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Does corporate social responsibility affect cost of capital in China?

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ABSTRACT

Firms in China with higher corporate social responsibility (CSR) performance may not substantially reduce their cost of equity capital versus firms in developed countries. To compare the different capital structures between developing and developed countries, this study examines whether CSR affects a firm's cost of equity and debt capital in China. Our results show that Chinese firms with higher CSR performance can rapidly reduce their cost of debt capital. When we use capital structure (CS) as a moderator to evaluate the relationship between CSR and the cost of capital, the findings present that CS does not play a moderating role. The CSR value curve indicates that CSR investment by Chinese firms is still at legal and compliant levels, incurring more information asymmetry and less market efficiency in the country's financial sector.

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1. Introduction

The dramatic growth in international financial markets has caused corporate social responsibility (CSR) to become increasingly important. A firm now has to focus its attention on both increasing its revenue and being a good corporate citizen. Such a major transformation requires national and global companies to approach their business from the perspective of sustainable development and support CSR activity in order to benefit from any positive financial impact. CSR can be regarded as a manner in which companies consider environmental, social, and governance factors in their business decisions and processes, along with the strength of their relationships with various corporate stakeholders (Oikonomou, Brooks, & Pavelin, 2014).

In developed markets such as the United States, firms prefer to raise their funds through the equity market, but in China, a uniquely fast developing country, firms tend to raise funds from the external debt market rather than the external equity market (Pessarossia & Weill, 2013). Fig. 1 demonstrates that U.S firms raise

at least 70% of their corporate funds from the equity market, while less than 60% of Chinese corporate funds come from the equity market. There indeed is a huge gap in capital structure (CS) between China and developed markets such as the U.S (see Fig. 1).

Chinese corporate capital resources mainly derive from funding associated with debt, thus causing higher credit risk and the agency problem. Information asymmetry between corporations and investors influences how the former manage their debt ratio by aggressively issuing equity (Bessler, Drobetz, & Gruninger, 2011). Korajczyk, Lucas, and McDonald (1991, 1992) indicate that when information asymmetry is insignificant, firms tend to raise new capital by issuing equity; likewise, when firms raise capital through debt or bank funding, investors encounter higher information asymmetry and risk. Oikonomou et al. (2014) address that due to China debt market plays a critical and dynamic role, investigating the relationship between CSR and cost of debt becoming suitable for researchers and market participants. Moreover, unlike the maturity of financial markets, debt has become one of the most common financing tools for Chinese firms. This phenomenon causes a serious agency problem among Chinese shareholders and debtors, thus motivating this study to examine the cost of debt capital as well as cost of equity capital in China's capital markets.

According to IBM Global Business Service, the CSR value curve shows that CSR activity can help company growth and operation sustainability. First, when a company just starts its CSR activities at

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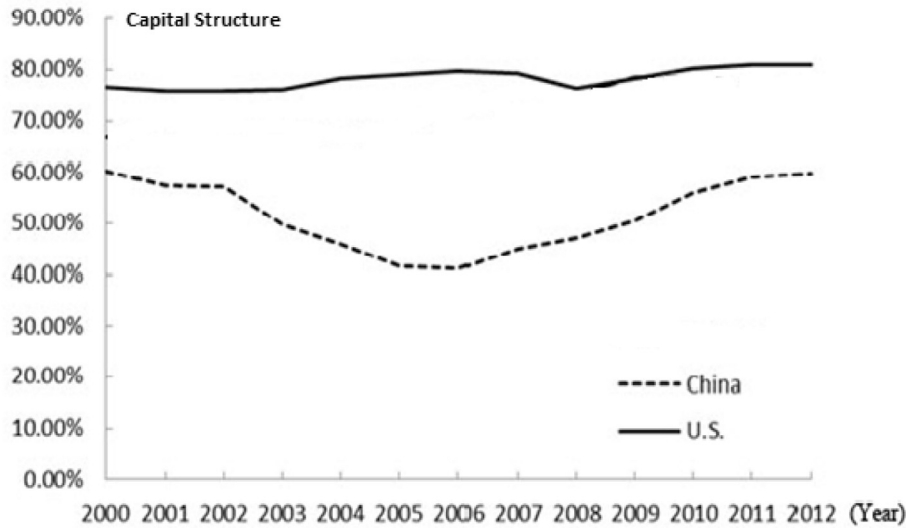


Fig. 1. Firms' capital structure in China and the United States. Notes: The vertical and horizontal axes are capital structure and years, respectively. This study calculates the capital structure from total stockholders' equity divided by total liabilities and stockholders' equity.

the legal or compliant level, it tends to satisfy the basic regulations or promises to society, whereas the second level brings about strategic philanthropy. These CSR activities strengthen the company's social commitment as well as offer a positive impact on financial performance. The third level results in value-based self-regulation. Firms build a system or standard operation process that can guide their business model and behavior. The fourth level is the efficiency level, which creates a win-win scenario in both business operations and society. Thus, CSR activities like energy savings not only can reduce the overall cost of operations, but also positively affect the environment.

With strong economic growth, China has become a strong emerging capital market. The China government encourages companies to implement their CSR practices and requires state-owned enterprises (SOEs) to take leading roles. Political connections have been found to have a positive relationship with awareness and adoption of CSR policies among Chinese companies (Gu, Ryan, Bin, & Wei, 2013). With strong support and encouragement by the

government, Chinese firms tend to invest and disclose their CSR intentionally. Conversely, most western firms invest in CSR activities voluntarily. Why are western firms willing to disclose their CSR activities? Prior studies have argued that CSR activities can improve the satisfaction of all stakeholders, enhance the corporate brand image, and even more so increase firm value and lower the cost of capital (Ghoul, Guedhami, Kwok-Chuck, & Mishra, 2011).

There is a growing strand of research focusing on the relationship between CSR and cost of capital in China's market. For example, Cheng, Ioannou, and Serafeim (2014) investigate whether superior CSR performance can lead firms to have better financial access ability. Their study indicates that firms with better CSR performance face significantly lower capital constraints. Similarly, some pioneer research also documents that strong CSR can lower the cost of equity capital (Xu, Liu, & Huang, 2015), cost of debt capital (Ye & Zhang, 2011; Cooper & Uzun, 2015), and credit spreads (Zhou, Li, & Lin, 2016), but these studies construct the CSR index focusing on only five major aspects (i.e., environment, employees,

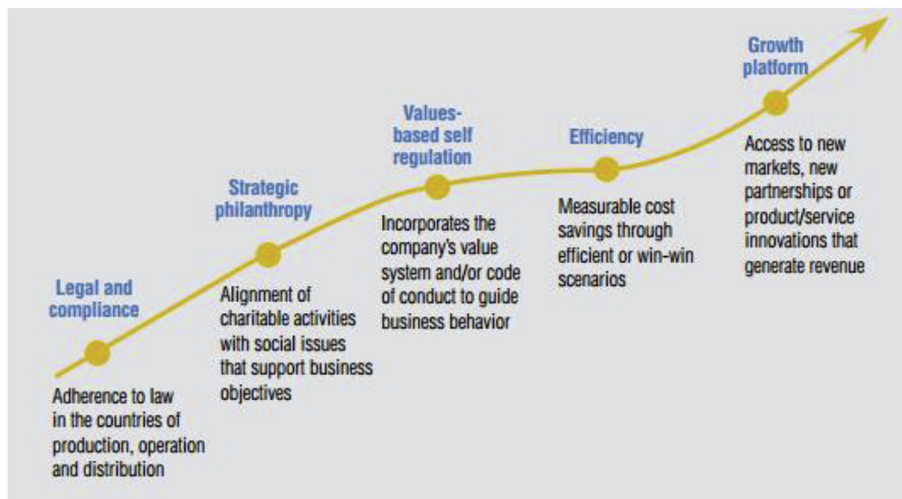


Fig. 2. CSR value curve. Notes: This figure is collected from IBM Global Business Service. The vertical axis is realized return and the horizontal axis is the level of CSR integrated into a company's core strategy.

consumers, communities, and other stakeholders). This does not seem comprehensive enough to capture the full picture of CSR performance. We thus conduct a content analysis approach and employ the Expert Assessment System to evaluate CSR in Chinese firms so as to gather more detailed information with both qualitative and quantitative measures to estimate CSR performance (Yeh, Kuo, & Yu, 2011).

By utilizing our hand-collected data from China's capital market, we find that CSR performance can lower the cost of debt capital, but not lower the cost of equity capital. These results are robust after we use the Fama and Macbeth cross-section estimation, by controlling the endogeneity problem and an alternative CSR measurement. Moreover, we evaluate the moderate effects of capital structure or state-owned control on the relationship between CSR performance and cost of capital. However, our empirical results fail to show a suitable moderate variable on the relationship between CSR performance and cost of capital. Finally, we find that the lagged 2 year of CSR performance can effectively lower the cost of debt under higher information asymmetric.

This study overall points out that CSR performance can lower the cost of debt, but fails to prove that any moderate effect of capital structure or state-owned control on the relationship between CSR performance and cost of capital. We offer the following contributions to the CSR and external financing literature. First, we examine the relationship between CSR performance and cost of capital. This study not only extends prior research with the relationship between CSR performance and cost of debt capital, but also considers the effect of CSR performance on cost of equity. Although our results show that CSR performance does not significantly affect the cost of equity, we do see a lower cost of debt relationship exists in firms with higher CSR performance. This finding is important for emerging markets since Chinese firms' external financing is mainly from debt resources, and the empirical results provide a useful way for firms to improve their cost of debt capital. Second, the methodology of this study can effectively measure CSR performance. Different from prior research (Cheng et al., 2014; Xu et al., 2015; Cooper & Uzun, 2015; Zhou et al., 2016) focusing only on five major CSR aspects, we implement content analysis to examine CSR reports, which can further integrate qualitative and quantitative information, thus reducing subjective involvement.

The remainder of the paper is structured as follows. Section 2 reviews the relevant research. Section 3 describes our sample and research methodology. Section 4 presents the empirical results and robustness tests. Section 5 discusses the findings and provides a conclusion.

2. Literature review

2.1. The capital market in China

Many studies in the literature have demonstrated that the financial system, including banking and capital markets, provides an important mechanism for assisting enterprises to raise capital. Groenewold, Tang, and Wu (2003) indicate that compared with developed markets, China's capital market is relatively new and growing quickly. Recently, the Shanghai Exchange and the Shenzhen Exchange stock markets have together become the second largest in Asia. Under the efficiency market Hypothesis, Groenewold et al. (2003) argue that China's stock market exhibits weak efficiency, indicating that investors in China react slowly when they receive related information from the market. In addition, many scholars have found that investors exhibit different reactions to good and bad news releases (Chiang, 2001; Koutmos, 1998; Sarantis, 2001). Chiang (2001) finds that investors' adjustment speed is slow in response to good news released in the stock

markets of China, illustrating that when investors receive good news, they may react slowly. It supports the conclusion that China's capital market presents weak efficiency. Therefore, to account for such weak efficiency, this study employs a lag term in the regression to describe the current market status.

2.2. CSR in China

Companies with higher financial performance generally tend to disclose CSR practices (Li, Luo, Wang, & Wu, 2013). Tan (2009) indicates that there is a cognitive gap in CSR regulation and standard references between developed markets and China. Mullich (2011) suggests that the difference in CSR between western countries and China is the driving force, whereby stakeholders and state-owned holders in western and China respectively elicit this driving force. Thus, CEOs in China put less effort into CSR in both state-owned and private companies. To develop CSR in China's market, the government began to formulate CSR-related regulations and practices in state-owned companies (Kuo, Yeh, & Yu, 2012). In 2012, a CSR guiding committee at the national governmental level was organized. Chinese firms, especially those at the national level, were required to assume increased social responsibilities, including not firing workers and not cutting salaries during economic recessions.

2.3. Signaling theory

Information asymmetry results from agency problems, which concern the relationship between an agent and owners. Easley and O'Hara (1992) argue that when some investors have more private information than others, information asymmetry occurs in the capital market. To reduce the cost of capital, corporations exert great effort at reducing information asymmetry (Easley & O'Hara, 2004; Francis, Lafond, Olsson, & Schipper, 2005). Therefore, lower information asymmetry in the capital market leads to a lower cost of capital.

The signaling theory can offer one solution to information asymmetry. Connelly, Certo, Ireland, and Reutzel (2011) use a signaling timeline to explain the signaling process between the signaler and receiver. To reduce information asymmetry, the signaler conveys a signal to the receiver. After the receiver observes and interprets this signal, he or she makes a decision and transmits it to the signaler. In this study, the signaler is a firm that conveys CSR as a signal to the receivers, who are investors. After investors receive and interpret this signal, they make their investment decision and decide how much payment they require, which is the feedback. Michael (2003) suggests that CSR can signal cooperation information, which concerns governments, businesses, and society, to investors. Sanders and Boivie (2004) find that firms transmit corporate governance-related information to potential investors to reduce their information asymmetry and investment risk. Zhang and Wiersema (2009) assert that corporate executives can deliver non-financial messages to potential investors. Ghouli et al. (2011) explain that CSR can reduce the cost of capital for firms through information transmission, such as signaling. Therefore, to reduce information asymmetry and investment risk, CSR can be regarded as an effective mechanism for potential investors to make correct investment decisions and to effectively lower their cost of capital.

2.4. Hypothesis

2.4.1. The association between CSR and cost of equity capital

Pástor, Sinha, and Swaminathan (2008) show that the cost of equity perfectly correlates with the conditional expected stock return. Therefore, if CSR affects the perceived risk of firms, then

socially responsible firms should benefit from a lower equity financing cost (Ghoul et al., 2011). Previous research suggests that effective corporate governance and stricter disclosure standards can decrease a firm's cost of equity capital through a reduction in agency and information asymmetry problems (Chen, Chen, & Wei, 2009; Hail & Leuz, 2006). Cheng et al. (2014) also report that superior CSR performance can lead to better access to finance. They specifically argue that better access to finance can be attributed to CSR as follows: (1) enhanced stakeholder engagement reduces agency costs and (2) increased reporting transparency reduces informational asymmetry.

Reverte (2012) shows that higher CSR can decrease estimation risks, transaction costs, and information asymmetry in Spain's capital markets. Ghoul et al. (2011) demonstrate that information asymmetry is likely to be more severe for low-CSR firms and that better CSR performance exhibit lower equity financing cost. Similarly, Xu et al. (2015) find that better CSR performance can lower the cost of equity capital in China's capital market. Therefore, our first Hypothesis is as follows.

Hypothesis 1. Firms with higher CSR performance have a lower cost of equity capital.

2.4.2. The association between CSR and cost of debt capital

According to information asymmetry between corporation management and outside investors, Myers and Majluf (1984) reveal that corporations give priority to raising capital through debt financing. In addition, Denis and Mihov (2003) demonstrate that firms with the highest credit quality level may choose to raise capital from the public market. According to the aforementioned literature, we conclude that when corporations raise more capital through debt financing (versus equity financing), information asymmetry may further increase and raise the cost of capital. In other words, when debt holders control most of the capital resources, they may also have access to private information for making investing decisions. Outside investors who have less access to private information may ask for a higher return on investments in a corporation.

Goss and Roberts (2011) provide two alternative viewpoints on CSR investment: the overinvestment view and risk mitigation perspectives. The overinvestment view indicates that CSR investments represent costly diversions of firm resources, and therefore managers will overinvest in CSR to gain private benefits at the expense of shareholders. Therefore, higher CSR performance is positively associated with cost of debt (Menz, 2010; Sharfman & Fernando, 2008). The risk mitigation perspective argues that CSR investment can reduce risk (Boutin-Dufresne & Savaria, 2004; Lee & Faff, 2009); thus, banks are more willing to provide attractive loan terms to socially responsible firms. The evidence from China's capital market shows that better CSR performance can lower the cost of debt capital (Ye & Zhang, 2011; Cooper & Uzun, 2015) and credit spreads (Zhou et al., 2016). Therefore, our second Hypothesis is as follows.

Hypothesis 2. Firms with higher CSR performance have a lower cost of debt capital.

2.4.3. Complementary relation between capital structure and cost of capital in CSR firms

According to the agency theory, there is a relationship between a firm's CSR and information disclosure. Numerous studies have found that higher corporate governance and information disclosure can effectively reduce the degree of information asymmetry and agency problems, leading a firm to realize a lower cost of capital

(Botosan, 1997; Chen et al., 2009). Capital structure choices also reflect a firm's cost of capital when the decision is affected by information asymmetry (Bertomeu, Beyer, & Dye, 2011; Bharath, Pasquariello, & Wu, 2009). We infer that information asymmetry creates an incentive for corporations to raise capital through debt financing. For example, Kochhar and David (1996) indicates that a tax shield is a major incentive for managers to raise funds from the debt capital market, but when firms are unable to pay interest and loan payments, debt financing increases risks. Thus, when firms encounter higher information asymmetry, they tend to raise capital through debt financing. When firms raise their capital through debt financing with higher information asymmetry among insiders and outside investors, it potentially leads to a higher cost of equity capital. Therefore, we predict that firms with a lower debt ratio that disclose CSR can reduce their cost of equity capital. Combining the above predictions of the theoretical models, we conclude the following hypotheses.

Hypothesis 3a. Higher CSR performance reduces the cost of equity capital more effectively in firms with a lower debt ratio in China's market.

Hypothesis 3b. Higher CSR performance reduces the cost of debt capital more effectively in firms with a lower debt ratio in China's market.

3. Methodology

3.1. Sample overview and data description

To specify our sample for CSR in China, we develop a rating scale based on the Expert Assessment System for the CSR China Honor Roll through content analysis. Chinese firms' annual financial variables, systematic risk index (β), information opacity, and debt ratio are obtained from the Taiwan Economic Journal database. After the removal of firms that have missing data, we include a total of 662 Chinese firms in our sample for 2008–2011.¹ Before 2008, the number of Chinese firms issuing CSR reports was low.

3.2. The regression model

A decision by a firm to disclose its CSR report may be non-random and will cause a self-selection bias. Thus, this study utilizes Heckman's (1979) two-stage model as a method to check the relationship between CSR performance and cost of capital. For the first-stage regression, we consider firm characteristics, corporate governance, and firm complexity as our independent variables (Goss & Roberts, 2011). In addition, the following firm characteristics are taken into account: firm size, firm performance, financial leverage, and firm having a net loss. The corporate governance variables are big 10 auditor,² the number of directors on the board, and the ratio of independent directors on the board. Firm complexity is measured by the number of subsidiaries.

The first-stage regression³ is as follows:

¹ In order to calculate the one-year-ahead cost of capital, we collect data from 2008 to 2012.

² Lin and Lin (2009) argue that Big 4 auditors neither represent the largest auditors nor take a leading position in the public audit market. Therefore, a prior study focusing on capital in China uses Big 10 auditors, taking the auditor's client assets as a measure for audit quality (Wang et al., 2008).

³ In order to filter out the sample selection bias that results from voluntary CSR disclosure, the sample observation totals 4392, including firms with CSR disclosure and those with no CSR disclosure.

$$CSR_D_{it} = \beta_0 + \beta_1 SIZE_{it} + \beta_2 ROA_{it} + \beta_3 LEV_{it} + \beta_4 LOSS_{it} + \beta_5 BIGN_{it} + \beta_6 BSZIE_{it} + \beta_7 INDR_{it} + \beta_8 LNSUB_{it} + Year + \varepsilon_{it} \quad (1)$$

Here, CSR_D is a dummy variable that equals 1 if a firm discloses a CSR report and zero otherwise. SIZE is firm size equal to the natural logarithm of total assets. ROA is return on assets and equals net income before extraordinary items divided by total assets. LEV is financial leverage measured as total liability divided by total assets. LOSS is a dummy variable that equals 1 if a firm has a net loss and zero otherwise. BIGN is a dummy variable that equals 1 if a firm hires a big 10 auditor and zero otherwise. BSZIE represents the number of board directors. INDR is the ratio of independent directors over the board of directors. LNSUB is the natural logarithm of the number of firm subsidiaries.

The second-stage regression is adopted to verify our Hypothesis. The dependent variable is cost of capital (COC), which includes cost of equity and cost of debt. The independent variables include CSR performance (CSR) and control variables. Moreover, this study employs the inverse Mills ratio (IMR) to control for self-selection bias. IMR is extracted from equation (1). The empirical model is in equation (2).

$$COC_{it+1} = \beta_0 + \beta_1 CSR_{it} + \beta_2 SIZE_{it} + \beta_3 MTB_{it} + \beta_4 ROA_{it} + \beta_5 LEV_{it} + \beta_6 CHER_{it} + \beta_7 OANCF_{it} + \beta_8 LOSS_{it} + IMR + Year + \varepsilon_{it} \quad (2)$$

We note that COC is the cost of capital that can be distinguished into cost of equity capital and cost of debt capital. CSR represents CSR performance. SIZE shows firm size equal to the natural logarithm of total assets. MTB is the market to book ratio. ROA illustrates the return on assets. LEV represents financial leverage. CHER is the cash ratio that equals the amount of cash holdings over total assets. OANCF is cash flow from operations divided by total assets. LOSS is a dummy variable that equals 1 if firms have a net loss and zero otherwise. IMR is the inverse Mills ratio as noted above.

In order to verify the moderate effect of capital structure, we modify our equation (2) into equation (3), with the empirical model as follows:

$$COC_{it+1} = \beta_0 + \beta_1 CSR_{it} + \beta_2 CS_{it} + \beta_3 CSR_CS_{it} + \beta_4 SIZE_{it} + \beta_5 MTB_{it} + \beta_6 ROA_{it} + \beta_7 CHER_{it} + \beta_8 OANCF_{it} + \beta_9 LOSS_{it} + IMR + Year + \varepsilon_{it} \quad (3)$$

Here, CS represents a dummy variable that equals 1 if financial leverage is over 50% and zero otherwise. CSR_CS is an interaction term between CSR performance and capital structure. The moderating effect of capital structure can be observed from the coefficient of the cross term (β_3). If the coefficient is significant in β_3 , then the slope between CSR and the cost of capital will vary between firms with a high debt ratio and those with a low debt ratio. Finally, this study adopts one-year-ahead of cost of capital to verify our Hypothesis.⁴

3.3. Measures

3.3.1. CSR performance

Accurately measuring CSR is crucial to the reliability of results presented in any study that investigates the relationship between CSR and the cost of capital. The rating scale (i.e. disclosure scoring) is constructed according to the Expert Assessment System for the CSR China Honor Roll (Yeh et al., 2011). The rating table (Appendix 1) consists of 42 grid items in 10 columns: corporate governance and ethical values, employment and employee equity protection, environmental protection, product quality control, protection of consumer equity, supply chain partnership, promotion of China's technological development, tax contribution, scientific responsibility management systems, and sound corporate image. Of the 42 items, 17 are quantitative measures and 25 are qualitative measures. The rating scale used for coding is similar to those adopted by Aerts and Cormier (2009) and Al-Tuwajria, Christensenb, and Hughes (2004). Quantitative measures evaluate items depending on statistical figures: a value of "0" is assigned to items for which no figure is available. Qualitative measures evaluate items depending on text descriptions: a value of "0" is assigned to items for which no text description is available.

We use questionnaire quantitative item 3-1 as an example:

"Paying attention to environmental protection and use of consistent standards around the globe." Firms that have identified global standards (e.g. ISO 14000) or local standards (e.g. waste gas emission standards) that align with their environmental protection actions and have provided related statistical data in their CSR reports are assigned a value of "2" for this item; those that did not provide an explanation are assigned a value of "0." Questionnaire item 3–4 provides another example: "Dedication to production of environmental friendly products or services." Firms that have explained their dedication to the production of environmental friendly products in their CSR reports are assigned a value of "2" for this item; those that did not provide an explanation are assigned a value

of "0." We first create the coding results by integrating the qualitative and quantitative information into a single figure and then compare firms by relevant items to analyze the adequacy of CSR reporting among Chinese firms.

Most prior studies on CSR disclosure measure a firm's efforts in CSR reporting by using either word counts or report length (e.g. Unerman, 2000; Kolk & Pinkse, 2010). Using both qualitative and quantitative measures can objectively reflect the reality of CSR reporting among Chinese firms. We employ confirmatory factor analysis to measure our CSR variables (see Appendix 1). Table 1 presents a goodness of fit index of 0.864. According to Jöreskog and Sörbom (1993), a value "between 0.80 and 0.89" is acceptable. The standard root mean residual (SRMR) is 0.065, or lower

⁴ This paper also examines the lagged two-year effect of CSR performance.

Table 1
The model fit of CFA in measuring CSR.

Indicator	Value	Reference value
GFI	0.864	GFI >0.85
SRMR	0.065	SRMR <0.08
RMSEA	0.053	RMSEA <0.06

1. This table reports the model fit of CFA in measuring the corporate social responsibility (CSR) variable. It contains goodness of fit (GFI), standard root mean residual (SRMR), and root mean square error of approximation (RMSEA).

2. The reference values are obtained from Jöreskog and Sörbom (1993) and Hu and Bentler (1999).

than the suggested value of 0.08 (Hu & Bentler, 1999). The root mean square error of approximation (RMSEA) = 0.053 and is lower than the suggested value of 0.06 (Hu & Bentler, 1999). These results show that the measuring model and process are useful in estimating the variable of CSR performance in this study. We also classify CSR performance into high CSR performance and low CSR performance based on each year's median. If CSR performance is higher than the CSR performance median, then the value is 1 and zero otherwise.

3.3.2. Estimation of the cost of equity capital and cost of debt capital

Previous studies have conducted both price and earnings forecasts in advance to estimate the cost of capital (Francis et al., 2005; Ben-Nasr, Boubakri, & Cosset, 2012). This study uses excess returns received by an individual as the expected return of investors, which serve as a proxy for the cost of capital.

$$COE_t = R_{it} - R_t^f = \alpha + \beta(R_t^m - R_t^f) \quad (4)$$

Where:

- R_{it} = individual stock return in year t
- R_t^f = risk-free rate in year t
- R_t^m = market return in year t
- $R_{it} - R_t^f$ = excess return of individual stock
- $R_t^m - R_t^f$ = market factor
- β = systematic risk

We follow Francis et al. (2005) to employ the realized cost of debt as the cost of debt capital, which is calculated from the ratio of interest expenses in year t divided by the average interest-bearing debt outstanding during year t . The equation is as follows:

$$COD_t = \frac{\text{Interest Expense}_t}{\text{interest bearing debt outstanding}_t} \quad (5)$$

Here, the average interest-bearing debt outstanding is for year t .

3.3.3. Capital structure

In this study we adopt the debt ratio, which is calculated by dividing total liability by both total liabilities and stockholders' equity, as the CS variable. A high ratio implies that firms raise more capital through debt financing than through equity. According to prior studies, firms obtaining capital through debt financing may increase the information asymmetry between insiders and outside investors. We expect that firms with higher ratios encounter higher information asymmetry, and that the capital structure positively moderates the relationship between CSR and the cost of capital. We classify CS into high debt financing firms and lower debt financing firms based on each year's median. If CS is higher than the CS median, then the value is 1 and zero otherwise.

3.3.4. Control variable

We follow prior research by specifying several control variables that affect the cost of capital (such as Dhaliwal, Heitzman, & Li, 2006, and Ghoul et al., 2011). These control variables include: size (SIZE), measured as the natural logarithm of total assets; market-to-book ratio (MTB); return on assets (ROA); financial leverage (LEV); cash ratio (CHER); cash flow from operations (OANCF); and whether firms have a net loss (LOSS). In addition, we control for time and industry variables as well.

4. Empirical results

4.1. Descriptive statistics

Table 2 presents the descriptive statistics for the full sample. The mean of cost of equity (debt) is 28.1% (10.7%), implying that external equity financing is more expensive than external debt financing. The mean CSR is 47.1%, which means that 47.1% of our analysis sample have better CSR performance. The mean ROA is 6.1%. Financial leverage is 48.8%. It implies our analysis sample has nearly 49% financial leverage on average. The mean of loss is 3.6%, implying that 3.6% of our sample have a net loss.

4.2. Correlation analysis

Table 3 illustrates the Pearson correlations among the cost of capital, CSR performance, and the control variables. CSR is negative, but not significantly correlated with the cost of equity or debt (−0.017 and −0.060). We also find that CSR is positively and significantly correlated with firm size, denoting that large firms have higher CSR performance. Several of the control variables are correlated with the cost of equity capital. The correlation coefficients on SIZE are all negatively and significantly correlated with the cost of capital. It implies that large firms have lower cost of capital. In addition, we do not find high correlations among these explanatory variables, suggesting that multicollinearity is not a serious concern in our research.

4.3. CSR and the cost of capital

To examine the effect of CSR on the cost of capital, Heckman's (1979) two-stage approach is adopted. The first-stage regression results are shown in Table 4. We observe that firm size, firm performance, number of board directors, and firm complexity are positively and significantly associated with firms disclosing a CSR report. Moreover, firms with a net loss are negatively and significantly associated with disclosure of a CSR report.

Table 2
Descriptive statistics.

	Mean	S.D	Min	Max	P25	P50	P75
COE	0.281	0.747	−0.657	4.303	−0.258	0.014	0.679
COD	0.107	0.244	0.000	0.406	0.020	0.042	0.061
CSR	0.471	0.500	0.000	1.000	0.000	0.000	1.000
SIZE	15.579	1.404	12.755	19.944	14.528	15.481	16.418
MTB	3.080	2.555	0.424	26.803	1.531	2.304	3.812
ROA	0.061	0.079	−0.148	0.818	0.020	0.048	0.081
LEV	0.488	0.183	0.029	0.944	0.353	0.506	0.636
CHER	0.179	0.128	0.003	0.960	0.093	0.144	0.230
OANCFR	0.060	0.095	−0.393	1.029	0.017	0.056	0.102
LOSS	0.036	0.187	0.000	1.000	0.000	0.000	0.000
Obs.	662						

a. Variable definitions: cost of equity capital (COE), cost of debt capital (COD), CSR performance (CSR), firm size (SIZE), market-to-book ratio (MTB), return on assets (ROA), financial leverage (LEV), cash ratio (CHER), cash flow from operations (OANCFR), and firm having a net loss (LOSS).

Table 3
Pearson correlation.

	COE	COD	CSR	SIZE	MTB	ROA	LEV	CHER	OANCF	LOSS
COE	1.000									
COD	−0.038 (0.331)	1.000								
CSR	−0.017 (0.659)	−0.060 (0.121)	1.000							
SIZE	−0.217*** (0.000)	−0.211*** (0.000)	0.129*** (0.001)	1.000						
MTB	−0.240*** (0.000)	0.372*** (0.000)	0.017 (0.668)	−0.359*** (0.000)	1.000					
ROA	−0.042 (0.275)	0.296*** (0.000)	−0.019 (0.627)	−0.069 (0.074)	0.306*** (0.000)	1.000				
LEV	−0.033 (0.395)	−0.359*** (0.000)	0.028 (0.468)	0.454*** (0.000)	−0.219*** (0.000)	−0.397*** (0.000)	1.000			
CHER	0.012 (0.765)	0.339*** (0.000)	−0.026 (0.503)	−0.285*** (0.000)	0.299*** (0.000)	0.303*** (0.000)	−0.396*** (0.000)	1.000		
OANCFR	−0.054 (0.166)	0.221*** (0.000)	0.001 (0.973)	−0.054 (0.166)	0.176*** (0.000)	0.587*** (0.000)	−0.271*** (0.000)	0.268*** (0.000)	1.000	
LOSS	0.078** (0.045)	0.007 (0.863)	−0.021 (0.586)	−0.064* (0.099)	0.136*** (0.000)	−0.281*** (0.000)	0.121*** (0.002)	−0.071** (0.070)	−0.104*** (0.007)	1.000

a. Variable definitions: cost of equity capital (COE), cost of debt capital (COD), CSR performance (CSR), firm size (SIZE), market-to-book ratio (MTB), return on assets (ROA), financial leverage (LEV), cash ratio (CHER), cash flow from operations (OANCFR), and firm having a net loss (LOSS).

b. P-values in parentheses; *p < 0.10, **p < 0.05, and ***p < 0.01.

Table 4

The result of the Heckman two-stage estimation - first-stage estimation.

	(1)
	CSR_D
SIZE	0.387*** (0.000)
ROA	1.846*** (0.000)
LEV	−0.085 (0.564)
LOSS	−0.247** (0.049)
BIGN	−0.060 (0.553)
BFSIZE	0.054*** (0.000)
INDR	−0.317 (0.539)
LNSUB	0.103*** (0.000)
Cons	−6.898*** (0.000)
Year	Included
Observations	4392
Chi ²	637.068
Pseudo R ²	0.171

a. Variable definitions: firm size (SIZE), return on assets (ROA), financial leverage (LEV), firm having a net loss (LOSS), firms hiring a big 10 auditor (BIGN), number of board members (BFSIZE), independent directors over total board directors (INDR), and natural logarithm of the number of firm subsidiaries (LNSUB).

b. P-values in parentheses; *p < 0.10, **p < 0.05, and ***p < 0.01.

Table 5

The result of the Heckman two-stage estimation - second-stage estimation.

	Model 1	Model 2	Model 3	Model 4
	COE	COE	COD	COD
CSR	0.019 (0.554)	0.073* (0.080)	−0.028* (0.090)	−0.007 (0.761)
SIZE	−0.042 (0.428)	−0.051 (0.157)	0.052* (0.071)	0.010 (0.812)
MTB	−0.039*** (0.000)	−0.020** (0.013)	0.028*** (0.001)	0.035*** (0.004)
ROA	1.020*** (0.007)	0.612** (0.032)	0.350 (0.226)	0.477 (0.383)
LEV	0.223** (0.041)	0.040 (0.752)	−0.295*** (0.005)	−0.179 (0.175)
CHER	0.228 (0.110)	0.337* (0.094)	0.311** (0.031)	0.284 (0.147)
OANCF	−0.461** (0.041)	−0.276 (0.407)	0.129 (0.277)	0.331 (0.104)
LOSS	0.239 (0.155)	0.258 (0.104)	0.002 (0.958)	0.048 (0.538)
IMR	0.084 (0.576)	−0.016 (0.881)	0.134 (0.151)	0.001 (0.996)
Cons	1.632* (0.093)	0.822 (0.208)	−0.828 (0.135)	−0.223 (0.789)
Year	Included	Included	Included	Included
Observations	662	261	662	261
R ²	0.677	0.279	0.263	0.350
Adj R ²	0.671	0.247	0.249	0.322
F-value	86.462	14.805	3.913	3.805

a. Variable definitions: cost of equity capital (COE), cost of debt capital (COD), CSR performance (CSR), firm size (SIZE), market-to-book ratio (MTB), return on assets (ROA), financial leverage (LEV), cash ratio (CHER), cash flow from operations (OANCFR), firm having a net loss (LOSS), and inverse Mills ratio (IMR).

b. P-values in parentheses are based on standard errors that are clustered by firm; *p < 0.10, **p < 0.05, and ***p < 0.01.

Table 5 lists the second-stage regression results. The left (right) second column represents the result of CSR performance on cost of equity (debt) capital. We use one- (two)-year-ahead cost of capital and current period of CSR performance to capture the effect of lagged 1 year (Model 1 and Model 3) and lagged 2 year (Model 2 and Model 4) of CSR performance on cost of capital, respectively. The results indicate that the lagged 1 year of CSR performance is

negatively and significantly associated with cost of debt capital (Model 3). However, the lagged 2 year of CSR performance is positively and significantly associated with cost of equity capital (Model 2). We infer the reason for the positive relationship between CSR performance and cost of equity capital is that the China government started to promote CSR activity with multi-purposes in the market. Investments in corporate CSR activities are solely to

comply with these regulations in some private sectors. These activities are defined as expense-increasing activities and can generate increased risk, which causes investors to raise their expected return when they make investment decision, thus increasing the cost of equity capital. Furthermore, we find that the market-to-book value is negatively and significantly associated with cost of equity capital, but is the reverse for cost of debt capital. Overall, our results preliminarily support that the performance of CSR can lower the cost of debt capital, therefore supporting our Hypothesis 2.

4.4. The moderating role of capital structure

This study discusses the moderating role of CS on the relationship between CSR performance and the cost of capital. We employ the debt ratio as the proxy for CS and implement two-way interactions into our regression model for the cost of both equity and debt capital. Table 6 shows that the coefficient of the interaction term CS*CSR is positive, but not significantly associated with cost of equity capital (Model 1 and Model 2). These results illustrate that CSR performance does not help firms, whereas higher debt ratios can effectively reduce their cost of equity capital. Thus, CS does not play a moderating role between CSR performance and the cost of equity capital. This result does not support Hypothesis 3a.

To validate these findings further, we adopt the cost of debt capital as our dependent variable to investigate the moderating role of CS. Model 3 and Model 4 (in Table 6) examine that the

coefficients of the cross term CS*CSR have no significant relation with the cost of debt capital. The results reveal that CS does not play a moderating role between CSR performance and the cost of debt capital. Thus, Hypothesis 3b is not supported. We conclude that the debt market in China is still underdeveloped. According to the CSR value curve in the IBM Global Business Service Report, China's market remains at the legal or compliant level, meaning that firms only satisfy the minimal regulations and cannot create additional revenue from operation or financing processes. This explains why firms with lower debt that adopt CSR do not have a lower cost of debt capital in China's market.

4.5. Additional analysis

4.5.1. Fama and Macbeth estimation method

In order to mitigate the cross-sectional correlation problem, we also use the Fama and MacBeth (1973) estimation method to verify our inference, with the results in Table 7. We find that CSR performance is negatively and significantly associated (mean coefficient = -0.028 and p value = 0.007) with cost of debt capital. It implies that firms with higher CSR performance can lower their cost of debt capital. However, we find the coefficient between CSR performance and cost of equity is positive, but not significant. This result is also consistent with the finding in Table 5.

4.5.2. State-owned control issue

Huang and Yu (2006) indicate that state-owned control not only means government intervention in the economy, but also government involvement in the economy. Xu et al. (2015) argue that political interference is an important institutional characteristic in China's capital market. Thus, we consider the state-owned effect on the relationship between CSR performance and cost of capital in Table 8. We show that the coefficients of the interaction term SOWN*CSR are positively or negatively, but not significantly,

Table 6
The effect of CSR performance on capital cost considering the role of capital structure.

	Model 1	Model 2	Model 3	Model 4
	COE	COE	COD	COD
CSR	-0.015 (0.720)	0.043 (0.490)	-0.010 (0.764)	0.013 (0.755)
CS	0.044 (0.355)	-0.011 (0.828)	-0.017 (0.549)	-0.009 (0.789)
CSR_CS	0.063 (0.340)	0.054 (0.497)	-0.018 (0.626)	-0.040 (0.414)
SIZE	-0.046 (0.383)	-0.051 (0.164)	0.051* (0.091)	0.001 (0.974)
MTB	-0.038*** (0.000)	-0.020** (0.020)	0.026*** (0.004)	0.034*** (0.006)
ROA	0.942** (0.011)	0.602** (0.032)	0.590* (0.062)	0.576 (0.282)
CHER	0.184 (0.199)	0.313 (0.126)	0.391** (0.011)	0.317 (0.114)
OANCF	-0.454** (0.046)	-0.274 (0.423)	0.132 (0.324)	0.355* (0.077)
LOSS	0.243 (0.152)	0.256 (0.111)	-0.010 (0.796)	0.052 (0.511)
IMR	0.065 (0.663)	-0.017 (0.878)	0.173* (0.078)	-0.007 (0.961)
Cons	1.809* (0.062)	0.858 (0.201)	-1.019* (0.083)	-0.167 (0.843)
Year	Included	Included	Included	Included
Observations	662	261	662	261
R ²	0.677	0.279	0.234	0.344
Adj R ²	0.670	0.244	0.219	0.312
F-value	82.267	12.678	3.259	3.598

a. Variable definitions: cost of equity capital (COE), cost of debt capital (COD), CSR performance (CSR), capital structure (CS), firm size (SIZE), market-to-book ratio (MTB), return on assets (ROA), financial leverage (LEV), cash ratio (CHER), cash flow from operations (OANCFR), firm having a net loss (LOSS), and inverse Mills ratio (IMR).

b. P-values in parentheses are based on standard errors that are clustered by firm; *p < 0.10, **p < 0.05, and ***p < 0.01.

Table 7
The result of CSR performance on capital cost - Fama and Macbeth method.

	Model 1	Model 2	Model 3	Model 4
	COE	COE	COD	COD
CSR	0.021 (0.651)	0.051 (0.363)	-0.028*** (0.007)	-0.019 (0.374)
SIZE	-0.077 (0.434)	-0.073 (0.355)	0.067* (0.077)	0.042 (0.310)
MTB	-0.065 (0.241)	-0.022* (0.100)	0.028** (0.040)	0.041* (0.086)
ROA	1.191 (0.149)	0.444 (0.338)	0.614 (0.214)	0.828 (0.175)
LEV	0.229 (0.304)	0.029 (0.624)	-0.278** (0.033)	-0.153 (0.397)
CHER	0.225 (0.348)	0.324 (0.355)	0.312** (0.013)	0.278 (0.223)
OANCF	-0.357 (0.295)	-0.116 (0.687)	0.134* (0.098)	0.236** (0.015)
LOSS	0.304 (0.257)	0.269 (0.346)	0.032 (0.427)	0.134 (0.105)
IMR	0.038 (0.859)	-0.050 (0.527)	0.176 (0.121)	0.089 (0.382)
Cons	1.315 (0.483)	1.029 (0.414)	-1.228 (0.105)	-0.821 (0.300)
Observations	662	261	662	261
Ave R ²	0.183	0.220	0.297	0.409
F-value	6.976	0.815	11.275	12.135

a. Variable definitions: cost of equity capital (COE), cost of debt capital (COD), CSR performance (CSR), firm size (SIZE), market-to-book ratio (MTB), return on assets (ROA), financial leverage (LEV), cash ratio (CHER), cash flow from operations (OANCFR), firm having a net loss (LOSS), and inverse Mills ratio (IMR).

b. P-values in parentheses; *p < 0.10, **p < 0.05, and ***p < 0.01.

Table 8
The result of CSR performance on capital cost – the role of state-owned control.

	Model 1	Model 2	Model 3	Model 4
	COE	COE	COD	COD
CSR	0.019 (0.763)	−0.006 (0.933)	−0.027 (0.380)	−0.028 (0.559)
SOWN	−0.048 (0.356)	−0.061 (0.233)	0.047 (0.158)	0.034 (0.422)
CSR_SOWN	0.001 (0.994)	0.121 (0.149)	−0.003 (0.944)	0.030 (0.583)
SIZE	−0.039 (0.456)	−0.050 (0.190)	0.050* (0.078)	−0.000 (1.000)
MTB	−0.039*** (0.000)	−0.019** (0.018)	0.028*** (0.001)	0.035*** (0.005)
ROA	0.982** (0.010)	0.615** (0.040)	0.386 (0.200)	0.479 (0.393)
LEV	0.223** (0.037)	0.049 (0.703)	−0.295*** (0.004)	−0.187 (0.150)
CHER	0.198 (0.173)	0.307 (0.128)	0.340** (0.017)	0.300 (0.118)
OANCF	−0.447* (0.051)	−0.283 (0.404)	0.115 (0.333)	0.317 (0.114)
LOSS	0.251 (0.138)	0.247 (0.122)	−0.009 (0.821)	0.036 (0.656)
IMR	0.075 (0.622)	−0.016 (0.888)	0.143 (0.123)	−0.011 (0.938)
Cons	1.641* (0.091)	0.855 (0.214)	−0.837 (0.127)	−0.071 (0.931)
Year	Included	Included	Included	Included
Observations	662	261	662	261
R ²	0.677	0.285	0.269	0.356
Adj R ²	0.670	0.248	0.253	0.322
F-value	76.061	12.386	3.560	3.269

a. Variable definitions: cost of equity capital (COE), cost of debt capital (COD), CSR performance (CSR), state-owned control (SOWN), firm size (SIZE), market-to-book ratio (MTB), return on assets (ROA), financial leverage (LEV), cash ratio (CHER), cash flow from operations (OANCFR), firm having a net loss (LOSS), and inverse Mills ratio (IMR).

b. *P*-values in parentheses are based on standard errors that are clustered by firm; **p* < 0.10, ***p* < 0.05, and ****p* < 0.01.

associated with the cost of the equity capital or cost of debt. It implies that there is no state-owned moderate effect on the relationship between CSR performance and cost of capital. Prior research states that the inefficiency of state-owned control firms may produce a higher cost of capital (Bai, Lu, & Tao, 2006; Li & Xia, 2008; Omran, 2004). However, alternative research argues that state-owned control firms receive more supportive policies and lower risks that result in a lower cost of capital (Hitt, Lee, & Yucel, 2002; Lin, Cai, & Li, 1998; Wang, Wong, & Xia, 2008). These inconsistent results lead us to not find a moderate effect of state-owned control on the relationship between CSR performance and cost of capital.

4.5.3. Information opacity problem

Kothari (2000) indicates that financial reporting quality can lower information asymmetry between managers and investors. Furthermore, higher reporting quality can lower the cost of capital and mitigate the volatility of stock price. Therefore, this study further investigates whether CSR performance can lower the cost of capital under information opacity.⁵

Table 9 presents the result of CSR performance on cost of capital under information opacity. Obviously, we find that the interaction term of CSR performance with information opacity is positively or negatively, but not significantly, associated with cost of equity

⁵ In our paper, we use discretionary accruals to measure information asymmetry. The discretionary accruals are extracted from the performance match Jones model (Kothari, Leone, & Wasley, 2005).

Table 9
The result of CSR performance on capital cost – the role of information opacity.

	Model 1	Model 2	Model 3	Model 4
	COE	COE	COD	COD
CSR	−0.026 (0.458)	0.103** (0.042)	−0.029 (0.196)	0.046 (0.198)
OPACITY	0.030 (0.523)	0.023 (0.669)	0.015 (0.541)	0.056 (0.146)
CSR_OPACITY	0.088 (0.175)	−0.062 (0.398)	−0.001 (0.985)	−0.108** (0.045)
SIZE	−0.045 (0.401)	−0.049 (1.000)	0.052* (0.071)	0.014 (0.751)
MTB	−0.038*** (0.000)	−0.020** (0.011)	0.028*** (0.001)	0.034*** (0.004)
ROA	0.952** (0.011)	0.624** (0.028)	0.338 (0.246)	0.499 (0.360)
LEV	0.197* (0.068)	0.034 (0.789)	−0.302*** (0.004)	−0.194 (0.151)
CHER	0.206 (0.149)	0.345* (0.084)	0.306** (0.032)	0.297 (0.121)
OANCF	−0.452** (0.048)	−0.277 (0.403)	0.131 (0.272)	0.333* (0.100)
LOSS	0.245 (0.145)	0.269 (0.104)	0.003 (0.932)	0.070 (0.372)
IMR	0.072 (0.633)	−0.014 (0.897)	0.133 (0.156)	0.006 (0.967)
Cons	1.688* (0.085)	0.785 (0.226)	−0.825 (0.135)	−0.297 (0.721)
Year	Included	Included	Included	Included
Observations	662	261	662	261
R ²	0.680	0.281	0.264	0.361
Adj R ²	0.673	0.243	0.248	0.327
F-value	76.532	12.816	3.370	3.581

a. Variable definitions: cost of equity capital (COE), cost of debt capital (COD), CSR performance (CSR), financial opacity (OPACITY), firm size (SIZE), market-to-book ratio (MTB), return on assets (ROA), financial leverage (LEV), cash ratio (CHER), cash flow from operations (OANCFR), firm having a net loss (LOSS), and inverse Mills ratio (IMR).

b. *P*-values in parentheses are based on standard errors that are clustered by firm; **p* < 0.10, ***p* < 0.05, and ****p* < 0.01.

capital. However, we show that the lagged 2-year CSR performance interacting with information opacity is negatively and significantly associated with cost of debt capital. These results partially support our inference that CSR performance increases information transparency, thus lowering cost of debt capital.

4.5.4. Endogeneity problem

Our analysis focuses on the relationship between CSR and cost of capital. Since the potential endogenous relationship between CSR and cost of capital could affect our study results, we employ instrument variables to ensure the robustness of our results to endogeneity. We follow a previous study that applies the industry median CSR score as an instrument for the CSR score (Kim, Li, & Li, 2014).

Table 10 lists the empirical results. Obviously, CSR performance remains negatively and significantly associated with cost of debt capital. It implies that our results are robust after controlling for the endogeneity problem and consistent with the findings from using Heckman's (1979) two-stage regression estimation and Fama and Macbeth's (1973) cross-sectional estimation.

4.5.5. Alternative CSR measurement

To increase the robustness of our CSR measurement, we apply an alternative CSR performance⁶ measure to verify our inference. The results are in Table 11. CSR performance is negatively and

⁶ We also follow Huang, Duan, and Zhu (2017) and use a CSR performance measurement extracted from the RANKINS (hereafter, RKS) CSR rating database.

Table 10
The result of CSR performance on cost of capital after controlling the endogeneity problem.

	Model 1	Model 2	Model 3	Model 4
	COE	COE	COD	COD
CSR	0.035 (0.637)	-0.082 (0.438)	-0.125* (0.060)	-0.081 (0.304)
SIZE	-0.028 (0.381)	0.046 (0.264)	0.075*** (0.005)	0.095** (0.014)
MTB	-0.013*** (0.004)	-0.022*** (0.001)	0.015** (0.019)	0.026** (0.015)
ROA	0.947*** (0.000)	1.285*** (0.000)	0.647* (0.051)	0.652 (0.160)
LEV	0.248*** (0.000)	0.092 (0.207)	-0.317*** (0.000)	-0.460*** (0.000)
CHER	-0.033 (0.643)	-0.067 (0.559)	0.550*** (0.000)	0.472*** (0.003)
OANCF	-0.166 (0.328)	-0.566** (0.037)	0.158 (0.187)	-0.024 (0.893)
LOSS	0.059 (0.437)	0.066 (0.245)	0.101*** (0.002)	0.124*** (0.010)
IMR	0.034 (0.687)	0.168 (0.133)	0.221*** (0.006)	0.244** (0.022)
Cons	-0.071 (0.902)	-0.880 (0.239)	-1.287*** (0.010)	-1.560** (0.027)
Year	Included	Included	Included	Included
Observations	662	261	662	261
R ²	0.299	0.393	0.311	0.324
Adj R ²	0.290	0.377	0.301	0.306
F-value	43.455	27.338	9.037	5.488

a. Variable definitions: cost of equity capital (COE), cost of debt capital (COD), CSR performance (CSR), firm size (SIZE), market-to-book ratio (MTB), return on assets (ROA), financial leverage (LEV), cash ratio (CHER), cash flow from operations (OANCF), firm having a net loss (LOSS), and inverse Mills ratio (IMR).

b. *P*-values in parentheses are based on standard errors that are clustered by firm; **p* < 0.10, ***p* < 0.05, and ****p* < 0.01.

Table 11
The result of CSR performance on cost of capital - alternative CSR measurement.

	Model 1	Model 2	Model 3	Model 4
	COE	COE	COD	COD
CSR	0.013 (0.522)	-0.012 (0.614)	-0.047** (0.020)	-0.101*** (0.000)
SIZE	-0.028 (0.378)	0.039 (0.360)	0.076*** (0.004)	-0.000 (0.993)
MTB	-0.013*** (0.003)	-0.021*** (0.001)	0.016** (0.012)	0.027*** (0.006)
ROA	0.954*** (0.000)	1.132*** (0.000)	0.621* (0.057)	0.319 (0.469)
LEV	0.251*** (0.000)	0.079 (0.306)	-0.326*** (0.000)	-0.428*** (0.000)
CHER	-0.034 (0.636)	-0.084 (0.478)	0.552*** (0.000)	0.446*** (0.007)
OANCF	-0.161 (0.343)	-0.548** (0.037)	0.140 (0.238)	-0.045 (0.797)
LOSS	0.059 (0.432)	0.073 (0.207)	0.099*** (0.002)	0.131*** (0.009)
IMR	0.037 (0.661)	0.147 (0.185)	0.211*** (0.009)	-0.047 (0.684)
Cons	0.382 (0.496)	-1.047 (0.165)	-1.315*** (0.007)	0.232 (0.737)
Year	Included	Included	Included	Included
Observations	814	386	814	386
R ²	0.300	0.393	0.315	0.345
Adj R ²	0.290	0.377	0.306	0.328
F-value	43.269	28.160	9.113	6.034

a. Variable definitions: cost of equity capital (COE), cost of debt capital (COD), CSR performance (CSR), firm size (SIZE), market-to-book ratio (MTB), return on assets (ROA), financial leverage (LEV), cash ratio (CHER), cash flow from operations (OANCF), firm having a net loss (LOSS), and inverse Mills ratio (IMR).

b. *P*-values in parentheses are based on standard errors that are clustered by firm; **p* < 0.10, ***p* < 0.05, and ****p* < 0.01.

significantly associated with cost of debt, which is consistent with the findings in Table 5. However, we see that it is positively or negatively, but not significantly, associated with cost of equity. It implies that firms with strong CSR performance can improve their cost of debt capital, which is consistent with the findings when we use different CSR measurements. In summary, our results support Hypothesis 2 whereby the performance of CSR can lower the cost of debt capital.

5. Discussion and conclusion

This study investigates whether CSR can affect a firm's cost of equity and debt capital in China's capital market. Prior studies have shown only that CSR can reduce the cost of capital. Our results infer that higher CSR performance could decrease the cost of debt capital. This result has critical implications for both practice and academia.

From the practical aspect, we assert that debt financing plays an important role in emerging markets. Emerging market firms aggressively find useful ways to lower their debt financing cost. This study provides an alternative way to lower Chinese firms' cost of debt financing by investigating the relationship between CSR performances and cost of capital. The results herein indicate that better CSR performance can effectively lower the cost of debt capital. This result is essential for the Chinese market, which heavily relies on external debt financing. Firms can implement CSR as a mechanism to lower their cost of debt by conveying a sustainable development commitment and social responsibility to creditors. On the other hand, creditors can decide whether to assist sustainable firms to lower their cost of capital by observing firms' CSR performance. Unlike western research, we do not find a negative relationship between CSR performance and cost of equity in China. One possible explanation is that Chinese CSR activities only meet the minimum regulation requirement by the government, and thus CSR effects are not timely and reflected in the equity capital market.

From the academic viewpoint, we not only focus on the effect of CSR performance on cost of equity, but also investigate the relationship between CSR performance and cost of debt. Although there is no negative effect of CSR performance on cost of equity capital, strong CSR performance can lower the cost of debt capital as noted from our empirical studies. This result is essential since prior research pays less attention on emerging capital markets and cost of debt capital. Our research fills the gap in the literature concerning CSR performance's impact on the cost of capital. We specifically use China's capital market to implement our analysis and show that strong CSR performance does improve the cost of debt financing.

One limitation is that we adopt China capital market data to investigate the relationship between CSR and cost of capital. Whether this can be extended to other emerging markets in Southeast Asia such as Vietnam, Indonesia, India, or Thailand is still an unanswered question. Thus, we encourage future research to employ our method to verify CSR performance in other capital markets and to examine its relationships with various factors.

Appendix 1. The Expert Assessment System for CSR China Honor Roll

Dimension	Item	Disclosure scoring
Corporate governance and ethical value	1-1. Specification of corporate governance structure	2
	1-2. Compliance with laws and regulations	2
	1-3. Conformance of the company's core management strategies with CSR principles, promised framework agreement, and standards	1
	1-4. Availability of consistent social responsibility policies	1
	1-5. Engagement in actively responding to reasonable expectations and demands of stakeholders to create harmony	2
Employment and employee equity protection	2-1. Growth of job opportunities and employees	3
	2-2. Sufficient social security and insurance for employees	2
	2-3. Efforts made at ensuring non-discrimination, maternity benefits, salary equity, and adequate holidays	2
	2-4. Active engagement in employee training and cultivation of local technical and managerial human resources	2
	2-5. Paying attention to maintenance of harmonious labor relations and development and operation of a labor union	1
Environmental management	3-1. Paying attention to environmental protection and use of consistent standards around the world	2
	3-2. Active engagement in promoting environmental awareness	1
	3-3. Availability of tangible measures of environmental protection and effective fulfillment of responsibility for environmental protection	3
	3-4. Dedication to production of environmental friendly products or services	2
	3-5. Active launch or participation in extensive environmental protection projects	1
	3-6. Paying attention to energy savings/carbon reduction and development of a circular economy	2
	3-7. Using clean energies and diffusing this idea to other people in the community	2
	3-8. Promotion of research, new techniques, and methods of energy savings/carbon reduction	2
	3-9. Availability of the awareness of and strategies for sustainable development	1
	3-10. Performance in sustainability of strategies, production, profitability, research, and environmental protection	2
	3-11. Paying attention to sustainable use of the environment and resources	2
Product quality control	4-1. Strengthening product quality control at all times to provide qualified products to consumers	5
	4-2. Using quality control methods that are stricter than external standards	5
Protection of consumer equity	5-1. Availability of a sound after-sales service system and active engagement in collecting and reacting to consumer feedbacks	3
	5-2. Evaluation of customer satisfaction and active handling of customer complaints	3
	5-3. Voluntary recall of defective products and provision of compensation	2
Supply chain partnership	6-1. Providing fair opportunities of transactions with upstream and downstream firms in the supply chain	2
	6-2. Promoting healthy business ethics in the supply chain	2
	6-3. Leading more enterprises to become outstanding corporate citizens	2
Promotion of China's technological development	7-1. Degree of research, investment, and openness of core technologies	3
	7-2. Engagement in active transformation of advanced development results into productivity and inducing enhancement of development quality of other enterprises	2
	7-3. Contribution of new technologies and products to national and social development as well as changes in social production and life styles	3
Tax contribution	8-1. Longitudinal and cross-sectional comparison of tax revenue and its growth	4
	8-2. The effects of tax contribution on regional economic development	3
	8-3. The effects of actively paying tax on development of the entire industry	3
Scientific responsibility management system	9-1. Availability of an independent CSR management institution and incorporation of CSR performance into core management strategies	2
	9-2. Availability of a management system that supports business principles or ethical norms	2
	9-3. Introduction of stakeholder communication and performance improvement mechanisms	1
Sound corporate image	10-1. Availability of corporate culture that highly emphasizes social responsibility	4
	10-2. Adequacy of information communication and disclosure mechanisms	4
	10-3. Availability of active and effective improvement mechanisms	4
	10-4. Experience of being awarded or honored for leading other competitors in CSR performance	3
Total		100

Items in bold face are quantitative items.

Source: The Expert Assessment System for CSR China Honor Roll (www.csr-china.net).

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