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The Impact of Corporate Social Responsibility Disclosures on The Cost of Capital: The Trade-Off Between Cost of Equity and Cost of Debt

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Abstract

Purpose: This study examines the impact of corporate social responsibility disclosures (CSR D) on the cost of capital (COC), covering both cost of equity (COE) and cost of debt (COD). The findings can guide managers and investors regarding the role of CSR disclosure in their capital structure decisions.

Design/methodology/approach: The research uses a sample of 225 nonfinancial firms listed on the Vietnamese stock market between 2014 and 2019. The System Generalized Method of Moments (System GMM) estimator is used to address the potential endogeneity issue and other defects.

Findings: First, the results of the study suggest that firms with higher CSR D tend to have lower COE and COD, confirming the beneficial effects of CSR D, especially in the context of a developing country. Second, firms that are engaged in CSR D tend to enjoy lower COE than COD. This could be because debt providers receive less benefit from extra information on CSR, compared to equity holders. This link has not been examined in the extant studies.

Originality/value: Previous studies tend to discuss the effect of CSR D on either COE or COD, and none have delved into the relationship between the two types of cost. By exploring the priority in the reduction of COE and COD (or the examination of the COE-COD trade-off), this study adds to the body of knowledge on the link between CSR D and COC, as well as brings important implications to the management of capital structure and CSR activities of firms.

Keywords: Corporate Social Responsibility Disclosures, Cost of Capital, Cost of Equity Capital, Cost of Debt, Trade-off relationship

JEL Classifications: G12, G32, G34

1. Introduction

Corporate social responsibility disclosures (CSRD) are still in the early stage of quasi-voluntary compliance in the business and regulatory environment of Vietnam. The country still lacks a unified and strict CSRD legal framework. There are Circular No. 96/2020/TT-BTC from the Ministry of Finance and some guidelines from the State Securities Commission and other entities providing instructions on CSR-related information disclosure. Specifically, Circular No. 96/2020/TT-BTC requires listed firms to report their operations' environmental and social impacts in their annual or sustainability reports. This Circular mandates the reporting of eight items, three of which are not compulsory for firms operating in the financial services, banking, securities, and insurance sectors. Consequently, we remove firms in these industries from the sample.

The Sustainable Development Reporting Handbook by the State Securities Commission and the International Financial Corporation encourages Vietnamese firms to present their effort in sustainable development in line with international standards, i.e., the Global Reporting Initiative (GRI). In addition to the documents above, several free trade agreements aim to promote voluntary disclosure of CSR-related information. These agreements require Vietnamese firms to satisfy global standards for business sustainability. For example, the Vietnam-EU Free Trade Agreement (EVFTA) and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CTPPP) clarify corporate requirements concerning protecting the environment and labor.

This study is highly relevant to the field of Decision Sciences, as it provides empirical insights that enhance quantitative decision modeling for firm-level resource allocation in emerging markets. By examining how CSRD influences the cost of equity (COE) versus the cost of debt (COD), the research offers a data-driven framework to support strategic decision-making processes regarding capital structure optimization. Under conditions of information asymmetry, these findings enable managers to more accurately calibrate their financing strategies and prioritize CSR investments, thereby refining the mathematical and heuristic models used to balance stakeholder expectations with financial performance.

Vietnamese firms have become aware of the importance of sustainable development and have proactively complied with international principles and standards on CSRD, such as GRI, ISO26000, SA8000, and AA1000. However, the level of CSRD in Vietnam is rather low compared to that in neighboring countries in the region and others around the world. This could be because the history of corporate social responsibility in Vietnam is relatively short and has a less strict regulatory framework. The need to empirically examine the effect of CSRD on several aspects of firm operations, as well as firm performance, is inherent, serving as a basis to modify the policies or guidelines for managers to consider the optimal operations for CSR activities.

CSRD allows firms to improve transparency and earn legitimacy, thus enabling firms to access societal resources at a reasonable cost (Nguyen & Nguyen, 2021). CSR has been shown to exert impact on many aspects of firms, from firm performance (Lins et al., 2017; Ngo & Tian, 2021; Shen et al., 2016; Whelan & Atz, 2021; Wu & Shen, 2013), firm risk (Ameur et al., 2020; Boubaker et al., 2020; Jo & Na, 2012;

Mishra & Modi, 2013), cost of debt, cost of equity and shareholders wealth (Bhuiyan & Nguyen, 2020; El Ghouli et al., 2011; Kruger, 2015) and credit ratings (Jiraporn et al., 2014). Related to the topic in the current study, previous literature on corporate social responsibility has examined the impact of CSRD on firms' access to capital markets (Bhuiyan & Nguyen, 2020; El Ghouli et al., 2018; Reverte, 2012). However, these studies mainly focus on developed countries, with established financial markets and high institutional quality compared to those in developing countries. Few studies have investigated the effect of CSRD on the cost of capital, especially in the context of developing countries. In these economies, due to higher information asymmetry and inadequate institutions, it is more challenging and costly for firms to tap into external financing (Vo, 2018, 2019). In developed countries, firms could prefer to raise funds through the equity market, while in developing countries, external debt markets could be more convenient (Naveed et al., 2023; Pessarossi & Weill, 2015; Yeh et al., 2020). This implies a significant difference in firms' capital structure between developed and developing countries, suggesting that firms may weigh the cost of debt and equity differently across these regions. Consequently, the role of CSRD in mitigating information asymmetry might vary, potentially influencing the cost of debt (COD) and the cost of equity (COE) differently, depending on whether a firm operates in a developed or developing market.

Le and Van Le (2019) investigate the relationship between CSRD and cost of equity capital (COE) in the context of Vietnam; however, the CSR content in the research is limited to the environmental aspect only, thus being unable to generalize the impact of CSRD. In fact, CSR can be seen as an effort a firm takes to integrate environmental, social, and governance (ESG) considerations into its business decisions and operations, while also emphasizing the importance of maintaining strong relationships with various corporate stakeholders (Oikonomou et al., 2014).

This study differs from Le and Van Le (2019) in that it utilizes data on all main aspects (economic, environmental, and societal) of CSR to build an overall index of CSRD. This approach is better as firms do not engage only in environmental or social activities. Therefore, an effort to consider all aspects to gauge the overall engagement in CSR is valuable.

Another important contribution of our study is that CSRD tends to focus on reducing COE, rather than COD. This linkage has not been uncovered in previous studies. Extant studies on CSRD and cost of capital tend to discuss either COE or COD separately or at the same time. However, the discussion on the relative importance of COE and COD or the priority between the two types of cost has not been previously examined. CSRD might be prioritized in Vietnam to address COE rather than COD. This is arguably due to the characteristics of diffused individual ownership and low institutional quality to protect shareholders in this country. This finding is important since it can help instruct firms about what to expect when it comes to the effect of CSRD, given the limited resources that firms always have to face in determining CSR investment strategies. This can help calibrate the cost of capital, thus helping firms achieve higher performance. The results could be generalized to countries with more information asymmetry, inadequate institutional quality, and bank-based markets. These features are a better fit for developing countries.

The remainder of this study is structured as follows. Section 2 discusses relevant literature and empirical studies to develop our main hypotheses. Section 3 presents research methodology, including the description of the research sample, the quantitative model, variable construction, and estimators to test the hypotheses in Section 2. Section 4 provides empirical results and related discussions. Finally, Section 5 concludes the study and discusses practical implications derived from our findings for relevant parties.

2. Literature Review and Hypothesis Development

Before developing the hypotheses, it is important to acknowledge the foundational literature on the estimation of the cost of capital. Thompson and Wong (1991) show that estimating the cost of capital inevitably involves judgment because different reasonable forecasting assumptions may lead to different estimates. Thompson and Wong (1996) further revisit the dividend-yield-plus-growth approach and discuss its applicability in estimating the cost of capital, while Wong and Chan (2004) extend this line of work by examining the estimation and reliability of cost-of-capital measures. These studies provide an important methodological foundation for the present research because our empirical analysis relies on cost-of-capital proxies as dependent variables. Building on this foundation, our study does not seek to develop a new cost-of-capital estimator. Instead, it applies established cost-of-capital measures to examine whether CSRD helps firms reduce financing costs in an emerging-market setting. More importantly, we extend the discussion by distinguishing between the cost of equity and the cost of debt, thereby showing whether CSRD contributes more strongly to reducing equity-related or debt-related financing costs.

Recent studies in the broader sustainability, capital-structure, and decision-sciences literature also confirm the increasing importance of CSR, ESG, and sustainability-related information in corporate financial decisions. For example, Issa et al. (2024) examine the influence of CSR on trade credit, Nguyen et al. (2023) discuss corporate capital structure, Boadu et al. (2025) link green human resource management, green innovation, CSR, and environmental performance, and Al-Qadhi et al. (2026) investigate ESG investment in the climate-risk-firm-value nexus. These studies reinforce the relevance of examining whether CSRD provides financially useful information to capital providers.

2.1. Corporate Social Responsibility Disclosure and Cost of Equity

According to the Legitimacy theory, firms usually face various political and social pressures from diverse stakeholders. Therefore, firms are pressured to conduct "social" behavior to legitimize their activities (De Villiers & Van Staden, 2006). Firms can conduct CSRD so that society may be aware of and accept their businesses (Li & Foo, 2015). Al-Haddad et al. (2023) highlight that companies with high pollution levels face the risk of environmental violations, prompting financial institutions and stakeholders to factor in carbon-related risks when making investment and lending decisions. These disclosures can also be employed to maintain a socially responsible image (De Villiers & Marques, 2016). Controversial industries, e.g., mining, tobacco, gambling, sex, and other sensitive industries, often generate negative externalities (El Ghouli et al., 2011; Hong & Kacperczyk, 2009). Hence, these firms are expected to disclose more detailed information about their socially responsible activities to legitimize their business

activities and to reduce COC by adhering to social norms to establish good business practices and rapport with stakeholders (De Villiers & Marques, 2016).

The Agency theory assumes the existence of a conflict of interest between the principal (shareholders) and the agent (management board), whereby the agent may act in the pursuit of their interest at the expense of the shareholders. To improve the situation, shareholders need to exert more effort in monitoring and bear costs accordingly (Jensen & Meckling, 1979). Voluntary information disclosure, such as CSRD, reduces information asymmetry and transaction costs and increases demand for stocks, thus helping to lower COE (Diamond & Verrecchia, 1991). The agency theory suggests that managers are likely to pursue and implement CSRD to prevent future conflicts of interest with shareholders and enhance job security (Healy & Palepu, 2001), as well as reduce information asymmetry and financial uncertainty of the firm (Richardson & Welker, 2001).

The Stakeholder theory suggests that firms need to implement CSRD to build a decent rapport with various stakeholders, including employees, customers, suppliers, government organizations, and shareholders. In addition, the goal of disclosing financial and non-financial information, such as CSRD, is to inform stakeholders about socially responsible activities, and this is to maintain the firm's operational stability and reduce its financial risk. Overall, this can lower COE (Li & Foo, 2015).

2.2. Corporate Social Responsibility Disclosure and Cost of Debt

Stakeholder theory also focuses on the relationship between CSRD and the cost of debt financing. Ge and Liu (2015) examine how CSRD is related to the cost of issuing new bonds, and they find that better CSRD is often associated with higher credit ratings, thus lowering COD. Schneider (2011) argues that a firm's environmental performance is reflected in the pricing of its bonds. For firms operating in highly polluting businesses, these financing costs can be significant enough to impede a firm's ability to meet fixed payment obligations to its creditors. Therefore, a weak CSRD leads to higher COD.

Similarly, Chava (2014) finds that firms with environmental concerns have to pay significantly higher interest rates on their loans. Moreover, banks might offer a lower interest rate to firms with a higher awareness of social responsibility. This is because this compliance will likely enhance the firm's reputation and lead to higher ensured profitability from the loan. Therefore, firms with higher CSRD are more likely to experience a lower cost of debt than their counterparts (Goss & Roberts, 2011).

2.3. Hypothesis Development

2.3.1. Influence of Corporate Social Responsibility Disclosure on The Cost of Equity Financing

Literature on CSR has shown that corporate social responsibility activities can affect COE through at least four channels: (i) enhancing reputation, (ii) reducing information asymmetry, (iii) attracting institutional investors, and (iv) improving income quality (El Ghoul et al., 2011; Reverte, 2012).

First, with enhanced reputation through CSRD, firms will be more attractive to stakeholders. In turn, this can reduce COE. Second, serving a similar role to financial statements, sustainable development reports can also reduce information asymmetry. Specifically, the more a firm discloses information about its social responsibility performance, the higher the number of analysts evaluating it, leading to lower information asymmetry. This lowering of information asymmetry is believed to reduce the risk for investors and, in turn, reduce the firm's equity cost. Third, a positive association exists between CSRD and the number of long-term institutional investors. Institutional investors might prioritize firms that excel in social responsibility practices and/or have fewer concerns related to social responsibility issues, especially in sensitive industries. Finally, firms with higher corporate social responsibility also have higher income quality. This is due to lower information asymmetry and opportunities for opportunistic behavior (earnings management). In other words, earnings quality is another way CSR can reduce COE.

However, not all studies show a negative relationship between CSRD and COE. Breuer et al. (2018) document a positive relationship between CSR and COE. The authors argue that implementing CSRD could be a costly diversion of scarce resources.

Based on the aforementioned arguments and a few papers on a negative relationship, previous studies suggest that CSRD helps reduce COE (El Ghouli et al., 2011; Reverte, 2012). Based on these arguments, we propose the following hypothesis:

H1: CSR has a negative impact on COE.

2.3.2. Influence of CSRD on COD

Bank credit plays a crucial role in corporate external financing, especially in developing economies heavily reliant on banking systems. Studies on the link between CSR and bank credit show that companies with high CSR performance can utilize their derived reputation to obtain funding at lower borrowing costs (Jiraporn et al., 2014; Yeh et al., 2020). Consistently, Attig et al. (2013), Boubaker et al. (2020), and Sun and Cui (2014) find that firms with a high level of CSR engagement can reduce their risk of default and receive high credit ratings thanks to their positive corporate image (Attig et al., 2013; Boubaker et al., 2020; Sun & Cui, 2014). Boubaker et al. (2020) find that CSR can mitigate firms' financial distress risk.

Furthermore, firms engaged in CSR activities tend to be more transparent and less involved in earnings management and/or hoarding bad news, thus having a lower stock price crash risk. Consistently, firms with a strong interest in CSR tend to have easier access to finance at a lower cost than firms with CSR issues (Goss & Roberts, 2011).

Nonetheless, CSR investments can also be a diversion of firm resources so that managers/shareholders can gain private benefits at the expense of debtholders. In line with this view, Menz (2010) finds a positive association between CSR performance and the cost of debt.

Even though there are opposing views regarding how CSRD can affect COD, the mainstream evidence points to a positive effect, rather than a negative one. Therefore, we propose the following hypothesis:

H2: CSR has a negative effect on COD.

2.3.3. Influence of CSRD on The Tradeoff Between COE and COD

Theories suggest that CSRD can affect the COC of a firm, including both COE and COD. Firms using CSRD to minimize COC may do so by reducing COE, COD, or both. The question is whether or not there is a trade-off between COE and COD in the above relationship. Lowering COE and COD to lower COC in general might not be effective, as lowering both might require the firm to address more stakeholders in its activities. This could be more costly and cumbersome.

Banks in Vietnam might not weigh much on CSR performance as a hard criterion to determine interest rates, even though there is evidence that CSR performance tends to lower COD in previous works for other countries (Chava, 2014; Ge & Liu, 2015). This might be because the requirements on CSRD in Vietnam are not as strict as those in other countries. Therefore, although CSRD might bring some insight into firm performance, the information might still be inadequate to tackle informational asymmetry in Vietnam. This developing country has not had adequate institutions.

Yeh et al. (2020) suggest that information asymmetry tends to lead firms to raise capital through debt financing, which is at least in line with the Pecking order theory. In this context, information asymmetry makes it more costly to depend on equity financing since equityholders are not protected as much as debtholders. CSRD might not be highly important to banks, given that banks tend to have more incentives and more ability to monitor firms than equityholders, who tend to be quite diffuse. Therefore, banks might already have more information than equityholders regarding authentic corporate performance, at least in Vietnam, a bank-based market. To sum up, CSRD could be more helpful in lowering the COE than the COD.

H3: Firms tend to reduce COE more compared to COD through CSRD.

3. Research methodology

3.1 Data description

We construct the CSRD proxy using the content analysis method based on the 2016 GRI standard. The data used to calculate the CSRD measurement was collected from sustainability reports or annual reports, whichever had information on CSR activities. We excluded these firms from the sample as Circular 96/2020/TT-BTC does not require financial firms to disclose certain items in the environmental and social impact reporting section. In addition, to ensure the generalizability of the research's findings, we selected a sample of firms that can be representative. Accordingly, firms with total assets accounting for more than 90% of the entire industry were included in the sample. The final sample included 225 listed firms in the

Vietnam stock market. We did not collect data from 2020 onwards to avoid the impact of the COVID-19 pandemic on business activities, which has had remarkable effects on the cost of capital.

We collect data from the Refinitiv Eikon database for financial indicators to construct COE and COD proxies. The data used to calculate control variables were also collected from the Refinitiv Eikon database. Therefore, the final sample included 1,046 observations for 225 listed firms from 2014 to 2019.

3.2 Regression specification

We follow previous studies (Dhaliwal et al., 2014; Reverte, 2012) and specify the following model:

$$COC_{it} = \delta_0 + \delta_1 COC_{it-1} + \delta_2 CSR_{it} + \delta_3 CONTROLS_{it} + INDUSTRY_i + \varepsilon_{it}, \quad (1)$$

where COC is the dependent variable, representing the cost of capital. This includes four aspects: Cost of equity (COE), cost of debt (COD), total cost of capital (COC), and the trade-off between the cost of equity and the cost of debt (COE_vs_COD). CSR is the independent variable of interest, representing the level of disclosure of corporate social responsibility. Control variables include Firm size (SIZE), financial leverage (LEV), tangible assets (TANG), profitability (ROA), and listing firm age (AGE). Industry is the Industry dummy variable, introduced to control for the industry effect. Industry classification is conducted based on the Refinitiv Eikon classification standards. ε_{it} is the error term.

3.3 Variable construction

3.3.1 Corporate social responsibility disclosure proxies

When analyzing a firm's Annual Report or Sustainable Development Report, if one standard belonging to the 2016 GRI set of standards appears, that standard score is 1; otherwise, it is assigned a value of 0. The formula for calculating the CSR Index is as follows:

$$CSR_{it} = \frac{\sum X_i}{33}, \quad (2)$$

where CSR_{it} is the CSR score of the i^{th} firm, $0 \leq CSR \leq 1$, and X_i takes the value 1 if the firm meets standard i , otherwise it is 0. Therefore, $\sum X_i$ is the sum of met standards, and 33 is the total number of standards in the 2016 GRI criteria. Table 1 provides the specific standards as follows.

Table 1: Items of GRI standard (GRI, 2016)

GRI 200: Economy	GRI 300: Environment	GRI 400: Society
201: Economic efficiency	301: Material	401: Employment
202: Presence in the market	302: Energy	402: Relationship between management and labor force
203: Indirect economic effect	303: Water	403: Occupational health and safety
204: Shopping habits	304: Biodiversity	404: Education and training
205: Anti-corruption	305: Emissions	405: Diversity and equal opportunity
	306: Wastewater and waste	

206: Competition impediment activities	307: Environmental compliance	407: No discrimination
	308: Assessment of suppliers regarding the environment	407: Freedom of association, creation, and collective bargaining
		408: Child labor
		409: Forced or compulsory labor
		410: Common security practices
		411: Rights of local/indigenous population
		412: Assessment of human rights
		413: Local community
		414: Assessment of suppliers regarding environmental impacts
		415: Public policy
		416: Customers' safety and health
		417: Marketing and brand
		418: Customer rights to the confidentiality of information
		419: Economic and social compliance

Source: GRI (2016)

3.3.2 Cost of equity financing

We follow Easton (2004) in the calculation of the cost of equity financing:

$$P_t = \frac{FEPS_{t+2} - FEPS_{t+1}(1 - K_{ES} * k_{t+1})}{K_{ES}^2}, \quad (3)$$

where P_t represents the stock's market value (adjusted closing price) at the end of year t ; K_{ES} represents the cost of equity capital (COE). $FEPS_{t+1}$ and $FEPS_{t+2}$ represent the expected earnings per share of the firm in year $t+1$ and $t+2$, respectively; k_{t+1} is the dividend payout ratio in year $t+1$ and assumed to be equal to the dividend payout ratio in year t for firms with positive profits. Several recent empirical studies have used the method proposed by Hou et al. (2012) to estimate expected earnings per share. In the context of emerging markets like Vietnam, we apply the method of Easton (2004) to estimate the cost of equity capital and the method of Harris and Wang (2019) to forecast one to two years ahead for individual firms. The Harris and Wang (2019) model is as follows:

$$e_{j,t+k} = \alpha_0 + \alpha_1 P_{j,t} + \alpha_2 e_{j,t} + \alpha_3 b_{j,t} + \alpha_4 b_{j,t-1} + \alpha_5 P_{j,t-1} + \varepsilon_{j,t+k}; k = 1, 2, \quad (4)$$

where $e_{j,t}$ is the earnings per share of firm j in year t , $P_{j,t}$ is the market value (adjusted closing price), and $b_{j,t}$ is the book value of share j at the end of year t . $k=1, 2$ since we aim to generate one- and two-year ahead forecasts of EPS (Harris & Wang, 2019). The earnings per share predicted from the above model are used to calculate the measure of cost of equity capital using the Easton model (2004).

In line with the measurement concerns raised by Thompson and Wong (1991, 1996) and Wong and Chan (2004), we treat the estimated cost of equity as a model-based proxy rather than an error-free observation

of firms' true required return. These studies show that cost-of-capital estimation depends on valuation assumptions and that the reliability of the resulting estimate is an important methodological issue. Building on this foundation, the present study does not attempt to develop a new estimator of the cost of capital. Instead, it applies established cost-of-capital proxies to examine whether CSRD is associated with lower financing costs. This approach allows us to extend the cost-of-capital literature from the issue of estimation reliability to the empirical question of whether CSR disclosure affects different financing-cost components, namely the cost of equity and the cost of debt. The use of Easton (2004), together with the forecasting approach of Harris and Wang (2019), is intended to provide a transparent and replicable proxy suitable for firm-year panel estimation in an emerging-market setting.

3.3.3 Cost of debt financing

COD represents the cost of debt, measured as interest expense for the year divided by the sum of short-term and long-term debt (Karjalainen, 2011; Lim, 2011; Lorca et al., 2011).

3.3.4 Priority between the cost of equity financing and the cost of debt financing

To analyze the trade-off between COE and COD, we create a variable that directly measures the priority in reducing the cost of these two financing options. We follow the method of Bozzolan et al. (2015) in sorting the costs of the two financing types (COE, COD) into deciles (Decile COE, Decile COD) and creating the following two variables:

$$COC = Decile\ COE + Decile\ COD, \quad (5)$$

$$COE_{vsCOD} = \frac{Decile\ COE}{Decile\ COE + Decile\ COD}. \quad (6)$$

By construction, COC measures a firm's overall cost of capital, and the higher its value, the higher the overall cost of capital. Meanwhile, the higher the value of COE_vs_COD, the greater the firm's orientation towards reducing COD compared to COE. Bozzolan et al. (2015) use the same method of sorting two variables into deciles, but for the two types of earnings management. We are the first to apply this method to the cost of two types of financing sources.

The control variables include Size, Lev, Tang, ROA, and Age. Size is used to control for the effect of firm size (Ng & Rezaee, 2015; Yao et al., 2022; Yeh et al., 2020). Size is calculated as the natural logarithm of total assets. Financial leverage (Lev) is a control for the effect of leverage (Ng & Rezaee, 2015; Xu et al., 2021; Yao et al., 2022; Yeh et al., 2020). Lev is constructed as the ratio of total debt to total assets. Tangible assets (Tang) help firms to raise debt at a lower cost since they can be regarded as collateral. Tang is calculated as the ratio of the property, plant, and equipment to total assets (Xu et al., 2021). Firm age is calculated as the natural logarithm of the number of years from establishment (Xu et al., 2021; Yao et al., 2022).

The formulas for the variables are as follows:

Size = natural log (total assets),
 Lev = total debt/total assets,
 Tang = property, plant, and equipment/total assets,
 Age = natural log (number of years since establishment).

3.4 Estimation strategy

Several studies on the relationship between CSRD and COC suggest that ordinary least squares regression may not be reliable due to endogeneity issues (Breuer et al., 2018; El Ghouli et al., 2018). In the current study, endogeneity might exist. First, there might be a two-way relationship between the dependent and explanatory variables. Second, the use of the lagged value of the dependent variable as a regressor (dynamic models) also leads to the correlation between the explanatory variable and the residual (Roodman, 2009). To address endogeneity, we use the System Generalized Method of Moments (System GMM) to estimate the dynamic models (Roodman, 2009). To ensure the validity of the estimates, we rely on the two conventional tests of System GMM, which are the autocorrelation of order two and the overidentification condition.

Dynamic endogeneity refers to the concept that a firm's current cost of capital influences its future cost of capital and future disclosures (Eugster, 2020). Issues with dynamic endogeneity arise from the possibility that the disclosure variable is not entirely exogenous, as current disclosure decisions are likely influenced by previous cost of capital outcomes. This phenomenon is similar to omitted variable bias, which occurs when the lagged regressand is excluded as a regressor (Eugster, 2020). Therefore, it is essential to use a dynamic model that incorporates the lagged dependent variable. Additionally, prior cost of equity likely impacts the main variable, sustainability disclosure (Dhaliwal et al., 2014; Frankel et al., 1995). Dhaliwal et al. (2014) discovered that past cost of equity affects voluntary sustainability disclosure, meaning that firms with higher equity costs tend to have stronger incentives to improve their disclosures. Recognizing this temporal relationship is crucial in empirical estimation. Finally, adopting a dynamic model is important because market participants might make short-term errors regarding the cost of capital, and firms need to address this by providing additional disclosures (Eugster, 2020).

$$COC_{it} = \delta_0 + \delta_1 COC_{it-1} + \delta_2 CSRD_{it} + \delta_3 CONTROLS_{it} + \delta_4 INDUSTRY_i + \varepsilon_{it}, \quad (7)$$

$$\Delta COC_{it} = \beta_0 + \beta_1 \Delta COC_{it-1} + \beta_2 \Delta CSRD_{it} + \beta_3 \Delta CONTROLS_{it} + \Delta \varepsilon_{it}. \quad (8)$$

The dynamic panel System GMM estimator consists of one equation in levels (Equation 7) and another in differences (see Equation 8; Eugster, 2020). We explained in detail the variables in Sections 3.2 and 3.3. The delta (Δ) symbol in Equation 8 indicates the differenced variables. This approach offers two primary econometric benefits (Eugster, 2020; Roodman, 2009). First, differencing helps remove any potential firm fixed effects. Second, utilizing past values of the explanatory variables as instruments for the current explanatory variables helps to reduce potential biases arising from reverse causality and simultaneity (Eugster, 2020). One more important strength of System GMM is that it is robust to non-normality in the residuals of the regression model, whose test is reported in Appendix 2. Unlike ordinary

least squares, which assumes normality for inference in small samples, System GMM relies on Generalized Method of Moments (GMM) identification through moment conditions based on internal instruments, without requiring a specific distributional form for the errors (Blundell & Bond, 1998; Roodman, 2009). The two-step variant with Windmeijer-corrected standard errors further accounts for heteroskedasticity, autocorrelation, and non-normality, ensuring valid hypothesis tests via the Hansen J-statistic for overidentifying restrictions and Arellano-Bond AR tests for serial correlation (Windmeijer, 2005).

4 Empirical results

4.1 Descriptive statistics

Table 2. Descriptive statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
COE	1,046	0.108	0.049	0.016	0.726
COD	1,046	0.058	0.057	0.000	0.469
COC	1,046	10.907	3.936	2.000	20.000
COE_VS_COD	1,046	0.504	0.213	0.091	0.909
CSRD	1,046	0.275	0.148	0.030	0.939
SIZE	1,046	28.261	1.283	24.710	32.254
LEV	1,046	0.245	0.185	0.000	0.731
TANG	1,046	0.294	0.229	0.000	0.970
ROA	1,046	0.105	0.090	-0.231	0.589
AGE	1,046	2.862	0.413	1.609	4.787

Source: Authors' calculation

According to Table 2, the COE of listed firms in the sample has an average value of 10.8%. having a relatively large variation among firms. COD is on average 5.8%, also with a relatively large variation among firms. The degree of CSRD is relatively low, with an average value of 27.5%, indicating that about a quarter of all the standards are mentioned in the annual reports/sustainability reports. The average value of financial leverage (LEV) is 0.245, indicating that debt accounts for about a quarter of total assets. The proportion of tangible assets (TANG) has an average value of 0.294; this means that nearly a third of the firm's total assets are fixed tangible assets. ROA has an average value of approximately 10%. AGE has an average value of 2.862, corresponding to an average number of 17 to 18 years from the date of being listed.

4.2 Correlation matrix

Table 3. Correlation matrix

	CSRD	COE	COD	SIZE	LEV	TANG	ROA	AGE
CSRD	1							
COE	-0.0867*	1						
COD	-0.0713*	-0.0653*	1					
SIZE	0.2950*	-0.0998*	-0.0321	1				
LEV	0.0039	-0.0248	-0.0010	0.3387*	1			

TANG	0.0506	-0.0476	0.1064*	0.1057*	0.2753*	1		
ROA	0.1033*	0.1132*	-0.1835*	-0.2344*	-0.4413*	-0.0872*	1	
AGE	0.1190*	0.1176*	0.0145	0.0125	0.0633*	-0.0827*	0.0067	1

Source: Authors' calculation using research sample. * Indicates significance at the 10 percent level.

According to Table 3, we reckon that there is no serious issue of multicollinearity in the regression model because the correlation coefficients between the study variables are less than 0.9 in absolute value (Tabachnick et al., 2007). Furthermore, the Variance Inflation Factor test is conducted and shows that none of the VIF values are larger than 2, confirming that multicollinearity should not be an issue of concern in our study.

4.3 Empirical findings

4.3.1 Corporate social responsibility disclosure, cost of equity financing, and cost of debt financing

For all the panel variables, we conduct appropriate panel unit root tests to check for stationarity, which is crucial to avoid spurious regression issues. Appendix 1 presents the result of unit root tests, which suggests that all the variables are stationary at $I(0)$. However, Wong et al. (2024) suggest that the use of stationary series does not guarantee the absence of spurious regression. To mitigate the risk of spurious correlations and address potential endogeneity, we employ the System GMM estimator. This approach is superior in this context as it utilizes lagged internal instruments to handle the persistence of the dependent variable. By satisfying the Hansen J-test for instrument validity and the AR2 test for second-order serial correlation, we demonstrate that our model specifications are robust against the statistical nuances identified in recent literature regarding $I(0)$ spuriousity.

We further acknowledge the recent methodological literature showing that spurious-like inference may arise under nearly non-stationary series, autoregressive disturbances, mixed $I(0)/I(1)$ settings, or even some stationary-series settings. To keep the discussion focused rather than exhaustive, we cite representative studies from this stream, including Cheng et al. (2021, 2022), Wong, Cheng, and Yue (2024), Wong, Pham, and Yue (2024), Wong and Yue (2024), and Wong and Pham (2026a). In our sample, the panel unit-root results reported in Appendix 1 show that the main variables and controls are stationary at $I(0)$. In addition, COC and COE_VS_COD are constructed from the decile rankings of COE and COD and are therefore bounded transformations of stationary cost-of-capital variables. Accordingly, the specific concern that the regressions combine $I(1)$ and $I(0)$ variables is not detected in our data structure. Nevertheless, we interpret stationarity evidence as a necessary diagnostic rather than an absolute guarantee against all spurious-like relationships, and we therefore evaluate the estimates together with dynamic specification, instrument-validity tests, serial-correlation tests, and functional-form diagnostics.

To evaluate the research hypotheses H1 and H2, we estimate the model regression (1) with the dependent variables being COE and COD, respectively. The regression results are presented in Table 4.

Table 4. Regression result of the relationship between CSRD, COE, and COD

MODEL/DEPENDENT VARIABLE	(1)	(2)
	COE	COD
CSRD	-0.062***	-0.023*
	[-4.94]	[-1.88]
SIZE	0.011***	0.004**
	[3.91]	[2.41]
LEV	-0.009	-0.035*
	[-0.69]	[-1.91]
TANG	-0.062***	0.013
	[-3.86]	[0.78]
ROA	0.073**	0.070***
	[2.48]	[2.79]
AGE	0.015***	0.034***
	[3.77]	[5.26]
COE_{it-1}	0.336***	
	[19.21]	
COD_{it-1}		0.235***
		[12.26]
CONSTANT	-0.262***	-0.169***
	[-3.39]	[-3.53]
INDUSTRY DUMMIES	Yes	Yes
NO OF OBS	817	1098
NO. OF INSTRUMENTS	99	80
AR2 TEST p-value	0.864	0.525
HANSEN TEST p-value	0.264	0.118

Note: This table presents the System GMM estimation results for the impact of CSRD on the cost of equity (COE) and cost of debt (COD). COE is the cost of equity capital. COD is the cost of debt. CSRD is the CSRD score of the firm. Size is the firm's size. Lev is financial leverage. Tang represents asset tangibility. ROA is return on total assets. Age is the firm's age. T-test values are in square brackets. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively. We ran the Ramsey linearity (RESET) test, and the result (Appendix 3) suggests there is nonlinearity detected. However, we would like to proceed with the current specifications because linear models are standard in CSRD-cost of capital literature for interpretability, and the theory posits direct linear effects. Also, adding polynomials (e.g., CSR²) risks multicollinearity/overfitting. Finally, System GMM mitigates biases arising from endogeneity and omitted dynamic effects, which may contribute to RESET rejections.

As shown in Table 4, the lagged value of the dependent variables is positive and statistically significant ($\beta = 0.336$, $p < 1\%$; $\beta = 0.235$, $p < 1\%$), suggesting the validity of using a dynamic model in the current study. Furthermore, as the p-values of the autocorrelation of order two (AR2 test) and overidentification tests (Hansen test) are greater than 5 per cent, the necessary conditions for the reliability of the estimates under System GMM are met (Roodman, 2009). Specifically, the autocorrelation of order two test shows that there is no second-order correlation in the error of the difference equation, while the Hansen test suggests that the instruments are valid. Together, this indicates that the results are valid for statistical inferences.

First, in column (1), the regression coefficient shows the negative and statistically significant relationship between CSRD and COE ($\beta = -0.062$; $p < 1\%$). Therefore, there is evidence in line with the hypothesis

H₁ that CSRD has a negative impact on COE. This result is consistent with previous studies (El Ghouli et al., 2011; Reverte, 2012) and supports the Legitimacy theory, Agency theory, and Stakeholder theory. The evidence suggests that CSRD reduces COE by addressing information asymmetry and enhancing the reputation of the firm. CSRD helps firms create a positive impression with investors; this, in turn, can potentially lead to a reduction in the estimated investment risk of investing in stocks and a decrease in expected returns, or a reduction in the cost of equity.

In column (2), there is a statistically significant and negative relationship ($\beta = -0.023$, $p < 10\%$) between CSRD and COD. Therefore, the hypothesis H₂ that CSRD has a negative association with the cost of debt is confirmed. This is in line with previous studies (Bhuiyan & Nguyen, 2020; Izzo & Magnanelli, 2012; Xu et al., 2021) and supports the arguments of Stakeholder theory. Banks can reduce COD for firms that comply with CSRD because they believe that the uncertainty and risk caused by asymmetric information are mitigated for these firms. Firms that focus more on stakeholders can maintain a competitive advantage over those that do not focus on these relationships. Firms with higher levels of CSRD can garner resources more efficiently from different stakeholders, such as suppliers, employees, and the community. As a result, these firms tend to be better evaluated by creditors.

4.3.2. Trade-off between cost of equity financing and cost of debt financing

To test hypothesis H3, we estimate model (1) with the dependent variable being COC and COE_VS_COD, respectively. Again, to mitigate the risk of spurious correlations and address potential endogeneity, we employ the System GMM estimator. The results of the regression are presented in Table 5.

Table 5. Trade-off between the cost of equity financing and the cost of debt financing

MODEL/DEPENDENT VARIABLE	(3) COC	(4) COE_VS_COD
CSRD	-4.972*** [-5.49]	-0.125** [-2.28]
SIZE	1.156*** [4.81]	0.007 [0.75]
LEV	-4.380*** [-3.65]	0.046 [0.86]
TANG	0.671 [0.52]	-0.120** [-2.17]
ROA	2.403 [1.09]	0.496*** [5.28]
AGE	1.173*** [4.49]	0.004 [0.35]
COC _{it-1}	0.420*** [12.42]	
COE_VS_COD _{it-1}		0.438*** [19.59]
CONSTANT	-27.548*** [-3.99]	0.088 [0.37]

INDUSTRY DUMMIES	Yes	Yes
No. of obs	817	817
No. of INSTRUMENTS	115	115
AR2 test p-value	0.103	0.102
HANSEN test p-value	0.103	0.319

Note: This table presents the System GMM estimation results for the impact of CSRD on the cost of capital (COC) and cost of equity vs cost of debt (COE_vs_COD). COE is the cost of equity capital. COD is the cost of debt. CSRD is the CSRD score of the firm. Size is the firm's size. Lev is financial leverage. Tang represents asset tangibility. ROA is return on total assets. Age is the firm's age. T-test values are in square brackets. *, **, *** denote significance at the 10%, 5%, and 1% levels, respectively. We ran the Ramsey linearity (RESET) test, and the result (Appendix 3) suggests there is nonlinearity detected. However, we would like to proceed with the current specifications because linear models are standard in CSRD-cost of capital literature for interpretability, and the theory posits direct linear effects. Also, adding polynomials (e.g., CSRD²) risks multicollinearity/overfitting. Finally, System GMM mitigates biases arising from endogeneity and omitted dynamic effects, which may contribute to RESET rejections.

As shown in Table 5, the lagged value of the dependent variable is positive and statistically significant, suggesting the validity of using a dynamic model in the current study. Similarly to the results in Table 4, as the p-values of the autocorrelation of order 2 and overidentification tests are greater than 5 percent, the necessary conditions for the reliability of the estimates under System GMM are acquired (Roodman, 2009). This indicates that the results are valid for statistical inferences.

In column (1), the regression coefficient shows the statistical significance and negative relationship between CSRD and COC ($\beta = -4.972$, $p < 1\%$), indicating a negative relationship of CSRD on COC. Similarly, in column (2), the regression coefficient shows the statistical significance and negative relationship between CSRD and COE_VS_COD ($\beta = -0.125$, $p < 5\%$); this result also indicates a negative effect of CSRD on COE_VS_COD. This means that firms tend to enjoy the reduction in COE rather than COD through the use of CSRD. In this context, the hypothesis H₃ on the trade-off between COE and COD in the relationship between CSRD and COC is confirmed.

There are two reasons that can explain the results. Firstly, CSRD is a quasi-voluntary compliance in the Vietnamese business environment. Thus, Vietnamese firms might conduct CSRD to ensure compliance with information disclosure on the stock market rather than facilitate bank loans. Secondly, banks can theoretically incorporate corporate social responsibility criteria into their credit rating process and require their customers to comply with CSRD to enjoy preferential interest rates. However, in reality, banks might have few incentives to conduct this initiative because they are not obliged to report several items in the evaluation of environmental and social impacts according to Circular No. 96/2020/TT-BTC. Moreover, there are many other factors that affect a firm's access to bank loans, such as political relations or real estate collateral.

Importantly, Yeh et al. (2020) suggest that information asymmetry tends to lead to firms raising capital through debt financing, in line with Pecking order theory. In this context, information asymmetry makes it more costly to depend on equity financing since equityholders are not protected as much as debtholders. Nonetheless, by utilizing hand-collected data from China's capital market, Yeh et al. (2020) find that CSR performance can lower the cost of debt capital, but not the cost of equity capital. In the context of Vietnam, CSRD might not be highly important to banks, given that banks tend to have more incentives to monitor

firms, compared to equityholders, who tend to be quite diffuse. CSRD can be helpful in addressing information asymmetry, reducing firm risk and/or earnings management behavior, and enhancing earnings quality and informational transparency overall. Therefore, CSRD could be more useful in lowering the COE rather than the COD.

5. Conclusions and implications

In this study, we examine the impact of CSRD on COC for listed firms in the Vietnamese stock market and the trade-off relationship between the COE and COD. We extend prior literature by examining the cost of capital in a more comprehensive way. We explore both COE and COD and analyze whether firms can reduce COE or COD when using CSRD.

Using a dataset covering 225 listed firms in the Vietnamese stock market during the period 2014-2019, we calculate the COE, COD, COC, and COE_vs_COD measures, representing the cost of equity, cost of debt, overall COC, and the trade-off between the cost of equity and the cost of debt, respectively. By proposing a new measure of tradeoff in terms of COE and COD, and investigating whether CSR disclosure prioritizes the reduction of equity versus debt costs, this research extends the literature on the CSRD-COC nexus. Furthermore, it offers actionable insights for corporate managers balancing capital structure optimization with sustainability reporting strategies. This should also provide a venue for future research in this direction. Applying the content analysis method and the 2016 GRI standards, we construct a CSRD measure that measures the level of disclosure of corporate social responsibility information. We use the System GMM estimation method to address the endogeneity issue mentioned in previous studies, while also addressing the shortcomings of panel data, such as autocorrelation and heteroscedasticity, thanks to the two-step System GMM estimator.

The research results show significant findings. First, firms with higher CSRD have lower capital costs, for both equity and debt. Essentially, this finding is consistent with many previous results, confirming the benefits of disclosing CSR activities on annual reports/sustainability reports. The result highlights the role of CSRD in mitigating information asymmetry, reducing firm risk, and improving corporate governance. Second, firms use CSRD to reduce the cost of capital and tend to prioritize the reduction in COE rather than COD. This might be because banks have more incentives to monitor the borrowing firms closely, so extra information on CSR is not as useful for banks as it is for equity holders. This result on the priority of reducing COE has not been uncovered previously.

The obtained results have important management implications. The reduction of borrowing costs through CSRD encourages managers to pay special attention to the transparency of the firm and to disclose more information about the firm's social responsibility practices. Corporate social responsibility is, in fact, an effective communication tool to demonstrate the ability of firms to build and maintain a competitive advantage over time, and it can also reduce information asymmetry and allow better evaluation of default risk. Managers should find ways to report more useful CSR information to influence credit approval officers. They should collect and disseminate information about issues that are important to lenders.

The results of this study suggest several directions for future research. Firstly, future research could explore the trade-off between COE and COD with databases from different countries and compare economies that are independent of and dependent on banks. Secondly, future research could also analyze the trade-off between COE and COD with databases from firms in different industries. We also recommend focusing on controversial industries to analyze the role of CSRD in these specific industries. One limitation of the current study is the potential effect of nonlinearity, which might require some refinement. Even though we have sound reasoning for the continuation of the use of linear specifications, some robustness checks using nonlinear models might help check the robustness of the findings.

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Appendix

Appendix 1 – Unit root test

	Levin-Lin-Chu Adjusted t statistic	ADF Modified inverse chi2
CSRD	-3.3e+02***	1019.3668***
Size	-19.6708***	1105.1441***
Lev	-39.9456***	1416.2465***
Tang	-45.5690***	1406.9583***
ROA	-7.9e+02***	1531.6547***
Age	-28.4507***	8068.2214***
COE	-42.6339***	1151.1759***
COD	-23.0616***	892.8014***
ROE	-57.0781***	1382.0090***

Note: this table presents the unit root tests. LLC is the Levin-Lin-Chu test, while ADF is the Augmented Dickey-Fuller test.

*, **, *** denote significance at the 10%, 5%, and 1% levels, respectively

Appendix 2 – Normality test

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	chi2(2)	Prob>chi2
res_cod	590	0.000	0.000	.	0.000
res_coe	590	0.000	0.000	.	0.000
res_coc	817	0.4887	0.0224	5.68	0.0584
res_coevsco	817	0.934	0.0004	11.71	0.0029

Note: this table presents the normality test of the residuals in each model. RES_COD/COE/COC/COEVSCOD are the residuals of the model with COD/COE/COC/COEVSCOD as the dependent variable, respectively.

Appendix 3 – Ramsey RESET test

Dependent variable	F statistic	Prob > F
COE	7.21	0.0001
COD	13.80	0.0000
COC	0.26	0.8565
COE_VS_COD	3.42	0.0169

Additional note on Hui et al. (2017): Hui et al. (2017) propose a specialized nonlinearity test designed to detect nonlinear dependence without requiring the exact nonlinear form to be specified. The present study does not implement the specific Hui et al. (2017) procedure. Instead, we report the Ramsey RESET test as a general diagnostic for functional-form misspecification. The RESET results indicate possible nonlinearity in some specifications; therefore, the reported coefficients should be interpreted as average linear effects. We retain the current linear dynamic panel specification because it is standard in the CSRD-cost-of-capital literature, directly corresponds to our directional hypotheses, and allows comparability with prior studies. Future research could extend the present analysis by applying the Hui et al. (2017) procedure or alternative nonlinear panel estimators.