



Article

# Corporate Sustainability Performance and Firm Value through Investment Efficiency

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**Abstract:** This study investigates the influence of corporate sustainability performance (CSP) on firm value through investment efficiency. By applying a panel regression analysis using a large sample of 26,838 firm-year observations that represent 9218 Asian listed companies over the period of 2012–2019, we illustrate that high corporate sustainability performance (CSP) increases investment efficiency. This result coincides with both stakeholder theory and information asymmetry theory where economic, environmental, social, and governance involvements play a fundamental role in improving firm value. Our results further show that the social dimension significantly improves investment decisions, unlike dimensions associated with environment and governance, which show no significant effect on investment efficiency. These insights about the impact of CSP on investment decisions will be useful to stakeholders, decision-makers, policymakers, as well as academics to improve their awareness of the importance of corporate sustainability practices. Particularly, the positive relationship between the social dimension of CSP and investment efficiency should motivate managers to improve their corporate social responsibility policy formation and implementation, and the management of investment portfolios in enhancing firm value.

**Keywords:** corporate social sustainability performance; investment efficiency; firm value; Asian firms



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## 1. Introduction

The concept of corporate social responsibility (CSR) has broadened from the areas of ethics, governance, corporate philanthropy, and volunteerism to include sustainability, hence the term corporate sustainability. However, the academic community uses CSR, environment social governance (ESG), and corporate sustainability performance (CSP) interchangeably [1,2]. Corporate sustainability is an alternative to the traditional growth and profit-maximization model that benefits only the shareholders. While corporate sustainability recognizes that corporate growth and profitability are important, it also requires the corporation to pursue sustainable development, which balances the need for economic growth with environmental protection, social justice, and equity, hence, placing firms at an economic advantage by benefiting all stakeholders including shareholders.

In this study, our main objective is to explore the influence of corporate sustainability performance (CSP) in Asia on investment efficiency by which corporate value is generated. We further identify which individual components of CSP matter the most in improving investment efficiency. With more investors considering companies' corporate sustainability (economic, environmental, social, and governance) performance (CSP) when making their investment decisions, many companies worldwide, including those in Asia, have started to adopt stakeholder-oriented strategies to increase both the firm and social value. Corporations are now investing efforts in internal improvement in enhancing their corporate sustainability performance (CSP) to stay competitive. High CSP is associated with higher firm performance [3–5], easier access to finance [6], and lower cost of equity [7,8]. Hence,

the need for examining the effect of *CSP* on firm investment efficiency in Asia is timely. The existence of a research gap in examining the factors that affect investment efficiency is in need of further investigation, given the rapidly developing global conditions that require companies to make the right investment decisions. Further, empirical results suggest that the benefits to a firm of increased corporate sustainability involvement remain mixed.

The value-enhancing view based on the stakeholder theory posits that companies need to make efficient investment decisions whereby firms simultaneously create value for different stakeholder groups rather than merely those of shareholders [9,10]. High-*CSP* firms have been seen as strategically effective in meeting the demands of these diverse stakeholder groups [4]. Further, low information asymmetry between managers and stakeholders can reduce the costs of raising funds and efficient investment selection [11]. In fact, a firm engaged in corporate sustainability activities will enhance its long-term value through increased transparency by disclosing more transparent and reliable information, enhanced brand value, motivated employees, supportive corporate information, and a “greener” production process, among others. The study by [12] provides evidence that stakeholder relationship capability, because of equity of information and knowledge among stakeholders, enhances investment efficiency. Other studies by [13–16] have also found that higher-*CSR*-involvement firms experience lower information asymmetry and higher stakeholder relationships, hence increasing investment efficiency.

In contrast, the agency theory argues that managers with high *CSR* involvement are self-interested and tend to invest inefficiently to expropriate some firms’ existing resources. Refs. [11,17–19] are some studies that raise the problem of information asymmetry between management and financial institutions and agency conflicts between management and shareholders, which likely increase investment inefficiency. Other scholars [20,21] also argue that companies with high *CSP* involvement are more likely to create a competitive disadvantage compared to their less socially responsible counterparts due to its unnecessary costs, and the conflict created between different stakeholders.

Our study provides new findings to bridge the gap in the general corporate sustainability literature relative to the lack of consensus on the investment efficiency impacts of *CSP*. In light of the rapidly changing landscape of *CSP* in Asia, this study contributes to the body of knowledge by extending key dimensions in the literature in investigating the influence of corporate sustainability performance on investment efficiency in Asian markets. This enhances generalisability compared to single-market studies. We further identify which dimensions of *CSP* (environmental, social, and governance) best improve investment efficiency by which firm value is generated. The need for *CSP*–investment-efficiency relationship research in Asia is deemed important as Asia’s economic transformation in recent decades has been unprecedented in pace and scale, which has attracted increased participation by foreign and domestic investors. According to UNCTAD’s World Investment Report 2022, foreign direct investment (FDI) in developing countries in Asia increased by 19% to an all-time high of USD619 billion in 2021 [22]. More than 80% of FDI inflows went to China as the main recipient, followed by Hong Kong (China), Singapore, India, United Arab Emirates, and Indonesia.

Finally, the findings in this study have important practical implications for investors and policymakers. Given the importance of investment as both the determinant of growth and as a major determinant of the return on capital obtained by investors, our work contributes to the investment community which will benefit from an improved understanding of how enhancing *CSP* activities will influence investment activities in the Asian market. These insights about the impact of *CSP* on investment decisions will also be useful to policymakers to construct a *ROADmap* for reform priorities. As our results show that the social dimension significantly improves investment decisions, policymakers should focus on the social dimension to improve the overall performance of sustainability. Policymakers need to ensure that companies are dedicated to taking good care of people inside and outside the business, such as the stakeholders, employees, and the local community.

Our result coincides with both stakeholder theory and information asymmetry theory where economic, environmental, social, and governance involvements play a vital role in investment efficiency. In other words, firms with high CSP activities enjoy low information asymmetry and high stakeholder solidarity, hence improving firm decisions to invest in profitable projects. Our results further show that the social dimension significantly improves investment decisions, unlike dimensions associated with environment and governance, which show no significant effect on investment efficiency. The results of this study highlight the important role that corporate sustainability performance plays in shaping firms' investment behaviour and efficiency across Asia.

The remainder of the article is organized as follows: the literature review and hypothesis development are described in Section 2, followed by the subsequent data and sample selection in Section 3, and methodology in Section 4. Section 5 provides a discussion of empirical results and Section 6 concludes and synthesises the study.

## 2. Literature Review and Hypotheses

### 2.1. Enhancing Corporate Value through Investment Efficiency

One of the critical factors for measuring the value of a firm is investment efficiency. Investment efficiency is an important concept that signifies the efficient use of resources and is a driving force for the survival and market development of a corporation. High-efficiency investment behaviour is conducive to gaining market opportunities, increasing competitiveness, and improving the efficiency of capital use. Indeed ref. [23] provides evidence that investment efficiency is one of the critical drivers for enhancing environmental, social, and governance (ESG) reporting. Particularly in Asian emerging economies, improving the efficiency of corporate investment is a particular concern as it contributes to corporate value [16]. Under the [24] paradigm, firms take up all projects with positive net present value (NPV) and reject all projects with negative present values. However, in the presence of market imperfection, capital market frictions, particularly asymmetries and agency problems, may impede corporate investment efficiency. As a result, firms might make suboptimal investment decisions: underinvestment and overinvestment. Underinvestment (investing less than the optimal level) is where firms reject investment opportunities with positive NPV; and overinvestment (investing more than the optimal level) is when there are many investments in different projects, sometimes even in projects with negative NPV, which damages the firm's value [25].

The information asymmetry model of [11] implies that information asymmetry between managers and shareholders can affect the cost of raising funds and project selection. Information asymmetry occurs when corporate managers have more information about companies and investment opportunities than outside capital providers, resulting in two problems: adverse selection and moral hazard. Ref. [11] claimed that adverse selection can lead to underinvestment and moral hazard can lead to overinvestment. The adverse selection model suggests that when managers are better informed than shareholders that capital instruments are overvalued, they are likely to raise capital by issuing new shares or bonds. However, shareholders tend to restrict firms' capital by discounting new security issues without knowing the potential profits of a new project. This increases the cost of capital and managers are reluctant to issue new securities at a discounted price even if it means passing up good investment opportunities, leading to underinvestment. Refs. [17–19,25,26] are among the studies that have provided supportive empirical evidence that information asymmetry may cause corporate managers to under- or overinvest, leading to suboptimal outcomes for firms.

Moral hazard is the risk that management has not entered a contract in good faith, and it arises from a separation of ownership and control. The agency models of [27] emphasise that managerial self-interest motives tend to maximise their welfare by making overinvestments that deviate from the goal of maximising the value of the enterprise which is not systematically in the interest of shareholders. That is, managers tend to invest in negative NPV projects when there is divergence in shareholders–managers incentives and

a lack of monitoring of managers. Alternatively, moral hazard can further exacerbate the agency problem, leading to overinvestment when managers have more resources. For example, ref. [28] argued that empire building and entrenchment motives lead managers with free CASH flow to overinvest. Managers tend to invest in large rather than profitable investment projects to impress shareholders with ostentatious project sizes. Empirical evidence from [29,30] are examples of studies that support the view that agency conflict is a principal source of investment inefficiency because of empire building.

## 2.2. Corporate Sustainability Performance and Investment Efficiency

In summary, the extant literature suggests that information asymmetry and separation of ownership and control (agency theory) between managers and shareholders can lead to investment inefficiency. The following section discusses how high-CSP firms that are associated with less information asymmetry and better management practices due to better stakeholders' consideration (stakeholder theory) can improve investment efficiency.

CSP reflects the continuing commitment by firms to foster their sustainability via sound business practices that promote accountability and information transparency and contribute to economic development while improving the quality of social life. In line with the stakeholder theory that a company is in essence "a nexus of a set of contractual relationships" among different stakeholders [31,32], managers in firms with high CSP activities considers firms' fiduciary and moral responsibilities to expand their attention to include the needs and contributions of multiple stakeholders. Refs. [4,14] argued that firms engaged in CSP activities that respond to the implicit claims of stakeholders will enhance their long-term value, which is more likely due to good investment efficiency.

Similarly, refs. [25,33,34] also argued that the implementation of CSP can also reduce asymmetries between firms and suppliers of capital. The usefulness of CSP information to capital providers is evident in reducing the cost of capital [8], increasing access to finance [6], and improving corporate control mechanisms, which prevent managers from expropriating investors' wealth [35]. Managers know more about the firm's CSP engagement in terms of its goal, plan program, and related activities than outsiders, hence information on a firm's CSP can be used as a signal of the firm's expected future prospects between the firm and outsiders. Outside capital providers will have more information to evaluate the return of investment opportunities; hence they will provide sufficient capital to invest in projects that enhance shareholder value. An improved corporate transparency through a better information environment and higher levels of monitoring of managerial actions reduces asymmetries between insiders and outsiders, and discourages managerial self-dealing, which again improves investment efficiency. Ref. [36] claimed that the transparency of the company with its stakeholders acts as a controlling tool for management to deviate management from making sub-optimal investment choices. Refs. [37,38] are among the studies that found an inverse relationship between CSR performance and information asymmetry.

More importantly, refs. [14,21,25,39] are among the studies that found CSR has a pronounced effect of enhancing efficient investment. Using a sample of 21,030 US firm-year observations over the 1998–2012 period, ref. [14] found strong evidence that high CSR involvement decreased investment inefficiency and consequently increases investment efficiency. Similarly, ref. [40] found that CSR involvement decreased investment inefficiency among Taiwanese firms during the period 2014–2017. In examining whether CSR disclosures influence corporate capital investment efficiency in nine Asian emerging markets, ref. [16] found that high CSR disclosure reduces underinvestment. Using Chinese A-share firms listed on the Shanghai and Shenzhen stock markets from 2018–2021, ref. [41] found that firms with greater environmental schemes experienced more efficient investments over the course of COVID-19. These results provide evidence that socially responsible firms have fewer agency problems, high stakeholder unanimity, and lower information asymmetry, thus enhancing investment efficiency.

Accordingly, we hypothesise that if the value-enhancing view of CSR dominates, high CSP involvement is positively associated with high investment efficiency.

**H1.** *High corporate sustainability performance is positively related to investment efficiency*

The use of an aggregate score might mask the effect of each CSP dimension on investment efficiency [14]. Hence, similar to [4,14], we seek to identify which individual dimensions of CSP (environmental, governance, and social) matter the most in enhancing investment efficiency. Corporate environmental practices include a production strategy that improves environmental performance, provides low-carbon products, and reduces greenhouse gas emissions and environmental pollution. Among the items to be disclosed in corporate environmental information, either as part of their CSR report or in a separate report, are company environmental protection policy, annual total energy consumption, emission/pollutant types, quantity, concentration, and production waste treatment. Based on GRI G4 Guidelines [42], social information to be disclosed is divided into sub-categories: (1) labour practice and decent work, (2) human rights, (3) society, and (4) product responsibility. Whilst standard components of corporate governance statements include disclosures regarding the board of directors (roles and responsibilities, independence, composition, among others), executive committees (remuneration, audit, governance, risk management), and codes of conduct and related policies.

Hence, our second hypothesis is as follows:

**H2.** *Individual components of corporate sustainability performance are positively related to investment efficiency***H2a.** *Environmental components of corporate sustainability performance are positively related to investment efficiency***H2b.** *Governance components of corporate sustainability performance are positively related to investment efficiency***H2c.** *Social components of corporate sustainability performance are positively related to investment efficiency***3. Data**

Our main data on corporate sustainability performance (CSP) for the period 2012 to 2019 are extracted from the Thomson Reuters ASSET4, now known as ASSET4/Refinitiv ESG [43]. The information on the control and dependent variables requiring the firm's financial statement items are also gathered from the same datastream. Our initial sample consists of 28,582 firm-year observations. We then matched these data against ASSET4 and CSP-related data, resulting in a final sample of 9218 Asian publicly listed companies with a total of 26,838 firm-year observations as shown in Table 1.

**Table 1.** Sample by Countries.

Countries	Number of Companies
CHINA	500
HONG KONG	1067
INDIA	532
INDONESIA	202
JAPAN	5201
KOREA (SOUTH)	712
MALAYSIA	286
PHILIPPINES	139
SINGAPORE	405
THAILAND	174
Total	9218

The Thomson Reuters ASSET4 database collects extensive sustainability data from international companies which are rolled up into various performance indicators and further aggregated into a framework of 18 categories. Then, category scores are grouped



into four pillars: governance, social, environmental, and economic performance. The environmental (*SUS\_ENV*) pillar measures various inputs on living and non-living natural systems such as emissions, pollution, and hazardous waste to avoid risk. The corporate governance (*SUS\_CG*) pillar measures corporate systems and processes to assure that the company's executives and board members perform in order to generate long-term shareholder value. The social pillar (*SUS\_SOC*) measures a company's capacity to generate trust and loyalty among employees, customers, and society. The economic pillar measures corporate abilities to efficiently use resources to generate a high return on investment and sustainable growth.

The scores or ratings in each pillar range from 0 (for companies that do not disclose the respective data) to the highest disclosure level of 100 (for companies that disclose every data point collected) [4]. The Thomson Reuters Asset 4 also provides the overall score of corporate sustainability performance (CSP) as the mean of the four pillars. The equal-weighted overall score implies that all pillar scores are of equal importance, thus reflecting a balanced view of corporate performance in the four pillars.

#### 4. Methodology and Regression Models

Investment efficiency measures the ability of the company to undertake those projects with positive net present value (NPV) and reject all projects with negative present values. Similar to the method adopted by previous studies, e.g., [14,21,25,40], investment efficiency is estimated as a function of growth opportunities measured by sales growth.

$$Investment_{i,t} = \beta_0 + \beta_1 Sales\ Growth_{i,t-1} + \varepsilon_{i,t} \quad (1)$$

where  $Investment_{i,t}$  is the total investment for firm  $i$  in year  $t$ , calculated as a net increase in property, plant and equipment, and intangible assets and scaled by the lagged book value of total assets of firm  $i$  in year  $t$  (similar to the measurement used by [40]).  $Sales\ growth_{i,t-1}$  is the percentage change in sales for firm  $i$  in year  $t - 1$  to  $t$ . We initially estimate Equation (1) cross-sectionally by year and industry. The absolute value of residuals from the regression model in Equation (1) is used as our proxy for deviations from the expected investments, that is, investment inefficiency (*INEFF\_INV*) in Equation (2). Higher absolute values of residuals represent higher levels of inefficient investment.

We analyse the impact of CSP on investment efficiency among Asian publicly listed firms using the following model with clustered robust standard errors to correct for cross-sectional and time-series dependence [42].

$$INEFF\_INV_{it}^j = \beta_0 + \beta_1 CSP \times \beta_2 SUS\_ENV_{it} + \beta_3 SUS\_CG_{it} \times \beta_4 SUS\_SOC_{it} + \beta_5 Size_{it} + \beta_6 ROA_{it} + \beta_7 FIN\_LEV_{it} + \beta_8 FIN\_PERF_{it} + \beta_9 INFOR\_ASY_{it} + \beta_{10} INV_{it} + \beta_{11} CFO_{it} + \beta_{12} SALEGROWTH_{it} + \beta_{13} AGE_{it} + \beta_{14} CASH_{it} + Year\ Dummies + Industry\ Dummies + Country\ Dummies + \varepsilon_{it} \quad (2)$$

where *INEFF\_INV* is the absolute value of the residuals from Model 1 in year  $t$ . A positive association between corporate sustainability performance (CSP) and inefficient investment (*INEFF\_INV*), the residual from the investment Model 1, indicates that CSP increases investment inefficiency. In contrast, a negative CSP–*INEFF\_INV* relationship suggests that CSP decreases investment inefficiency. That is, firms with higher CSP activities are expected to deviate less from inefficient investment and consequently have enhanced investment efficiency.

*SUS\_ENV* is the environmental score, which considers various inputs on living and non-living natural systems such as emissions, pollution, and hazardous waste. *SUS\_CG* is the corporate governance pillar, which measures a company's systems and processes which include, among others, information such as board structure and function, board committee activities, and company political involvement. *SUS\_SOC* is the social pillar, which measures a company's capacity to generate trust and loyalty with its workforce, customers' rights and complaints, and social issues such as human rights through its use of best management practices.

Data for *SUS-ENV*, *SUS\_CG*, and *SUS\_SOC* are obtained from the Thomson Reuters ASSET4 database. Each pillar score ranges between 0 and 100, with higher scores being more desirable in terms of corporate sustainability performance. Also, we used the aggregate measure (mean of the four pillars) provided by this database for the total corporate sustainability performance (*CSP*). Hence, the *CSP* reflects an equal-weighted rating of a company's financial performance in four areas: economic, environmental, social, and corporate governance pillars.

Since our hypothesis H1 predicts that *CSP* enhances investment efficiency, we expect  $B_1$  to be negative and statistically significant. Similarly, our hypotheses H2 (H2a, H2b, and H2c) predict that the individual components of corporate sustainability performance (environment, governance, and social) are positively related to investment efficiency. Hence, we expect  $B_2$ ,  $B_3$ , and  $B_4$  to have a negative and statistically significant effect on *INNEFF\_INV*.

To reduce the possibility that investment efficiency is a function of correlated omitted variables, we include several control variables to better isolate the effect of *CSP* on investment efficiency [14,25,44,45]. The proxy for firm size (*SIZE*) is the natural logarithm of total assets. Larger firms may take advantage of economies of scale to have access to the capital market in an easier and cheaper way to fulfill their financing needs. Further, large-sized firms are more diversified, have lower cost of capital, and employ better technology that could contribute positively to enhancing firm value through investment efficiency [40]. Hence, we expect  $B_5$  to be negative and statistically significant.

*ROA* (Return of assets) denotes the ratio of net income to total assets. *FIN\_PERF* (Financial performance) represents the market value of equity minus book value of equity plus the book value of assets. Both *ROA* and financial performance are proxies for measuring management effectiveness in asset utilization. A higher asset utilization ratio can either lead to lower or higher investment inefficiency [14]. Similar to [14,40], we do not predict the sign of the correlation between *ROA* and *FIN\_PERF*, and investment inefficiency, respectively.

*FIN\_LEV* (Financial leverage), the amount of debt used to finance a firm's assets and projects, is measured by the ratio of total debt to total assets. Ref. [28] argues that when debt level is too high, it will stimulate excessive (over) investment in negative NPV projects and reduce investment efficiency. However, debt financing can also be utilized as an instrument to curtail the over-investment problem by forcing managers to pay out excess funds to service debt. Hence, we do not predict the sign of the correlation between *FIN\_LEV* and *INNEFF\_INV*.

*INFOR\_ASY* (information asymmetry) denotes the bid–ask spread of the [46] model and is measured as follows: AP is the average ask price and PB is the average bid price. As managers have more information about companies and investment opportunities than external parties, managers who are self-interested may cause corporate managers to under or overinvest, leading to investment inefficiency.

*INV* (Investment) is the total investments. *CFO* is a proxy for *CASH*-flow sensitivity, measured by the total *CASH* and short-term investments and scaled by the book value of total assets. Refs. [14,40] suggest that firms with higher *CASH*-flow volatility are likely to undertake inefficient investments due to information asymmetry and agency problems.

*SALEGROWTH* (Sales Growth) is the rate of change in sales from  $t - 1$  to  $t$ . Growth ability reflects the future potential and market value of companies. High-growth firms have more investment opportunities so they easily to fall into excessive investment. On the contrary, the impact of financial leverage on low-growth firms is more underinvestment.

*AGE* reflects the natural logarithm of the firm age. Ref. [14] argues that older firms are more likely to have better investment experience than younger firms, and hence better investment efficiency. However, Ref. [40] claims that older firms tend to undertake inefficient investments when they have more investment experience and more *CASH* flow.

Lastly, *CASH* represents the ratio of *CASH* to total assets from firm  $i$  in year  $t$ . Based on the information asymmetry and agency problem views, firms with more financial resources tend to undertake inefficient investments [14]. On the contrary, firms with excess *CASH*-

flow volatility are more likely to invest in more positive NPV projects, hence decreasing investment inefficiency [40].

To address potential year-, industry-, and country-specific effects, three dummy variables, Year, Industry, and Country, are included in the analysis.

## 5. Empirical Results

Achieving the goal of this study requires, first of all, an analysis of the investment efficiency of the sample firms. The descriptive results in Table 2 show that investment inefficiency (*INEFF\_INV*) for our Asian data has a mean of  $-0.03$ , ranging from  $-0.25$  to  $0$ . Further, *INEFF\_INV* records a median of  $-0.02$ , suggesting the residuals from the investment model are normally negative but at a smaller magnitude. The mean and median score for *INEFF\_INV* in this study are close to the results found in the study by [14] in the US.

**Table 2.** Descriptive results.

	Mean	Median	Maximum	Minimum	Std. Dev.	Observations
<i>INEFF_INV</i>	$-0.03$	$-0.02$	$0.00$	$-0.25$	$0.038906$	21,949
<i>CSP</i>	40.09171	39.08000	92.80000	0.310000	20.75444	14,269
<i>SUS_ENV</i>	35.36401	33.33000	99.06000	0.000000	28.33856	14,267
<i>SUS_SOC</i>	36.19170	33.40000	97.47000	0.050000	23.97626	14,267
<i>SUS_CG</i>	48.03888	48.28000	98.25000	0.430000	22.97115	14,269
<i>SIZE</i>	19.31254	19.42510	27.97618	6.214608	2.664377	23,868
<i>ROA</i>	0.059629	0.045900	4.294500	$-2.78$	0.105796	23,216
<i>FIN_LEV</i>	0.250820	0.216200	169.0563	0.000000	1.132546	23,760
<i>FIN_PERF</i>	2.447130	1.480000	1323.850	$-266.93$	10.63417	23,245
<i>INFOR_ASY</i>	0.470290	0.256849	78.61272	$-1.66$	1.368659	21,648
<i>INV</i>	$-0.16$	0.005811	0.975851	$-617.42$	7.042611	22,961
<i>CFO</i>	0.076324	0.068589	1.158459	$-4.77$	0.097385	23,745
<i>SALEGROWTH</i>	18.67075	0.069686	224634.4	$-46.86$	1547.506	22,859
<i>AGE</i>	8.616070	8.829519	9.771669	0.693147	0.982010	23,769
<i>CASH</i>	0.170103	0.127801	2.461527	0.000000	0.151643	21,709

Further analysis in Table 2 shows that there is significant panel-data variation in *CSP* for the Asian firms ranging from 0.31 to 92.8 and with a mean and median score of 40.1 and 39.08, respectively. The medians for individual components of *CSP* (environment, social, and governance) are 33.33, 33.40, and 48.28, respectively. The mean and median score for the composite *CSP* in this study is not too far from the results found in the study by [4] in examining the economic, environmental, and social (EES) sustainability performance among Asian firms during the period 2005–2017. Using the KLD rating database, ref. [14] found that the median for the overall CSR score and individual components of CSR among the US firms in their sample equal 0, ranging from  $-9$  to 18. The rest of the data in Table 2 portray the descriptive statistics for the control variables.

Table 3 reports the Pearson pair-wise correlation coefficients between all variables in our sample. As expected, the *CSP* indicator variable is significantly and negatively correlated with *INEFF\_INV* (correlation of 0.134). This result provides initial support for H1 that firms with high *CSP* are positively related to efficient investment. *INEFF\_INV* is also significantly and negatively correlated with *SUS\_ENV*, *SUS\_SC*, and *SUS\_CG*. We also find that the investment inefficiency is significantly related to most of our control variables, providing assurance on the relevance of our variables. Initial results show that investment inefficiency is negatively related to size, financial leverage, information



asymmetry, sales growth, and age. No significant relationship is found between *INEFF\_INV* and financial performance, and *CASH*. Further, the results do not find a high correlation between all the explanatory variables, indicating that our regressions do not suffer from any multicollinearity concerns.

**Table 3.** Pearson correlation coefficients.

	<i>INEFF_INV</i>	<i>CSP</i>	<i>SUS_ENV</i>	<i>SUS_SOC</i>	<i>SUS_CG</i>	<i>SIZE</i>	<i>ROA</i>	<i>FIN_LEV</i>	<i>FIN_PERF</i>	<i>INFOR_ASY</i>	<i>INV</i>	<i>CFO</i>	<i>SALE_GROWTH</i>	<i>AGE</i>	<i>CASH</i>
<i>INEFF_INV</i>	1														
<i>CSP</i>	<b>−0.134</b>	1													
<i>SUS_ENV</i>	<b>−0.057</b>	<b>0.309</b>	1												
<i>SUS_SOC</i>	<b>−0.006</b>	<b>0.244</b>	<b>0.148</b>	1											
<i>SUS_CG</i>	<b>−0.027</b>	<b>0.132</b>	<b>0.124</b>	<b>0.024</b>	1										
<i>SIZE</i>	<b>−0.006</b>	<b>0.014</b>	<b>0.022</b>	<b>0.013</b>	<b>0.073</b>	1									
<i>ROA</i>	<b>0.000</b>	<b>−0.058</b>	<b>−0.248</b>	<b>0.014</b>	<b>−0.002</b>	<b>−0.027</b>	1								
<i>FIN_LEV</i>	<b>−0.001</b>	<b>0.129</b>	<b>0.280</b>	<b>0.175</b>	<b>−0.081</b>	<b>0.061</b>	<b>−0.004</b>	1							
<i>FIN_PERF</i>	<b>−0.003</b>	<b>1.779</b>	<b>−0.509</b>	<b>0.498</b>	<b>0.050</b>	<b>−0.954</b>	<b>0.123</b>	<b>−0.002</b>	1						
<i>INFOR_ASY</i>	<b>−0.001</b>	<b>−0.427</b>	<b>−0.374</b>	<b>−0.235</b>	<b>−0.182</b>	<b>−0.211</b>	<b>−0.002</b>	<b>0.010</b>	<b>−0.008</b>	1					
<i>INV</i>	<b>0.000</b>	<b>−0.038</b>	<b>−0.081</b>	<b>−0.015</b>	<b>−0.020</b>	<b>0.000</b>	<b>0.002</b>	<b>−0.002</b>	<b>0.012</b>	<b>−0.002</b>	1				
<i>CFO</i>	<b>0.000</b>	<b>0.081</b>	<b>0.019</b>	<b>0.096</b>	<b>0.104</b>	<b>−0.018</b>	<b>0.003</b>	<b>−0.005</b>	<b>0.135</b>	<b>−0.002</b>	<b>0.000</b>	1			
<i>SALEGROWTH</i>	<b>−0.002</b>	<b>−0.302</b>	<b>−0.010</b>	<b>−0.405</b>	<b>−0.135</b>	<b>−0.073</b>	<b>0.002</b>	<b>0.021</b>	<b>0.063</b>	<b>0.005</b>	<b>0.001</b>	<b>−0.001</b>	1		
<i>AGE</i>	<b>−0.004</b>	<b>0.336</b>	<b>−0.656</b>	<b>0.198</b>	<b>0.310</b>	<b>0.265</b>	<b>−0.008</b>	<b>−0.008</b>	<b>−0.059</b>	<b>−0.029</b>	<b>−0.006</b>	<b>−0.003</b>	<b>−0.050</b>	1	
<i>CASH</i>	<b>0.001</b>	<b>−0.228</b>	<b>−0.624</b>	<b>−0.286</b>	<b>0.060</b>	<b>−0.074</b>	<b>0.002</b>	<b>−0.011</b>	<b>0.066</b>	<b>0.000</b>	<b>−0.001</b>	<b>0.003</b>	<b>0.003</b>	<b>−0.015</b>	1

Coefficients in boldface are significant at least at the 5% level.

Using OLS with standard errors corrected for heteroscedasticity and clustered at the firm level, the results of estimating Model 2 are presented in Table 4. The estimated coefficient of *CSP* (corporate sustainability performance) is negatively significant (at the 1% level) with investment inefficiency (*INEFF\_INV*), indicating that an increase in *CSP* leads to lower investment inefficiency. Our result finds support for our hypothesis H1 that firms with high *CSP* are positively related to efficient investment. Paralleling previous studies [13,14,16,21,44], our results in Table 4 indicate that high corporate social performance (*CSP*) improves the firm's overall investment efficiency.

Further analysis shows that among the individual components of *CSP*, only the sustainability social dimension (*SUS\_SOC*) has a positive effect on investment inefficiency. The estimated coefficient of *SUS\_SOC* is negatively significant (at the 1% level) with *INEFF\_INV*, indicating that an increase in the sustainability social dimension (*SUS\_SOC*) leads to lower investment inefficiency. Hence, we accept our hypothesis H2c that the social components of corporate sustainability performance are positively related to investment efficiency. However, the estimated coefficient of the sustainability environmental dimension (*SUS\_ENV*) is negative but not significantly related to *INEFF\_INV*. Hypothesis H2a, that environmental components of *CSP* are positively related to investment efficiency, is thus rejected. Similarly, the estimated coefficient of the sustainability governance dimension (*SUS\_CG*) is negative but not significantly related to *INEFF\_INV*. Hence the result rejects hypothesis H2b that governance components of *CSP* are positively related to investment efficiency.

We also document several significant relations between the control variables and investment inefficiency. In contrast to the findings by [14,40], the estimated coefficient on firm size (*SIZE*) is negative and significant. The results indicate that large-sized firms are more diversified, and have lower costs of capital due to their economies of scale to deviate less from investment inefficiency. The significant negative coefficient of *ROA* indicates that management effectiveness in asset utilisation leads to less investment inefficiency. Other control variables that have negatively significant coefficients include *SALEGROWTH* and *AGE*. This result is consistent with the expectation that high growth and older firms

have more investment opportunities and experience to invest in positive NPV projects. The coefficient of *INFOR\_ASY* is significantly positive with *INEFF\_INV*. The positive relationship between information asymmetry and investment inefficiency indicates that lower information asymmetry between management and outside providers leads to lower investment inefficiency.

**Table 4.** Corporate Social Performance (CSP) and Investment Inefficiency (*INEFF\_INV*).

Variable	Coefficient	t-Statistic
<i>CSP</i>	−0.0003 ***	−1.343561
<i>SUS_ENV</i>	$-4.23 \times 10^{-5}$	−0.584853
<i>SUS_SOC</i>	−0.000146 ***	−1.545771
<i>SUS_CG</i>	$-9.67 \times 10^{-5}$	−1.417067
<i>SIZE</i>	−0.001679 **	−1.716974
<i>ROA</i>	−0.001159 **	−0.211091
<i>FIN_LEV</i>	−0.011754 *	−4.682328
<i>FIN_PERF</i>	$-1.97 \times 10^{-6}$	−0.093236
<i>INFOR_ASY</i>	0.000325 ***	0.411831
<i>INV</i>	−0.011768 *	−4.876438
<i>CFO</i>	0.014762 *	2.339691
<i>SALEGROWTH</i>	−0.001069 ***	−3.228508
<i>AGE</i>	−0.007066 ***	−4.822364
<i>CASH</i>	0.012678	2.856679
<i>C</i>	−0.124657	−5.897016
<i>Country Dummies</i>	Included	Included
<i>Industry dummies</i>	Included	Included
<i>Year dummies</i>	Included	Included
<i>R-squared</i>	0.300869	
<i>Adjusted R-squared</i>	0.228016	
<i>F-statistic</i>	4.129799	
<i>Durbin-Watson stat</i>	1.893994	

\*  $p < 0.1$ , \*\*  $p < 0.05$ , and \*\*\*  $p < 0.01$  represent significance at 10%, 5%, and 1%, respectively. Cross-section and year dummies are included in all the equations. Cross-sections included: 2142. Total panel observations: 26,838.

In summary, our results provide strong evidence that high *CSP* involvement among Asian firms decreases investment inefficiency and consequently increases investment efficiency. Further analysis indicates that CSR components that are directly related to the social dimension are more relevant in reducing investment inefficiency compared with those related to environment and governance. Indeed, the social responsibility programs that organizations carry out with other entities or on their own initiative generate social benefits that can be converted into market opportunities and long-term profits. A firm's relationships and confidence-building among its employees to generate trust and loyalty among its workforce, community involvement such as human rights, and product characteristics for customer satisfaction have a positive impact on society and local communities they operate in. These stakeholders (investors, employees, customers, suppliers, human rights, and community) have a direct effect on the corporation's operations and activities and are directly affected by the corporation's activities. Compared to environmental and governance components, these stakeholders are more interested in the company's invest-

ment decisions. Hence, investing in relationships with these stakeholders will increase competitive advantage and increase firm value through investment efficiency.

The results also show that *CSP* firms associated with larger size (*SIZE*), efficient use of assets (*ROA*), lower information asymmetry (*INFOR\_ASY*), high sales growth (*SALES-GROWTH*), and older firms (*AGE*) enhance firm value through investment efficiency.

## 6. Conclusions

Given the importance of investment efficiency in determining the corporate value for market development, and that information asymmetry and agency problems are persistent concerns in relation to investment efficiency, we examine whether *CSP* influences investment efficiency in Asian markets. Using a large sample of 26,838 firm-year observations that represent 9218 Asian listed companies over the period of 2012–2019, the results of this study highlight the important role that corporate sustainability performance plays in shaping firms' investment behaviour and efficiency across Asia. We found statistically significant evidence that firms with higher *CSP* increase investment efficiency. In line with the value-enhancing view of the stakeholder theory and information asymmetry, attention to stakeholders and abundant disclosed information in *CSP* firms reduce financial risk, which helps to enhance investment efficiency.

Further, unlike the environmental and governance dimensions, the social dimension of sustainability performance is well perceived and plays the most important role in improving investment efficiency through high employee loyalty, good reputation, and consumer confidence in product quality. A high performance score in social involvement firms reduces idiosyncratic (firm) risk, which leads to higher investment efficiency.

From a theoretical perspective, the findings in this study provide compelling evidence that sheds light on the debate regarding the value implications of *CSP*. Consistent with enlightened stakeholder theory and the low information asymmetry [31,32] that high-*CSP* firms enjoy, our findings suggest that by addressing the needs and contributions of various stakeholders, managers commit themselves to enhanced monitoring that leads to investment efficiency. This is in contrast to *CSP* detractors' arguments that *CSR* may be a source of agency conflicts. Our study also complements the *bROAd*er *CSP*–firm-value literature which is widely focused on developed Western markets by investigating whether investment efficiency might be a channel by which corporate value is generated in Asian markets. While previous studies of the *CSP*–investment nexus in Asia mostly examine a single market, e.g., [40,41], this study examines ten emerging Asian markets, which may enhance the generalizability of the results to other emerging markets.

Refs. [37,47] argued that the institutional framework of a country may influence the components of *CSP* scores and moderate the relationship between *CSP* and firm value. Hence, future research should examine how differences in institutional environments through its regulative component (i.e., shareholder-oriented and stakeholder-oriented countries) influence the link between *CSP* and investment efficiency.

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