

Corporate Social Responsibility and Profitability — Cost of Debt as the Mediator

Chang, Yuan and Chung-Hua Shen *

Abstract

This study examines two issues related to corporate social responsibility (CSR) and the firm's cost of debt as, proxied by credit ratings. First, we investigate whether CSR has a positive effect on credit ratings and therefore reduces the cost of debt. Second, we consider the credit ratings as the mediator between CSR and the firm's profitability. The mediator here means that, given the presence of credit ratings, the impacts of CSR on the firm's performance will be lower than in those cases where credit ratings are not considered in the regression analysis. By employing companies listed on the Taiwan Stock Exchange (TWSE) during 2005~2009, our results show that CSR firms tend to have higher creditworthiness and therefore a lower cost of debt. In addition, after controlling for credit ratings, the impact of CSR on the firm's profitability is reduced, thereby showing that credit ratings serve as the mediator between CSR and performance.

Keywords: Corporate Social Responsibility, Cost of Debt, Credit Ratings, Mediator

JEL Classification: C21, G10, M14

* Chang, Yuan, Associate Professor of Department of Finance, National Changhua University of Education, No. 2, Shi-Da Rd., Changhua City, Changhua County 50074, Taiwan, R.O.C., Tel: 886-4-7232105 ext. 7350, E-mail: ccuecon@yahoo.com.tw.
Chung-Hua Shen, Professor of Department of Finance, National Taiwan University, No. 1, Sec. 4, Roosevelt Rd., Da-an Dist., Taipei City 10617, Taiwan, R.O.C., Tel: 886-2-33661087, E-mail: chshen01@ntu.edu.tw.

Received 15 August 2011; revised 14 November 2011; accepted 17 September 2013.

1. Introduction

Corporate social responsibility (CSR) has already become an important management issue due to a succession of corporate frauds, environmental pollution and climate change over the last decade. The public have also been paying increasing attention to whether a company exercises CSR during its operations. The World Business Council for Sustainable Development (WBCSD) defined CSR as the “continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large”. In coping with this trend and development in their operating environment and management philosophy, numerous firms regularly publish CSR reports and much anecdotal evidence also shows that large numbers of firms are devoting substantial resources to CSR initiatives around the globe.

In the academic literature, as to whether CSR activities bring positive feedback to firm performance or value is still an ongoing debate, both theoretically and empirically. A number of extant studies have established a positive linkage between CSR and financial performance (FP). For example, Freeman (1984) proposed that a firm’s social activity is value-enhancing because of the satisfaction derived by the stakeholders and the improvement in public image and reputation (Waddock and Graves, 1997). Others have proposed that a negative relationship exists between CSR and FP, such that CSR activities are costly, reducing the firm’s competitiveness (Friedman (1962, 1970)) and are thus value-destroying. For a survey, see

Allouche and Laroche (2005) and Shen and Chang (2009).¹

While the vast number of existing studies are far from reaching a consensus, McWilliams and Siegel (2000), Orlitzky et al. (2003) and Margolis and Walsh (2003) indicated that a possible reason for the inconclusive empirical results is that existing models on the relationship between CSR and FP provide insufficient controls over important variables and thus give rise to a model misspecification problem. In addressing this issue, Rowley and Berman (2000) proposed that some “moderators” and “mediators” between CSR and FP should be considered in the model. A “moderator” denotes a variable which can strengthen or weaken the relationship between two variables of concern, and a “mediator” denotes a variable that serves as an intermediary for the effects of one variable on the other (Baron and Kenny, 1986). For example, Surroca et al. (2010) suggested that intangible assets are a mediator between CSR and FP.

The main purpose of this paper is to propose and examine the extent to which the cost of debt (proxied by credit ratings) serves as a mediator between CSR and FP. Baron and Kenny (1986) proposed that three conditions must hold if the cost of debt is to be identified as a mediator between CSR and FP. The three conditions are “CSR affects FP”, “CSR

¹ Existing empirical studies exhibit a positive relationship between CSR and FP, for example, Wokutch and Spencer (1987), McGuire et al. (1988), Waddock and Graves (1997), Tsoutsourz (2004); Some studies reveal a negative relationship between CSR and FP, such as Vance (1975), Marcus and Goodman (1986), Lerner and Fryxell (1988), Holman et al. (1990), Brammer et al. (2006) and Anginer et al. (2008). Other studies report the neutral evidence, such as Alexander and Buchholz (1978), Aupperle et al. (1985), Ullmann (1985) and Shane and Spicer (1983). The empirical investigation of the relationship between CSR and FP is well-documented, and the reader should refer to Griffin and Mahon (1997), Mahon and Griffin (1999), Roman et al. (1999), Rowley and Berman (2000), Margolis and Walsh (2003), Orlitzky et al. (2003), Barnett and Salomon (2006), Chih et al. (2008) and Shen and Chang (2009) for the details.

affects the cost of debt” and “the influence of CSR affects FP that is weakened after controlling for the cost of debt”. This study follows these three conditions to empirically investigate the mediating role of the cost of debt between CSR and FP.

The first condition, “CSR affects FP”, is already well-documented in existing studies. What, then, drives the second condition, “CSR affects the cost of debt”? Godfrey (2005) argued that CSR activities generate positive reputational capital among stakeholders and provide shareholders with insurance-like protection, contributing to higher shareholder wealth and lower operational risks. If CSR activities reduce the overall risk of a firm and this reduced risk is perceived by investors, then the firm could obtain a lower risk premium and thereby decrease its cost of capital.² Czarnitzki and Kraft (2007) indicated that credit ratings are commonly used by lenders to assess the risk of default. Our cost of debt is proxied by the Taiwan credit rating index (TCRI) published by the Taiwan Economic Journal (TEJ). Although Menz (2010) uses bond yield data to proxy the cost of debt, however, because listed companies on Taiwan Stock Exchange (TWSE) rarely issue bonds, the number of firms will be greatly reduced if we also use the bond yield. CSR is helpful for rating because a credit rating includes both objective and subjective evaluations of a company. When a corporation implements CSR, the good reputation obtained strengthens the subjective evaluation of raters. Thus its credit rating will be affected by CSR. To summarize, our principal proposition is that a socially responsible firm tends to be less risky, and to enjoy a favorable credit rating and thus a lower cost of debt. A higher cost of debt imposes a borrowing burden on a company, and a declining cost of debt implies an increase in profits.

² Generally speaking, a firm’s sources of funds are roughly divided into equity capital and debt capital, and because debt is a very important funding source, our focus in this paper is on the effects of CSR on the cost of debt.

Following the recent developments in the literature, we also study the issue of the mechanism of the CSR-FP nexus. Our sample is comprised of firms listed on the Taiwan Stock Exchange (TWSE) during 2005~2009, and our regression results support the view that a credit rating serves as a mediator between CSR and FP. First, a firm that engages in CSR activities is associated with higher profitability. Next, a firm that engages in CSR activities is associated with favorable credit ratings. CSR companies obtain better credit ratings and thus cheaper debt financing. The management implications are that the management should understand the beneficial effects of CSR activities on a firm's debt financing burden. Lastly, after controlling for credit ratings, the impact of CSR on a firm's profitability is reduced, by either the magnitude of the estimated coefficients or their statistical significance.

This paper contributes to the existing literature by examining how a firm's credit rating serves as a mechanism between CSR and performance. Given that a credit rating is important but is often ignored by existing studies, our model mitigates the mis-specification problem and probes into the mechanism on the relationship between CSR and FP. Based on our findings, the main managerial implications are that the management should understand the beneficial effects of CSR activities on a firm's debt financing burden, allocate appropriate resources on social initiatives in corporate strategic planning, and comprehend that the cost of debt is a channel through which financial markets encourage firms to become more socially responsible.

In passing, a recent challenge for empirical economics and financial researchers is the endogeneity problem (of the firm being a CSR-firm). To be specific, a company's engagement in CSR serves as an endogenous self-selection process. Existing studies have indicated that firms with abundant resources tend to engage in CSR activities (Waddock and Graves, 1997;

Schuler and Cording, 2006). Other firm characteristic variables might also affect a firm's adoption of CSR. Insufficient control of these factors leads to contamination in identifying the pure effects of engaging in CSR activities on a firm's performance or other variables of interest. Bhagat and Black (2002) and Hermalin and Weisbach (2003) also indicated that the endogeneity issue is an epidemic in the explanation of empirical evidence in almost all extant studies. While the endogeneity issue is usually not directly addressed and controlled for, the estimated coefficients of key independent variables are likely to be biased. Overcoming this endogeneity problem is crucial for empirically investigating the relevance of adopting CSR.

In this paper, we apply Rosenbaum and Rubin (1983, 1985a, 1985b) propensity score matching (PSM) model to control for the endogeneity of the firm's decision to adopt CSR.³ The PSM involves two steps. The first is to estimate the probability of observations being CSR-firms by employing theoretically electable self-selection characteristics as the explanatory variables. Then, for each CSR-firm in the sample, a NonCSR-firm is selected as matching samples according to the closeness of the above estimated probability. The self-selection bias resulting from endogenously adopting CSR could be mitigated if each pair of self-selection factors was to be approximately the same between two groups of firms (see Shen and Chang (2009) for the details).

³ The traditional solving of the endogeneity problem is based on Heckman (1979) two-stage estimation. Based on Elston et al. (2011), however, the two-stage estimation needs to satisfy the identification requirement. Specifically, we must have at least one variable in the probability equation (the first stage) that is not included in the performance evaluation equation (the second stage). This method also incurs LaLonde (1986) critiques which suggest that non-experimental estimates may vary widely, become sensitive to model specifications, and differ greatly from the experimental estimates.

The remainder of this study is organized as follows. Section 2 theoretically states how a firm's cost of debt plays a mediating role in terms of the relationship between CSR and FP. Section 3 describes our variables, econometric model and data. Section 4 presents the empirical results. The last section concludes.

2. The Role of the Cost of Debt as a Mediator between CSR and FP

While most existing empirical studies on CSR focus on the effects of CSR on firm performance, the number of studies examining the effects of CSR on the cost of capital is relatively small.

In general, a company's source of finance could be divided into equity financing versus debt financing. El Ghouli et al. (2011) indicated that the cost of equity capital is defined as the rate of return that equity investors expect to earn from ownership as a compensation for bearing risks that they cannot diversify away. A corporation without sustainable operating goals might be subjected to higher operational and financial risks that might impact the company's license to operate, and investors would become more and more concerned about these risks. Investors want to make sure that companies employ good management practice to manage these risks, and socially irresponsible firms lose their investor base and thus face a higher required rate of returns on the part of existing investors. They obtained supportive evidence that a socially responsible firm tends to have a lower cost of equity. Heinkel et al. (2001) established a theoretical model and pointed out that green investors influence the expected returns of polluting firms by boycotting them. Fewer investors are going to hold stocks in polluting firms, and thus the opportunities for risk diversification are reduced and the firm's cost of capital will be higher.

Hong and Kacperczyk (2009) provided evidence that the stocks of “sin” companies, such as firms whose earnings are substantially from tobacco, alcohol and gambling, are more cheaply priced by the market (implying a lowered cost of equity) because they are not preferred by socially norm-constrained institutional investors. Based on the Kinder, Lydenberg, Domini research and analytics (KLD) CSR ratings for around 1,000 public companies, Derwall and Verwijmeren (2007) found that there is a negative and statistically significant association between three of the four CSR indexes and the implied cost of equity capital. Firms with leading track records in environmental performance, governance, and product quality have a lower implied cost of equity capital and, on the contrary, the relationship between a social index (which covers diversity, human rights, employee relations, and community involvement) and the cost of equity is positive (a better social performance in these fields increases the cost of equity).

As for debt financing, Menz (2010) proposed that socially responsible equity investment is ineffective, because, first of all, equity capital accounts for only a small part of the funding sources of a firm. And second, sometimes when a firm raises equity capital during the final stage of a stock price improvement, the investor’s risk appetite is high and he often behaves irrationally (neglects fundamental factors and demands risk premiums that are too low). Thus the possibilities of exerting pressure on companies via higher equity capital costs are therefore limited. Third, shareholder activism works through active shareholders participating in general meetings. However, the free rider problem exists among shareholders and coordination among them is also difficult. Menz (2010) argued that the impacts of CSR on the credit market of a company are much larger than those on the equity market. First, debt instruments account for a large part of a firm’s funding resources. Second, banks and creditors are also aware that environmental and social issues have posed

potential risks for firms in recent decades. Third, since bond markets are dominated by institutional investors, CSR requirements are relatively easier to impose on creditors than on stockholders because the latter give rise to a larger free rider problem and coordination problem than the former. However, Menz (2010) did not obtain evidence of a significant relationship between CSR and the risk premium of firms.

Goss and Roberts (2011) proposed two conflicting views, namely, the risk mitigation view and the overinvestment view regarding the relationship between CSR and credit spreads, and found that a firm with good performance in relation to CSR paid lower credit premiums. Others studies, such as Di Giulio et al. (2007), Orlitzky and Benjamin (2001) and Spicer (1978) provide supportive evidence that socially irresponsible firms are regarded as highly volatile in terms of their operations and are hence financially risky, *ceteris paribus*, which leads to larger yield claims by the lenders and, in turn, larger risk premiums.

How to measure the cost of debt, in addition to credit spreads by Menz (2010) and Goss and Roberts (2011) is thus most important. According to Czarnitzki and Kraft (2007), credit ratings is commonly used by lenders to assess the default risk, because every credit is connected with a possible loss. Reeb et al. (2001) proposed that a credit rating is a principal determinant of the cost of debt. They employed a sample of 2,194 observations for the U.S. and found that firms with greater levels of international activity have better credit ratings and that the cost of debt financing is inversely related to the degree of firm internationalization, thus implying that a lower cost of debt is related to better credit ratings. Thus, the credit ratings could serve as a proxy variable of the cost of debt.

In the current research on the CSR-FP nexus, more and more researchers have proposed remedying the model misspecification problem and investigate the mechanism inside the relationship (McWilliams and Siegel, 2000; Orlitzky et al., 2003; Margolis and Walsh, 2003; Rowley and

Berman, 2000). We follow this trend of development and empirically investigate the cost of debt (proxied by credit ratings), which serves as one mechanism inside the CSR-FP relationship. According to Baron and Kenny (1986), a variable functions as a mediator when it meets the following three conditions: (i) variations in levels of the independent variable significantly account for variations in the presumed mediator (i.e., path a in Figure 1), (ii) variations in the mediator significantly account for variations in the dependent variable (i.e., path b in Figure 1), and (iii) when path a and b are controlled, a previously significant relationship between the independent and dependent variables is no longer significant, with the strongest demonstration of mediator occurring when path c is zero.

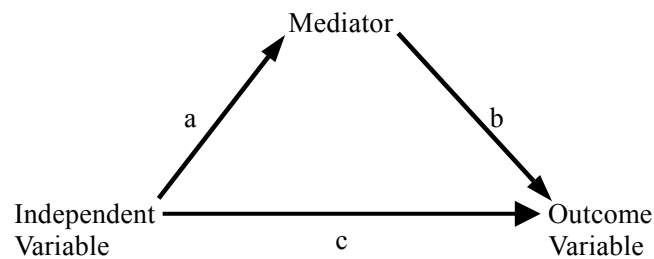


Figure 1 Mediator Model (Baron and Kenny, 1986)

Empirically, if the cost of debt serves as a mediator between CSR and FP, then we would expect that (i) CSR affects the firm's cost of debt, and (ii) the cost of debt affects FP, and (iii) after controlling for the cost of debt, the effects of CSR on FP are reduced or become insignificant.⁴ Empirically,

⁴ In fact, we could also employ a simultaneous equation model to estimate these three conditions and apply a joint test to examine whether the three conditions hold simultaneously to identify the cost of debt as a mediator between CSR and the firm's financial performance (the critical value of the statistical significance is also inflated accordingly). Here we follow Baron and Kenny (1986) steps to identify the mediating variables. We thank the anonymous referees for reminding us about alternative estimation techniques and statistical tests to identify the mediators.

following Surroca et al. (2010),⁵ we only execute three empirical steps by examining the following three hypotheses: (i) without the cost of debt in the model, whether or not CSR affects performance, (ii) whether or not CSR affects the cost of debt, and (iii) with the cost of debt in the model, whether or not the effects of CSR on performance are reduced, either by the magnitude or statistical significance.

3. Variables, Econometric Models and Data

Out of concern for CSR measurement, some research and financial institutions such as the KLD and Financial Times Stock Exchange (FTSE) have developed several widely-acknowledged social responsibility criteria that have by and large been employed in existing empirical research (see Shen and Chang (2009) for the details). In Taiwan, one of the leading business magazines, Global Views Monthly (GVM), developed a framework to evaluate the social responsibility engagement of TWSW-listed companies based on three dimensions, performance in terms of community participation, environmental protection and financial transparency. By referring to OEKOM, an independent research and rating agency for CSR in Germany, GVM designed a questionnaire about the

⁵ Surroca et al. (2010) employed four kinds of intangible assets (innovation, human capital, reputation and culture) as mediators between CSR and a firm's performance. Their argument is based on the resources-based view (RBV) such that a firm's intangible assets, which are accumulated by the firm's being devoted to CSR, and act as unique, inimitable and valuable resources and capabilities, contribute to the firm's superior competitive advantage. However, our argument is based on the financial implications of the firm's credit rating. More specifically, the firm's credit rating tends to be more favorable due to the firm being devoted to CSR, and this better creditworthiness is associated with a lower cost of debt, a lower interest burden and thus higher earnings. Although a firm's intangibles and credit ratings are two possible mechanisms between CSR and firm performance, their theoretical backgrounds are distinguished from each other. We are grateful to the anonymous referees for their revision suggestions.

engagement and effectuation of the above three aspects. They computed scores based on the respondents' replies and ranked companies according to their total scores for each of the above three aspects. The GVM also conferred the CSR Award annually to companies whose scores were relatively higher.

While the continuous ranking among listed firms is the private information of the GVM, the name lists of winners of the CSR Award are still made available to the public. Thus, our measure of CSR is a dummy variable, and whenever a company wins a CSR Award, it is a CSR-firm and CSR is equal to one; otherwise, it is a NonCSR-firm and CSR is equal to zero. The data are arranged yearly from 2005~2009. Table 1 reports the annual name list of winners of the GVM's CSR Award.

Since the focus of our econometric models is to test whether the cost of debt plays a mediating role between CSR and FP, we follow Baron and Kenny (1986) proposition and the execution steps of Surroca et al. (2010). First, we investigate the effects of CSR on a firm's profitability (measured by the return on assets (*ROA*) by estimating the following equation:

$$\begin{aligned}
 ROA = & \beta_0 + \lambda CSR + \beta_1 \ln Asset + \beta_2 DEBT + \beta_3 SALES/G \\
 & + \beta_4 RD + \beta_5 AGE + \beta_6 BOARD + \beta_7 CEOHOLD \\
 & + \beta_8 PLEDGE + \beta_9 INSTHOLD + \gamma YD + \delta IND + \varepsilon, \quad (1)
 \end{aligned}$$

where *ROA* serves as a proxy for the firm's profitability and *CSR* is a dummy variable as mentioned before.⁶ Other control variables for the firm's profitability are considered based on existing studies. First, total

⁶ Because the cost of debt is lower, the interest burden is lower. Based on the fact that equity holders are residual claimers, a lower interest burden implies more after-tax earnings, and more resources (dividends) are thus available for residual claimers, *ceteris paribus*. We thank the anonymous referees for their revision suggestions.

assets (*lnAsset*) control for the scale effect, defined as the natural log of total assets of a firm. Second, the debt to equity ratio (*DEBT*) controls for the leverage effect, defined as the firm's total debt divided by total equity. Third, the research and development expense ratio (*RD*) controls for the innovation effect, defined as the firm's R&D expense divided by net sales. Fourth, sales growth (*SALESG*) controls for growth opportunities, defined as the growth rate of net sales. The years of a firm's establishment (*AGE*) controls for the learning and reputational effects on performance (Morck et al., 1988; Demsetz and Villalonga, 2001; McConnell, 1990; Luo and Hachiya, 2005; Mak and Kusnadi, 2005).

Yermack (1996) found evidence of an inverse relationship between board size and corporate value, and thus the board size (*BOARD*), defined as the total number of directors, serves as a control variable for the firm's performance. While the shareholding by CEOs (*CEOHOLD*), defined as the number of shares held by the CEO divided by the total number of shares outstanding, is a measure for the severity of the agency problem and thus influences performance, we incorporate it into the regression model as a control factor. For similar reasons, the pledge ratio for directors' shareholdings (*PLEDGE*), defined as the average number of shares pledged by directors divided by the average number of shares held by directors, also serves as a control variable for performance (Fich and Shivdasani, 2006; Claessens et al., 2000). Because institutional investors have informational and knowledge advantages and thus have a positive stimulus for performance, so *INSTHOLD*, the institutional investor's shareholdings, should also serve as a control variable. Because our sample data cover 5 years and 18 industries, thus 4 yearly dummies (*YD*) and 17 industrial dummies (*IND*) are also incorporated into the regression equation.

Table 1 Winners of the GVM's CSR Award (Only TWSE-listed Companies)

2005	Lite-On Technology Co. Ltd.	Taiwan Semiconductor Manufacturing Company
	Delta Electronics Inc.	Accton Technology Co. Ltd.
	Taiwan Mobile Co. Ltd., China Motor Co. Ltd.	President Chain Store Co. Ltd.
2006	Taiwan Semiconductor Manufacturing Company	AU Optronics Co. Ltd., Wah Lee Industrial Co. Ltd.
	Delta Electronics Inc.	Advantech Co. Ltd., China Airlines
	President Chain Store Co. Ltd.	Sinyi Realty Inc.
	China Motor Co. Ltd.	Yulon-Nissan Motor Co. Ltd.
	Uni-President Enterprises Co. Ltd.	Lite-On Technology Co. Ltd.
2007	Delta Electronics Inc.	Chimei Innolux Corp.
	Advantech Co. Ltd.	Lite-On Technology Co. Ltd.
	Chunghwa Telecom	MediaTek Inc., Taiwan Mobile Co. Ltd.
	China Motor Co. Ltd.	Sinyi Realty Inc.
	Uni-President Enterprises Co. Ltd.	Yulon-Nissan Motor Co. Ltd.
		AVerMedia Technologies Inc.
2008	Chimei Innolux Corp.	UMC, Lite-On Technology Co. Ltd.
	Chimei Innolux Corp.	UMC, Lite-On Technology Co. Ltd.
	Camel Precision Co. Ltd.	ZyXEL Communications Co. Ltd.
	Hotai Motor	MediaTek Inc.
	Yulon Motors	President Chain Store Co. Ltd.
	TECO Electric and Machinery Co. Ltd.	Sinyi Realty Inc. Pou Chen Group.
2009	Sinyi Realty Inc. Advantech Co. Ltd.	President Chain Store Co. Ltd.
	Chunghwa Telecom, Yulon Motors	AU Optronics Co. Ltd.
	Taiwan Semiconductor Manufacturing Company	Uni-President Enterprises Co. Ltd.
	ZyXEL Communications Corp.	Macronix International Co. Ltd.

Note: This table reports name list of firms that conferred "CSR-Award" by the Global Views Monthly. Financial Institutions are excluded.

When running the regression, four model specifications prevail. For model 1, only the CSR dummy (*CSR*) and five controls, *lnAsset*, *DEBT*, *RD*,

SALESG and *AGE* are included in the model. For model 2, only the CSR dummy (*CSR*) and four controls, *BOARD*, *CEOHOLD*, *PLEDGE* and *INSTHOLD* are included in the model. For model 3, the CSR dummy (*CSR*) and the above nine controls are included in the model. Model 4 is similar to model 3, and includes a further 4 yearly dummies and 17 industrial dummies. Besides, in order to reduce the possibility of contemporaneous correlation, we set two kinds of lead-lag specifications. Lead-lag specification I, namely, the benchmark specification, indicates that the explained variable and explanatory variables of the regression equation are contemporaneous. Lead-lag specification II, an incremental specification, indicates that the explained variable is in a subsequent period relative to the explanatory variables. See Table 2 for the definitions of variables.

Second, we examine the effects of CSR on the firm's cost of debt (proxied by credit ratings, *TCRI*).⁷ As for credit ratings, while there are many international credit ratings agencies (CRAs) such as Standard & Poor's and Moody's, they do not investigate a full range of listed companies for the TWSE. Fortunately, *TCRI* obtained from the TEJ database provides TWSE-listed companies' credit ratings. The principal assessment factors of the *TCRI* include profitability, security, activity and scale and each factor is measured by several financial ratios (such as the return on assets, return on equity, operating profit ratio, quick ratio, interest payout ratio, debt to equity ratio, monthly accounts receivable outstanding, monthly sales outstanding, operating income, and total assets, respectively).

⁷ Relative to Menz (2010), we lack sufficient data about bond yields for Taiwan-Stock-Exchange-listed companies (corporate bond issuance is not very popular for all TWSE-listed companies) to make statistical inferences, instead, the data on credit ratings is more available for us, so we employ the latter rather than the former. Chang et al. (2013) collected the data on bank loans (measure of the cost of private debt) for TWSE-listed companies (also from the TEJ), and based on regression analysis the results show that firms with CSR tend to have a lower average rate of bank loans.

Numerous financial ratios are integrated to obtain a score that presents a rating of between 1 and 10 (10 represents near bankruptcy). A higher rating represents higher credit risks and lower credit worthiness, and vice versa.

Table 2 Mnemonics and Definitions of Variables

Variable	Definition
<i>ROA</i>	Return on assets, proxied for the firm's profitability.
<i>CSR</i>	A dummy variable is equal to 1 if the firm is a winner of the "CSR Award" (interchanged with CSR-firm). Otherwise, it is equal to 0 (interchanged with NonCSR-firms).
<i>lnAsset</i>	Natural logarithm of total assets.
<i>DEBT</i>	Total liabilities divided by total equity.
<i>RD</i>	Firm's R&D expenses divided by net sales.
<i>SALESG</i>	The growth rate of net sales.
<i>AGE</i>	The years a firm has been established.
<i>BOARD</i>	Total number of directors.
<i>CEOHOLD</i>	The number of shares held by the CEO divided by the total number of shares outstanding.
<i>PLEDGE</i>	The average number of shares pledged by directors divided by the average number of shares held by all directors.
<i>INSTHOLD</i>	The number of shares held by institutions (including domestic financial institutions, foreign financial institutions, domestic trust funds and offshore trust funds) divided by the total number of shares outstanding.
<i>TCRI</i>	Taiwan corporate credit risk index, which is a corporate credit rating system, developed by TEJ. Ratings range from 1 to 9, and a small number means better ratings and thus better creditworthiness.
<i>ACTIVITY</i>	Operating income to total income.
<i>PROFITL</i>	Level of firm's after-tax net income.
<i>YD</i>	Yearly dummy variable.
<i>IND</i>	Industrial dummy variable.

Note: All definitions of variables and data sources are from the TEJ and GVM.

Extant studies have examined the determinants of credit ratings. In a cross country study, Huang and Shen (2009) used 5 financial ratios, namely, the capital adequacy ratio, net income to assets, liquid assets to customers and short-term funding, the cost to income ratio and liquid assets to net interest revenues, as the main determinants of credit ratings. Borensztein et al. (2006, 2007) employed cross country data and found a firm's sovereign credit rating to be significantly positive with its own credit rating and thus the sovereign credit rating is an added main determinant. We examine the Taiwan data without considering sovereign ratings.⁸

Based on the above existing studies and the TCRI's ratings construction, we initially employ four factors as the main determinants of the credit ratings. For profitability, the *ROA* is used. For security, we employ the *DEBT*. For *ACTIVITY*, we employ the ratio of operating income to total income. For scale, we employ $\ln Asset$. Recall that our main explanatory variable is the *CSR* dummy variable (*CSR*), justified by our previous inference that a socially responsible firm tends to obtain favorable credit ratings. Because the corporate governance issue has become important nowadays, we also incorporate four corporate governance variables as four control variables, *BOARD*, *CEOHOLD*, *PLEDGE* and *INSTHOLD*, in the model. *YD* and *IND* are also considered.

⁸ Sengupta (1998) found evidence of a negative relationship between disclosure quality and credit rating. Ashbaugh-Skaife et al. (2006) found that firms with strong corporate governance result in higher credit ratings and a lower cost of debt. Huang and Shen (2009) found that rating agencies downgrade their credit ratings when earnings management exists, implying that earnings management increases the borrowing costs of firms. Other studies include Ferri and Liu (2003) and Poon (2003).

We employ an ordered-probit model because there are 10 classes of credit ratings, they are ordinal credit worthiness condition measures, and one can rank their order among classes but cannot indicate the magnitude of their differences between classes. To sum up, our econometric model for the determination of credit ratings is

$$\begin{aligned}
 TCRI^* = & \beta_0 + \lambda CSR + \beta_1 ROA + \beta_2 ACTIVITY + \beta_3 \ln Asset \\
 & + \beta_4 DEBT + \beta_5 BOARD + \beta_6 CEOHOLD \\
 & + \beta_7 PLEDGE + \beta_8 INSTHOLD + \gamma YD + \delta IND + \varepsilon,
 \end{aligned} \tag{2}$$

with

$$\begin{aligned}
 TCRI^* = & 1 \quad \text{if } TCRI^* < \mu_1, \\
 & 2 \quad \text{if } \mu_1 \leq TCRI^* < \mu_2, \\
 & 3 \quad \text{if } \mu_2 \leq TCRI^* < \mu_3, \\
 & 4 \quad \text{if } \mu_3 \leq TCRI^* < \mu_4, \\
 & 5 \quad \text{if } \mu_4 \leq TCRI^* < \mu_5, \\
 & 6 \quad \text{if } \mu_5 \leq TCRI^* < \mu_6, \\
 & 7 \quad \text{if } \mu_6 \leq TCRI^* < \mu_7, \\
 & 8 \quad \text{if } \mu_7 \leq TCRI^* < \mu_8, \\
 & 9 \quad \text{if } \mu_8 \leq TCRI^* < \mu_9, \\
 & 10 \quad \text{if } \mu_9 \leq TCRI^*,
 \end{aligned}$$

where $TCRI$ represents the TCRI's ratings scores and ranges from 1 to 10. Other variables have been defined above.

As discussed earlier, when running regressions, four model specifications prevail. For model 1, only CSR and four variables, namely, ROA , $ACTIVITY$, $\ln Asset$ and $DEBT$ are included in the model. For model 2, only CSR and four other corporate governance controls, $BOARD$, $CEOHOLD$, $PLEDGE$ and $INSTHOLD$ are included in the model. For model 3, the CSR and the above eight controls are included in the model. Model 4 shares a similarity with model 3, and has a further YD and IND . For lead-lag specifications, lead-lag specification I indicates that the

explained variable and explanatory variables of the regression equation are contemporaneous. Lead-lag specification II indicates that the explained variable is in a subsequent period relative to the explanatory variable. See Table 2 for the definitions of variables. Note that our focus is on the estimated coefficient of the *CSR* variable. If the estimated coefficient for *CSR* is significantly negative, it means that *CSR*-firms tends to have a lower credit ratings score and better creditworthiness, and thus empirically supports the view that a socially responsible firm has a lower debt burden.

Third, similar to the above, with added controls, credit ratings (*TCRI*) are used to examine the effects of *CSR* on a firm's profitability by estimating the following equation:

$$\begin{aligned} ROA = & \beta_0 + \varphi TCRI + \lambda CSR + \beta_1 \ln Asset + \beta_2 DEBT + \beta_3 SALES \\ & + \beta_4 RD + \beta_5 AGE + \beta_6 BOARD + \beta_7 CEOHOLD \\ & + \beta_8 PLEDGE + \beta_9 INSTHOLD + \gamma YD + \delta IND + \varepsilon. \end{aligned} \quad (3)$$

The focus is still on the estimated coefficient of the *CSR* variable. Recall that if credit ratings serve as a mediator between *CSR* and *FP*, then after incorporating credit ratings in the evaluation of the impacts of *CSR* on *FP*, the marginal impacts of *CSR* on *FP* should diminish, namely, the original positive estimated coefficients of the *CSR* dummy in equation (1) should decrease in magnitude or be insignificantly different from zero. As stated before, we establish 4 model specifications and 2 lead-lag specifications.

Table 2 reports the mnemonics and definitions of the variables of interest. The data cover the period from 2005 to 2009 and all of them are obtained from the *TEJ* and the *GVM*.

According to Shen and Chang (2009), the classification of samples between *CSR*-firms versus *NonCSR*-firms may not be a random process and is endogenously determined. Thus, we employ a two-stage estimation and Rosenbaum and Rubin (1983, 1985a, 1985b) propensity score matching (*PSM*) to correct for the sample's self-selection bias for a

robustness check.⁹ According to Shen and Chang (2009), the self-selection characteristic variables are $\ln Asset(-1)$ (natural log of last-period total assets), $DEBT(-1)$ (last-period debt to equity ratio) and $PROFITL(-1)$ (the natural log of the last-period after-tax profits levels).

4. Empirical Results

We have a total of 4,155 firm-year observations, 53 observations with CSR and 4,102 observations without CSR.¹⁰ Table 3 reports the basic statistics of the variables of interest. We observe that CSR-firms tend to have a higher return on assets than NonCSR-firms (ROA : 15.6628% versus 9.1135%) and lower credit ratings than NonCSR-firms ($TCRI$: 2.7021 versus 5.4627), meaning that CSR-firms tend to have better profitability and sounder creditworthiness. CSR-firms tend to be larger in scale ($\ln Asset$: 18.0276 versus 15.5603), to have lower leverage ($DEBT$: 65.4254 versus 87.5531), to have a lower ratio of research and development expenses to sales (RD : 3.1932 versus 3.9877), a lower sales growth rate ($SALESG$: 1.8958 versus 52.2630) and to be slightly younger (AGE : 24.8300 versus

⁹ Preston and O'Bannon (1997) proposed the available funds hypothesis which states that the more resources or earnings that are available to the firm, the higher the probability and ability to engage in social initiatives. Waddock and Graves (1997) proposed the slack resources hypothesis, which gave rise to similar predictions to the available funds hypothesis. Based on the evaluation process to be conferred by the CSR-Award for listed companies on the Taiwan Stock Exchange, the earnings and debt ratio are two important considerations. Besides, because the larger the size of a firm, the more significant its visibility and public concerns are in the society and financial markets, there is a higher probability that the firm will be devoted to benevolent activities. Thus, size (measured by assets) serves as the third self-selection variable. We thank the anonymous referees for requesting that we validate employing these three self-selection variables (which also serve as matching variables).

¹⁰ We have a very small number of CSR-firms in our sample. Under this situation, to some extent, we must be careful when generalizing the statistical inferences from our empirical findings. We thank the anonymous referees for reminding us to provide this statement.

Table 3 Descriptive Statistics

Variables	All Samples						Samples with CSR						Samples without CSR					
	Mean	Std. Dev.	Min.	Max.	Mean	Std. Dev.	Min.	Max.	Mean	Std. Dev.	Min.	Max.	Mean	Std. Dev.	Min.	Max.		
<i>CSR</i>	0.0148	0.1206	0.0000	1.0000	1.0000	0.0000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	0.0000	0.0000	0.0000	0.0000		
<i>ROA</i>	9.2050	11.1641	-129.9500	63.5400	15.6628	9.4413	-2.0300	41.7200	9.1135	11.1609	-129.9500	63.5400	9.1135	11.1609	-129.9500	63.5400		
<i>lnAsset</i>	15.5942	1.3075	10.2989	20.5411	18.0276	1.2447	15.4153	20.1741	15.5603	1.2762	10.2989	20.5411	15.5603	1.2762	10.2989	20.5411		
<i>DEBT</i>	87.2493	259.5113	0.0100	11451.4000	65.4254	62.3041	12.6200	339.7400	87.5531	261.1975	0.0100	11451.4000	87.5531	261.1975	0.0100	11451.4000		
<i>RD</i>	3.9766	33.7263	0.0000	1434.0400	3.1932	4.0003	0.0000	22.2400	3.9877	33.9613	0.0000	1434.0400	3.9877	33.9613	0.0000	1434.0400		
<i>SALESG</i>	51.5593	1388.7600	-100.0000	75718.4900	1.8958	19.7201	-38.4300	48.2900	52.2630	1398.5520	-100.0000	75718.4900	52.2630	1398.5520	-100.0000	75718.4900		
<i>AGE</i>	25.3567	14.5879	1.0000	64.0000	24.8302	14.9238	1.0000	62.0000	25.3635	14.5852	1.0000	64.0000	25.3635	14.5852	1.0000	64.0000		
<i>BOARD</i>	7.2836	2.6146	3.0000	21.0000	8.7647	2.9298	5.0000	21.0000	7.2630	2.6045	3.0000	21.0000	7.2630	2.6045	3.0000	21.0000		
<i>CEGHOLD</i>	1.5417	2.4819	0.0000	23.0200	0.7751	0.9521	0.0000	4.4400	1.5524	2.4950	0.0000	23.0200	1.5524	2.4950	0.0000	23.0200		
<i>PLEDGE</i>	11.4084	21.1993	0.0000	100.0000	14.0063	23.2032	0.0000	90.1000	11.3721	21.1712	0.0000	100.0000	11.3721	21.1712	0.0000	100.0000		
<i>INSTHOLD</i>	41.2083	23.0853	0.0000	100.0000	72.9488	17.5708	28.9100	98.4100	40.7643	22.8443	0.0000	100.0000	40.7643	22.8443	0.0000	100.0000		
<i>TCRI</i>	5.4247	1.7347	1.0000	10.0000	2.7021	1.3818	1.0000	6.0000	5.4627	1.7089	1.0000	10.0000	5.4627	1.7089	1.0000	10.0000		
<i>ACTIVITY</i>	130.2173	1204.5550	-7612.6030	41485.1000	95.3856	93.4356	-112.6611	418.6231	130.7413	1213.5240	-7612.6030	41485.1000	130.7413	1213.5240	-7612.6030	41485.1000		
<i>PROFITL</i>	5.3454	10.3284	-17.2290	17.3560	10.4448	9.3075	-16.9729	17.3389	5.2687	10.3250	-17.2290	17.3560	5.2687	10.3250	-17.2290	17.3560		

Note: See Table 2 for the definitions of variables. Yearly data cover the period from 2005 to 2009. There are 4,155 firm-year observations, 53 observations with CSR and 4,102 observations without CSR.

25.3630). Firms with CSR tend to be larger in size in terms of the number of directors on the board (*BOARD*: 8.7647 versus 7.2630), to have smaller managerial shareholdings (*CEOHOLD*: 0.7751% versus 1.5524%), a higher director's shareholding pledge ratio (*PLEDGE*: 14.0060% versus 11.3720%) and higher institutional investors' shareholdings (*INSTHOLD*: 72.9490% versus 40.76400%). Evidence of a relatively larger scale, a lower debt ratio and higher profit levels of CSR-firms also lend support to the fact that being a CSR-firm is an endogenously determined process and a self-selection phenomenon.

Table 4 presents the matrix of pairwise Pearson correlation coefficients among the variables of interest. From the first column we observe that, first, the correlation coefficient between *CSR* and *ROA* is significantly positive (0.0714), and the correlation coefficient between *CSR* and *TCRI* is significantly negative (-0.1852), meaning that the CSR-firms tend to have a higher profitability and better creditworthiness. Conclusions from other presented correlation coefficients are similar to the results of the summary statistics in Table 3.

Table 5 reports the pooled OLS estimation results of the regression analysis ranging from profitability (*ROA*) to the *CSR dummy* and control factors. As mentioned before, this is the first step (i.e., equation (1)) to empirically examine whether the cost of debt serves as a mediator between CSR and FP. In this step, we expect that CSR has a positive influence on profitability. Starting from lead-lag specification I, we observe that, regardless of which model is employed, the four estimated coefficients of the CSR dummy are all positive, and two of them are significantly different from zero (3.1725 and 2.6898). None of them is negative. This means that the firm's engaging in CSR is positively associated with profitability.

Table 4 Correlation Matrix

Variables	CSR	ROA	lnAsset	DEBT	RD	SALESG	AGE	BOARD	CEOHOLD	PLEDGE	INSTHOLD	TCRI	ACTIVITY	PROFITL
CSR	1.0000													
ROA	0.0714*	1.0000												
lnAsset	0.2220*	0.1196*	1.0000											
DEBT	-0.0101*	-0.1200*	-0.0391*	1.0000										
RD	-0.0027	-0.1767*	-0.1093*	-0.0130	1.0000									
SALESG	-0.0037	0.0000	-0.0102	0.0030	0.0040	1.0000								
AGE	-0.0234	-0.2070*	0.2019*	0.0397*	-0.1029*	-0.0277*	1.0000							
BOARD	0.0839*	0.0443*	0.3419*	-0.0409*	0.0029	-0.0177	0.1073*	1.0000						
CEOHOLD	-0.0395*	0.1036*	-0.1754*	-0.0356*	0.0291*	-0.0095	-0.2627*	-0.0836*	1.0000					
PLEDGE	0.0184	-0.1066*	0.1302*	0.0484*	-0.0305*	0.0419*	0.1304*	0.0223	-0.1224*	1.0000				
INSTHOLD	0.1767*	0.2850*	0.4085*	-0.0268	-0.0453*	-0.0007	-0.0739*	0.2585*	-0.2047*	0.0221	1.0000			
TCRI	-0.1852*	-0.5417*	-0.5148*	0.2412*	0.0048	0.0210	0.0364*	-0.2635*	-0.0312*	0.1312*	-0.4103*	1.0000		
ACTIVITY	-0.0035	0.0412*	-0.0191	-0.0159	-0.0082	-0.0007	-0.0049	-0.0007	-0.0170	0.0197	-0.0112	-0.0164	1.0000	
PROFITL	0.0606*	0.5538*	0.1313*	-0.1034*	-0.0547*	0.0165	-0.1014*	0.0386*	0.0744*	-0.0881*	0.1987*	-0.4346*	0.0334*	1.0000

Note: This table reports the Pearson correlation coefficients among the variables of interest. Yearly data are used and cover the period from 2005 to 2009. There are 4,155 firm-year observations. A correlation coefficient followed by an asterisk indicates that it is at least 10% significantly different from zero.

Table 5 Do Firms with CSR Perform Better? — OLS Regression Analysis

Variables	Explained Variables (<i>ROA</i>)							
	Lead-Lag Specification I				Lead-Lag Specification II			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Constant	-2.4565 (-0.92)	3.5028*** (6.04)	0.8018 (0.27)	1.0752 (0.37)	2.1360 (0.90)	3.9973*** (6.97)	3.7666 (1.45)	5.9457** (2.27)
CSR	3.1725** (2.48)	2.6898** (2.07)	1.4536 (1.17)	1.3118 (1.06)	4.0947*** (3.07)	3.2262** (2.31)	2.3953* (1.79)	2.3843* (1.78)
<i>ln Asset</i>	1.1587*** (6.99)		0.5212*** (2.66)	0.4053** (2.00)	0.8055*** (5.41)		0.2978* (1.71)	0.2112 (1.18)
<i>DEBT</i>	-0.0045* (-1.90)		-0.0041* (-1.95)	-0.0035* (-1.73)	-0.0035 (-1.54)		-0.0033 (-1.54)	-0.0028 (-1.38)
<i>RD</i>	-0.0581** (-2.57)		-0.0345*** (-4.71)	-0.0348*** (-4.24)	-0.0247*** (-3.18)		-0.0280*** (-3.85)	-0.0299*** (-4.01)
<i>SALESG</i>	0.0000 (-0.56)		0.0000 (1.37)	0.0001*** (2.87)	0.0002* (1.66)		0.0002*** (6.98)	0.0002 (6.50)
<i>AGE</i>	-0.2141*** (-15.5)		-0.1513*** (-10.7)	-0.1284*** (-6.71)	-0.1874*** (-14.60)		-0.1308*** (-9.51)	-0.1205*** (-6.50)
<i>BOARD</i>		-0.1018* (-1.71)	-0.0316 (0.51)	-0.0303 (-0.49)		-0.0516 (-0.87)	0.0284 (0.47)	0.0202 (0.33)
<i>CEOHOLD</i>		0.6272*** (7.03)	0.4121*** (4.58)	0.4108*** (4.48)		0.5256*** (7.39)	0.3316*** (4.51)	0.3403*** (4.56)

Table 5 Do Firms with CSR Perform Better? — OLS Regression Analysis (Continued)

Variables	Explained Variables (<i>ROA</i>)							
	Lead-Lag Specification I				Lead-Lag Specification II			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
<i>PLEDGE</i>	-0.0430*** (-6.13)	-0.0430*** (-6.13)	-0.0331*** (-4.64)	-0.0320*** (-4.42)	-0.0345*** (-4.48)	-0.0345*** (-4.48)	-0.0252*** (-3.17)	-0.0258*** (-3.25)
<i>INSTHOLD</i>	0.1430*** (17.6)	0.1430*** (17.6)	0.1181*** (13.5)	0.1200*** (13.3)	0.1223*** (15.9)	0.1223*** (15.9)	0.1037*** (12.5)	0.1080*** (12.8)
<i>YD</i>	NO	NO	NO	YES	NO	NO	NO	YES
<i>IND</i>	NO	NO	NO	YES	NO	NO	NO	YES
Adj. R-square	0.1070	0.1146	0.1605	0.2059	0.0775	0.0909	0.1252	0.1734
Num. of Obs.	3,480	3,426	3,425	3,425	3,480	3,429	3,425	3,425

Note: This table reports pooled OLS estimation results of the regression analysis relating a firm's profitability to CSR dummy and control factors. For model 1, only *CSR* and five control variables, *lnAsset*, *DEBT*, *RD*, *SALESG* and *AGE* are included in the model. For model 2, only *CSR* and another four control variables, *BOARD*, *CEOHOLD*, *PLEDGE* and *INSTHOLD* are included in the model. For model 3, *CSR* and the above nine controls are included in the model. For model 4, the variables are similar to those in model 3, plus *YD* and *IND*. Yearly data cover the period from 2005 to 2009. Lead-lag specification I indicates that the explained variable and explanatory variables of the regression equation are contemporaneous. Lead-lag specification II indicates that the explained variable is in a subsequent period relative to the explanatory variables. The t-statistics (computed by White's heteroskedasticity-consistent standard errors) are shown in the parentheses below the estimated coefficients, and *, **, and *** denote significantly different from zero at the 1%, 5% and 10% levels.

As for lead-lag specification II (the reason being to avoid contemporaneous correlation), no matter which model is used, the four estimated coefficients of the CSR dummy are all positive and significant, indicating that CSR-firms tend to have superior profitability. This result is consistent with McGuire et al. (1988), Waddock and Graves (1997) and Tsoutsourz (2004), which also support the view that CSR is performance-enhancing. The estimated coefficients of the other control variables are generally consistent under various specifications of the variables and lead-lag relationships. Firms with larger assets, lower debt to equity ratios, lower ratios of research and development expenses to sales, higher sales growth rates and those that are older in terms of age tend to perform better in regard to profitability. Besides, firms with smaller board sizes, higher managerial shareholdings, lower directors' shareholding pledge ratios and higher institutional investors' shareholdings also tend to perform better in terms of profitability.

Table 6 reports the pooled OLS estimation results of the regression analysis relating *TCRI* to *CSR* and control factors. As expected, this is the second step (i.e., equation (2)) used to empirically investigate the cost of debt as a mediator between *CSR* and *FP*. In this step, we expect that *CSR* has a positive influence on a firm's credit worthiness. Because a higher *TCRI* represents worse credit worthiness, we expect that *CSR* has a negative impact on the *TCRI* score. Starting with lead-lag specification I, we observe that regardless of which model is employed, the four estimated coefficients of the *CSR* dummy are all significantly negative (-0.8065, -1.6849, -0.6827 and -0.4775), meaning that a firm's engagement in *CSR* is positively associated with the favored credit ratings. As for lead-lag specification II, no matter which model is used, the four estimated coefficients of the *CSR* dummy are still all significantly negative, which still indicates that the *CSR*-firms tend to have superior performance in terms of credit ratings. Such a result is parallel to the view and findings of

Table 6 Do Firms with CSR Have Better Credit Ratings?—OLS Regression Analysis

Variables	Explained Variables (<i>TCRD</i>)							
	Lead-Lag Specification II							
	Model 1	Model 2	Model 3	Model 4				
Constant	15.205*** (54.2)	7.4403*** (76.1)	15.002*** (49.3)	14.957*** (49.4)	14.584*** (44.4)	7.3567*** (67.3)	14.315*** (40.3)	14.205*** (39.7)
CSR	-0.8065*** (-4.24)	-1.6849*** (-8.95)	-0.6827*** (-3.94)	-0.4775*** (-2.86)	-0.9477*** (-4.74)	-1.6238*** (-7.62)	-0.7615*** (-4.07)	-0.6154*** (-3.45)
ROA	-0.0762*** (-22.7)	-0.0684*** (-21.0)	-0.0643*** (-20.6)	-0.0727*** (-18.3)	0.0000	0.0000	-0.0644*** (-17.2)	-0.0625*** (-16.9)
ACTIVITY	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
ln.Asset	(-0.55) -0.5851*** (-32.8)	(-1.05) -0.5346*** (-25.1)	(-1.36) -0.5652*** (-27.0)	(0.11) -0.5516*** (-26.5)	(-0.34) -0.4956*** (-19.7)	(-0.48) -0.5230*** (-21.1)	0.0015*** (2.23)	0.0017*** (2.81)
DEBT	0.0011** (2.23)	0.0010** (2.27)	0.0009** (2.28)	0.0018*** (2.70)	0.0015*** (3.95)	0.0017*** (3.81)	0.0015*** (3.81)	0.0015*** (3.95)
BOARD	-0.1220*** (-10.2)	-0.0558*** (-5.94)	-0.0378*** (-4.35)	-0.0404*** (-5.26)	-0.1145*** (-8.65)	-0.0532*** (-5.10)	-0.0355*** (-3.65)	-0.0436*** (-3.65)
CEOHOLD	-0.0704*** (-5.80)	-0.0376*** (-5.05)	-0.0404*** (-5.26)	-0.0404*** (-5.26)	-0.0683*** (-5.33)	-0.0383*** (-4.58)	-0.0383*** (-4.58)	-0.0436*** (-5.02)

Table 6 Do Firms with CSR Have Better Credit Ratings? — OLS Regression Analysis (Continued)

Variables	Explained Variables (<i>TCRI</i>)							
	Lead-Lag Specification I				Lead-Lag Specification II			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
<i>PLEDGE</i>		0.0099*** (7.16)	0.0106*** (9.01)	0.0110*** (9.71)		0.0103*** (6.63)	0.0100*** (7.24)	0.0108*** (8.32)
<i>INSTHOLD</i>		-0.0284*** (-21.7)	-0.0080*** (-6.74)	-0.0093*** (-7.83)		-0.0279*** (-19.9)	-0.0088*** (-6.42)	-0.0100*** (-7.24)
<i>YD</i>	NO	NO	NO	YES	NO	NO	NO	YES
<i>IND</i>	NO	NO	NO	YES	NO	NO	NO	YES
Adj. R-square	0.5191	0.2367	0.5540	0.6052	0.5118	0.2348	0.5464	0.6011
Num. of Obs.	3,352	3,407	3,347	3,347	2,659	2,738	2,656	2,656

Note: This table reports the pooled OLS estimation results of the regression analysis relating *TCRI* to the *CSR* and control factors. For model 1, only *CSR* and four control variables, *ROA*, *ACTIVITY*, *lnAsset* and *DEBT* are included in the model. For model 2, only *CSR* and another four control variables, *BOARD*, *CEOHOLD*, *PLEDGE* and *INSTHOLD* are included in the model. For model 3, *CSR* and the above eight controls are included in the model. For model 4, the variables are similar to those in model 3, plus *YD* and *IND*. Yearly data cover the period from 2005 to 2009. Lead-lag specification I indicates that the explained variable and explanatory variables of the regression equation are contemporaneous. Lead-lag specification II indicates that the explained variable is in a subsequent period relative to the explanatory variables. The t-statistics (computed by White's heteroskedasticity-consistent standard errors) are shown in the parentheses below the estimated coefficients, and ***, **, and * denote significantly different from zero at the 1%, 5% and 10% levels.

Derwall and Verwijmeren (2007), Hong and Kacperczyk (2009), El Ghouli et al. (2011) and Goss and Roberts (2011), which all support the view that firms with better performance in terms of CSR tend to be perceived as lower-risk ones and thus to enjoy a lower cost of capital. The estimated coefficients of the other control variables are generally consistent under various specifications. We omit reporting them.

Table 7 reports the pooled OLS estimation results of the regression analysis relating a firm's profitability to *CSR*, *TCRI* and control factors. This is the third step (i.e., equation (3)) used to empirically investigate the cost of debt as a mediator between CSR and FP. In this step, we expect that after incorporating *TCRI* into the model, the positive impact of CSR on profitability will be captured by the fact that the credit ratings are also improved through the firm's being a socially responsible firm. Thus, the impact of CSR on FP is reduced, by either its marginal impact coefficient or statistical significance.

In Table 7, we observe that regardless of which model (and lead-lag specification) is used, all estimated coefficients of *TCRI* are significantly negative (for lead-lag specification I, they are -3.7416, -3.1271, -3.5849 and -3.6659), indicating that a firm with better credit worthiness tends to have superior profitability. Interestingly, we also observe that all estimated coefficients of CSR are insignificantly different from zero, meaning that after considering credit ratings in the model, the effects of CSR on FP are captured by the effects of credit ratings on FP. In accordance with the findings from Tables 5 and 6, we empirically prove that credit ratings play the role of mediator in terms of the relationship between CSR and profitability.¹¹

¹¹ Because our data comprise an unbalanced panel and some of the needed data are unavailable, we only employ pooled estimation while using industry and yearly dummies as control variables. We would like to thank the anonymous referees for reminding us to include them in the estimation of our data.

Table 7 Effects of CSR on Performance after Controlling for Credit Ratings — OLS Regression Analysis

Variables	Explained Variables (<i>ROA</i>)							
	Lead-Lag Specification I				Lead-Lag Specification II			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Constant	53.351*** (21.9)	26.388*** (29.5)	53.741*** (18.8)	55.439*** (18.7)	47.980*** (19.2)	23.274*** (25.5)	48.653*** (18.7)	52.233*** (19.2)
<i>TCRI</i>	-3.7416*** (-36.9)	-3.1271*** (-32.0)	-3.5849*** (-28.5)	-3.6659*** (-26.1)	-3.2036*** (-30.8)	-2.6357*** (-26.4)	-3.0692*** (-27.9)	-3.1459*** (-27.3)
<i>CSR</i>	-1.5778 (-1.23)	-3.4418 (-1.38)	-2.1936 (-1.00)	-1.6733 (-1.04)	-0.0697 (-0.05)	-1.8661 (-1.40)	-0.6708 (-0.51)	-0.0919 (-0.07)
<i>lnAsset</i>	-1.2562*** (-9.17)		-1.4586*** (-8.24)	-1.6630*** (-8.97)	-1.1499*** (-8.17)		-1.3666*** (-9.02)	-1.5297*** (-9.82)
<i>DEBT</i>	0.0009* (1.65)		0.0007** (2.10)	0.0007** (2.25)	0.0010* (1.71)		0.0008 (1.39)	0.0008 (1.39)
<i>RD</i>	-0.0415*** (-6.38)		-0.0385*** (-4.08)	-0.0362*** (-3.99)	-0.0343*** (-5.13)		-0.0318*** (-4.80)	-0.0316*** (-4.84)
<i>SALESG</i>	0.0001 (1.27)		0.0001** (2.47)	0.0001** (2.50)	0.0003** (2.22)		0.0002** (1.97)	0.0002* (1.78)
<i>AGE</i>	-0.1527*** (-13.3)		-0.1339*** (-10.7)	-0.1372*** (-8.26)	-0.1287*** (-10.9)		-0.1156*** (-9.29)	-0.1279*** (-8.34)
<i>BOARD</i>		-0.4713*** (-7.39)	-0.2000*** (-3.39)	-0.1384** (-2.39)		-0.3558*** (-5.47)	-0.1129* (-1.72)	-0.0671 (-1.03)

Table 7 Effects of CSR on Performance after Controlling for Credit Ratings—OLS Regression Analysis (Continued)

Variables	Explained Variables (<i>ROA</i>)											
	Lead-Lag Specification I					Lead-Lag Specification II						
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
<i>CEOHOLD</i>		0.4348*** (7.04)	0.1608** (2.26)	0.1565** (2.24)						0.3410*** (5.41)	0.0963 (1.50)	0.1023 (1.60)
<i>PLEDGE</i>		-0.0104 (-1.44)	0.0142** (2.07)	0.0169** (2.42)						-0.0063 (-0.85)	0.0157** (2.12)	0.0168** (2.28)
<i>INSTHOLD</i>		0.0596*** (8.01)	0.0613*** (7.44)	0.0571*** (6.61)						0.0507*** (6.68)	0.0532*** (6.96)	0.0515*** (6.53)
<i>YD</i>	NO	NO	NO	YES	NO	NO	NO	NO	NO	NO	NO	YES
<i>IND</i>	NO	NO	NO	YES	NO	NO	YES	NO	NO	NO	NO	YES
Adj. R-square	0.3586	0.3244	0.3748	0.4014	0.2778	0.2475	0.2886	0.3193				
Num. of Obs.	3,350	3,347	3,345	3,345	3,350	3,347	3,345	3,345				

Note: This table reports the pooled OLS estimation results of the regression analysis relating the firm's profitability to *CSR*, *TCRI* and control factors. For model 1, only *CSR* and five control variables, *LnAsset*, *DEBT*, *RD*, *SALESG* and *AGE* are included in the model. For model 2, only *CSR* and other four control variables, *BOARD*, *CEOHOLD*, *PLEDGE* and *INSTHOLD* are included in the model. For model 3, *CSR* and the above nine controls are included in the model. Model 4 is similar to model 3, plus *YD* and *IND*. Yearly data cover the period from 2005 to 2009. Lead-lag specification I indicates that the explained variable and explanatory variables of the regression equation are contemporaneous. Lead-lag specification II indicates that the explained variable is in a subsequent period relative to the explanatory variables. The t-statistics (computed by White's heteroskedasticity-consistent standard errors) are shown in the parentheses below the estimated coefficients, and ***, **, and * denote significantly different from zero at the 1%, 5% and 10% levels.

As mentioned before, because of possible self-selection phenomena in the sample due to the non-random sampling of CSR-firms versus NonCSR-firms, a two-stage estimation is proposed to address this concern. Table 8 thus reports the two-stage estimation results of the regression analysis. The first stage employed last-period $\ln Asset$, $DEBT$ and $PROFITL$ as determinants of being CSR-firms. The second stage is composed of panel A, panel B and panel C. Panel A relates the firm's profitability to the CSR dummy and control factors, panel B relates the firm's credit ratings to the CSR dummy and control factors, and panel C relates the firm's profitability to the CSR dummy, credit ratings and control factors. For each panel, four models with different variable specifications still prevail. The variable specification of panel A (panel B and panel C) is similar to that in Table 5 (6 and 7, respectively). Table 8 presents the estimation results under lead-lag specification I.

From Table 8, the estimated results of the first stage show that the estimated coefficients of $\ln Asset(-1)$, $DEBT(-1)$ and $PROFITL(-1)$ are 0.4666, -0.0081 and 0.0182, respectively, and all of them are significant, meaning that a firm with a larger scale, lower debt ratio and larger after-tax profits in the last period is more likely to be selected as a CSR-firm. This result confirms the previous expectation that samples selected as CSR-firms versus NonCSR-firms are based on self-selection phenomena. It is also consistent with the consideration of the GVM being chosen through winners of their CSR awards.

As for the second stage, we observe that, after controlling for selection bias, in the first of three steps to identify credit ratings as a mediator between CSR and FP, the estimated coefficients of the CSR dummy are all positive and two of them are significant (9.8129 and 8.5766), meaning that CSR positively affects profitability. In the second step, the estimated coefficients of the CSR dummy are all significantly negative (-2.3112, -10.157, -1.8196 and -0.9996), indicating that CSR positively affects creditworthiness. In the third step, after incorporating

Table 8 Do Firms with CSR Perform Better? Two-stage Estimation (Lead-Lag Specification I)

Variables	Second Stage											
	panel A (step 1)				panel B (step 2)				panel C (step 3)			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Constant	-9.7635*** (-11.9)	-4.6258*** (-1.74)	-1.2046 (-0.42)	-0.6440 (-0.22)	14.627*** (45.0)	7.1950** (66.4)	14.508*** (44.5)	14.655*** (45.1)	50.826*** (18.7)	26.839*** (30.3)	-10.696*** (-11.6)	54.536*** (18.8)
<i>ln Asset</i> (-1)	0.4666*** (9.86)											
<i>DEBT</i> (-1)	-0.0081* (-1.84)											
<i>PROFITL</i> (-1)	0.0182** (2.42)											
<i>TCRI</i>												
<i>CSR</i>	9.8129** (2.01)	8.5766*** (3.20)	1.6077 (0.48)	1.2528 (0.38)	-2.3112*** (-4.02)	-10.157*** (-15.1)	-1.8196*** (-3.23)	-0.9996* (-1.82)	-0.6745 (-0.16)	-16.529*** (-4.80)	-1.2691 (-0.31)	1.3980 (0.35)
<i>ROA</i>					-0.0779** (-37.0)		-0.0700** (-33.0)	-0.0659*** (-32.0)				
<i>ACTIVITY</i>					0.0000 (-0.51)		0.0000 (-1.12)	0.0000 (-1.20)				
<i>ln Asset</i>	1.2203*** (7.05)	0.6264*** (3.26)	0.5052*** (2.61)	-0.5465*** (-26.0)			-0.5002*** (-22.6)	-0.5423*** (-25.2)	-1.1423*** (-7.15)	-1.3435*** (-8.05)	-1.5927*** (-9.33)	
<i>DEBT</i>	-0.0042*** (-6.66)	-0.0039*** (-6.45)	-0.0033*** (-5.50)	-0.0338*** (-4.67)	0.0011*** (13.3)		0.0010*** (13.2)	0.0009*** (12.1)	0.0009* (1.69)	0.0007 (1.31)	0.0007 (1.40)	
<i>RD</i>	-0.0374*** (-4.88)	-0.0333*** (-4.50)	-0.0338*** (-4.67)						-0.0406*** (-6.33)	-0.0377*** (-5.93)	-0.0359*** (-5.72)	
<i>SALESG</i>	0.0000 (0.02)	0.0000 (0.34)	0.0001 (0.82)						0.0001 (1.20)	0.0001 (1.09)	0.0001 (1.00)	

Table 8 Do Firms with CSR Perform Better? Two-stage Estimation (Lead-Lag Specification I) (Continued)

Variables	Second Stage											
	panel A (step 1)			panel B (step 2)			panel C (step 3)			Dep. Var.: <i>ROA</i>		
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
<i>AGE</i>	-0.1899*** (-14.0)	-0.1428*** (-10.2)	-0.1215*** (-7.11)	-0.1215*** (-7.11)	-0.1419*** (-12.3)	-0.1419*** (-12.3)	-0.1419*** (-12.3)	-0.1419*** (-12.3)	-0.1419*** (-12.3)	-0.1419*** (-12.3)	-0.1257*** (-10.4)	-0.1308*** (-8.81)
<i>BOARD</i>	-0.1288* (-1.78)	-0.0461 (-0.63)	-0.0383 (-0.53)	-0.0383 (-0.53)	-0.0924*** (-7.21)	-0.0924*** (-7.21)	-0.0563*** (-6.38)	-0.0390*** (-4.56)	-0.0390*** (-4.56)	-0.0390*** (-4.56)	-0.4312*** (-6.90)	-0.1570*** (-2.49)
<i>CEOHOLD</i>	0.5969*** (8.44)	0.3980*** (5.55)	0.3964*** (5.60)	0.3964*** (5.60)	-0.0701*** (-5.39)	-0.0701*** (-5.39)	-0.0403*** (-4.69)	-0.0427*** (-5.09)	-0.0427*** (-5.09)	-0.0427*** (-5.09)	0.3702*** (5.96)	0.1291*** (2.08)
<i>PLEDGE</i>	-0.0415*** (-5.09)	-0.0321*** (-3.97)	-0.0310*** (-3.89)	-0.0310*** (-3.89)	0.0116*** (7.80)	0.0116*** (7.80)	0.0107*** (10.8)	0.0110*** (11.6)	0.0110*** (11.6)	0.0110*** (11.6)	-0.0036 (-0.51)	0.0176*** (2.49)
<i>INSTHOLD</i>	0.1392*** (17.0)	0.1188*** (14.1)	0.1215*** (14.2)	0.1215*** (14.2)	-0.0252*** (-17.1)	-0.0252*** (-17.1)	-0.0085*** (-8.05)	-0.0099*** (-9.62)	-0.0099*** (-9.62)	-0.0099*** (-9.62)	0.0583*** (7.76)	0.0522*** (6.77)
<i>YD</i>	NO	NO	YES	YES	NO	NO	NO	YES	YES	NO	NO	YES
<i>IND</i>	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
Chi-square	359.41	427.87	552.04	769.33	3537.6	933.81	3119.5	3955.7	1863.8	1642.7	1976.5	2207.4
Num. of Obs.	3,304	3,304	3,303	3,303	3,279	3,278	3,278	3,278	3,278	3,278	3,277	3,277

Note: This table reports the two-stage estimation results of the regression analysis. The first stage employs last-period *lnAsset*, *DEBT* and *PROFITL* as determinants of CSR-firms. The second stage is composed of Panel A, Panel B and Panel C. Panel A comprises the results of the regression relating *ROA* to CSR and control factors. Panel B includes the results of the regression relating *TCRI* to CSR and control factors. Panel C consists of the results of the regression relating *ROA* to CSR, credit ratings and control factors. For each panel, four models of variable specification prevail. The variable specification of Panel A (Panel B and Panel C) is similar with that in Table 5 (6 and 7, respectively). Lead-lag specification I indicates that the explained variable and explanatory variables of the regression equation are contemporaneous. Yearly data cover the period from 2005 to 2009. The t-statistics (computed by White's heteroskedasticity-consistent standard errors) are shown in the parentheses below the estimated coefficients, and ***, **, and * denote significantly different from zero at the 1%, 5% and 10% levels.

credit ratings (*TCRI*) into the model, three of the four estimated coefficients of the CSR dummy are insignificant. However, one coefficient is significantly negative (-16.529). Thus, although there is one exception, the two-stage estimation results generally confirm that credit ratings serve as a mediator between CSR and FP. The estimated coefficients of the other control variables are consistent under the various model specifications.

In order to mitigate the contemporaneous correlation problem, under lead-lag specification II, Table 9 reports the two-stage estimation results, and we observe that they are similar to the results in Table 8, either the first stage or the second stage. Interesting findings are that, first, in the first of three steps to identify credit ratings as a mediator between CSR and FP, the estimated coefficients of the CSR dummy are all positive and significant without exception (12.208, 14.584, 9.2463 and 9.9996). In the second step, the estimated coefficients of the CSR dummy are all significantly negative (-2.8349, -10.518, -2.12 and -1.2765). In the third step, after incorporating credit ratings (*TCRI*) into the model, three of the four estimated coefficients of the CSR dummy become insignificant and are reduced in magnitude. However, one coefficient is significantly negative (-11.6). Similar to the above, although with one exception, the evidence from this table still generally supports the view that credit ratings serve as a mediator between CSR and FP.

We employ another technique to correct for sample selection bias, namely, Rosenbaum and Rubin (1983, 1985a, 1985b) PSM.¹² The first step

¹² Both Heckman (1979) two-stage estimation and the matching methods of Rubin (1973, 1977) and Rosenbaum and Rubin (1983, 1985a, 1985b) could be employed by correcting for self-selection bias and have also been widely applied in the fields of economics, finance and accounting. For example, Persson (2001) applied propensity score matching to investigate the effects of joining currency unions on the trade growth of countries. Hutchison (2004) employed PSM to examine the effects of IMF program participation on output growth. Elston et al. (2011) investigated the relationship between institutional ownership and the dividend payout behavior of the firm while using PSM to control for the selection bias problem. Glick et al. (2006)

is to estimate the probability model (propensity score function) (Similar to the two-stage estimation, we employ $\ln Asset(-1)$, $DEBT(-1)$ and $PROFITL(-1)$ as independent variables), which describes whether the samples are selected as CSR-firms or NonCSR-firms. Then, for each firm in the sample of CSR-firms, the observations in the NonCSR-firms are selected as matched observations according to the closeness of the above estimated probability (propensity scores). The drawback of applying PSM is that the number of after-matching observations will be substantially reduced (see Shen and Chang (2009) for the details).¹³

Based on the after-matching samples, Table 10 reports the pooled OLS estimation results of the regression analysis relating the firm's profitability to the CSR dummy and control factors. We observe that regardless of which model specification and lead-lag specification is employed, the estimated coefficients of the CSR dummy are all positive (for lead-lag specification I, they are 0.5233, 0.9568, 0.4379 and 1.8590, respectively), two of them are significant and none of them is negative. While the number of positive and significant coefficients is less than that based on the results in Table 5, this finding still shows no conflicting outcomes relative to the previous findings.

applied PSM in currency crisis and liberalization. Vega and Winkelried (2005) applied matching methods in inflation targeting, Ham et al. (2005) applied them in the migration and wage growth of young men. Poon and Firth (2005) employed Heckman (1979) two-stage estimation to examine whether unsolicited credit ratings are downward biased. Huang et al. (2012) employed PSM to re-examine the issue in Poon and Firth (2005) using cross-country data.

¹³ Because the sample matching technique matches the sample of CSR-firms with the observations of Non-CSR-firms with similar characteristics, some Non-CSR-firm observations which are significantly different from the observations for CSR-firms are not considered due to the one-for-one nearest sample matching algorithm. This might result in a loss of efficiency in estimation. We would like to thank the anonymous referees for reminding us to refer to the drawback associated with employing sample matching.

Table 9 Do Firms with CSR Perform Better? Two-stage Estimation (Lead-Lag Specification II)

Variables	Second Stage											
	panel A (step 1)				panel B (step 2)				panel C (step 3)			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Constant	-9.7635*** (-11.9)	4.0681*** (6.89)	3.2280 (1.22)	6.2512** (2.29)	13.876*** (37.0)	7.1160*** (57.7)	13.776*** (36.3)	13.860*** (36.9)	46.814*** (16.8)	23.804*** (26.1)	48.021*** (16.7)	52.848*** (17.6)
InAsset (-1)	0.4666*** (9.86)											
DEBT (-1)	-0.0081* (-1.84)											
PROFITL (-1)	0.0182** (2.42)											
TCRI												
CSR	12.208** (2.57)	14.584*** (3.73)	9.2463** (1.98)	9.9996** (2.19)	-2.8349*** (-4.19)	-10.518*** (-13.0)	-2.1200*** (-3.13)	-1.2765* (-1.93)	4.3458 (1.03)	-11.600*** (-3.18)	3.6569 (0.87)	1.4872 (1.28)
ROA												
ACTIVITY												
InAsset	0.9194*** (5.42)		0.3107* (1.72)	0.2010 (1.11)	-0.5040*** (-20.8)		-0.4587*** (-17.8)	-0.4994*** (-20.0)	-1.1281*** (-6.85)		-1.3357*** (-7.74)	-1.5488*** (-8.81)
DEBT	-0.0034*** (-5.51)		-0.0032*** (-5.27)	-0.0027*** (-4.56)	0.0018*** (14.7)		0.0017*** (14.6)	0.0015*** (13.3)	0.0010* (1.74)		0.0008 (1.43)	0.0008 (1.41)
RD	-0.0309*** (-4.09)		-0.0277*** (-3.76)	-0.0301*** (-4.17)					-0.0336*** (-5.07)		-0.0314*** (-4.76)	-0.0317*** (-4.88)
SALESG	0.0001 (0.92)		0.0002 (1.22)	0.0002 (1.51)					0.0002* (2.04)		0.0002* (1.93)	0.0002* (1.72)

Table 9 Do Firms with CSR Perform Better? Two-stage Estimation (Lead-Lag Specification II) (Continued)

Variables	Second Stage											
	panel A (step 1)				panel B (step 2)				panel C (step 3)			
	Dep. Var.: <i>ROA</i>				Dep. Var.: <i>TCRI</i>				Dep. Var.: <i>ROA</i>			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
<i>AGE</i>	-0.1568*** (-11.8)		-0.1193*** (-8.61)	-0.1115*** (-6.59)					-0.1150*** (-9.69)		-0.1044*** (-8.35)	-0.1193*** (-7.80)
<i>BOARD</i>		-0.0764 (-1.08)	0.0057 (0.08)	0.0051 (0.07)		-0.0812*** (-5.59)	-0.0525*** (-5.31)	-0.0355*** (-3.71)		-0.3326*** (-5.15)	-0.1404*** (-2.14)	-0.0950 (-1.47)
<i>CEOHOLD</i>		0.4872*** (6.98)	0.3166*** (4.44)	0.3286*** (4.67)		-0.0718*** (-4.89)	-0.0412*** (-4.28)	-0.0468*** (-5.01)		0.2976*** (4.69)	0.0911 (1.41)	0.0998 (1.56)
<i>PLEDGE</i>		-0.0323*** (-4.02)	-0.0237*** (-2.96)	-0.0243*** (-3.08)		0.0117*** (6.91)	0.0100*** (8.90)	0.0108*** (10.1)		0.0001 (0.01)	0.0168** (2.28)	0.0176** (2.42)
<i>INSTHOLD</i>		0.1157*** (14.5)	0.1006*** (12.1)	0.1048*** (12.4)		-0.0251*** (-14.9)	-0.0091*** (-7.64)	-0.0105*** (-8.99)		0.0472*** (6.12)	0.0479*** (6.21)	0.0452*** (5.68)
<i>YD</i>	NO	NO	NO	YES	NO	NO	NO	YES	NO	NO	NO	YES
<i>IND</i>	NO	NO	NO	YES	NO	NO	NO	YES	NO	NO	NO	YES
Chi-square	258.56	314.49	441.75	660.89	2000.0	698.50	2359.8	3045.3	1267.8	1114.6	1331.8	1669.6
Num. of Obs.	3,304	3,304	3,303	3,303	2,594	2,594	2,593	2,593	3,278	3,278	3,277	3,277

Note: This table reports the two-stage estimation results of the regression analysis. The first stage employs the last-period *InAsset*, *DEBT* and the regression relating *ROA* to *CSR* and control factors. Panel B comprises the results of the regression relating *TCRI* to *CSR* and control factors. Panel C consists of the results of the regression relating *ROA* to *CSR*, credit ratings and control factors. For each panel, four models of variable specification prevail. The variable specification of Panel A (Panel B and Panel C) is similar with that in Table 5 (6 and 7, respectively). Lead-lag specification II indicates that the explained variable is in a subsequent period relative to the explanatory variables. Yearly data cover the period from 2005 to 2009. The t-statistics (computed by White's heteroskedasticity-consistent standard errors) are shown in the parentheses below the estimated coefficients, and ***, **, and * denote significantly different from zero at the 1%, 5% and 10% levels.

Table 10 Do Firms with CSR Perform Better? OLS Regression Analysis (After-matching Samples)

Variables	Explained Variables (<i>ROA</i>)							
	Lead-Lag Specification I				Lead-Lag Specification II			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Constant	2.3568 (1.64)	4.6206 (1.34)	14.150 (1.05)	17.718 (1.18)	3.6868** (2.24)	4.1034 (0.97)	10.106 (0.68)	13.386 (0.84)
<i>CSR</i>	0.5233 (0.83)	0.9568 (0.51)	0.4379 (0.29)	1.8590 (1.03)	0.8992 (1.34)	3.0023* (1.70)	2.3289 (1.37)	4.3111** (2.06)
<i>lnAsset</i>	-0.0396*** (-3.15)		-0.0203 (-0.03)	-0.0566 (-0.06)	-0.0325** (-2.10)		0.1573 (0.19)	0.2293 (0.22)
<i>DEBT</i>	0.1007 (0.50)		-0.0292** (-2.40)	-0.0522*** (-3.08)	0.1629 (0.51)		-0.0236 (-1.46)	-0.0391** (-2.11)
<i>RD</i>	0.1661*** (3.71)		0.3162 (1.57)	0.3422 (1.53)	0.0888** (2.34)		0.3262 (0.95)	0.4436 (1.30)
<i>SALESG</i>	-0.2466*** (-4.92)		0.1681*** (4.10)	0.1473*** (3.72)	-0.2109*** (-3.67)		0.0955** (2.56)	0.0859** (2.11)
<i>AGE</i>	12.512 (1.07)		-0.2216*** (-4.30)	-0.1252 (-1.52)	2.9393 (0.23)		-0.2068*** (-3.47)	-0.1527 (-1.57)
<i>BOARD</i>		-0.5029* (-1.70)	-0.0198 (-0.07)	0.1207 (0.30)		-0.2335 (-0.79)	0.1252 (0.36)	0.3169 (0.68)
<i>CEOHOLD</i>		0.1919 (0.34)	-0.2321 (-0.61)	-0.6649 (-1.34)		0.1269 (0.21)	-0.2830 (-0.47)	-0.5168 (-0.82)

Table 10 Do Firms with CSR Perform Better? OLS Regression Analysis (After-matching Samples) (Continued)

Variables	Explained Variables (<i>ROA</i>)							
	Lead-Lag Specification I				Lead-Lag Specification II			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
<i>PLEDGE</i>		-0.0020 (-0.06)	-0.0176 (-0.46)	-0.0397 (-0.86)		0.0435 (0.97)	0.0289 (0.61)	0.0077 (0.15)
<i>INSTHOLD</i>		0.1926*** (3.63)	0.1160*** (2.76)	0.1219** (2.22)		0.1347** (2.35)	0.0679 (1.21)	0.0557 (0.80)
<i>YD</i>	NO	NO	NO	YES	NO	NO	NO	YES
<i>IND</i>	NO	NO	NO	YES	NO	NO	NO	YES
Adj. R-square	0.4266	0.1745	0.4817	0.6212	0.3131	0.1458	0.3429	0.5128
Num. of Obs.	100	100	100	100	100	100	100	100

Note: Based on the after-matching samples, this table reports the pooled OLS estimation results of the regression analysis relating *ROA* to *CSR* and control factors. For model 1, only *CSR* and five control variables, *lnAsset*, *DEBT*, *RD*, *SALESG* and *AGE* are included in the model. For model 2, only *CSR* and another four control variables, *BOARD*, *CEOHOLD*, *PLEDGE* and *INSTHOLD* are included in the model. For model 3, the *CSR* dummy (*CSR*) and the above nine control variables are included in the model. Model 4 is similar to model 3, plus *YD* and *IND*. Yearly data cover the period from 2005 to 2009. Lead-lag specification I indicates that the explained variable and explanatory variables of the regression equation are contemporaneous. Lead-lag specification II indicates that the explained variable is in a subsequent period relative to the explanatory variables. The t-statistics (computed by White's heteroskedasticity-consistent standard errors) are shown in the parentheses below the estimated coefficients, and ***, **, and * denote significantly different from zero at the 1%, 5% and 10% levels.

Table 11 reports the pooled OLS estimation results of the regression analysis relating the firm's credit ratings (*TCRI*) to the CSR dummy and control factors. We observe that no matter which model specification and lead-lag specification is adopted, the estimated coefficients of the CSR dummy are all negative (for lead-lag specification I, they are -0.5135, -0.1864, -0.1473 and -0.309, respectively), two of them are significant and none of them is positive. Although the number of negative and significant coefficients is less than that indicated by the results in Table 6, this finding again shows no conflicting outcomes relative to the previous findings.

Table 12 reports the pooled OLS estimation results of the regression analysis relating a firm's profitability to the CSR dummy, credit ratings and control factors. We observe that regardless of which model specification and lead-lag specification is adopted, 7 of the 8 estimated coefficients of *TCRI* are significantly negative (for lead-lag specification I, they are -2.0494, -2.8440, -1.7688 and -1.6665), indicating that firms with better creditworthiness tend to have superior profitability. Interestingly, we also observe that the estimated coefficients of CSR are all insignificantly different from zero, meaning that, after considering credit ratings in the model, the effects of CSR on FP are captured by the effects of credit ratings on FP. In accordance with the findings of Tables 10 and 11, while the results slightly lose statistical significance, after controlling for the sample's self-selection bias, we still obtain evidence supporting the view that credit ratings plays the role of a mediator in the relationship between CSR and profitability.

According to whether or not a company is part of a high-tech industry (with high industrial growth in Taiwan), we divide the full firm-year sample into a high-growth sector versus a non-high-growth sector, and re-examine whether the cost of debt serves as a mediator between CSR and FP. Based on the regression results in Table 13 (the sample for the high-growth sector), in the first step for the first three steps for identifying the

Table 11 Do Firms with CSR Have Better Credit Ratings? OLS Regression Analysis (After-matching Samples)

Variables	Explained Variables (<i>TCRI</i>)							
	Lead-Lag Specification I				Lead-Lag Specification II			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Constant	11.697*** (5.71)	6.8417*** (7.93)	11.892*** (5.45)	10.905*** (3.94)	11.145*** (4.56)	7.0716*** (6.49)	9.5678*** (3.43)	8.5267*** (2.64)
CSR	-0.5135** (-2.04)	-0.1864 (-0.74)	-0.1473 (-0.65)	-0.3090 (-0.96)	-0.7582** (-2.22)	-0.3137 (-1.08)	-0.1958 (-0.73)	-0.3335 (-0.77)
ROA	-0.0603*** (-3.98)		-0.0390** (-2.55)	-0.0335** (-1.99)	-0.0587*** (-3.56)		-0.0395** (-2.35)	-0.0370** (-2.05)
ACTIVITY	-0.0013 (-0.91)		-0.0020 (-1.43)	-0.0006 (-0.43)	-0.0020 (-1.14)		-0.0026 (-1.52)	-0.0007 (-0.32)
lnAsset	-0.4370*** (-3.61)		-0.3465*** (-2.62)	-0.3390** (-2.03)	-0.3980*** (-2.67)		-0.1887 (-0.99)	-0.1246 (-0.52)
DEBT	0.0078** (2.47)		0.0071*** (2.60)	0.0060* (1.88)	0.0091** (1.97)		0.0072* (1.79)	0.0066 (1.45)
BOARD		0.0471 (1.06)	0.0526 (1.41)	0.0498 (1.22)		0.1210*** (2.63)	0.1159** (2.42)	0.0901 (1.42)
CEOHOLD		-0.2469** (-2.52)	-0.2143** (-2.52)	-0.2410** (-2.50)		-0.3719* (-1.90)	-0.3105 (-1.46)	-0.3638 (-1.32)

Table 11 Do Firms with CSR Have Better Credit Ratings? OLS Regression Analysis (After-matching Samples) (Continued)

Variables	Explained Variables (<i>TCRI</i>)							
	Lead-Lag Specification I				Lead-Lag Specification II			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
<i>PLEDGE</i>	-0.0022 (-0.43)	0.0045 (0.93)	0.0027 (0.48)	0.0027 (0.48)	-0.0113* (-1.72)	-0.0069 (-0.87)	-0.0064 (-0.68)	-0.0064 (-0.68)
<i>INSTHOLD</i>	-0.0565*** (-5.87)	-0.0381*** (-4.29)	-0.0394*** (-4.39)	-0.0394*** (-4.39)	-0.0642*** (-5.16)	-0.0487*** (-3.43)	-0.0536*** (-3.77)	-0.0536*** (-3.77)
<i>YD</i>	NO	NO	NO	YES	NO	NO	NO	YES
<i>IND</i>	NO	NO	NO	YES	NO	NO	NO	YES
Adj. R-square	0.4629	0.4243	0.5952	0.7052	0.4124	0.4454	0.5573	0.6768
Num. of Obs.	96	97	96	96	80	81	80	80

Note: Based on the after-matching samples, this table reports the pooled OLS estimation results of the regression analysis relating *TCRI* to *CSR* and control factors. For model 1, only *CSR* and four control variables, *ROA*, *ACTIVITY*, *lnAsset* and *DEBT* are included in the model. For model 2, only *CSR* and another four control variables, *BOARD*, *CEOHOLD*, *PLEDGE* and *INSTHOLD* are included in the model. For model 3, the *CSR* and the above eight controls are included in the model. Model 4 is similar to model 3, plus *YD* and *IND*. Yearly data cover the period from 2005 to 2009. Lead-lag specification I indicates that the explained variable and explanatory variables of the regression equation are contemporaneous. Lead-lag specification II indicates that the explained variable is in a subsequent period relative to the explanatory variables. The t-statistics (computed by White's heteroskedasticity-consistent standard errors) are shown in the parentheses below the estimated coefficients, and ***, **, and * denote significantly different from zero at the 1%, 5% and 10% levels.

Table 12 Effects of CSR on Performance after Controlling for Credit Ratings – OLS Regression Analysis
(After-matching Samples)

Variables	Explained Variables (<i>ROA</i>)									
	Lead-Lag Specification I					Lead-Lag Specification II				
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4		
Constant	20.931** (1.99)	23.780*** (4.32)	21.281 (1.65)	28.704* (1.75)	13.753 (1.01)	26.553*** (4.42)	-2.6138*** (-3.63)	28.675 (1.50)		
<i>TCRI</i>	-2.0494*** (-4.12)	-2.8440*** (-3.91)	-1.7688*** (-2.81)	-1.6665** (-2.06)	-2.3009*** (-3.31)	-3.3269*** (-4.69)	-0.4852 (-0.30)	-2.2975** (-2.28)		
<i>CSR</i>	-1.1953 (-0.82)	-0.1809 (-0.11)	-1.5247 (-0.99)	-0.5706 (-0.33)	-0.1906 (-0.12)	0.8631 (0.54)	-0.0414 (-0.05)	0.6363 (0.33)		
<i>lnAsset</i>	0.2571 (0.47)		0.0503 (0.07)	-0.3887 (-0.39)	0.5319 (0.76)		-0.0028 (-0.15)	-0.2752 (-0.25)		
<i>DEBT</i>	-0.0178 (-1.34)		-0.0161 (-1.28)	-0.0366** (-2.23)	-0.0078 (-0.44)		0.5312* (1.71)	-0.0166 (-0.76)		
<i>RD</i>	0.4015* (1.96)		0.4616** (2.13)	0.4445* (1.86)	0.4979* (1.81)		0.0772* (1.96)	0.6092* (1.88)		
<i>SALESG</i>	0.1488*** (3.30)		0.1557*** (3.62)	0.1478*** (3.48)	0.0679* (1.76)		-0.1527*** (-2.62)	0.0817* (1.71)		
<i>AGE</i>	-0.1736*** (-3.77)		-0.1842*** (-4.03)	-0.1107 (-1.49)	-0.1311** (-2.26)		0.3221 (0.93)	-0.1247 (-1.47)		
<i>BOARD</i>		-0.2509 (-0.88)	0.1584 (0.55)	0.2720 (0.70)		0.0100 (0.04)	-0.7121 (-1.18)	0.4710 (1.02)		
<i>CEOHOLD</i>		-0.5627 (-1.02)	-0.5628 (-1.43)	-1.0355** (-1.98)		-0.6965 (-1.21)	0.0335 (0.72)	-0.9469 (-1.49)		

Table 12 Effects of CSR on Performance after Controlling for Credit Ratings — OLS Regression Analysis (After-matching Samples) (Continued)

Variables	Explained Variables (<i>ROA</i>)							
	Lead-Lag Specification I				Lead-Lag Specification II			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
<i>PLEDGE</i>		-0.0064 (-0.21)	-0.0182 (-0.49)	-0.0404 (-0.91)		0.0397 (0.98)	-0.0418 (-0.72)	0.0090 (0.18)
<i>INSTHOLD</i>		0.0218 (0.35)	0.0298 (0.55)	0.0577 (0.97)		-0.0509 (-0.87)	25.580 (1.58)	-0.0190 (-0.29)
<i>YD</i>	NO	NO	NO	YES	NO	NO	NO	YES
<i>IND</i>	NO	NO	NO	YES	NO	NO	NO	YES
Adj. R-square	0.5154	0.3058	0.5351	0.6405	0.4121	0.3236	0.4392	0.5335
Num. of Obs.	96	96	96	96	96	96	96	96

Note: Based on the after-matching samples, this table reports the pooled OLS estimation results of the regression analysis relating *ROA* to *CSR*, *TCRI* and control factors. For model 1, only *CSR* and five control variables, *lnAsset*, *DEBT*, *RD*, *SALESG* and *AGE* are included in the model. For model 2, only *CSR* and another four control variables, *BOARD*, *CEOHOLD*, *PLEDGE* and *INSTHOLD* are included in the model. For model 3, *CSR* and the above nine control variables are included in the model. Model 4 is similar to model 3, plus *YD* and *IND*. Yearly data cover the period from 2005 to 2009. Lead-lag specification I indicates that the explained variable and explanatory variables of the regression equation are contemporaneous. Lead-lag specification II indicates that the explained variable is in a subsequent period relative to the explanatory variables. The t-statistics (computed by White's heteroskedasticity-consistent standard errors) are shown in the parentheses below the estimated coefficients, and ***, ** and * denote significantly different from zero at the 1%, 5% and 10% levels.

credit rating as a mediator between CSR and FP, the estimated coefficients of the CSR dummy are all significantly positive (4.3581, 3.3574 and 3.0496) with one exception being insignificant. In the second step, the estimated coefficients of the CSR dummy are all significantly negative (-0.5462, -1.6591, -0.4989 and -0.5060). In the final step, after incorporating *TCRI* into the model, the four estimated coefficients of the CSR dummy become insignificantly different from zero. The evidence from the sample for the high-growth sector generally supports the view that a firm with CSR tends to have favorable credit ratings, and credit ratings serve as a mediator between CSR and firm performance. The empirical findings for the sample for the non-high-growth sector (Table 14) show similar results to those in Table 13, although the statistical significance is slightly reduced.

Finally, we divide the full sample into a sample of credit ratings with the investment grade versus with the non-investment grade (neutral and speculative grade), and re-examine whether the cost of debt serves as a mediator between CSR and FP. Based on the regression results in Table 15 (the investment grade sample), we first observe that the estimated coefficients of the CSR dummy are all insignificantly different from zero, meaning that for the investment grade sample, firms with CSR have no advantage in terms of profitability. Second, the estimated coefficients of the CSR dummy are all significantly negative (-0.3913, -0.7502, -0.3577 and -0.3708), meaning that a firm with CSR tends to obtain favorable credit ratings and thus a lower cost of debt. Third, after incorporating credit ratings (*TCRI*) into the model, four estimated coefficients of the CSR dummy are still insignificant and four estimated coefficients of *TCRI* are significantly negative. Although one of the three steps in identifying credit ratings serves as a mediator between CSR and performance failures, in the investment grade sample, we still observe that a firm with CSR is rewarded by obtaining superior credit ratings, and getting better credit ratings is associated with an advantageous profitability.

Table 13 Cost of Debt as a Mediator between CSR and Performance (High-growth Sector)

Variables	step 1				step 2				step 3			
	Dep. Var.: <i>ROA</i>				Dep. Var.: <i>TCRI</i>				Dep. Var.: <i>ROA</i>			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Constant	6.8432* (1.80)	5.1333*** (4.70)	12.025*** (2.77)	9.9472** (2.30)	14.989*** (41.2)	6.9757*** (47.6)	14.695*** (36.2)	14.619*** (35.5)	65.075*** (16.5)	25.696*** (16.6)	65.646*** (16.0)	66.331*** (16.2)
<i>TCRI</i>									-4.1510*** (-23.3)	-3.1121*** (-18.1)	-3.9044*** (-20.6)	-3.8879*** (-20.9)
<i>CSR</i>	4.3581** (2.17)	2.6596 (1.53)	3.3574* (1.86)	3.0496* (1.73)	-0.5462** (-2.43)	-1.6591*** (-8.40)	-0.4989** (-2.39)	-0.5060** (-2.40)	1.8626 (1.03)	1.3827 (0.73)	1.6130 (0.89)	1.8227 (1.03)
<i>ROA</i>					-0.0652*** (-20.1)		-0.0586*** (-18.0)	-0.0594*** (-18.0)				
<i>ACTIVITY</i>					0.0000 (-0.15)		0.0000 (-0.41)	0.0000 (-0.43)				
<i>lnAsset</i>	0.8107*** (3.48)		0.0328 (0.11)	0.0548 (0.19)	-0.5855*** (-24.6)		-0.5448*** (-19.1)	-0.5440*** (-19.0)	-1.8305*** (-8.65)		-2.0716*** (-9.07)	-2.0757*** (-9.27)
<i>DEBT</i>	-0.0089* (-1.68)		-0.0094* (-1.91)	-0.0093* (-1.84)	0.0010** (2.25)		0.0011** (2.33)	0.0011** (2.35)	-0.0017 (-1.45)		-0.0023** (-2.00)	-0.0024** (-2.18)
<i>RD</i>	-0.3520** (-5.20)		-0.2467*** (-3.42)	-0.2246*** (-3.09)					-0.0818* (-1.85)		-0.0602 (-1.35)	-0.0575 (-1.31)
<i>SALESG</i>	0.0002 (0.46)		0.0218** (2.52)	0.0192** (2.35)					0.0129*** (5.94)		0.0221*** (5.82)	0.0234*** (6.25)
<i>AGE</i>	-0.3224*** (-10.5)		-0.1718*** (-5.24)	-0.1646*** (-5.12)					-0.2094*** (-8.50)		-0.1770*** (-6.78)	-0.1691*** (-6.58)
<i>BOARD</i>		-0.3229** (-2.34)	-0.4700*** (-3.42)	-0.4417*** (-3.23)		-0.0598*** (-3.24)	0.0008 (0.05)	0.0013 (0.09)		-0.2869** (-2.13)	-0.1315 (-1.01)	-0.1312 (-1.03)

Table 13 Cost of Debt as a Mediator between CSR and Performance (High-growth Sector) (Continued)

Variables	step 1				step 2				step 3			
	Dep. Var.: <i>ROA</i>		Dep. Var.: <i>TCRI</i>		Dep. Var.: <i>ROA</i>		Dep. Var.: <i>TCRI</i>		Dep. Var.: <i>ROA</i>		Dep. Var.: <i>TCRI</i>	
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
<i>CEOHOLD</i>	0.4471*** (3.81)	0.3012*** (2.77)	0.2914*** (2.68)	0.2914*** (2.68)	-0.0580*** (-3.85)	-0.0456*** (-4.86)	-0.0458*** (-4.90)	-0.0458*** (-4.90)	0.2493*** (2.85)	0.2493*** (2.85)	-0.0347 (-0.40)	-0.0320 (-0.38)
<i>PLEDGE</i>	-0.0403*** (-2.61)	-0.0301** (-2.04)	-0.0268* (-1.85)	-0.0268* (-1.85)	0.0015 (0.73)	0.0034** (2.39)	0.0035** (2.47)	0.0035** (2.47)	-0.0153 (-1.12)	-0.0153 (-1.12)	0.0091 (0.70)	0.0107 (0.83)
<i>INSTHOLD</i>	0.1855*** (15.5)	0.1548*** (10.6)	0.1528*** (10.7)	0.1528*** (10.7)	-0.0323*** (-19.5)	-0.0092*** (-5.77)	-0.0092*** (-5.78)	-0.0092*** (-5.78)	0.0591*** (4.76)	0.0591*** (4.76)	0.0538*** (4.29)	0.0577*** (4.68)
<i>IND and YD</i>	NO	NO	YES	YES	NO	NO	YES	YES	NO	NO	NO	YES
Adj. R-square	0.1167	0.1330	0.2081	0.2225	0.5873	0.2595	0.6042	0.6053	0.3285	0.2552	0.3362	0.3623
Num. of Obs.	1,733	1,692	1,691	1,691	1,646	1,703	1,643	1,643	1,646	1,643	1,643	1,643

Note: Based on the sample for the high-growth sector, this table reports the OLS estimation results of identification for the cost of debt as a mediator between *CSR* and performance. The identification is composed of three steps. Step 1 is the regression relating *ROA* to *CSR* and control factors. Step 2 is the regression relating *TCRI* to *CSR* and control factors. Step 3 is the regression relating *ROA* to *CSR*, credit ratings and control factors. For each step, the four models of the variable specifications prevail. The variable specification for the three steps is similar to that in Table 5 (6 and 7, respectively). For simplicity, the lead-lag specification is that the explained variable and explanatory variables of the regression equation are contemporaneous. Yearly data cover the period from 2005 to 2009. The t-statistics (computed by White's heteroskedasticity-consistent standard errors) are shown in the parentheses below the estimated coefficients, and ***, **, and * denote significantly different from zero at the 1%, 5% and 10% levels.

Table 14 Cost of Debt as a Mediator between CSR and Performance (Non-high-growth Sector)

Variables	step 1				step 2				step 3			
	Dep. Var.: ROA				Dep. Var.: TCRI				Dep. Var.: ROA			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Constant	-6.1818* (-1.70)	2.3381*** (3.46)	-4.0682 (-1.05)	-0.5406 (-0.14)	15.516*** (35.8)	7.7319*** (59.5)	15.024*** (33.5)	15.705*** (36.1)	37.842*** (12.0)	20.302*** (18.6)	37.620*** (11.5)	42.447*** (12.1)
TCRI												
CSR	2.9847* (1.68)	1.6986 (0.99)	0.8831 (0.52)	0.2756 (0.15)	-1.2179*** (-3.91)	-1.4257*** (-4.02)	-0.9216*** (-3.01)	-0.5104* (-1.84)	1.0723 (1.64)	1.1459 (1.21)	0.6400 (0.97)	0.2305 (0.92)
ROA					-0.0898*** (-12.3)		-0.0802*** (-11.8)	-0.0724*** (-11.1)				
ACTIVITY					0.0000 (-0.49)	0.0000 (-1.04)	0.0000 (-1.29)	0.0000 (-1.29)				
lnAsset	1.1922*** (5.29)		0.6818*** (2.64)	0.5568* (2.13)	-0.5918*** (-21.9)	-0.5188*** (-16.5)	-0.6054*** (-19.8)		-0.7664*** (-4.18)		-0.8850*** (-4.46)	-1.1473*** (-5.43)
DEBT	-0.0030 (-1.52)		-0.0023 (-1.56)	-0.0015 (-1.29)	0.0010* (1.65)	0.0009* (1.70)	0.0008* (1.72)		0.0017*** (2.83)		0.0017*** (2.86)	0.0017*** (2.94)
RD	-0.0484* (-2.31)		-0.0274*** (-6.64)	-0.0306*** (-6.22)					-0.0305*** (-5.04)		-0.0288*** (-4.77)	-0.0303*** (-5.16)
SALESG	0.0000*** (-3.42)		0.0000** (2.37)	0.0001*** (5.13)					0.0002* (1.81)		0.0002* (1.79)	0.0002* (1.68)
AGE	-0.1337*** (-6.01)		-0.0890*** (-3.95)	-0.0952*** (-4.08)					-0.0997*** (-5.87)		-0.0798*** (-4.51)	-0.0781*** (-4.23)
BOARD		0.0719 (1.14)	0.0790 (1.12)	0.0883 (1.32)		-0.1582*** (-10.8)	-0.0785*** (-6.40)	-0.0453*** (-4.08)		-0.2854*** (-4.12)	-0.1211* (-1.68)	-0.0465 (-0.65)

Table 14 Cost of Debt as a Mediator between CSR and Performance (Non-high-growth Sector) (Continued)

Variables	step 1				step 2				step 3			
	Dep. Var.: <i>ROA</i>				Dep. Var.: <i>TCRI</i>				Dep. Var.: <i>ROA</i>			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
<i>CEOHOLD</i>	0.5886*** (4.75)	0.5230*** (4.11)	0.6258*** (4.88)	0.6258*** (4.88)	-0.0308 (-1.43)	-0.0308 (-1.43)	-0.0006 (-0.05)	-0.0306** (-2.26)	0.3624*** (3.65)	0.3624*** (3.65)	0.2546** (2.56)	0.2801*** (2.85)
<i>PLEDGE</i>	-0.0324*** (-4.67)	-0.0327*** (-4.74)	-0.0354*** (-5.00)	-0.0354*** (-5.00)	0.0124*** (7.10)	0.0124*** (7.10)	0.0134*** (8.08)	0.0151*** (9.43)	-0.0030 (-0.36)	-0.0030 (-0.36)	0.0096 (1.14)	0.0095 (1.12)
<i>INSTHOLD</i>	0.1059*** (10.3)	0.0866*** (7.98)	0.0812*** (7.48)	0.0812*** (7.48)	-0.0254*** (-13.3)	-0.0254*** (-13.3)	-0.0080*** (-4.78)	-0.0099*** (-5.86)	0.0389*** (4.22)	0.0389*** (4.22)	0.0381*** (4.08)	0.0331*** (3.43)
<i>IND and YD</i>	NO	NO	YES	YES	NO	NO	NO	YES	NO	NO	NO	YES
Adj. R-square	0.0810	0.0932	0.1209	0.2141	0.4702	0.2421	0.5258	0.6068	0.2485	0.2279	0.2571	0.3065
Num. of Obs.	1,747	1,736	1,734	1,734	1,706	1,704	1,704	1,704	1,704	1,704	1,702	1,702

Note: Based on the sample for the non-high-growth sector, this table reports the OLS estimation results of identification for the cost of debt as a mediator between *CSR* and performance. The identification is composed of three steps. Step 1 is the regression relating *ROA* to *CSR* and control factors. Step 2 is the regression relating *TCRI* to *CSR* and control factors. Step 3 is the regression relating *ROA* to *CSR*, credit ratings and control factors. For each step, the four models of the variable specifications prevail. The variable specification for the three steps is similar to that in Table 5 (6 and 7, respectively). For simplicity, the lead-lag specification is that the explained variable and explanatory variables of the regression equation are contemporaneous. Yearly data cover the period from 2005 to 2009. The t-statistics (computed by White's heteroskedasticity-consistent standard errors) are shown in the parentheses below the estimated coefficients, and ***, **, and * denote significantly different from zero at the 1%, 5% and 10% levels.

Table 15 Cost of Debt as a Mediator between CSR and Performance (Samples of Credit Ratings with Investment Grade)

Variables	step 1				step 2				step 3			
	Dep. Var.: ROA				Dep. Var.: TCRI				Dep. Var.: ROA			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Constant	31.062 ^{***} (9.88)	12.358 ^{***} (13.1)	32.362 ^{***} (9.97)	31.206 ^{***} (9.51)	10.136 ^{***} (35.3)	4.3936 ^{***} (55.9)	9.9475 ^{***} (34.7)	9.8617 ^{***} (33.0)	65.098 ^{***} (13.3)	16.999 ^{***} (8.91)	62.316 ^{***} (12.6)	62.221 ^{***} (12.3)
TCRI									-3.8035 ^{***} (-9.71)	-1.4125 (-3.80)	-3.2976 ^{***} (-8.26)	-3.2156 ^{***} (-7.92)
CSR	1.4254 (1.20)	-0.6341 (-0.46)	0.5332 (0.45)	1.2675 (1.13)	-0.3913 ^{**} (-2.12)	-0.7502 ^{**} (-4.35)	-0.3577 ^{**} (-2.03)	-0.3708 ^{**} (-2.14)	0.8102 (0.66)	-0.6938 (-0.52)	0.2466 (0.20)	1.2559 (1.05)
ROA					-0.0223 ^{***} (-10.1)		-0.0187 ^{***} (-8.05)	-0.0174 ^{***} (-7.18)				
ACTIVITY					0.0000 (-0.75)		0.0000 [*] (-1.92)	0.0000 (0.33)				
ln _{Asset}	-0.3785 [*] (-1.93)		-0.7734 ^{***} (-3.59)	-0.8318 ^{***} (-3.53)	-0.3790 ^{***} (-21.7)		-0.3608 ^{***} (-19.5)	-0.3823 ^{***} (-20.0)	-1.8319 ^{***} (-7.53)		-2.0779 ^{***} (-8.19)	-2.1783 ^{***} (-8.12)
DEBT	-0.0644 ^{***} (-9.32)		-0.0618 ^{***} (-8.75)	-0.0598 ^{***} (-8.12)	0.0010 (1.55)		0.0010 (1.49)	0.0014 ^{**} (2.04)	-0.0391 ^{***} (-5.45)		-0.0358 ^{***} (-4.86)	-0.0343 ^{***} (-4.66)
RD	-0.0487 (-0.76)		0.0359 (0.59)	0.0670 (1.09)					-0.0185 (-0.28)		0.0588 (0.88)	0.0812 (1.22)
SALESG	0.0618 ^{***} (3.94)		0.0591 ^{***} (3.99)	0.0563 ^{***} (4.06)					0.0290 ^{***} (3.74)		0.0273 ^{***} (3.57)	0.0342 ^{***} (4.49)
AGE	-0.2485 ^{***} (-12.1)		-0.2031 ^{***} (-9.57)	-0.1758 ^{***} (-6.86)					-0.1907 ^{***} (-9.93)		-0.1641 ^{***} (-8.06)	-0.1515 ^{***} (-6.22)
BOARD		-0.4576 ^{***} (-6.24)	-0.1825 ^{**} (-2.27)	-0.0920 (-1.06)		-0.0172 ^{**} (-2.14)	0.0023 (0.37)	0.0152 ^{**} (2.38)		-0.3437 ^{***} (-3.94)	-0.0313 (-0.37)	0.0704 (0.83)

Table 15 Cost of Debt as a Mediator between CSR and Performance (Samples of Credit Ratings with Investment Grade)
(Continued)

Variables	step 1				step 2				step 3			
	Dep. Var.: ROA		Dep. Var.: TCR1		Dep. Var.: ROA		Dep. Var.: TCR1		Dep. Var.: ROA		Dep. Var.: TCR1	
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
<i>CEOHOLD</i>	0.4078*** (4.05)	0.1439 (1.33)	0.0777 (0.80)	0.0777 (0.80)	-0.0045 (-0.72)	0.0034 (0.53)	0.0034 (0.47)	0.0033 (0.47)	0.3567*** (2.97)	0.1044 (0.92)	0.1044 (0.92)	0.1130 (1.01)
<i>PLEDGE</i>	-0.0566*** (-3.94)	-0.0280** (-2.04)	-0.0296** (-2.15)	-0.0296** (-2.15)	0.0001 (0.09)	0.0034*** (2.76)	0.0043*** (3.43)	0.0043*** (3.43)	-0.0349* (-2.25)	0.0033 (0.23)	0.0033 (0.23)	0.0012 (0.09)
<i>INSTHOLD</i>	0.1127*** (8.92)	0.0969*** (8.13)	0.0973*** (8.06)	0.0973*** (8.06)	-0.0125*** (-11.6)	-0.0042*** (-4.41)	-0.0042*** (-4.44)	-0.0042*** (-4.44)	0.0848** (6.22)	0.0755*** (5.83)	0.0755*** (5.83)	0.0822*** (6.29)
<i>IND and YD</i>	NO	NO	YES	YES	NO	NO	YES	YES	NO	NO	NO	YES
Adj. R-square	0.2663	0.0958	0.3155	0.3893	0.4556	0.2027	0.4745	0.5347	0.2365	0.0783	0.2583	0.3294
Num. of Obs.	1,019	1,017	1,016	1,016	1,020	1,035	1,017	1,017	1,019	1,017	1,016	1,016

Note: Based on the sample of credit ratings with investment grade, this table reports the OLS estimation results of the identification of the cost of debt as a mediator between CSR and performance. The identification is composed of three steps. Step 1 is the regression relating ROA to CSR and control factors. Step 2 is the regression relating TCR1 to CSR and control factors. Step 3 is the regression relating ROA to CSR, credit ratings and control factors. For each step, the four models of the variable specifications prevail. The variable specification for the three steps is similar to that in Table 5 (6 and 7, respectively). For simplicity, the lead-lag specification is that the explained variable and explanatory variables of the regression equation are contemporaneous. Yearly data cover the period from 2005 to 2009. The t-statistics (computed by White's heteroskedasticity-consistent standard errors) are shown in the parentheses below the estimated coefficients, and ***, **, and * denote significantly different from zero at the 1%, 5% and 10% levels.

The empirical findings for the non-investment grade sample (Table 16) reveal somewhat dissimilar results to those in Table 15, although the main direction of the findings is unchanged. First, in step 1, the coefficients of the CSR dummies are all positive and significant, meaning that firms with CSR tend to have higher profitability. Second, in step 2, the four estimated coefficients of the CSR dummies for *TCRI* are negative yet insignificant, meaning that in the non-investment grade sample, engaging in CSR is of little help towards obtaining an improved credit rating. Third, in step 3, after incorporating credit ratings (*TCRI*) in the model, the four estimated coefficients of the CSR dummy become insignificantly different from zero and the four estimated coefficients of *TCRI* are all significantly negative (-3.1358, -2.9168, -3.0847 and -3.1904). Based on these findings, because step 2 fails to identify that credit ratings serve as a mediator between CSR and performance due to their falling significance, firms with CSR and with better credit ratings tend to enjoy high profitability, but the linkage between whether engaging in CSR is rewarded by receiving better credit ratings is missing. Companies that strive for favorable credit ratings in order to enjoy higher profitability should not rely on engaging in CSR but on other efforts.

Generally speaking, our principal empirical outcome shows that firms with CSR are associated with favorable credit ratings and thus a lower cost of debt. Being a socially responsible firm is rewarded by a lower borrowing burden. Following Baron and Kenny (1986), except for a few cases, most of our regression results indicate that, firstly, a firm's engaging in CSR activities is associated with higher profitability, second, a firm's engaging in CSR activities is correlated with better credit ratings, and third, after controlling for credit ratings, the impacts of CSR on the firm's profitability are reduced by the magnitude of their estimated coefficients and their statistical significance. Thus, our empirical findings fairly clearly indicate the role that credit ratings play as a mediator between CSR and performance.

Table 16 Cost of Debt as a Mediator between CSR and Performance (Samples of Credit Ratings with Non-Investment Grade)

Variables	step 1				step 2				step 3			
	Dep. Var.: ROA				Dep. Var.: TCRI				Dep. Var.: ROA			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
Constant	10.863*** (2.64)	4.6237*** (5.99)	7.1864 (1.61)	8.0148* (1.76)	10.149*** (26.5)	6.9331*** (56.5)	10.773*** (26.6)	11.337*** (26.8)	39.623*** (12.7)	25.243*** (20.7)	39.235*** (11.9)	45.468*** (13.0)
TCRI									-3.1358*** (-21.7)	-2.9168*** (-20.1)	-3.0847*** (-20.9)	-3.1904*** (-20.7)
CSR	10.190** (2.29)	8.3929** (2.03)	8.1147** (2.02)	7.6918* (1.76)	-0.4931 (-0.80)	-0.3774 (-0.76)	-0.3034 (-0.46)	-0.4346 (-0.83)	5.5884 (0.89)	6.6819 (1.06)	5.6124 (0.90)	8.1253 (1.32)
ROA					-0.0634*** (-18.2)		-0.0602*** (-17.4)	-0.0575*** (-17.1)				
ACTIVITY					0.0000 (-0.06)	0.0000 (-0.15)	0.0000 (-0.51)	0.0000 (-0.51)				
ln.Asset	0.0997 (0.38)	0.0772 (0.26)	0.0772 (0.26)	-0.0697 (-0.23)	-0.2350*** (-9.45)	-0.2610*** (-9.36)	-0.2610*** (-9.36)	-0.3113*** (-11.0)	-0.6912*** (-3.67)	-0.7510*** (-3.72)	-0.7510*** (-3.72)	-1.0223*** (-4.92)
DEBT	-0.0034** (-1.96)	-0.0032** (-2.00)	-0.0032** (-2.00)	-0.0027 (-1.74)	0.0010** (2.38)	0.0009** (2.40)	0.0009** (2.40)	0.0008** (2.41)	0.0011* (1.85)	0.0010* (1.71)	0.0010* (1.71)	0.0009 (1.58)
RD	-0.0592** (-2.48)	-0.0355*** (-4.11)	-0.0355*** (-4.11)	-0.0348*** (-3.75)					-0.0331*** (-4.76)	-0.0308*** (-4.44)	-0.0308*** (-4.44)	-0.0319*** (-4.65)
SALESG	0.0000 (0.91)	0.0001* (1.84)	0.0001* (1.84)	0.0001*** (2.68)					0.0002** (2.04)	0.0002** (1.78)	0.0002* (1.78)	0.0002 (1.54)
AGE	-0.1805*** (-10.7)	-0.1178*** (-6.69)	-0.1178*** (-6.69)	-0.1007*** (-4.27)					-0.0976*** (-6.49)	-0.0938*** (-5.31)	-0.0938*** (-5.31)	-0.0927*** (-4.78)
BOARD		-0.2638 (-2.93)	-0.1855* (-1.95)	-0.2146** (-2.31)		-0.0532*** (-3.36)	-0.0327** (-2.40)	-0.0153 (-1.24)		-0.3478*** (-3.63)	-0.1922** (-1.97)	-0.1491 (-1.54)

Table 16 Cost of Debt as a Mediator between CSR and Performance (Samples of Credit Ratings with Non-Investment Grade) (Continued)

Variables	step 1				step 2				step 3						
	Model 1		Model 2		Model 1		Model 2		Model 1		Model 2		Model 3		
	Dep. Var.: <i>ROA</i>								Dep. Var.: <i>TCRI</i>						
<i>CEOHOLD</i>	0.6566 (5.97)	0.4750*** (4.16)	0.4618*** (4.01)	0.4618*** (4.01)	-0.0624*** (-5.13)	0.0089*** (6.34)	-0.0624*** (-5.13)	0.0089*** (6.34)	-0.0323*** (-3.90)	0.0087*** (6.83)	-0.0323*** (-3.90)	0.0087*** (6.83)	0.3351*** (4.50)	0.1708** (2.20)	0.1660** (2.15)
<i>PLEDGE</i>	-0.0294 (-3.80)	-0.0187** (-2.36)	-0.0213** (-2.55)	-0.0213** (-2.55)	0.0092*** (6.34)	0.0092*** (6.34)	0.0092*** (6.34)	0.0092*** (6.34)	0.0092*** (6.34)	0.0092*** (6.34)	0.0092*** (6.34)	0.0092*** (6.34)	0.0032 (0.38)	0.0153* (1.77)	0.0144* (1.65)
<i>INSTHOLD</i>	0.0892 (8.43)	0.0788** (7.20)	0.0799** (7.01)	0.0799** (7.01)	-0.0101*** (-6.75)	0.0799** (7.01)	-0.0101*** (-6.75)	0.0799** (7.01)	-0.0024* (-1.78)	-0.0024* (-1.78)	-0.0024* (-1.78)	-0.0024* (-1.78)	0.0424*** (4.50)	0.0416*** (4.38)	0.0368** (3.71)
<i>IND and YD</i>	NO	NO	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES
Adj. R-square	0.0783	0.0621	0.1388	0.1388	0.0634	0.3311	0.0634	0.3311	0.3591	0.4280	0.3591	0.4280	0.1992	0.1870	0.2068
Num. of Obs.	2,431	2,411	2,409	2,409	2,372	2,332	2,372	2,332	2,330	2,330	2,330	2,330	2,331	2,330	2,329

Note: Based on the sample of credit ratings with non-investment grade (neutral grade and speculative grade), this table reports the OLS estimation results of identification for the cost of debt as a mediator between CSR and performance. The identification is composed of three steps. Step 1 is the regression relating *ROA* to *CSR* and control factors. Step 2 is the regression relating *TCRI* to *CSR* and control factors. Step 3 is the regression relating *ROA* to *CSR* credit ratings and control factors. For each step, the four models of the variable specifications prevail. The variable specification for the three steps is similar to that in Table 5 (6 and 7, respectively). For simplicity, the lead-lag specification is that the explained variable and explanatory variables of the regression equation are contemporaneous. Yearly data cover the period from 2005 to 2009. The t-statistics (computed by White's heteroskedasticity-consistent standard errors) are shown in the parentheses below the estimated coefficients, and ***, **, and * denote significantly different from zero at the 1%, 5% and 10% levels.

The main contribution of this study is twofold. First, we follow recent developments in the literature on the CSR-FP nexus, and employ Baron and Kenny (1986) proposition to empirically identify the role that credit ratings play as a mediator between CSR and FP. Our principal outcomes are consistent with several existing studies in that engaging in CSR leads to a positive feedback on profitability and credit ratings, as mentioned before. Second, we employ two-stage estimation and a sample matching technique to mitigate concerns about the sample's self-selection phenomena and endogeneity bias.

The management implication of this study is that the positive linkages between CSR and profitability, and CSR and creditworthiness indicate that the cost of debt capital is a channel through which financial markets encourage firms to be more socially responsible. This encourages managers to throw off doubts about engaging in CSR activities and become more confident in pursuing philanthropic actions, because such benevolent actions both contribute to the society and benefit the firms themselves by either improving profitability or lowering financing costs. On the other hand, firms with poor performance in relation to CSR could also channel resources into CSR activities as doing so may increase their profitability and reduce the cost of capital, both of which are advantageous to company's stockholders and stakeholders.

5. Conclusion

While the concept of taking social responsibility is prevalent and accepted by management practices around the globe, academically, whether or not to engage in such seemingly non-profit-maximization activities that bring positive feedback to a firm's performance is still a matter of debate. The focus of recent empirical studies has moved to

mitigate model misspecification and investigate the mechanism inside the CSR-FP nexus (McWilliams and Siegel, 2000; Orlitzky et al., 2003; Margolis and Walsh, 2003; Rowley and Berman, 2000). We follow this trend to empirically investigate whether the cost of debt (proxied by credit ratings) acts as one mechanism inside the CSR-FP relationship.

Based on TWSE-listed firms for the period 2005~2009, our regression results generally present evidence that is supportive of the cost of debt (credit ratings) serving as a mechanism inside the CSR-FP relationship. More specifically, a firm's engaging in CSR activities is associated with higher profitability, while a firm's engaging in CSR activities is correlated with better credit ratings, and after controlling for credit ratings, the impacts of CSR on a firm's profitability are reduced by the magnitude of the estimated coefficients and their statistical significance. These outcomes pass through the identification steps of mediator suggested by Baron and Kenny (1986). As for robustness checks, since we employ two-stage estimation and Rosenbaum and Rubin (1983, 1985a, 1985b) PSM model to control for self-selection and endogeneity bias, the fundamental outcome experiences only a small shift. Encouraging managers to devote more resources to CSR activities to obtain better profitability and more favorable credit ratings and to enjoy a "win (stockholders)-win (stakeholders) situation" is the principal management implication of this study.

In future research, first, a longer period of data is needed, because engaging in CSR has a long-term effect on a firm's performance. Currently, we employ data for only five years. Second, employing a CSR dummy to measure CSR activity is too arbitrary. Since some CSR ratings procedures are the private information of rating agencies in Taiwan, developing a comprehensive tool, questionnaire and measurement of CSR continuous ratings has become the researcher's responsibility. In Taiwan, for example, in the development of a CSR measure one could refer to the "Corporate

Social Responsibility Best Practice Principles for TWSE / Gre Tai Securities Market (GTSM)-Listed Companies” published by the Taiwan Stock Exchange. Finally, equity financing is also an important funding method, and so examining whether a firm’s engaging in CSR is associated (positively or negatively) with the cost of equity is also needed.

References

- Alexander, G. J. and R. A. Buchholz (1978), “Corporate Social Responsibility and Stock Market Performance,” *Academy of Management Journal*, 21:3, 479-486.
- Allouche, J. and P. Laroche (2005), “A Meta-Analytical Investigation of the Relationship between Corporate Social and Financial Performance,” *Revue de Gestion des Ressources Humaines*, 57, 18-40.
- Anginer, D., K. L. Fisher and M. Statman (2008), “Stocks of Admired Companies and Despised Ones,” manuscript.
- Ashbaugh-Skaife, H., D. W. Collins and R. LaFond (2006), “The Effects of Corporate Governance on Firms’ Credit Ratings,” *Journal of Accounting and Economics*, 42:1-2, 203-243.
- Aupperle, K. E., A. B. Carroll and J. O. Hatfield (1985), “An Empirical Examination of the Relationship between Corporate Social Responsibility and Profitability,” *Academy of Management Journal*, 28:2, 446-463.
- Barnett, M. L. and R. M. Salomon (2006), “Beyond Dichotomy: The Curvilinear Relationship between Social Responsibility and Financial Performance,” *Strategic Management Journal*, 27:11, 1101-1122.
- Baron, R. M. and D. A. Kenny (1986), “The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic, and Statistical Considerations,” *Journal of Personality and Social Psychology*, 51:6, 1173-1182.
- Bhagat, S. and B. Black (2002), “The Non-Correlation Between Board Independence and Long-Term Firm Performance,” *The Journal of Corporation Law*, 27:2, 231-273.
- Borensztein, E., K. Cowan and P. Valenzuela (2006), “The Sovereign Ceiling

- Lite and Bank Credit Ratings in Emerging Markets Economies,” manuscript.
- Borensztein, E., P. Valenzuela and K. Cowan (2007), “Sovereign Ceiling “Lite?” The Impact of Sovereign Ratings on Corporate Ratings in Emerging Market Economies,” IMF Working Paper No. WP/07/75.
- Brammer, S., C. Brooks and S. Pavelin (2006), “Corporate Social Performance and Stock Returns: UK Evidence from Disaggregate Measures,” *Financial Management*, 35:3, 97-116.
- Chang, Y., C. H. Hsieh, T. C. Wang and T. Y. Hsieh (2013), “Corporate Social Responsibility, Cost of Equity and Cost of Bank Loan,” National Changhua University of Education Working Paper.
- Chih, H. L., C. H. Shen and F. C. Kang (2008), “Corporate Social Responsibility, Investor Protection, and Earnings Management: Some International Evidence,” *Journal of Business Ethics*, 79:1-2, 179-198.
- Claessens, S., S. Djankov and L. H. P. Lang (2000), “The Separation of Ownership and Control in East Asian Corporations,” *Journal of Financial Economics*, 58:1-2, 81-112.
- Czarnitzki, D. and K. Kraft (2007), “Are Credit Ratings Valuable Information?” *Applied Financial Economics*, 17:13, 1061-1070.
- Demsetz, H. and B. Villalonga (2001), “Ownership Structure and Corporate Performance,” *Journal of Corporate Finance*, 7:3, 209-233.
- Derwall, J. and P. Verwijmeren (2007), “Corporate Social Responsibility and the Cost of Equity Capital,” Erasmus University Working Paper.
- Di Giulio, A., P. O. Migliavacca and A. Tencati (2007), “What Relationship between Corporate Social Performance and the Cost of Capital,” Paper presented to the Academy of Management 2007 Annual Meeting, Philadelphia, PA, 3-8 August.
- El Ghouli, S., O. Guedhami, C. C. Y. Kwok and D. R. Mishra (2011), “Does Corporate Social Responsibility Affect the Cost of Capital?”

Journal of Banking & Finance, 35:9, 2388-2406.

Elston, J., R. Hofler and J. Lee (2011), "Dividend Policy and Institutional Ownership: Empirical Evidence Using a Propensity Score Matching Estimator," *Journal of Accounting and Finance*, 11:1, 89-102.

Ferri, G. and L. G. Liu (2003), "How Do Global Credit-Rating Agencies Rate Firms from Developing Countries?" *Asian Economic Papers*, 2:3, 30-56.

Fich, E. M. and A. Shivdasani (2006), "Are Busy Boards Effective Monitors?" *The Journal of Finance*, 61:2, 689-724.

Freeman, R. E. (1984), *Strategic Management: A Stakeholder Approach*, New York: Cambridge University Press.

Friedman, M. (1962), *Capitalism and Freedom*, Chicago: University of Chicago Press.

Friedman, M. (1970), "The Social Responsibility of Business is to Increase its Profits," *The New York Times Magazine*, 13, 32-33.

Glick, R., X. Guo and M. Hutchison (2006), "Currency Crises, Capital-Account Liberalization, and Selection Bias," *The Review of Economics and Statistics*, 88:4, 698-714.

Godfrey, P. C. (2005), "The Relationship between Corporate Philanthropy and Shareholder Wealth: A Risk Management Perspective," *Academy of Management Review*, 30:4, 777-798.

Goss, A. and G. S. Roberts (2011), "The Impact of Corporate Social Responsibility on the Cost of Bank Loans," *Journal of Banking & Finance*, 35:7, 1794-1810.

Griffin, J. J. and J. F. Mahon (1997), "The Corporate Social Performance and Corporate Financial Performance Debate (Twenty-Five Years of Incomparable Research)," *Business and Society*, 36:1, 5-31.

Ham, J. C., X. Li and P. B. Reagan (2005), "Propensity Score Matching, a Distance-Based Measure of Migration, and the Wage Growth of

- Young Men,” IEPR Working Paper No. 05.13.
- Heckman, J. J. (1979), “Sample Selection Bias as a Specification Error,” *Econometrica*, 47:1, 153-162.
- Heinkel, R., A. Kraus and J. Zechner (2001), “The Effect of Green Investment on Corporate Behavior,” *Journal of Financial and Quantitative Analysis*, 36:4, 431-449.
- Hermalin, B. E. and M. S. Weisbach (2003), “Boards of Directors as an Endogenously Determined Institution: A Survey of the Economic Literature,” *Economic Policy Review*, 9:1, 7-20.
- Holman, W. R., J. R. New and D. Singer (1990), “The Impact of Corporate Social Responsiveness on Shareholder Wealth,” in *Corporation and Society Research: Studies in Theory and Measurement*, ed., L. Preston, 265-280, Greenwich CT: JAI Press.
- Hong, H. and M. Kacperczyk (2009), “The Price of Sin: The Effects of Social Norms on Markets,” *Journal of Financial Economics*, 93:1, 15-36.
- Huang, Y. L., Y. Chang and C. H. Shen (2012), “Are Unsolicited Bank Credit Ratings Biased Downward? A Matching Approach,” *Taiwan Economic Review*, 40:2, 149-188. (in Chinese with English abstract)
- Huang, Y. L. and C. H. Shen (2009), “The Effect of Earnings Management on the Bank Cost of Debt—The Credit Rating Approach,” *Journal of Management*, 26:6, 599-623. (in Chinese with English abstract)
- Hutchison, M. M. (2004), “Selection Bias and the Output Cost of IMF Programs,” EPRU Working Paper Series 2004-15.
- LaLonde, R. J. (1986), “Evaluating the Econometric Evaluations of Training Programs with Experimental Data,” *The American Economic Review*, 76:4, 604-620.
- Lerner, L. D. and G. E. Fryxell (1988), “An Empirical Study of the Predictors of Corporate Social Performance: A Multi-Dimensional

- Analysis,” *Journal of Business Ethics*, 7:12, 951-959.
- Luo, Q. and T. Hachiya (2005), “Corporate Governance, Cash Holdings, and Firm Value: Evidence from Japan,” *Review of Pacific Basin Financial Markets and Policies*, 8:4, 613-636.
- Mahon, J. F. and J. J. Griffin (1999), “Painting a Picture: A Reply,” *Business & Society*, 38:1, 126-133.
- Mak, Y. T. and Y. Kusnadi (2005), “Size Really Matters: Further Evidence on the Negative Relationship between Board Size and Firm Value,” *Pacific-Basin Finance Journal*, 13:3, 301-318.
- Marcus, A. A. and R. S. Goodman (1986), “Compliance and Performance: Toward a Contingency Theory,” in *Research in Corporate Social Performance and Policy*, ed., J. E. Post and L. E. Preston, 193-221, Greenwich CT: JAI Press.
- Margolis, J. D. and J. P. Walsh (2003), “Misery Loves Companies: Rethinking Social Initiatives by Business,” *Administrative Science Quarterly*, 48:2, 268-305.
- McConnell, J. J. (1990), “Additional Evidence on Equity Ownership and Corporate Value,” *Journal of Financial Economics*, 27:2, 595-612.
- McGuire, J. B., A. Sundgren and T. Schneeweis (1988), “Corporate Social Responsibility and Firm Financial Performance,” *Academy of Management Journal*, 31:4, 854-872.
- McWilliams, A. and D. Siegel (2000), “Corporate Social Responsibility and Financial Performance: Correlation or Misspecification?” *Strategic Management Journal*, 21:5, 603-609.
- Menz, K. M. (2010), “Corporate Social Responsibility: Is it Rewarded by the Corporate Bond Market? A Critical Note,” *Journal of Business Ethics*, 96:1, 117-134.
- Morck, R., A. Shleifer and R. W. Vishny (1988), “Management Ownership and Market Valuation: An Empirical Analysis,” *Journal of Financial*

Economics, 20:1-3, 293-315.

- Orlitzky, M. and J. D. Benjamin (2001), "Corporate Social Performance and Firm Risk: A Meta-Analytic Review," *Business & Society*, 40:4, 369-396.
- Orlitzky, M., F. L. Schmidt and S. L. Rynes (2003), "Corporate Social and Financial Performance: A Meta-Analysis," *Organization Studies*, 24:3, 403-441.
- Persson, T. (2001), "Currency Unions and Trade: How Large is the Treatment Effect?" *Economic Policy*, 16:33, 433-462.
- Poon, W. P. H. (2003), "Are Unsolicited Credit Ratings Biased Downward?" *Journal of Banking & Finance*, 27:4, 593-614.
- Poon, W. P. H. and M. Firth (2005), "Are Unsolicited Credit Ratings Lower? International Evidence from Bank Ratings," *Journal of Business Finance & Accounting*, 32:9-10, 1741-1771.
- Preston, L. E. and D. P. O'Bannon (1997), "The Corporate Social-Financial Performance Relationship," *Business & Society*, 36:4, 419-429.
- Reeb, D. M., S. A. Mansi and J. M. Allee (2001), "Firm Internationalization and the Cost of Debt Financing: Evidence from Non-Provisional Publicly Traded Debt," *Journal of Financial and Quantitative Analysis*, 36:3, 395-414.
- Roman, R. M., S. Hayibor and B. R. Agle (1999), "The Relationship between Financial and Social Performance Repainting a Portrait," *Business & Society*, 38:1, 109-125.
- Rosenbaum, P. R. and D. B. Rubin (1983), "The Central Role of the Propensity Score in Observational Studies for Causal Effects," *Biometrika*, 70:1, 41-55.
- Rosenbaum, P. R. and D. B. Rubin (1985a), "Constructing a Control Group Using Multivariate Matched Sampling Methods that Incorporate the Propensity Score," *The American Statistician*, 39:1, 33-38.

- Rosenbaum, P. R. and D. B. Rubin (1985b), “The Bias Due to Incomplete Matching,” *Biometrics*, 41:1, 103-116.
- Rowley, T. and S. Berman (2000), “A Brand New Brand of Corporate Social Performance,” *Business & Society*, 39:4, 397-418.
- Rubin, D. B. (1973), “Matching to Remove Bias in Observational Studies,” *Biometrics*, 29:1, 159-183.
- Rubin, D. B. (1977), “Assignment to a Treatment Group on the Basis of a Covariate,” *Journal of Educational and Behavioral Statistics*, 2:1, 1-26.
- Schuler, D. A. and M. Cording (2006), “A Corporate Social Performance-Corporate Financial Performance Behavioral Model for Consumers,” *Academy of Management Review*, 31:3, 540-558.
- Sengupta, P. (1998), “Corporate Disclosure Quality and the Cost of Debt,” *The Accounting Review*, 73:4, 459-474.
- Shane, P. B. and B. H. Spicer (1983), “Market Response to Environment Information Produced Outside the Firm,” *The Accounting Review*, 58:3, 521-538.
- Shen, C. H. and Y. Chang (2009), “Ambition Versus Conscience, Does Corporate Social Responsibility Pay off? The Application of Matching Methods,” *Journal of Business Ethics*, 88:1, 133-153.
- Spicer, B. H. (1978), “Investors, Corporate Social Performance and Information Disclosure: An Empirical Study,” *Accounting Review*, 53:1, 94-111.
- Surroca, J., J. A. Tribo and S. Waddock (2010), “Corporate Responsibility and Financial Performance: The Role of Intangible Resources,” *Strategic Management Journal*, 31:5, 463-490.
- Tsoutsourz, M. (2004), “Corporate Social Responsibility and Financial Performance,” Applied Financial Project, Berkeley, California.
- Ullmann, A. A. (1985), “Data in Search of a Theory: A Critical

Examination of the Relationships among Social Performance, Social Disclosure, and Economic Performance of U.S. Firms,” *Academy of Management Review*, 10:3, 540-557.

Vance, S. G. (1975), “Are Socially Responsible Firms Good Investment Risks?” *Management Review*, 64:8, 18-24.

Vega, M. and D. Winkelried (2005), “Inflation Targeting and Inflation Behavior: A Successful Story?” *International Journal of Central Banking*, 3:1, 153-175.

Waddock, S. and S. B. Graves (1997), “The Corporate Social Performance-Financial Performance Link,” *Strategic Management Journal*, 18:4, 303-319.

Wokutch, R. E. and B. A. Spencer (1987), “Corporate Saints and Sinners: The Effects of Philanthropic and Illegal Activity on Organizational Performance,” *California Management Review*, 29:2, 62-77.

Yermack, D. (1996), “Higher Market Valuation of Companies with a Small Board of Directors,” *Journal of Financial Economics*, 40:2, 185-211.

企業社會責任與公司獲利 —兼論債務資金成本的中介角色

張元、沈中華

摘 要

本研究檢驗關於企業社會責任與公司債務資金成本之間關聯性（以信用評等作為代理變數）的兩個問題。第一、我們檢驗公司承擔社會責任是否對於信用評等具有增進的作用，並因此減少了公司的債務資金成本。第二、我們考慮並檢驗信用評等是否可作為企業社會責任和公司的盈利能力之間的中介。這裡的中介是指，當信用評等存在於迴歸式中時，相對於不存在時，企業社會責任對公司績效的影響較不明顯。根據 2005 年至 2009 年期間之台灣證券交易所上市公司的資料，實證結果顯示，承擔企業社會責任的公司往往有較佳的信用評等，也因此有較低的債務資金成本；此外，在控制信用評等後，社會責任對公司盈利能力的影響降低，從而顯示信用評等可作為企業社會責任和公司獲利之間的中介。

關鍵詞：企業社會責任、債務資金成本、信用評等、中介
JEL 分類代號：C21, G10, M14

兩位作者分別為聯絡作者：張元，國立彰化師範大學財務金融技術學系副教授，50074 彰化縣彰化市師大路 2 號，電話：04-7232105 轉 7350，E-mail: ccuecon@yahoo.com.tw。沈中華，國立臺灣大學財務金融學系教授，10617 臺北市大安區羅斯福路 4 段 1 號，電話：02-33661087，E-mail: chshen01@ntu.edu.tw。
投稿日期：民國 100 年 8 月 15 日；修訂日期：民國 100 年 11 月 14 日；
接受日期：民國 102 年 9 月 17 日。