When Corporate Social Responsibility Investment Hits the Sweet Spot: Evidence from Dividend Payouts*

Chii-Shyan Kuo** and Shih-Ti Yu***

Abstract

The present study examined the association between corporate social responsibility (CSR) investment and dividend payout ratios. The study adopted a lending-bank perspective. In total, 1,140 listed firms in Taiwan were included in the analysis. The optimal level of CSR investment was identified. Across the overall sample, CSR investment was positively associated with dividend payout ratios. When CSR investment exceeded the optimal level, this association was nonsignificant. Notably, CSR investment was significantly and positively associated with dividend payouts when at or below the optimal level. These findings suggest that CSR investment can enhance profitability and increase dividend payouts when it does not exceed the optimal threshold.

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I. Introduction

The association between corporate social responsibility (CSR) investment and dividend payouts has not been conclusively demonstrated using empirical evidence. Some studies have suggested that companies with stronger CSR involvement pay higher dividends and have greater firm value (Rakotomavo, 2012; Cheung et al., 2018). Other studies have suggested that overinvestment in CSR, which is often linked to strict CSR disclosure requirements, reduces dividend payouts (Ni and Zhang, 2019) and shareholder value (Liu et al., 2020).

These inconsistencies in the literature reflect the diverse motivations for making CSR investments. Godfrey (2005) proposed the optimal level of CSR from a risk mitigation perspective. Ideally, a firm's social investments should not exceed the necessary amount to protect its risky assets from potential losses. However, managerial self-interest may lead to overinvestment in philanthropy (Bartkus et al., 2002) and CSR activities in general (Harjoto and Jo, 2015). Extending Godfrey's perspective, the present study identified the optimal level of CSR investment—at which the marginal benefits of additional investment equal the marginal costs—and distinguished between moderate CSR investment (below the optimal level) and excessive CSR investment (above the optimal level) to provide insights into the association between CSR investment and dividend payouts. Specifically, this study addressed two research questions. First, how is CSR investment associated with dividend payouts when CSR

investment is below or at the optimal level? Second, how is CSR investment associated with dividend payouts when such investment exceeds the optimal level?

To answer these questions, we first examined two competing views of the CSR–dividend association: the value-enhancement view and the value-reduction view. The value-enhancement view suggests that firms with greater CSR investments are likely to experience increases in cash flows or profitability that can be distributed to shareholders (Rakotomavo, 2012; Cheung et al., 2018). Additionally, higher CSR investment levels can help establish more stable relationships with governments and communities, reducing the risk of litigation and sanctions that could negatively affect profitability (Dhaliwal et al., 2011; Sharfman and Fernando, 2008). Moreover, studies have indicated that firms with superior CSR performance have lower debt-related (Ye and Zhang, 2011; Goss and Roberts, 2011; Ge and Liu, 2015), equity-related (Dhaliwal et al., 2011; El Ghoul et al., 2011), and overall capital (Sharfman and Fernando, 2008) costs.

CSR can influence dividend payouts through various channels, particularly earnings. Through earnings, CSR can affect profitability, which influences dividend policies (Cheung et al., 2018). Studies have also revealed that earnings are a key determinant of dividend payouts (Gul, 1999; Michaely and Roberts, 2012). CSR can enhance earnings by improving employee retention (Greening and Turban, 2000), fostering customer loyalty (Sen and Bhattacharya, 2001), increasing demand for products (Navarro, 1988), and enhancing access to valuable resources (Cheng et al., 2014). The value-enhancement view posits that these benefits flow to shareholders in the form of higher earnings and dividend payouts, creating a win-win scenario for both shareholders and stakeholders (Statman, 2000). The value-enhancement view thus predicts a positive association between CSR investment and dividend payouts.

The value-reduction view considers CSR as an investment in projects with negative net present value that reduces firm profitability and shareholder value (Ye and Zhang, 2011; Ni and Zhang, 2019; Liu et al., 2020). This perspective argues that managers may overinvest in CSR to enhance their reputations or status with stakeholders (Barnea and Rubin, 2010; Brown et al., 2006). Similarly, top executives may engage in CSR activities for the sake of appearances alone that yield little or no economic benefit to the firm (Surroca and Tribó, 2008).

Furthermore, mandatory CSR disclosures can shift power toward stakeholders, undermining shareholder value (Ni and Zhang, 2019). Studies have also revealed that shareholders often view high levels of charitable giving as an overinvestment in CSR that can damage firm value (Ye and Zhang, 2011) or lead to ethical violations (Godfrey, 2005). The value-reduction view predicts a negative association between CSR and dividend payouts through the adverse effects of CSR on the earnings channel.

In summary, the value-enhancement view predicts a positive association between CSR investments and dividend payouts, whereas the value-reduction view suggests a negative association. The exact nature of this association remains poorly understood. Nevertheless, what constitutes moderate versus excessive CSR investment must be defined before testable hypotheses can be formulated to explore this association.

To assess how CSR investments enhance or reduce firm profitability and affect dividend payouts, we examined the unique monitoring role of banks in the private debt market. Research (Goss and Roberts, 2011) has demonstrated that banks can differentiate between CSR initiatives that genuinely align shareholder value with societal benefits and those that may reduce firm value. The finance literature suggests that compared with other stakeholders, banks have superior access to private information regarding firms because of their monitoring role. This information asymmetry results in a more efficient loan market, with banks more able than public lenders to adjust for the risks associated with CSR investments. Goss and Roberts (2011) suggested that banks are among the most well-placed stakeholders to evaluate firm-level CSR initiatives and that their evaluations are reflected in the terms of bank loans.

By distinguishing between acceptable and excessive levels of CSR investment, we proposed two directional hypotheses regarding the association between CSR investment and dividend payouts. First, moderate CSR investment (below the optimal level) increases firm profitability and dividend payouts (H1). Second, excessive CSR investment (above the optimal level) reduces firm value and dividend payouts (H2).

To test these hypotheses, we collected data on firms listed on the Taiwan Stock Exchange (TSE) and Taiwan's over-the-counter (OTC) markets between 2015 and 2020, using an ordinary least squares (OLS) regression with standard errors adjusted for heteroskedasticity

and clustered at the firm level. The final dataset comprised 5,572 firm-year observations representing 1,140 distinct firms. First, we determined that bank borrowing rates (*SPREAD*) followed a U-shaped pattern in relation to CSR, with the optimal level of CSR investment occurring at a CSR score of approximately 13. We also observed that for the full sample, dividend payouts (*PAYOUT*) increased by 1% when the CSR value increased by 1, a result that was significant at the 1% level. Although this finding supports the value-enhancement view, the economic effects of CSR on *PAYOUT* appear to be modest, possibly because of an offsetting of positive and negative effects.

To test H1 and H2, we regressed *PAYOUT* on *CSR* and other factors, limiting the *CSR* variable to values ≤ 13. The results reveal that for every unit increase in *CSR*, *PAYOUT* increased by 1.768%, 1.230%, and 1.217% in subsamples where the *CSR* value was ≤ 11, ≤ 12, and ≤ 13, respectively. All findings were statistically significant at the 1% level, suggesting a positive association between *CSR* and *PAYOUT* when *CSR* investments are below the optimal level, supporting H1.

To test H2, we restricted the *CSR* variable to values > 13. In these tests, we observed that for every unit increase in *CSR*, *PAYOUT* decreased by 0.847% and 4.258% for *CSR* values of > 13 and > 14, respectively, although none of these results was significant. This finding suggests that no significant association exists between *CSR* and *PAYOUT* when CSR investment exceeds the optimal level, supporting H2.

Overall, the analysis results reveal that when *CSR* is below the optimal level, the positive effect of *CSR* on *PAYOUT* increases as firms reduce *CSR* from 13 to 11. This finding suggests a strong positive association between *CSR* and *PAYOUT* before *CSR* reaches its optimal level, with the positive association disappearing once *CSR* exceeds this level.

To address concerns related to zero-inflated *PAYOUT* data, we applied a Tobin (1958) model. For the full sample, the model revealed that a one-unit increase in *CSR* led to a 1.733% increase in *PAYOUT*, a result significant at the 1% level. Notably, this effect was greater than that observed in the OLS model. Additionally, *PAYOUT* decreased by 0.758% and 4.953% for CSR levels of > 13 and > 14, respectively, supporting H2. For firms with *CSR* levels of > 14, the negative association between *CSR* and *PAYOUT* was significant at the 10% level in a

one-tailed test. Finally, when *CSR* increased by 1, *PAYOUT* increased by 2.486%, 1.811%, and 1.852% for firms with CSR values of ≤ 11, ≤ 12, and ≤ 13, respectively, all significant at the 1% level, supporting H1. The magnitude of the positive effect and its significance were thus more pronounced in the Tobit model than in the OLS model. Moreover, firms with CSR values of ≤ 11 exhibited an approximately 10% increase in *PAYOUT* when CSR moved from the first quartile (7.0) to the third quartile (11.0). Because the mean *PAYOUT* was 50% for the full sample, this increase represented 20% of the average dividend payout ratio, a substantial economic gain.

We next conducted a robustness check. We investigated the nonlinear association between CSR investment and dividend by adopting a panel threshold regression model, following the recommendations of Hansen (1999, 2000). This approach enabled us to identify endogenous cutoff points in the data where the CSR–PAYOUT relationship undergoes substantial changes. The results of our analysis revealed two thresholds (CSR = 11 and CSR = 13), dividing the sample into three regimes: CSR ≤ 11, 11 < CSR ≤ 13, and CSR >13. The results indicate the lack of significant differences in the CSR–PAYOUT association between the first two regimes, suggesting the absence of a meaningful threshold effect at CSR = 11. However, a regime change occurred at CSR = 13, when the association between CSR and PAYOUT changed. These findings reinforce our earlier conclusions, emphasizing the nuanced role of CSR in shaping dividend payout decisions at varying investment levels.

Extending the identified nonlinear association between CSR investments and dividend payouts, we further investigated their dynamic interactions over time. Specifically, we employed a panel vector autoregression model with two lags for both *CSR* and *PAYOUT*. The results suggest that when CSR investments are optimal, *CSR* and dividend policies positively reinforce each other. However, when CSR spending is excessive, dividends are a control mechanism that curbs overinvestment. These findings underscore the importance of adopting a balanced and strategic CSR investment approach that supports firm profitability and shareholder interests.

This study contributes to the literature on CSR and dividend policy in several respects. First, we extend the findings of Benlemlih (2019) and Cheung et al. (2018), who focused on

overall CSR investments or individual CSR dimensions and revealed that firms engaged in CSR tend to pay more dividends. The present study is also similar to that of Jian and Lee (2015), who used a CSR expectation model to differentiate between expected and abnormal CSR investments but did not explore dividend policy. In contrast to Jian and Lee's approach, the present study adopted a lending-bank perspective, differentiating between moderate and excessive CSR investments to examine their effects on a firm's dividend policy. Theoretical arguments suggest that CSR can have two competing effects on dividend payouts; nevertheless, research has often explored only the net effect of CSR investment. This study provides a more detailed examination by demonstrating that CSR investment's influence on dividend payouts varies depending on whether such investment is below or above the optimal level. By distinguishing between moderate and excessive CSR, this study enables the prediction of how CSR investments may influence a firm's dividend policy.

Second, studies have indicated that strong CSR performance can reduce corporate bond yield spreads (Ge and Liu, 2015) or the cost of debt (Ye and Zhang, 2011) when CSR investments remain below the optimal level. Nevertheless, research has indicated that public debtholders are more diverse than banks and thus exercise less oversight over firms' managerial decisions. Following Goss and Roberts (2011), the present study used bank loan spreads to differentiate between moderate and excessive CSR investments. Goss and Roberts (2011) also demonstrated that banks bear less CSR-driven financial risk when firms invest in CSR at below-optimal levels. Hence, the positive association between CSR investment and dividends observed below optimum CSR investment levels suggests that CSR can enhance value for shareholders (Benlemlih, 2019; Cheung et al., 2018). Therefore, the findings of this study offer insights into how CSR investments reach the "sweet spot" at which the marginal benefits equal the marginal costs of additional CSR investment, aligning the interests of shareholders and creditors (i.e., banks).

The remainder of the study is organized as follows: Section 2 reviews the literature and develops the hypotheses, Section 3 explains the research design and methodology, Section 4 details the data sources, Section 5 presents the empirical findings, Section 6 reports the results of additional tests, and Section 7 presents the conclusions.

II. Literature and Hypothesis Development

A. Institutional Background of CSR Reporting Guidelines in Taiwan

In February 2010, the TSE introduced its Corporate Social Responsibility Best Practice Principles to guide listed companies in disclosing their CSR activities. In October 2011, the TSE encouraged all publicly traded firms to adopt the Global Reporting Initiative G3 Guidelines. Despite these efforts, by the end of 2011, only a few Taiwanese companies had acted to issue CSR reports. According to the TSE, only 31 TSE-listed firms, 1 firm from the OTC market, and 21 unlisted firms had published standalone sustainability reports on their websites.

To enhance corporate governance and align Taiwan's practices with global standards, the Financial Supervisory Commission launched its 2013 Blueprint for Enhancing Corporate Governance, outlining a 5-year plan to enhance governance in Taiwanese companies. As part of this initiative, the TSE issued a recommendation in June 2014 urging all listed firms to follow the updated Global Reporting Initiative G4 Guidelines when disclosing their CSR information.

In September 2014, the Financial Supervisory Commission mandated that specific listed companies publish annual CSR information beginning in 2015. This regulation applies to companies in sectors such as chemicals, finance, and food processing, as well as firms where more than 50% of the sales revenue is earned from beverages and food or those with paid-in share capital exceeding NT$10 billion (approximately US$310 million).

B. Association Between CSR and Dividend Payouts

Research on CSR has traditionally focused on its relationship with firm performance (Margolis and Walsh, 2003; Margolis et al., 2007; Kuo et al., 2019). The literature has also begun to explore CSR's influence on various aspects of corporate finance, such as information asymmetry (Dhaliwal et al., 2011), capital costs (El Ghoul et al., 2011; Benlemlih, 2019), and debt maturity (Benlemlih, 2017). However, although dividends are a crucial common form of payout, few studies have investigated how CSR investment affects dividend policy.

The literature offers two views on the link between CSR investments and dividend payments. The first perspective, the value-enhancement view, suggests that firms with a strong focus on CSR can enhance cash flows or profits, enabling larger dividend distributions to shareholders (Cheung et al., 2018). Similarly, Rakotomavo (2012) demonstrated that CSR efforts often coincide with increased dividends because CSR can increase a firm's stock value. Moreover, greater CSR engagements can strengthen relationships with governments and communities, mitigating the risk of legal actions or sanctions that could reduce profitability (Sharfman and Fernando, 2008; Dhaliwal et al., 2011).

Studies have further indicated that firms with superior CSR performance have lower equity costs (Dhaliwal et al., 2011; El Ghoul et al., 2011), borrowing costs (Ye and Zhang, 2011; Goss and Roberts, 2011; Ge and Liu, 2015), and costs of capital (Sharfman and Fernando, 2008). The earnings channel is the primary mechanism through which CSR influences dividend payments. By enhancing CSR investment, companies can retain talented employees (Greening and Turban, 2000), foster customer loyalty (Sen and Bhattacharya, 2001), stimulate demand (Navarro, 1988), and secure access to valuable resources (Cheng et al., 2014). The value-enhancement view posits that these advantages benefit shareholders in the form of higher earnings and greater dividends, creating a mutually beneficial scenario for shareholders and stakeholders (Statman, 2000). Consequently, the value-enhancement view suggests a positive association between CSR investment and dividend payouts.

The alternative perspective, the value-reduction view, argues that CSR may entail investments in projects with a negative net present value, reducing firm profitability and shareholder value (Ye and Zhang, 2011; Ni and Zhang, 2019; Liu et al., 2020). This view maintains that managers may allocate excessive resources to CSR, diverting wealth from shareholders to stakeholders. For example, one study suggested that managers may derive personal advantages from involvement in CSR, rendering CSR a disguised agency cost (Barnea and Rubin, 2010). Brown et al. (2006) contended that charitable contributions may enable managers to gain a reputation for social responsibility at shareholders' expense, with CSR activities serving to enhance managerial image.

Managerial self-interest can also drive excessive investment in philanthropy (Bartkus et al., 2002) and CSR initiatives more broadly (Harjoto and Jo, 2014). Executives may pursue CSR for symbolic purposes with minimal or no economic value for a firm (Surroca and Tribó, 2008). Ni and Zhang (2019) demonstrated that mandatory CSR disclosure can compel companies to reveal excessive CSR-related information, shifting influence toward stakeholders and potentially adversely affecting shareholders. Similarly, Liu et al. (2020) revealed that excessive CSR spending can reduce firm value. Other studies have indicated that shareholders may disapprove of high expenditures on CSR if they perceive them as exceeding the optimal level, negatively affecting firm value (Ye and Zhang, 2011) or leading to ethical concerns (Godfrey, 2005). Consequently, the value-reduction view suggests an inverse association between CSR investments and dividend distributions through the effects of CSR on the earnings channel.

In conclusion, the value-enhancement and value-reduction views suggest conflicting associations between CSR investments and dividend payments, and this association remains poorly understood. However, to establish hypotheses that can be tested to explore this association, we must first distinguish between acceptable and excessive CSR spending.

To make this distinction, we referred to the unique oversight function of banks within the private debt market. Research (Goss and Roberts, 2011) has revealed that banks can distinguish between CSR initiatives that truly align shareholder value with societal benefits and those that reduce firm value. Banks monitor firms differently than other stakeholders do because lenders

face asymmetric risks tied to the firm's net assets and thus have strong motivations to discourage managers from undertaking excessively risky projects (Ge and Liu, 2015).

Banks also have a distinct advantage in overseeing company operations and investment strategies because of their access to private information and established relationships with borrowing firms (Goss and Roberts, 2011). Consequently, the private loan market possesses higher informational efficiency than the public debt market does, enabling banks to more easily evaluate the effects of CSR activities. As Goss and Roberts (2011) observed, banks may be among the most qualified stakeholders to appraise a company's CSR efforts, and these evaluations are reflected in the conditions of bank loans.

With the ability to separate acceptable from excessive CSR investments provided by bank evaluations, we proposed two testable hypotheses regarding the association between CSR and dividend distributions.

On the basis of the value-enhancement view, we proposed the following hypothesis:

H1: CSR investment at or below the optimal level is positively associated with dividend payouts.

On the basis of the value-reduction view, we proposed the following hypothesis:

H2: CSR investment that exceeds the optimal level is negatively or nonsignificantly associated with dividend payouts.

III. Research Design and Methodology

A. Distinguishing Between Overinvestment and Underinvestment in CSR

We estimated the following regression to identify companies that overinvest in CSR versus those that underinvest:[1]

$$\begin{aligned} SPREAD_{it} = {} & \beta_0 + \beta_1 CSR_{it} + \beta_2 (CSR_{it})^2 + \beta_3 SIZE_{it} + \beta_4 CAP_{it} + \beta_5 MB_{it} + \beta_6 SALGW_{it} \\ & + \beta_7 VOL_{it} + \beta_8 AGE_{it} + \beta_9 LNTERM_{it} + \beta_{10} SECUR_{it} + \beta_{11} SYN_{it} \\ & + Industry\ dummies + Year\ dummies + \varepsilon_{it} \end{aligned} \quad (1)$$

where *SPREAD* represents the adjusted cost of a bank loan, with *i* and *t* denoting firm *i* in year *t*. Detailed data on short- and long-term bank loan amounts and fixed or variable interest rates were sourced from the *Taiwan Economic Journal* (*TEJ*) database, which has tracked this information for public companies since 2013. The borrowing rates were adjusted according to the Taipei Interbank Offered Rate (*TAIBOR*), the standard interest rate for transactions among prime banks in Taiwan's interbank money market. Initially measured as a percentage, *SPREAD* was converted to basis points by multiplying the interest rate by 100.

To assess CSR investment, we created a CSR score for each company in the sample, using

[1] Because sample firms may acquire numerous loans from the same bank borrowing contracts in a given year, the loan terms set for the same company in the same year may be correlated. To address this concern, we used OLS with standard errors adjusted for firm clustering and heteroskedasticity.

firm-specific CSR-relevant information as a proxy for the degree of CSR investment. Since 2002, the *TEJ* has collected CSR data on public companies, guided by the International Organization for Standardization 26000 (ISO 26000) framework on social responsibility, which assesses seven key areas. The *TEJ* also adapts KLD's environmental, social, and governance metrics to add an eighth category (diversity). KLD stands for Kinder, Lydenberg and Domini (social ratings). The CSR metrics in the KLD database were originally compiled by KLD Research & Analytics, Inc. Appendix I provides the definitions of each dimension, the scoring range, and the measurement procedures for CSR scores.

The regression also incorporated the following financial and operational control variables: *SIZE*, defined as the natural logarithm of total assets; *CAP*, the ratio of property, plant, and equipment to total assets; *MB*, the market-to-book ratio, measured by market value divided by book value of common equity at year-end; *SALGW*, the annual sales growth rate, computed as the difference between current and previous year sales divided by prior year sales; *VOL*, the standard deviation of quarterly earnings per share (EPS) over the last 5 years; and *AGE*, representing the number of years since the company's initial public offering.

Additional loan-specific factors comprised *LNTERM*, the natural logarithm of loan maturity in months; *SECUR*, a binary variable set to 1 if a loan required collateral and 0 otherwise; and *SYN*, a binary variable set to 1 for syndicated loans and 0 for other loans. To account for fixed effects, industry and year dummies were also included.

The discussion in Section 2.2 suggested a U-shaped association between bank loan cost and *CSR*. To confirm this U-shaped association, we first ensured that the coefficient estimates β_1 and β_2 in Equation (1) were negative and positive, respectively. Second, we located the minimum point of cost of bank loans and defined the corresponding level of *CSR* as the optimal *CSR* value. To identify this value, we simply set the first derivative of *SPREAD* in terms of *CSR* to 0:

$$\beta_1 + 2 \cdot \beta_2 CSR = 0 \quad \text{or} \quad CSR = \left(\frac{-\beta_1}{2 \cdot \beta_2} \right)$$

This suggests that *SPREAD* is negatively associated with *CSR* when *CSR* is less than its optimal level, indicating CSR investment below the optimal level. By contrast, when *CSR* exceeds the optimal level, *SPREAD* is positively associated with *CSR*, indicating overinvestment in CSR.[2]

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[2] To the best of our knowledge, only two other studies have investigated the nonlinear association between CSR investments and bank loan costs (or debt financing costs): Ye and Zhang (2011) and Bae et al. (2018). Ye and Zhang (2011) focused on a specific dimension of CSR investments—corporate philanthropy—which they measured as corporate charitable donations scaled by sales. Their study examined the nonuniform association between CSR investments and debt financing costs. By contrast, Bae et al. (2018) adopted a more nuanced approach by incorporating multiple CSR-related variables, specifically CSR strengths (CSR-STR), the squared term CSR-STR², and CSR concerns (CSR-CON). This model enabled them to capture the U-shaped association between bank loan spreads and CSR investments. The present study followed Ye and Zhang (2011) in using a single CSR measure (a researcher-constructed CSR score) to explore the association between CSR investments and bank loan costs. The decision to use a single CSR variable was based on the assumption that the optimal level of CSR investments simultaneously reflects both favorable and adverse effects. Therefore, the estimated coefficient captures the net effect of CSR investments.

By contrast, Bae et al. (2018) specified their model to assess CSR-STR, CSR-STR², and CSR-CON. This approach enabled them to distinguish between the diminishing favorable effects of CSR-STR and the adverse effects represented by CSR-CON. The underlying assumption of their model is that CSR-STR alone determines the optimal level of CSR investments. Although the regression models differ in specification, reconciling the findings of Bae et al. (2018) with those of Ye and Zhang (2011) and the present study is straightforward. One method of reconciling the results is to incorporate the coefficient of CSR-CON (representing the adverse effects of CSR investments) when determining the turning point. Ultimately, the definition of the optimal level of CSR investments hinges on the underlying assumptions embedded in the model specifications.

B. Tests for H1 and H2

To test H1 and H2, we estimated the following regressions:

$$\begin{aligned} PAYOUT_{it} = {} & \beta_0 + \beta_1 CSR_{it} + \beta_2 ROA_{it} + \beta_3 REARN_{it} + \beta_4 MB_{it} + \beta_5 RET_{it} + \beta_6 LEV_{it} \\ & + \beta_7 CASH_{it} + \beta_8 CAP_{it} + \beta_9 SIZE_{it} + \beta_{10} BIG4_{it} + \beta_{11} RDEXP_{it} \\ & + \beta_{12} INDIR_{it} + \beta_{13} REPUR_{it} \\ & + Industry\ dummies + Year\ dummies + \varepsilon_{it} \end{aligned} \quad (2)$$

$$\begin{aligned} PAYOUT_{it} = {} & \beta_0 + \beta_1 CSR\_UDR_{it} + \beta_2 ROA_{it} + \beta_3 REARN_{it} + \beta_4 MB_{it} + \beta_5 RET_{it} \\ & + \beta_6 LEV_{it} + \beta_7 CASH_{it} + \beta_8 CAP_{it} + \beta_9 SIZE_{it} + \beta_{10} BIG4_{it} \\ & + \beta_{11} RDEXP_{it} + \beta_{12} INDIR_{it} + \beta_{13} REPUR_{it} \\ & + Industry\ dummies + Year\ dummies + \varepsilon_{it} \end{aligned} \quad (3)$$

$$\begin{aligned} PAYOUT_{it} = {} & \beta_0 + \beta_1 CSR\_OVR_{it} + \beta_2 ROA_{it} + \beta_3 REARN_{it} + \beta_4 MB_{it} + \beta_5 RET_{it} \\ & + \beta_6 LEV_{it} + \beta_7 CASH_{it} + \beta_8 CAP_{it} + \beta_9 SIZE_{it} + \beta_{10} BIG4_{it} \\ & + \beta_{11} RDEXP_{it} + \beta_{12} INDIR_{it} + \beta_{13} REPUR_{it} \\ & + Industry\ dummies + Year\ dummies + \varepsilon_{it} \end{aligned} \quad (4)$$

where *PAYOUT* represents the dividend payout ratio, calculated as dividends per share divided by *EPS*; *CSR* denotes the CSR scores determined in this study; and *CSR_OVR* and *CSR_UDR* represent CSR investment that exceeds or falls below the optimal level, respectively. The model reveals that *PAYOUT* can be influenced by a firm's financial surplus and flexibility. Cash and cash equivalents to total assets ratio (*CASH*) served as a measure of a firm's liquidity buffer, representing the financial surplus available relative to its total assets. This indicator captures a firm's ability to meet financial obligations and support dividend payouts.

Furthermore, debt ratio (*LEV*) was used as a proxy for financial flexibility. A lower debt ratio reflects a reduced reliance on debt financing and an enhanced capacity to raise external funds and maintain financial stability. Therefore, we included *CASH* and *LEV* in the model as controls.

Additionally, the model included several other control variables. *REARN* was defined as retained earnings relative to total assets. *RDEXP* was calculated by dividing research and development expenses by net sales. *INDIR* indicated the percentage of independent directors on the board. *REPUR* was defined as the dollar amount of share repurchases over total assets at year-end. The other control variables were defined as in Equation (1).

The significant positive β_1 value in Equation (2) is consistent with the findings of other studies (Cheung et al., 2018; Benlemlih, 2019). The significant negative β_1 value for *CSR_OVR* in Equation (3) supports H2. The significant positive β_1 value for *CSR_UDR* in Equation (4) supports H1.

IV. Data

We collected data from 2015 to 2020 to test our hypotheses. The sample begins with 2015 because this was the year during which most CSR information for the TSE and OTC listed firms became available. The sample ends with 2020 because this was the last year in which we conducted this study. CSR and financial data were sourced from the *TEJ* databank. The sample selection and distribution are presented in Table 1.

Panel A reveals that the number of firm-years for the 2015–2020 period is 7,035. The numbers of missing firm-years of data to measure CSR scores and missing firm-years of data on research and development expenses were 895 and 366, respectively. Additionally, the numbers of missing firm-years of data on annual stock return, market-to-book ratio, and dividend payout ratio were 129, 46, and 27, respectively. Hence, the final dataset comprised 5,572 firm-years representing 1,140 distinct firms. Panel B reveals that more than 30% of the

sample firms were members of the semiconductor, optoelectronics, and electronic parts and components industry sectors. Additionally, Panel C indicates that the observations were evenly distributed over the sample period.

Table 1 Selection and Distribution of Sample

Panel A: Sample Selection Criteria

		Num. of firm-years
Firms listed in the TSE and OTC markets over the 2015−2020 period, excluding financial institutions, insurance, and foreign companies.		7,035
Less:	Missing data to calculate CSR scores	(895)
	Missing annual stock return	(129)
	Missing market-to-book ratio	(46)
	Missing dividend payout ratio	(27)
	Missing research and development expense	(366)
Final data set (1,140 firms)		5,572

Panel B: Distribution of Firms by Industry

Ind. codes	Industry classification	Num. of firms	Percentage
1	Cement Manufacturing	7	0.61
2	Food Products	24	2.11
3	Plastic	18	1.58
4	Textile	45	3.95
5	Machinery	69	6.05
6	Electric Wires and Cables Manufacturing	13	1.14
8	Pottery and Ceramics Products	5	0.44
9	Pulp and Paper	6	0.53
10	Iron & Steel	37	3.25
11	Rubber	10	0.88
12	Automobile	24	2.11

Panel B: Distribution of Firms by Industry (Countinued)

Ind. codes	Industry classification	Num. of firms	Percentage
14	Building materials	67	5.88
15	Marine Shipping	17	1.49
16	Hotels, Restaurants & Leisure	27	2.37
18	Multiline Retail	18	1.58
20	Others	40	3.51
21	Chemicals	35	3.07
22	Biotechnology & Pharmaceuticals	72	6.32
23	Oil, Gas & Consumable Fuels	2	0.18
24	Semiconductor	98	8.60
25	Computer and Peripheral Equipment	79	6.93
26	Optoelectronic	89	7.81
27	Communications and Internet	60	5.26
28	Electronic Parts and Components	155	13.60
29	Electronic Products Distribution	24	2.11
30	Information Services	19	1.67
31	Other Electronics	60	5.26
32	E-commerce	14	1.23
33	Agricultural technology	4	0.35
34	Cultural & creative industry	2	0.18
Total		1,140	100.00

Panel C: Distribution of Observations Over Sample Period

Year	Num. of observations	%
2015	829	15.43
2016	868	16.27
2017	930	16.53
2018	966	17.44
2019	976	17.03
2020	1,003	17.30
Total	5,572	100.00

Panel A presents the process for data selection. Data were collected from publicly traded companies listed on the TSE and the OTC markets from 2015 to 2020. Stock returns and financial information were obtained from the *TEJ* database. The final sample comprised 5,572 firm-year observations covering 1,140 unique companies. Panel B presents the industry distribution of these firms using the TSE's industry coding. Panel C presents the distribution of observations from 2015 to 2020.

V. Empirical Results

A. Descriptive Statistics

As indicated in Table 2, the average *PAYOUT* was approximately 50%. We observed that the *PAYOUT* for the first quartile was zero, indicating that a nontrivial fraction of observations was centered on zero. This concern is discussed in greater detail in Section 6. Additionally, the mean and median of *CSR* were 9.14 and 9.00, respectively. Both are close to the midpoint of the range of *CSR* scores, indicating that the *CSR* scores were roughly symmetrically distributed. Return on Assets (*ROA*) averaged 7.02%, and retained earnings accounted for 3.93% of the

total assets on average. Additionally, *MB* was 1.77 on average, indicating that the sample firms typically exhibited growth potential. Moreover, the average annual stock returns (*RET*) and *LEV* values were 12.28% and 46.28%, respectively. On average, a firm's cash holdings accounted for approximately 16% of its total assets. The mean of *CAP* was 26.34%, suggesting that property, plant, and equipment accounted for approximately 26% of a firm's total assets. The average value of *BIG*4 was 0.87, indicating that the Big Four CPA firms audited 87% of the sample firms. Moreover, the means of *RDEXP* and *INDIR* were 4.04 and 32.64, indicating that on average, research and development expenses accounted for approximately 4% of net sales and that the ratio of the number of independent directors to board size was approximately one-third. *REPUR* averaged 0.15, indicating that the dollar amount of buyback accounted for merely 0.15% of total assets on average. Furthermore, the average *ZSCORE* was 2.77, suggesting that the sample firms had fair financial strength on average.

The lower panel of Table 2 reports the descriptive statistics of the loan characteristics. The mean of *SPREAD* was 71.57, indicating that the bank loan rates, after adjusting for the TAIBOR, were 71.57 basis points on average. The average amount of bank loans (*AMT*) was approximately NT$395,000. Moreover, the mean value of *TERM* was 30.64, suggesting that the loan term was approximately 2.6 years on average. Finally, the means for *SECUR*, *SYN*, and *TYPE* were 0.41, 0.07, and 0.70, respectively, suggesting that approximately 41% of the bank loans obtained by the firms had collateral requirements, 7% of the bank loans obtained by a firm were syndicated, and 70% of the bank loan borrowing rates were fixed.

The correlation coefficients between key variables are listed in Table 3. *PAYOUT* was positively correlated with CSR investment (*CSR*), firms' accounting- and market-based performance (*ROA* and *RET*), firms' retained earnings (*REARN*), cash holdings (*CASH*), and firm size (*SIZE*). Furthermore, *SPREAD* was negatively correlated with *CSR*, suggesting that higher *CSR* values were associated with lower bank loan borrowing rates before controlling for other factors. Finally, *SPREAD* was negatively correlated with firms' financial performance (*ROA* and *RET*), *CASH*, *CAP*, and *SIZE*, and positively correlated with *LEV*.

Table 2 Summary Statistics

Variables	N	Mean	Std. dev	25th percentile	50th percentile	75th percentile
Firm characteristics						
PAYOUT (%)	5,572	49.50	48.79	0.00	53.5	77.50
CSR	5,572	9.14	2.76	7.00	9.00	11.00
ROA (%)	5,572	7.02	8.67	2.79	6.94	11.50
REARN (%)	5,572	3.93	169.38	3.58	12.22	22.17
MB	5,572	1.77	2.24	0.91	1.32	1.97
RET (%)	5,572	12.28	46.77	−13.22	4.20	25.53
LEV (%)	5,572	46.28	16.25	34.38	46.31	57.29
CASH (%)	5,572	15.91	11.47	7.32	13.75	21.96
CAP (%)	5,572	26.34	17.38	13.02	24.29	37.91
SIZE	5,572	15.59	1.50	14.59	15.38	16.37
BIG4	5,572	0.87	0.34	1.00	1.00	1.00
RDEXP (%)	5,572	4.04	7.57	0.17	1.76	4.48
INDIR (%)	5,572	32.64	11.24	28.57	33.33	42.86
REPUR (%)	5,572	0.15	0.80	0.00	0.00	14.45
SALGW (%)	5,572	4.83	37.99	−10.68	0.55	11.65
VOL	5,572	0.59	0.81	0.24	0.39	0.69
ZSCORE	5,572	2.77	2.01	1.56	2.36	3.47
FORINV (%)	5,572	9.91	13.44	0.83	4.67	12.97
AGE	5,572	15.84	10.33	9.00	15.00	20.00
Loan characteristics						
SPREAD (basis points)	42,108	71.57	64.99	26.93	55.47	100.43
AMT($ Thousand)	42,108	394.94	2,127.64	30.00	91.71	271.00
TERM (month)	42,108	30.64	42.24	5.04	12.00	37.08
SECUR	42,108	0.41	0.49	0.00	0.00	1.00
SYN	42,108	0.07	0.26	0.00	0.00	1.00
TYPE	42,108	0.70	0.46	0.00	1.00	1.00

The sample contains 42,108 loan-year observations and 5,572 firm-year observations for the period 2015–2020. All variables are as defined in Appendix II.

Table 3 Correlation Coefficient Matrix

Variables		1	2	3	4	5	6	7	8	9	10	11	12
1	*PAYOUT*												
2	*CSR*	**0.166**											
3	*ROA*	**0.322**	**0.270**										
4	*REARN*	**0.091**	**0.083**	**0.302**									
5	*MB*	**–0.031**	0.002	**–0.038**	**–0.650**								
6	*RET*	**0.042**	**0.060**	**0.231**	0.016	**0.226**							
7	*LEV*	**–0.130**	–0.007	**–0.157**	**–0.075**	**0.065**	0.006						
8	*CASH*	**0.064**	0.016	**0.101**	**0.038**	**0.153**	**0.040**	–0.300					
9	*CAP*	**–0.064**	**0.083**	**0.120**	**0.042**	**–0.041**	**–0.051**	–0.065	**–0.197**				
10	*SIZE*	**0.179**	**0.498**	**0.280**	**0.175**	**–0.141**	**0.056**	0.231	**–0.181**	0.008			
11	*BIG4*	**0.095**	**0.189**	**0.174**	**0.106**	**–0.031**	0.018	–0.056	**0.132**	**0.038**	**0.122**		
12	*RDEXP*	**–0.141**	–0.017	**–0.271**	–0.020	**0.153**	**–0.033**	–0.214	**0.270**	0.012	**–0.192**	**0.029**	
13	*INDIR*	–0.015	0.074	0.026	–0.004	**0.065**	**0.069**	–0.009	**0.118**	0.012	**–0.078**	**0.091**	**0.085**
14	*REPUR*	–0.001	**–0.027**	–0.005	0.009	–0.008	**–0.052**	**–0.067**	**0.048**	–0.007	**–0.037**	–0.009	0.017
15	*SPREAD*	**–0.191**	**–0.205**	**–0.236**	**–0.037**	**–0.032**	**–0.034**	**0.171**	**–0.120**	**–0.078**	**–0.161**	**–0.095**	0.013
16	*SALGW*	0.007	–0.014	**0.146**	**–0.032**	**0.114**	**0.209**	**0.062**	–0.006	**–0.114**	0.026	–0.014	0.022
17	*VOL*	**–0.048**	–0.024	**0.098**	**0.028**	**0.085**	0.004	**0.031**	**0.098**	**–0.106**	**0.123**	**0.043**	0.009
18	*ZSCORE*	**0.206**	**0.125**	**0.454**	**0.119**	**0.262**	**0.218**	**–0.590**	**0.389**	**–0.113**	**–0.076**	**0.110**	**0.183**
19	*LNAMT*	**0.111**	**0.292**	**0.149**	**0.002**	**–0.068**	0.013	**0.204**	**–0.076**	–0.023	**0.592**	**0.076**	**–0.076**
20	*LNTERM*	**–0.075**	**–0.036**	–0.016	**–0.093**	0.029	–0.024	**0.059**	–0.017	**0.148**	**–0.063**	–0.014	**0.050**
21	*SECUR*	**–0.113**	**–0.222**	**–0.136**	–0.003	**–0.027**	**–0.041**	–0.011	**–0.069**	0.026	**–0.276**	–0.127	**0.033**
22	*SYN*	**–0.054**	**0.047**	–0.011	–0.004	–0.012	0.004	**0.065**	–0.021	**0.063**	**0.119**	0.018	0.013
23	*TYPE*	**–0.040**	**–0.090**	**–0.030**	**0.043**	**–0.041**	0.013	**–0.049**	0.012	–0.002	**–0.118**	0.001	0.001
24	*FORINV*	**0.096**	**0.327**	**0.280**	**0.039**	**0.136**	**0.041**	0.005	**0.098**	**–0.036**	**0.505**	**0.129**	0.016
25	*AGE*	–0.001	**0.120**	**–0.070**	0.013	**–0.108**	0.018	**0.101**	**–0.294**	0.023	**0.428**	**–0.114**	–0.191

Table 3 Correlation Coefficient Matrix (Continued)

Variables		13	14	15	16	17	18	19	20	21	22	23	24
14	*REPUR*	–0.006											
15	*SPREAD*	–0.020	–0.008										
16	*SALGW*	0.016	–0.016	**0.074**									
17	*VOL*	**0.031**	0.014	0.007	**0.055**								
18	*ZSCORE*	**0.066**	**0.037**	–0.170	**0.108**	**0.098**							
19	*LNAMT*	–0.002	–0.018	–0.133	**0.028**	**0.092**	**–0.083**						
20	*LNTERM*	**0.032**	–0.004	–0.008	**0.037**	0.024	**–0.060**	**0.101**					
21	*SECUR*	**0.035**	–0.002	**0.216**	**0.037**	0.002	**–0.072**	**–0.048**	**0.391**				
22	*SYN*	0.009	0.007	**0.089**	–0.011	–0.002	**–0.075**	**0.164**	**0.174**	**0.107**			
23	*TYPE*	**–0.027**	0.001	–0.017	–0.008	–0.014	–0.002	**–0.161**	**–0.098**	**0.053**	–0.013		
24	*FORINV*	**0.032**	–0.015	**–0.132**	**0.036**	**0.164**	**0.190**	**0.332**	**–0.034**	**–0.188**	**0.049**	**–0.071**	
25	*AGE*	**–0.221**	**–0.063**	–0.014	**–0.035**	**–0.066**	**–0.213**	**0.220**	**–0.085**	**–0.076**	0.005	**–0.034**	**0.127**

Bold type indicates significance at the 5% level or better. All variables are as defined in Appendix II.

B. Identification of Underinvestment and Overinvestment in CSR

The regression results of Equation (1) are listed in Table 4. The coefficient estimates for *CSR* and CSR^2 were –9.288 ($t = -2.99$) and 0.364 ($t = 2.25$); both were significant at the 5% level. This result demonstrates that *SPREAD* is a U-shaped function of *CSR*. The turning point or the lowest point of *SPREAD* was located when *CSR* reached approximately 13 (i.e., $9.288 \div (2 \times 0.364)$), which represents the optimal level of *CSR* investment.[3]

Notably, the marginal effects of *CSR* on *SPREAD* were economically minimal after controlling for other factors. *Ceteris paribus*, when *CSR* increased from 1 to 2, *SPREAD* decreased by approximately 8 basis points; and when *SPREAD* increased from 19 to 20,

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[3] To ensure that the functional form of Equation (1) was not misspecified, we conducted two widely adopted tests for functional form misspecification in the regression model: Ramsey's RESET (Regression Specification Error Test; Ramsey, 1969) and the Link test (Pregibon, 1980). Ramsey's RESET tests whether nonlinear combinations of the fitted values add explanatory power to the model, suggesting a functional form misspecification. The Link test evaluates whether the predicted values capture the entire relationship between the predictors and the dependent variable. The Link test assesses omitted variables or incorrect functional form. The *Stata* output for the Ramsey test revealed an F-value of 0.85 and a *p* value of 0.4689; values that did not reject the null hypothesis that the model had no omitted variables. Additionally, the *Stata* result of the Link test indicated that the *t*-value of *_hat* (predicted values) was 20.97 and *_hatsq* (squared predicted values) was 0.22. The *t*-value of *_hat* was significant, suggesting the model is well-specified; *hatsq* was not significant, indicating that the model was not misspecified.

SPREAD increased by approximately 5 basis points. Nevertheless, the focus of this study is not how *CSR* affects *SPREAD*; rather, we employed Equation (1) simply to identify the optimal level of *CSR* investment from bankers' perspectives.[4]

C. Test Results for H1 and H2

To test H1 and H2, we estimated Equations (2), (3), and (4); results are listed in Table 5. Column (1) presents the results for the full sample. The coefficient estimate for *CSR* was 1.001 (t = 3.93), which was significant at the 1% level. This finding suggests that when *CSR* increased by 1, *PAYOUT* increased by approximately 1%. Because the effects of CSR investment on *PAYOUT* may be positive or negative, the results for the full sample exhibited an offsetting effect.

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[4] Goss and Roberts (2011) demonstrated that low-quality borrowers face higher loan spreads as their investments in CSR strengths increase. They attributed this finding to the overinvestment hypothesis. Specifically, they observed that a one-unit increase in CSR strength (i.e., overinvestment in CSR) led to a 3.3% increase in loan spread (Goss and Roberts, 2011). We log-transformed *SPREAD* and re-estimated Equation (1) to compare our findings with theirs. The untabulated results revealed that the coefficients for *CSR* and *CSR*^{2} are -0.166 $(t = -15.69)$ and 0.007 $(t = 12.33)$, respectively. These estimates suggest that *ceteris paribus*, when *CSR* increased from 13 to 14 (around the turning point of *SPREAD* at 13), the predicted change in *SPREAD* was approximately 0.023 (i.e., $-0.166 + 0.007 \times (14^2 - 13^2)$). This change translates into an incremental increase of approximately 2.3% in *SPREAD*. Notably, instead of using KLD CSR raw data, Goss and Roberts (2011) used a differently scaled CSR measure and principal component analysis, complicating direct comparisons of coefficient magnitude. Nevertheless, our findings align qualitatively with theirs, suggesting that overinvestment in *CSR* is associated with higher loan spreads.

Table 4 Results from Regression of Bank Loan Rates (*SPREAD*) on CSR, Determinants of Bank Loan Rates, and Other Controls

Indep. Var.	***SPREAD***	
CSR	–9.288	***
	(–2.99)	
CSR^2	0.364	**
	(2.25)	
SIZE	–4.636	***
	(–3.28)	
CAP	0.074	
	(0.60)	
MB	0.319	
	(0.38)	
SALGW	0.029	
	(1.28)	
VOL	–2.003	*
	(–1.84)	
AGE	0.271	
	(1.19)	
LNTERM	–6.491	***
	(–7.16)	
SECUR	20.667	***
	(9.45)	
SYN	31.611	***
	(9.70)	
Year effect	Yes	
Industry effect	Yes	
Adjusted R^2	0.192	
Number of obs.	43,310	

*, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively (two-tailed tests). Statistical significance is based on the heteroskedasticity-robust firm-clustered standard error; *t* statistics are reported in parentheses. All variables are as defined in Appendix II.

Table 5 Results of Ordinary Least Squares Regression of Dividend Payout Ratio (*PAYOUT*) on CSR and Other Controls

	PAYOUT					
Indep. Var.	(1) Full sample	(2) CSR ≤ 11	(3) CSR ≤ 12	(4) CSR ≤ 13	(5) CSR > 13	(6) CSR > 14
CSR	1.001 ***	1.768 ***	1.230 ***	1.217 ***	–0.847	–4.258
	(3.93)	(4.06)	(3.51)	(3.99)	(–0.45)	(–1.32)
ROA	1.425 ***	1.365 ***	1.445 ***	1.445 ***	0.300	0.002
	(17.16)	(14.15)	(15.96)	(16.84)	(0.59)	(0.00)
REARN	–0.006 *	–0.008 **	–0.007 *	–0.006	0.563 ***	0.758 **
	(–1.66)	(–1.98)	(1.76)	(–1.58)	(2.74)	(2.07)
MB	0.221	0.220	0.292	0.319	0.309	–0.717
	(0.76)	(0.66)	(0.91)	(1.03)	(0.32)	(–0.47)
RET	–0.038 ***	–0.028 *	–0.035 **	–0.036 ***	–0.042	0.027
	(–2.97)	(–1.88)	(–2.49)	(–2.65)	(–0.97)	(0.48)
LEV	–0.416 ***	–0.481 ***	–0.464 ***	–0.435 ***	0.113	0.245
	(–9.57)	(–9.51)	(–9.77)	(–9.67)	(0.66)	(0.57)
CASH	0.255 ***	0.277 ***	0.245 ***	0.268 ***	0.027	0.577
	(4.14)	(3.84)	(3.64)	(4.17)	(0.14)	(1.61)
CAP	–0.171 ***	–0.132 ***	–0.147 ***	–0.156 ***	–0.083	0.100
	(–4.14)	(–2.75)	(–3.24)	(–3.59)	(–0.52)	(0.46)
SIZE	2.807 ***	3.797 ***	3.145 ***	2.897 ***	2.556 *	1.048
	(5.55)	(5.48)	(5.24)	(5.29)	(1.66)	(0.62)
BIG4	6.245 ***	5.265 **	5.264 **	5.562 ***	22.422 **	31.203 **
	(3.19)	(2.48)	(2.59)	(2.80)	(2.14)	(2.08)
RDEXP	–0.483 ***	–0.539 ***	–0.498 ***	-0.495 ***	–0.129	0.799
	(–6.32)	(–6.43)	(–6.19)	(–6.31)	(–0.25)	(1.39)
INDIR	–0.084	–0.051	–0.061	–0.065	–0.449 **	–0.417
	(–1.38)	(–0.74)	(–0.92)	(–1.04)	(–2.17)	(–1.17)
REPUR	0.255	0.255	0.381	0.362	–1.332	10.529
	(0.38)	(0.35)	(0.54)	(0.53)	(–0.52)	(0.99)
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R^2	0.174	0.179	0.176	0.177	0.250	0.317
Number of obs.	5,572	4,352	4,814	5,159	413	184

*, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively (two-tailed tests). Statistical significance is based on the heteroskedasticity-robust standard error; *t* statistics are reported in parentheses. All variables are as defined in Appendix II.

As discussed in Section 5.2, the optimal level of *CSR* is 13; thus, we tested H1 by restricting *CSR* to values ≤ 13. We estimated Equation (3) for *CSR* ≤ 11, *CSR* ≤ 12, and *CSR* ≤ 13, and reported the results in Columns (2), (3), and (4), respectively. As indicated in Columns (2), (3), and (4), the coefficient estimates for *CSR* were 1.768 (t = 4.06), 1.230 (t = 3.51), and 1.217 (t = 3.99), respectively, and all were significant at the 1% level. These findings suggest that when CSR investments are below the optimal level, *CSR* is positively associated with *PAYOUT*, supporting H1. Additionally, the positive influence of *CSR* on *PAYOUT* increased when firms moderately reduced their CSR investment from 13 to 11. The results suggest that *CSR* strongly affected *PAYOUT* even before *CSR* reached the optimal level, and that the positive effect disappeared when *CSR* exceeded the optimal level.

When *CSR* was ≤ 11 and increased from the first quartile (7.0) to the third quartile (11.0), *PAYOUT* increased by approximately 7%. Nevertheless, we did not base our conclusions on this increase alone. Because the results reported in Table 5 are based on the results of an OLS and the zero-centered data concern noted in Section 5.1 was not considered, the coefficient estimates were potentially biased and inconsistent. We addressed this concern in Section 6.

We tested H2 by restricting *CSR* to values >13. We estimated Equation (4) for CSR > 13 and CSR > 14 and reported the results in Columns (5) and (6), respectively. Columns (5) and (6) reveal that the coefficients for *CSR* were −0.847 ($t = -0.45$) and −4.258 ($t = -1.32$), respectively. Both were negative and not significant at any conventional level, supporting H2.

VI. Robustness and Additional Tests

A. Tobit Model

The results reported in Table 2 indicate that the first quartile of *PAYOUT* is zero, suggesting that a crucial portion of the observations was centered on zero. This result could limit the dependent variable, potentially rendering the parameter estimates of the OLS biased

and inconsistent (Wooldridge, 2016). To address this concern, we employed a Tobin (1958) model, reconducted all tests, and reported the results in Table 6.

Column (1) of Table 6 presents the results of the full sample. The coefficient estimate for *CSR* was 1.733 (t = 4.92), which was significant at the 1% level. This finding indicates that when *CSR* increased by 1, *PAYOUT* increased by 1.733%, and the magnitude of the coefficient was greater than that for the analysis conducted using OLS.

We re-estimated Equation (4) for *CSR* > 13 and *CSR* > 14 and reported the results in Columns (5) and (6) of Table 6. Columns (5) and (6) reveal that the coefficients for *CSR* were −0.758 ($t = -0.37$) and −4.953 ($t = -1.53$), respectively. Both were negative, and the result for the subsample of *CSR* >14 was significant at the 10% level in a one-tailed test, supporting H2.

We also re-estimated Equation (3) for *CSR* ≤ 11, *CSR* ≤ 12, and *CSR* ≤ 13, respectively, and reported the results in Columns (2), (3), and (4). As indicated in Columns (2), (3), and (4), the coefficient estimates for *CSR* were 2.486 (t = 3.97), 1.811 (t = 3.62), and 1.852 (t = 4.27), respectively. All were significant at the 1% level. The findings exhibit similar patterns to those reported in Table 5. Nevertheless, all coefficient estimates and t statistics were greater than those presented in Table 5. After considering the zero-centered data problem, we observed that when *CSR* ≤11 and increased from the first quartile to the third quartile, *PAYOUT* increased by approximately 10%. The average *PAYOUT* for the full sample was approximately 50%; therefore, increasing *CSR* led to a 20% increase in *PAYOUT*.

B. Threshold Regression Model

The existence of a threshold value for *CSR* may influence the association between *CSR* and *PAYOUT*. The traditional linear assumptions may not hold if such a threshold exists, rendering classical regression methods inadequate. We adopted a panel threshold regression model following Hansen (1999, 2000) to address this concern. This approach enabled us to identify endogenous cutoff points in the data at which the *CSR–PAYOUT* association underwent substantial changes.

Table 6 Results of Tobit Regression of Dividend Payout Ratio (*PAYOUT*) on CSR and Other Controls

	PAYOUT					
	(1)	(2)	(3)	(4)	(5)	(6)
Indep. Var.	Full sample	CSR ≤ 11	CSR ≤ 12	CSR ≤ 13	CSR > 13	CSR > 14
CSR	1.733 ***	2.486 ***	1.811 ***	1.852 ***	–0.758	–4.953
	(4.92)	(3.97)	(3.62)	(4.27)	(–0.37)	(–1.53)
ROA	2.123 ***	2.334 ***	2.299 ***	2.248 ***	0.828	0.399
	(11.08)	(9.93)	(10.60)	(10.94)	(1.51)	(0.47)
REARN	1.612 ***	1.831 ***	1.779 ***	1.691 ***	0.695 ***	0.845 **
	(17.62)	(16.14)	(16.92)	(17.12)	(2.97)	(2.34)
MB	–4.812 ***	–6.721 ***	–5.813 ***	–5.231 ***	–0.822	–1.674
	(–6.05)	(–5.40)	(–5.25)	(–5.29)	(–0.79)	(–0.98)
RET	0.028	0.057 **	0.038	0.034	–0.026	0.039
	(1.37)	(2.20)	(1.59)	(1.52)	(–0.58)	(0.69)
LEV	0.099	0.045	0.071	0.080	0.187	0.238
	(1.35)	(0.49)	(0.84)	(1.03)	(0.99)	(0.58)
CASH	0.243 ***	0.283 **	0.229 **	0.255 **	–0.063	0.552
	(2.62)	(2.46)	(2.18)	(2.57)	(–0.31)	(1.60)
CAP	–0.232 ***	–0.217 ***	–0.216 ***	–0.214 ***	–0.155	0.076
	(–3.76)	(–2.81)	(–3.04)	(–3.18)	(–0.95)	(0.35)
SIZE	–0.704	–0.900	–1.319	–1.072	2.798 *	1.090
	(–0.92)	(–0.77)	(–1.35)	(–1.25)	(1.76)	(0.66)
BIG4	9.257 ***	8.600 **	8.187 **	8.731 ***	23.555 *	26.713 *
	(3.10)	(2.54)	(2.58)	(2.84)	(1.92)	(1.81)
RDEXP	–0.867 ***	–1.015 ***	–0.913 ***	0.919 ***	0.086	1.069 *
	(–4.72)	(–4.45)	(–4.43)	(–4.68)	(0.16)	(1.81)
INDIR	–0.147 *	–0.097	–0.110	–0.118	–0.567 **	–0.525
	(–1.71)	(–0.92)	(–1.15)	(–1.30)	(–2.55)	(–1.54)
REPUR	1.490	1.431	1.581	1.571	–0.997	10.465
	(1.55)	(1.30)	(1.50)	(1.57)	(–0.38)	(1.07)
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.052	0.058	0.056	0.054	0.035	0.044
Number of obs.	5,572	4,352	4,814	5,159	413	184

*, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively (two-tailed tests). Statistical significance is based on the heteroskedasticity-robust standard error; *t* statistics are reported in parentheses. All variables are as defined in Appendix II.

Using *Stata* software, we conducted a panel threshold regression with *CSR* as the threshold variable, identifying two thresholds (*CSR* = 11 and *CSR* = 13). These thresholds were used to divide the sample into three regimes: Regime 1 (CSR ≤ 11), Regime 2 (11 < CSR ≤ 13), and Regime 3 (CSR > 13). The results are presented in Panel A of Table 7.[5]

In Regime 1, the coefficient for CSR was 1.925 ($z = 4.93$), indicating a positive and statistically significant association between *CSR* and *PAYOUT* in low-*CSR* environments. The magnitude of this effect is consistent with that of the findings documented earlier for CSR ≤ 11. In Regime 2, the coefficient increased to 5.115 ($z = 1.61$). This estimate suggests a potentially stronger positive effect. Nevertheless, the effect was only marginally significant at the 10% level under a one-tailed test. Finally, in Regime 3, the coefficient for *CSR* was −2.984 (z = −1.07), suggesting that *CSR* may reduce *PAYOUT* in extremely high-CSR environments, although the result was nonsignificant. On average, the findings are consistent with the conclusions drawn in Section 5.3, in which *CSR* positively influenced *PAYOUT* in low-CSR environments but exerted diminishing or negative effects on payout in high-CSR environments.

To test the statistical significance of the threshold effects, we conducted Wald tests (Wald, 1943) to evaluate the equality of CSR coefficients across different regimes. Panel B of Table 7 presents the results. The first test examined whether the coefficients for CSR in Regimes 1 and 2 were equal. The result (χ^2 = 0.99, p = 0.31) indicates that the difference between the coefficients was nonsignificant, suggesting that no regime change occurred at *CSR* = 11. The second test compared the difference between the coefficients in Regimes 2 and 3, yielding χ^2 =

[5] In specifying the panel threshold model, we assumed that all control variables exerted stable and homogeneous effects on *PAYOUT* across *CSR* regimes, treating them as regime-invariant variables. However, certain control variables—such as *ROA*, *CAP*, and *CASH*—may theoretically influence *PAYOUT* differently across *CSR* thresholds. To test the robustness of this assumption, we conducted a sensitivity analysis by allowing *ROA*, *CAP*, and *CASH* to vary across regimes, reconducting the threshold regression. The results remained qualitatively consistent, reinforcing the validity of the primary findings.

3.68 (p = 0.05). This result provides moderate evidence at the 10% significance level that a regime change occurred at *CSR* = 13, indicating a significant threshold effect.

In summary, the findings suggest that the *CSR* coefficients were statistically indistinguishable between Regimes 1 and 2, indicating no significant threshold effect at *CSR* = 11. The *CSR–PAYOUT* association changed in Regime 3, with evidence supporting a regime change at *CSR* = 13. These results are consistent with the conclusions drawn in Sections 5.3 and 6.1, highlighting the nuanced role of *CSR* in influencing dividend payout as the value of CSR investment varied.

Table 7 Results of Threshold Regression of Dividend Payout Ratio (*PAYOUT*) on CSR and Other Controls and Wald Tests for Equality of CSR Coefficients

Panel A: Results from Threshold Regression

Indep. Var.	***PAYOUT***
ROA	1.401 ***
	(15.33)
REARN	−0.006
	(−1.09)
MB	0.305
	(0.75)
RET	−0.038 ***
	(−2.61)
LEV	−0.414 ***
	(−9.42)
CASH	0.259 ***
	(4.04)
CAP	–0.170 ***
	(–4.02)
SIZE	3.035 ***
	(5.55)
BIG4	6.065 ***
	(3.24)
RDEXP	–0.499 ***
	(–5.01)

Panel B: Results from Wald Tests

(1)Null: No regime switching

(Regime1 vs. Regime2)

$\chi^2(1) = 0.99$; $p = 0.31$

(2)Null: no regime switching

(Regime2 vs. Regime3)

$\chi^2(1) = 3.68$; $p = 0.05$

Panel A: Results from Threshold Regression (Countinued)

Indep. Var.	*PAYOUT*
INDIR	–0.082 *
	(–1.38)
REPUR	0.207
	(0.27)
Regime 1 where $CSR \leq 11$	
CSR	1.925 ***
	(4.93)
Regime 2 where $11 < CSR \leq 13$	
CSR	5.115 †
	(1.61)
Regime 3 where $CSR > 13$	
CSR	−2.984
	(−1.07)
Year effect	Yes
Industry effect	Yes
Number of obs.	5,572

*, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively (two-tailed tests). † indicates significance at the 10% level in a one-tailed test; *z*-statistics are reported in parentheses. All variables are as defined in Appendix II.

C. Granger Causality Association Between *CSR* and *PAYOUT*

This section investigates the temporal relationship between CSR investment and dividend payout decisions. Given the previously identified nonlinear association between these two variables, exploring their interaction over time is crucial. To address this interaction, we employed a panel vector autoregression model using two lags for both *CSR* and *PAYOUT*. The results are presented in Table 8.

Panel A reveals that when CSR was the dependent variable, the coefficients for both the lagged and the second-lagged CSR were nonsignificant. By contrast, the coefficient for the lagged *PAYOUT* was −0.007 (z = −2.39), which was significant at the 5% level and suggests that higher dividend payouts in the previous year constrained CSR investments. The second lag of *PAYOUT* also exerted a significant negative effect on CSR (−0.004, z = −2.63), reinforcing the argument that historical payout decisions can have a lingering effect on CSR investments. These findings are consistent with the agency conflict theory, which posits that dividend payouts reduce managerial discretion and mitigate the risk of overinvestment, including excessive CSR spending.[6]

When *PAYOUT* was the dependent variable, as indicated in the lower part of Panel A, the lagged values of *CSR* had no significant effect on *PAYOUT* (−0.069, z = −0.01 for the first lag and −0.266, z = −0.12 for the second lag). This result indicates that CSR investment did not meaningfully influence dividend payout decisions over time. However, a significant positive association existed between the first lag of *PAYOUT* and current *PAYOUT* (0.203, z = 2.68), suggesting persistence in payout policies. The second lag of *PAYOUT* was also nonsignificant, indicating that its effects diminished over time.

To determine whether *PAYOUT* could predict values of *CSR* (or vice versa) and establish a directional relationship between the two variables, we conducted a Granger causality test and

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[6] According to the agency conflict hypothesis, dividends can help reduce agency costs. Jensen (1986) argued that the availability of free cash flow often leads to conflicts between shareholders and managers. Managers may prioritize expanding a firm's size by pursuing risky projects and using all available cash. In this context, dividend payouts serve as a mechanism to limit discretionary funds that would otherwise be under managers' control. By distributing cash to shareholders, firms reduce the likelihood of overinvestment, including excessive CSR spending, which is often discretionary in nature (Vinjamury and Nattuvathuckal, 2024). This perspective suggests that *PAYOUT* may lead to Granger-caused CSR investments.

reported the results in Panel B. The test results rejected the null hypothesis that *PAYOUT* does not lead to Granger-caused CSR investment, a finding significant (χ^2 = 7.00, $p = 0.03$) at the 5% level, suggesting that past values of *PAYOUT* provided useful information in predicting CSR investments, assuming that past CSR investment remained constant. By contrast, the test failed to reject the null hypothesis that CSR investment does not lead to Granger-caused *PAYOUT* ($\chi^2 = 0.14$, $p = 0.93$), indicating that past CSR investments did not provide information for forecasting dividend payout decisions. This evidence suggests a unidirectional Granger causality from dividend payouts to CSR and the absence of such causality from CSR to dividend payouts.

Although contradictory at first glance, the Granger causality test findings can be reconciled through a nuanced understanding of the temporal dynamics between CSR investment and dividend payouts within different contexts and timeframes. The key to reconciling these results lies in the moderating role of financial resource constraints and managerial discretion. That is, CSR investment at or below the optimal level generates sufficient returns to maintain or increase dividends, benefiting both shareholders and stakeholders. However, managers with excess free cash flow and few constraints may engage in overinvestment, including excessive CSR expenditures. In such cases, dividend payouts serve as a discipline mechanism, constraining the resources available for discretionary activities, including those related to CSR.

In summary, our findings suggest that although CSR and dividend policies can positively influence each other when CSR investment is at the optimal level, dividends may also serve as a control mechanism, mitigating CSR overinvestment. This dynamic highlights the importance of a balanced and strategic approach to CSR investment that aligns with firm profitability and shareholder interests.

Table 8 Results of Panel Vector Autoregression Model Using Two Lags and the Granger Causality Test for the Association Between CSR Investment and Dividend Payout Ratio (*PAYOUT*)

Panel A: Results from Panel Vector Autoregression Model

Depend. Var.	**Indep. Var.**	**Lag**	**Coeff.**
CSR	*CSR*	1	−0.312
			(−1.11)
		2	−0.144
			(−1.82)
	PAYOUT	1	−0.007 **
			(−2.39)
		2	−0.004 ***
			(−2.63)
PAYOUT	*CSR*	1	−0.069
			(−0.01)
		2	−0.266
			(−0.12)
	PAYOUT	1	0.203 ***
			(2.68)
		2	0.036
			(0.89)
Number of obs.			2,315
Number of panels			869
Avg. number of time periods			2.66

Panel B: Panel Vector Autoregression–Granger Causality Wald Test Results

Null hypothesis	χ^2	**df**	***p-value***
PAYOUT does not Granger-cause *CSR*	7.00	2	0.03
CSR does not Granger-cause *PAYOUT*	0.14	2	0.93

*, **, *** indicate significance at the 10%, 5%, and 1% levels, respectively (two-tailed tests); *z*-statistics are reported in parentheses. All variables are as defined in Appendix II.

VII. Conclusion

We examined the association between CSR investment and dividend payout ratios using a sample of 1,140 listed firms in Taiwan, with the optimal level of CSR investment determined from the perspective of lending banks. The findings reveal a positive association between CSR investment and dividend payout ratios across the full sample. However, this association was nonsignificant when the *CSR* values exceeded the optimal level. Notably, *CSR* remained positively and significantly correlated with dividend payout ratios when the *CSR* value was at or below the optimal level. Additionally, the positive effect of *CSR* on *PAYOUT* was evident even before CSR investment reached the optimal level. These results suggest that CSR investment may enhance firm profitability and dividend payouts, particularly before reaching the point of diminishing returns.

Appendix I: Summary of Definitions, Score Ranges, and Dimension Evaluation Criteria

CSR scores range from 0 to 20 and are determined across 8 principal categories comprising a total of 15 specific dimensions. The definitions, score ranges, and evaluation criteria for each dimension are outlined as follows:

1. Labor Practices:

(1)**Employee Retention**: Firms with a turnover rate below the median for their industry and year receive a score of 1; otherwise, firms receive a score of 0.

(2)**Executive Pay Ratio**: Firms where executive compensation is below the median for the industry and year receive a score of 1; otherwise, firms receive a score of 0.

2. Corporate Governance:

(3)**Taiwan Stock Exchange Corporate Governance Score (0–6)**: Scores range from 6 for firms in the top 5% to 0 for those in the bottom 20%, calculated on the basis of governance ranking percentiles.

(4)**Corporate Social Responsibility (CSR) Assurance**: Firms using certified public accountants or authoritative organization assurance for CSR reporting receive a score of 1; all other firms receive a score of 0.

3. Consumer Concerns:

(5)**International Organization for Standardization (ISO) Certification**: Firms with ISO certification receive a score of 1; those without such certification receive a score of 0.

(6) **Made-in-Taiwan (MIT) Product Certification**: Firms with MIT Product certification receive a score of 1; otherwise, firms receive a score of 0.

(7) **Good Manufacturing Practice** (**GMP) Certification (Food or Drug)**: Firms with GMP certification are awarded a score of 1; otherwise, firms receive a score of 0.

4. Human Rights:

(8) **Equal Access Employment**: Firms employing staff with disabilities at or above the median rate for the industry-year receive a score of 1; otherwise, firms receive a score of 0.

5. Fair Operating Practices:

(9) **Legal Compliance**: Firms with no legal infractions within the year receive a score of 1; otherwise, firms receive a score of 0.

(10) **CSR Reputation**: Firms without negative CSR news throughout the year receive a score of 1; otherwise, firms receive a score of 0.

6. Community Engagement and Development:

(11) **Charitable Giving**: Firms making donations at or above the median for the industry-year receive a score of 1; otherwise, firms receive a score of 0.

7. Environmental Responsibility:

(12) **Carbon Emissions Reporting**: Firms disclosing carbon emissions information receive a score of 1; otherwise, firms receive a score of 0.

(13) **Green Mark Certification**: Firms holding Green Mark certification receive a score of 1; otherwise, firms receive a score of 0.

(14) **Water Use Disclosure**: Firms reporting water usage receive a score of 1; otherwise,

firms receive a score of 0.

8. Board Diversity:

(15) **Female Representation on the Board**: Firms with a proportion of female directors above the industry-year median receive a score of 1; otherwise, firms receive a score of 0.

Appendix II: Definitions of Key Variables

Dependent variables		
SPREAD	=	The borrowing cost of a bank loan is adjusted in accordance with the *Taipei Interbank Offered Rate* (*TAIBOR*), the standard interest rate for transactions among prime banks in Taiwan's interbank money market. Initially measured as a percentage, *SPREAD* is converted to basis points by multiplying the interest rate by 100.
PAYOUT	=	Dividend payout ratio, calculated as dividends per share divided by earnings per share.
Independent variables		
CSR	=	CSR score, as defined in Appendix I.
SIZE	=	The natural logarithm of total assets.
LEV	=	Total debt over year-end total assets.
CAP	=	The ratio of property, plant, and equipment to total assets.
CASH	=	Cash and cash equivalent divided by total assets.
ROA	=	Calculated as earnings before interest and taxes divided by total assets.
RET	=	Annual stock return.
MB	=	Measured by market value divided by book value of common equity at year-end.
SALGW	=	Computed as the difference between current and previous year sales, divided by prior year sales.
VOL	=	The standard deviation of quarterly earnings per share over the last 5 years.
LNTERM	=	The natural logarithm of loan maturity in months.
SECUR	=	A binary variable set to 1 if a loan requires collateral and 0 otherwise.
SYN	=	A binary variable set to 1 for syndicated loans and 0 for others.

(Countinued)

BIG4	=	A binary variable set to 1 if the auditor is one of the Big Four CPA firms and 0 otherwise.
AGE	=	The number of years since the company's initial public offering.
REARN	=	Retained earnings relative to total assets.
RDEXP	=	Calculated by dividing research and development expenses by net sales.
INDIR	=	The percentage of independent directors on the board.
REPUR	=	The dollar amount of share repurchases over total assets at year-end.

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最適企業社會責任投資水準：來自股利政策之證據 *

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摘　要

本研究以 1,140 家台灣上市櫃公司爲樣本，探討公司企業社會責任 (CSR) 投資與股利發放率之間的關係。本研究從銀行觀點來定位公司 CSR 投資之最適水準。研究發現，就整體樣本而言，CSR 與股利發放率呈正向關聯。再者，當 CSR 超過最適水準，CSR 與股利發放率間無統計相關。另外，當 CSR 低於或等於其最適水準，CSR 與股利發放率呈顯著正向關聯。最後，CSR 對股利之最明顯之正向影響發生在 CSR 達到最適水準之前。這些結果大體上與「當 CSR 不逾越最適水準之前提下，CSR 投資可強化公司獲利，因而可提高公司股利發放率之說法」相符。

關鍵詞：企業社會責任、股利政策、股利發放率

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