billion), India ($ 2,963 billion), United Kingdom ($ 2,744 billion), France ($ 2,707 billion), Italy ($ 1,989) billion), Brazil ($ 1,847 billion) and Canada ($ 1,731 billion).

We adopted the cut from 2010 due to the availability of the ESG performance index on the Eikon platform (Thomson Reuters database) for publicly traded companies and the removal of financial sector companies, resulting in a total of 1,660 companies. From this total of 1,660, we excluded companies with negative equity, totaling 1,642 companies represented by 14,370 observations in the final sample.

The sample of 1,642 companies is composed of ten economic sectors: industrials (331), consumer discretionary (265), materials (201), information technology (171), energy (135), consumer staples (117), real estate (116), health (111), communication services (98), and utilities (97), distributed among the ten highest 2019 GDP countries: United States of America (632), China (78), Japan (338), Germany (60), India (42), United Kingdom (201), France (73), Italy (21), Brazil (27) and Canada (170).

3. Research Design

3.1 Main Variables

Corporate Social Responsibility

We used the ESG score from Thomson & Reuters to measure Corporate Social Responsibility performance. The ESG score is an index obtained by weighing three pillars of sustainability: 34% represents the environmental pillar, 35.5% is the social pillar, and 30.5% is the governance pillar. About 400 ESG metrics are calculated through enterprise-level data capture, of which a subset of 178 comparable and relevant industry measures are selected. Subsequently, these measures are classified into ten categories, which, in turn, are weighted in their respective pillars (environmental, social, and governance) and finally constitute the final ESG index. Thus, the ESG score reflects the company's corporate social responsibility performance based on publicly disclosed information. Table 1 presents the weighting of the ESG performance index according to the three pillars of sustainability: environmental, social, and governance.

Table 1
ESG Index Weighting

Pillars	Category	N° of Indicators	Weights	Weighting
Environmental	Resource use	19	11%	(11%+12%+11%) 34%
	Emissions	22	12%	
	Innovation	20	11%	
Social	Work force	29	16%	(16%+4.5%+8%+7%) 35.5%
	Human rights	8	4.5%	
	Community	14	8%	
	Product responsibility	12	7%	
Governance	Management	34	19%	(19%+7%+4.5%) 30.5%
	Shareholders	12	7%	
	CSR strategy	8	4.5%	
Total		178	100%	

Source. Thomson & Reuters (2020).

The Environmental Pillar was obtained using resource use, emissions, and innovation. Resource use measures a company's performance and ability to reduce material, energy, and water use; emissions represent the company's commitment and effort to effectively reduce emissions from its operations, whereas innovation corresponds to new eco-friendly techniques, processes, or products (Thomson & Reuters, 2020). Empirical studies have revealed that polluting industries face more significant public pressure, forcing them to strategically engage in CSR activities to improve their reputation and firm value (Cai, Jo & Pan, 2012).

Four categories derive from the Social Pillar: workforce, human rights, community, and product responsibility. The employee category refers to the firm effectiveness in ensuring health and safety, job satisfaction, diversity, and equality; human rights reflect the firm's respect for them; the community represents the firm's commitment to citizenship with ethical standards and protection of public health; and, lastly, product responsibility refers to the firm's ability to produce for quality, safe goods, and services that do not infringe integrity or privacy (Thomson Reuters, 2020).

The Governance Pillar involves management, shareholders, and CSR strategy. Best corporate governance practices represent management; the shareholder category refers to equity of treatment to shareholders and anti-takeover measures; and the CSR strategy corresponds to the firm's communication and integration with economic, social, and environmental dimensions in its daily operations.

Estrutura Capital

Since the works of Durand (1952) and Modigliani and Miller (1958), discussions of capital structure have been multiplied. According to Myers (2003), existing theories attempt to explain the ratios of equity and third-party capital of firms and differ from each other by their emphasis on the factors that affect the choices between debt and equity.

For example, according to the Pecking Order, adverse selection costs are the dominant factor in capital structure; therefore, companies facing high adverse selection costs in debt markets tend to prefer equity financing to debt financing and vice versa. (Goldstein, Ju & Leland 2001; Lemmon & Zender 2010). According to the trade-off, the costs between debt financing and equity financing acquire relevance when influencing capital structure adjustment (Viswanath, 1993; Chang & Dasgupta, 2003). In the Agency Theory view, the debt acts as a monitoring tool for managers' actions in situations of information asymmetry. Thus, in a profitable company, the increase in the company's debt ratio signals quality financial management and a reduction of the agency's cost of capital (Jensen & Meckling, 1976).

As a measure of capital structure, prior studies use several variables. Similarly, that trend is no different in the relationship between capital structure and CSR. It is possible to perceive two lines of methodological choices. The first refers to studies that estimate the capital structure based on third-party capital, and the second focuses on variables that represent shareholders' equity.

About the first group, Teixeira et al. (2011) use the natural logarithm of the sum of short- and long-term debt. Almeida and Santos (2016) and Yang et al. (2018) use the leverage obtained by the ratio between total debt and the company's assets to measure the capital structure. Hamrouni et al. (2019) use both total debt (long-term plus short-term) and leverage (long-term). For the second group, the shareholders' equity, Ghoul et al. (2011) and Ahmed, Eliwa, and Power (2019) use the company's future earnings per share and growth. Dhaliwal et al. (2011) and Xu, Liu, and Huang (2015) consider the models based on the dividend discount and differ in patterns for the future growth assumption.

Despite the different proxies utilized in research to represent the capital structure, Kochhar (1997) explains that capital structure decisions involve a mix of debt and equity financing rather than alone. They are this mix related to the proportion of unique and regular resources, which means that the level of particular assets increases as the proportion of one grows. Hence, capital structure policies are essential to a firm obtaining the income generated through its assets.

Following Kochhar (1997) and Khan and Quaddus (2020), we understand the corporate capital structure as an assembly of capital the company selects to make investments, which involves both shareholders' equity and third-party capital. Hence, in this paper, we used the sum of long-term debt (third-party capital) with shareholders' equity (equity) divided by total assets as a variable for capital structure. In this context, it is also important to highlight that we are investigating the influence of capital structure on CSR and not determining the factors influencing structure. This point is different from the subject of our discussion.

3.2 Control Variables

Large corporations are prone to diversification in the capital structure choice and, thus, have lower risks of bankruptcy, besides the advantage of accessing the credit market over smaller corporations (Rajan & Zingales, 1995). Another interpretation refers to the ownership and control of large companies; that is, they dilute the ownership and have less control over management decision-making, so the Board of Directors prefers more significant debts to control management (Bartholdy & Mateus, 2006). Concerning ESG indices, the company's size and time of incorporation have a positive relationship with CSR, as they mainly determine the availability and resources to obtain data and information to measure a company's sustainability performance (Drempetic, Klein & Zwergel, 2019). In this study, we use the natural log of Total Revenue [ln (TR)] as the company size proxy and [IPO_date], the time since the initial public offering (IPO), as the company age proxy.

In discussing the relationship between corporate social responsibility and corporate market value, Aouadi and Marsat (2018) reveal that a high ESG ratio affects market value for large companies and directly and adversely affects operating cash flows, increasing costs or decreasing revenues, leading to lower operating performance. They demonstrate the result achieved through the visibility developed by the companies. We measure a company's Market Value (MV) by multiplying its outstanding shares by its current market price and using it as a proxy for operating cash flow EBITDA divided by total assets.

The market positively and significantly values environmental practices by companies unrelated to environmentally sensitive industries. In counterpoint, the market positively and significantly values the social and

corporate governance practices performed by companies belonging to these sensitive sectors. The results show that shareholders in sensitive sectors are especially concerned about environmental practices, although they are already reflected in stock prices. On the other hand, unexpected information about CSR practices generates significant added value (Miralles-Quirós et al., 2019). We use the book value per ordinary share (BVOS) to calculate the value per share of a company based on the company's net worth.

Trade-off theory suggests that companies use tangible assets as collateral to provide creditors with security in the event of financial difficulties. Jensen and Meckling (1976) sustain that guarantees protect creditors from the moral hazard problem caused by the conflict between shareholders and creditors. Williamson (1988) argues that the financing of capital projects depends on the tangibility of assets since it consists of debt collateral, which generally reduces the lender's risk. Titman and Wessels (1988), Rajan and Zingales (1995), and Chen (2004) reported significant positive relationships between asset tangibility and a company's debt structure. We define the tangibility of assets as the ratio of fixed assets to total assets.

Several studies have analyzed the relationship between corporate social responsibility and performance. Although these studies indicate a positive relationship, specific findings are contradictory, revealing negative or meaningless positions and various causalities. Wu (2006) explains that these heterogeneous results originate from several corporate responsibility and performance variables measurements. CSR can be measured by various indicators such as integrated reporting, Global Reporting Initiative (GRI), and ESG index. At the same time, accounting variables ROA, ROE, or market-based Tobin's Q can be used for corporate performance. In this study, we use ROE calculated by the net income ratio to shareholders' equity in addition to ROA.

One of the essential aspects to consider in estimating econometric models between CSR and CFP is to include time intervals between regressors of at least one year, given that corporate social responsibility will not affect company performance in one go. Moreover, we include a cause and effect analysis in the model, as CSR and capital structure may have a reverse causality.

3.3 Econometric model

Based on the literature review, the analysis of the relationship between capital structure and corporate social responsibility of this study will be developed through the econometric model evidenced in equation (1):

$$CRS_{i,t+1} = \beta_0 + \beta_1 Capital\ Structure_{i,t} + \beta_2 Instrumental_{i,t-1} + \sum_{k=3}^{11} \delta_k Controls_{kt} + \beta_{12} Sector_{i,t} + \beta_{13} Country_i + \mu_{i,t}$$

(eq. 1)

Where the ESG represents the Corporate Social Responsibility (CSR) (environmental, social and governance) index performed by Thomson & Reuters as shown in Table 1; Capital Structure evidenced by third-party capital (long-term debt) and shareholders' equity (equity); Instrumental variable represented by the lag of two periods of the capital structure given the issue related to the presence of endogeneity; control variables (size, age, market value, operating cash flow, tangibility, return on assets, return on equity and book value per share); and, dummy variables for sector and country.

Considering a short panel, where T < N, Fávero (2013) reports that a robust clustered standard error estimation is achieved by considering the assumption that the errors are independent between individuals and that $N \rightarrow \infty$, i.e., that $(\varepsilon_{i,t}, \varepsilon_{j,s}) = 0$ for $i \neq j$, that E $(\varepsilon_{i,t}, \varepsilon_{j,s})$ is not restricted and that $\varepsilon_{i,t}$ is heteroscedastic. The initial step for the application of a panel data model, according to Cameron and Trivedi (2009), is the application of a pooled ordinary least squares (POLS) model, which assumes the exogenous regressors and the error term $\mu_{i,t}$ instead of the decomposition $\alpha_i + \varepsilon_{i,t}$, as shown in equation (2):

$$y_{i,t} = \beta_0 + x'_{i,t}\beta_1 + \mu_{i,t}$$

(eq. 2)

The parameters of this model are estimated using OLS. However, inference requires a correlation control within the error μ (i, t) for a given individual; one is constructed using robust standard errors or grouped at the individual level. In this context, the assumption of exogeneity between variables is fundamental for inferences about the causal relationship. Nevertheless, besides the difficulty of verification in the corporate finance, this is an unlikely issue since secondary data from companies are used in this knowledge area (Barros et al., 2010).

Due to the invalidity of the non-correlation premise, one or more regressors are endogenous, causing bias in the estimators and mistaken inferences. Endogeneity issues arise for three reasons: omitted variables, regressor measurement errors, and simultaneity (Ketokivi & McIntosh, 2017). For instance, Antonakis et al. (2010) conducted a methodological review on a sample of 110 applied social science articles published in leading journals in the last ten years. The analysis revealed that researchers fail at least 66% to 90% to approach models and estimation conditions, invalidating causal inferences. The purpose of this study was to examine the relationship between Corporate Social Responsibility and Capital Structure using a dynamic panel estimator (GMM), which eliminates the primary sources of endogeneity inherent in the proposed relationship estimation, according to studies by Wintoki, Linck, and Netter (2012). Seminal studies on this estimator were prepared by Blundell and

Bond (1998), Arellano and Bover (1995), and Arellano and Bond (1991), providing economic specifications to manage the endogeneity issues that are likely to be present in the relationship the study investigates.

4. Results Analysis

Following the model's estimates presented in equation (1) and the following procedures for the short panel, it performs the first application using the POLS estimator. Observed by the tests applied after regression, there was no collinearity (VIF 1.56); however, the residues were identified as heteroscedasticity. Thus, it uses the POLS method with robust clustered standard errors for heteroscedasticity correction.

The analysis of descriptive statistics (1) is provided in Table 2.

Tabela 2
Estatística Descritiva

Variables	Obs.	Median	Coef. Var.	Stand. Dev.	[95% conf. interval]	
ESG Score	14.370	56,519	0,322	17,842	55,051	55,635
Capital Structure	14.370	0,708	0,230	0,159	0,690	0,695
Size	14.370	22,195	0,070	1,546	22,183	22,233
Age	14.370	8.459	0,743	8.259	10.974	11.244
Mkt Value	14.370	0,776	1,527	1,771	1,131	1,189
OCF	14.370	0,020	6,640	0,090	0,012	0,015
Tangibility	14.370	0,639	0,344	0,218	0,630	0,637
ROA	14.370	0,110	0,788	0,096	0,121	0,124
ROE	14.370	0,276	7,213	3,480	0,425	0,539
Book VPS	14.370	12,334	9,572	279,032	24,587	33,712

Source. research data (2022).

Note. Cap. Structure (Capital Structure); Mkt Value (Market Value); OCF (Operating Cash Flow); ROA (Return on Assets); ROE (Return on Equity); Book VPS (Book Value per Share).

However, considering that the dependent variable, the ESG score, presents continuity in time, i.e., past values explain present and future values, finding a method that solves the endogeneity issue is necessary. Consequently, we adopt the instrumental variables in the model, operating in the capital structure variable the lag of one and two periods in the dynamic specification.

As an efficient proposal to solve, or at least reduce, endogeneity problems, used estimators known as GMM. According to Baum, Schaffer, and Stillman (2007) and Roodman (2009), this method is the most appropriate for inferences about relationships between variables of interest when using panel data. Especially in cases where the short panel is verified, i.e., numerical sample about the analyzed period, dependent variables, fixed effects, endogeneity, and heteroscedasticity in individual units. Thus, the generalized moments's method becomes an undisputed alternative for consistent parameter stability. The results of equation (1) are provided in Table 3.

Table 3. *Estimation results on OLS pooled, IV 2SLS, and GMM 2SLS*
*Note. ***, **, * Indicate statistical significance at the 1 percent, 5 percent, and 10 percent levels, respectively. USA – United States of America, CHI – China, JAP – Japan, GER – Germany, IND – India, UK – United of Kingdom, FRA – France, ITA – Italy, BRA – Brazil, and CAN – Canada.*
Three estimators were applied in the regression model (eq. 1). The results of POLS estimation shown in Table 3, represented by its coefficients and significance values, differ from those with instrumental variables 2SLS and GMM 2SLS. The results found to the parameters of the variables and p-value relevance are similar in these last two estimators.

Hence, we will consider the outcomes derived from the GMM 2SLS estimator, as it has more reliable results in terms of capital structure coefficients and standard errors compared to the other estimators. The results show a positive and statistically significant relationship between CSR (ESG_score) and capital structure as well as for the control variables: size, age, and the company's market value. These findings are consistent with the studies of Yang et al. (2018) and Hamrouni et al. (2019). While the operating cash flow and ROA are statistically significant at the 1% level, their parameters are negative. The ROE's parameter result is negative and statistically significant at 10%. This model did not have significant statistical results between CSR (ESG_score) and control variables, tangibility, and book value per share.

In particular, we could note the negative correlation between CSP (ESG_score) and the performance variables, ROA and ROE. These results are similar to the study of Xiao et al. (2018). The authors argue that, generally, companies from countries with high sustainability performance find it harder to capitalize on CSR than those from countries with relatively low levels of CSR. We agree that this is probably one of the explanations for heterogeneous results in other studies that investigated the relationship between CSP and the CSR index.

By checking the signal results for the control variables of operating cash flow (negative), ROA (negative), and market value (positive), these findings are consistent with the study by Aouadi and Marsat (2018). Their study revealed that large companies with amplified visibility and high ESG ratios positively correlate with market value and negatively affect operating cash flows, increasing costs or decreasing revenues and conducting lower operating performance.

Furthermore, the coefficients have a percentage interpretation and a ceteris paribus arrangement. Specifically, the capital structure coefficient of 8.219 suggests that by holding factors such as size, age, market value, operating cash flow, tangibility, ROA, ROE, and book value per share constant, an increase in the capital structure would predictably result in an increase of 8.219 in the ESG Score. This increase represents approximately 821.9% [100(8.219)] in ESG. For all ten countries, the results reveal statistical significance at the 1% level, while only energy, health, information technology, materials, and real estate sectors are statistically significant for economic sectors. Likewise, the model developed by Allouche and Laroche (2005), when performing a meta-analysis in studies concerning the effects of CSR on CFP, demonstrates the relevance of identifying economic sectors and countries. Similarly, McWilliams, Siegel, and Wright (2006) reveal the importance of the qualification of the country, region, and business branch of companies in models with the CSR theme.

Observing the constant, we can note that the intercept value (-140.59) in the abscissa (Y) is negative and zero in the ordinate (X). To the value of this constant, we add the parameters already multiplied by the respective dummies of the countries and economic sectors to verify their differences. The angular coefficient (8.219x) of linear regression is the same for all countries. Consequently,

Dependent Variable		ESG_Score			ESG_Score			ESG_Score		
Estimation		*OLS pooled*			*IVregress 2SLS*			*GMM 2SLS*		
		Coef.		p-valor	Coef.		p-valor	Coef.		p-valor
Capital Structure		2,705	***	0,001	7,883	***	0,000	8,219	***	0,000
	(std. err.)	*(0,823)*			*(2,192)*			*(2,173)*		
Size		6,502	***	0,000	6,679	***	0,000	6,693	***	0,000
	(std. err.)	*(0,114)*			*(0,132)*			*(0,132)*		
Age		4,148	***	0,000	4,141	***	0,000	4,140	***	0,000
	(std. err.)	*(0,217)*			*(0,216)*			*(0,217)*		
Market value		1,103	***	0,000	1,109	***	0,000	1,110	***	0,000
	(std. err.)	*(0,170)*			*(0,169)*			*(0,169)*		
Operating Cash Flow		-5,732	***	0,001	-6,126	***	0,001	-6,144	***	0,001
	(std. err.)	*(1,762)*			*(1,795)*			*(1,797)*		
Tangibility		1,523	**	0,040	0,224		0,802	0,142		0,873
	(std. err.)	*(0,742)*			*(0,894)*			*(0,891)*		
ROA		-7,729	***	0,009	-7,976	***	0,008	-7,996	***	0,008
	(std. err.)	*(2,939)*			*(3,011)*			*(3,017)*		
ROE		-0,057	**	0,031	-0,044	*	0,086	-0,043	*	0,091
	(std. err.)	*(0,026)*			*(0,255)*			*(0,025)*		
Book Value per Share		-0,001		0,128	-0,001		0,113	-0,001		0,113
	(std. err.)	*(0,001)*			*(0,001)*			*(0,001)*		
_intercept		-133,77	***	0,000	-140,14	***	0,000	-140,59	***	0,000
USA										
CHI		-13,039	***	0,000	-13,139	***	0,000	-13,146	***	0,000
JAP		-5,532	***	0,000	-5,803	***	0,000	-5,823	***	0,000
GER		6,215	***	0,000	6,493	***	0,000	6,512	***	0,000
IND		3,006	***	0,000	2,776	***	0,000	2,763	***	0,000
UK		10,233	***	0,000	10,495	***	0,000	10,510	***	0,000
FRA		9,967	***	0,000	10,109	***	0,000	10,116	***	0,000
ITA		12,354	***	0,000	12,516	***	0,000	12,522	***	0,000
BRA		8,124	***	0,000	7,890	***	0,000	7,843	***	0,000
CAN		3,926	***	0,000	3,965	***	0,000	3,972	***	0,000
Sector										
Communication Services										
Consumer Discretionary		0,056		0,923	-0,131		0,824	-0,151		0,797
Consumer Staples		0,616		0,363	0,414		0,545	0,395		0,563
Energy		4,014	***	0,000	3,711	***	0,000	3,686	***	0,000
Health Care		4,643	***	0,000	4,229	***	0,000	4,202	***	0,000
Industrials		0,320		0,577	0,292		0,612	0,288		0,616
Information Technology		7,298	***	0,000	6,956	***	0,000	6,930	***	0,000
Materials		3,948	***	0,000	3,629	***	0,000	3,603	***	0,000
Real Estate		11,195	***	0,000	10,708	***	0,000	10,668	***	0,000
Utilities		-0,022		0,974	0,002		0,998	-0,001		0,999
Prob > F =		0,000			0,000			0,000		
R-squared =		0,3631			0,3617			0,3615		
Overidentification										
Sargan statistic										
Chi-sq(1) P-val =					0,103			0,265		

Source. research data (2022).

the line slope does not change. The constant value alters accordingly when selecting such a country and economic sector. For example, considering the sector of energy in China and Italy, China's intercept results in (-140.59) + (-13.146) + 3.686 = -150.05, while for Italy, the value corresponds to (-140.59) + 12.522 + 3.686 = -124.38. In short, when observing the regression line, we verify that Chinese energy companies need a more significant capital structure to achieve a specific CSR index than Italian companies.

In Figure 1, the graph shows the energy sector analysis for companies in China and Italy.

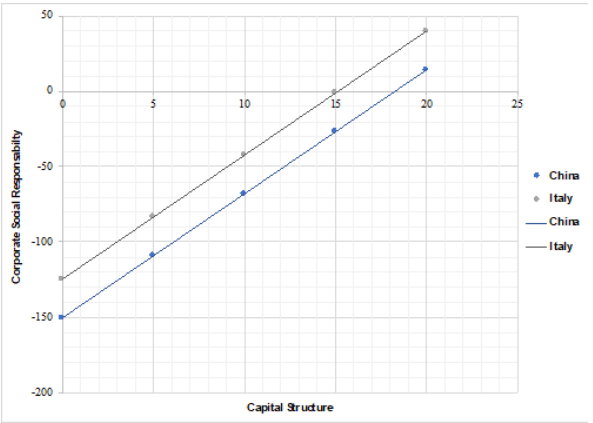

Figure 1. CSR index and Capital Structure of China and Italy for the energy sector. *Source*: research data.

In Table 4, we highlight that for China to achieve a positive CSR index, the contribution needed for the capital structure of its public enterprises is higher compared to other countries. Proportionally, it consists more of 20% than Italy, 18% than the UK and France, 16% than Brazil, 15% than Germany, 13% than Canada, 12% than India, 9% than the United States of America and 5% than Japan. Besides this, real estate is the economic sector of Chinese companies with the most considerable difference in the capital structure relative to other countries. At the same time, the smallest one lies in the consumer discretionary sector.

Table 4

The capital structure needed for a positive ESG score, comparing four selected countries with the others

	ITA	UK	FRA	BRA	GER	CAN	IND	USA	JAP	CHI
CHI	0.20	0.18	0.18	0.16	0.15	0.13	0.09	0.05	0.05	–
USA	0.10	0.08	0.08	0.06	0.05	0.03	0.02	–	0.04	0.09
JAP	0.15	0.13	0.12	0.10	0.09	0.07	0.06	0.04	–	0.05
BRA	0.04	0.02	0.02	–	0.01	0.04	0.03	0.06	0.09	0.14

Source. Research data.

Note. USA – United States of America, CHI – China, JAP – Japan, GER – Germany, IND – India, UK – United of Kingdom, FRA – France, ITA – Italy, BRA – Brazil, and CAN – Canada.

Concerning the United States of America, first ranked in the GDP 2019, there is a need for a larger capital structure for listed traded companies to achieve a positive CSR index. Proportionally, it consists more of 10% than Italy, 8% than the UK and France, 6% than Brazil, 5% than Germany, 3% than Canada, and 2% than India, as shown in Table 4. In contrast, the US public companies need less capital structure than 4% and 9% of Japanese and Chinese companies, respectively.

In its turn, Japan, regarding listed traded companies, needs a larger capital structure to achieve a positive CSR index than Italian, English, French, Brazilian, German, Canadian, Indian, and American companies, 15%, 13%, 12%, 10%, 9%, 7%, 6%, and 4%, respectively. As a counterparty, Japanese companies need less capital structure than 5% of Chinese companies, following Table 4.

In this context, Brazil, ninth-ranked in the GDP 2019, for its listed traded companies to achieve a positive CSR index, there is a need for a larger capital structure only to Italian (4%), English (2%), and French (2%) companies, as per Table 4. In turn, the capital structure required is smaller compared to publicly listed companies in Germany (1%), India (4%), Canada (3%), the United States of America (6%), Japan (9%), and China (14%).

Complementarily, we note that the country that achieves the positive CSR index with the lowest capital structure is Italy's publicly traded companies (eightieth ranked in the 2019 GDP).

5. Summary and Conclusions

In recent years, following a global movement, societies began to attach greater importance to companies' responsible social actions. Given this, we argue that the level of CSR is stimulated by the influence of all its stakeholders, which the companies' capital structure can verify. In this paper, we are guided by the following research question: Does capital structure influence the performance of corporate social responsibility?

As demonstrated in this study, no evidence conducted us to reject our hypothesis, and thereby, our findings reveal that capital structure correlates positively with CSR performance. It is essential to highlight that the variations found between countries, especially companies from nations with higher GDP, need a more significant capital structure than smaller ones to obtain a positive CSR index. We believe this contrast is due to the companies' size because these are larger than those presented in countries with the lowest GDP. Consequently, the companies of the highest countries' GDP need a more significant capital structure to finance all their operating activities and CSR actions. Nevertheless, our position needs further investigation, as other elements may lead to a more significant capital structure beyond the firms' size.

In addition, other results deserve attention. First, we highlight that the financial performance variables of the model presented negative coefficients, which indicates that the expenses incurred to increase CSR performance do not generate returns. We make this observation due to the short period time analyzed in this study. We also emphasize that CSR affects the company's reputation. This, in turn, is directly related to financial performance. However, it should be noted that corporate reputation derives from a process that does not occur overnight—the more prominent reason for inferring that corporate financial performance occurs in the long term. We encourage further research to verify such relationships in a larger time frame.

Second, it concerns the divergence between the parameter signals of the firm's market value and the book value per share and its significance, present only in market value. These results are not surprising since the different purposes of each variable. The first reveals the value attributed by the market to the organization, and the second displays the value based on the company's accounting. We understand that the positive and statistically significant findings in the relationship between market value and CSR index are because CSR has an intangible asset in its constitution: the corporate reputation. Indeed, the market ponders CSR actions and judges whether they should be accepted. The result converges into accepting these practices, which generate a firm's value, justifying the positive and significant association.
In the meantime, the results are closely connected with the ESG score used as a proxy for CSR, which we consider a limitation of the study. Despite being a methodological choice, there are several indicators of CSR with different elements and weighting. Thus, the results could differ from one another. To consolidate the results presented in this research, we encourage further research with different CSR indicators.

Beyond that, we would like to provoke a reflection. Are companies with a leveraged capital structure more sustainable or better disseminating CSR strategies? As with most CSR indexes, the ESG score is also based on social, environmental, and governance disclosures. Though, what is publicized by companies performed by companies? Or is it just a window dressing to meet the demands and lessen the external pressures of society? We believe that the answers to these questions can be found in research that looks inside companies.

We hope to contribute to the literature from the results obtained and the comments made. We seek to foster new discussions on the issues surrounding adopting socially responsible practices by companies from different corners of the world. We understand that the debate does not end in this article, and it needs new voices and evidence, as we live in a constantly changing society and, increasingly, new factors have influenced organizations.

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