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The Impact of Corporate Social Responsibility on Performance in High-Tech Industries

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Abstract:

With the rapid development of high-tech industries, the impact of corporate social responsibility (CSR) on firm performance has received increasing attention. This study employs panel data from A-share listed high-tech companies in China between 2010 and 2020 to empirically examine the extent and mechanisms through which CSR influences corporate performance. A multiple regression model is constructed with return on assets (ROA) as the dependent variable, and CSR performance as the key explanatory variable, alongside firm size, leverage, and effective tax rate as controls. The results show that CSR has a significant and positive impact on firm performance. Even in innovation-driven high-tech enterprises, proactive CSR engagement can contribute to actual improvements in performance by enhancing employee motivation, corporate reputation, and stakeholder trust. These findings provide new empirical support for the strategic value of CSR within high-tech sectors.

Keywords: Corporate Social Responsibility, High-Tech Industry, Firm Performance, ROA, Chinese Companies

1. Introduction

With the rapid development of high-tech industries, the impact of corporate social responsibility (CSR) on firm performance has attracted growing attention from scholars. A large body of research has explored the relationship between CSR and corporate performance from various perspectives, yet conclusions remain mixed. On the one hand, some studies suggest that CSR can enhance corporate reputation, increase consumer trust, and attract talent, thereby improving firm performance (Flammer, 2015; Wang & Qian, 2011)[1,2]. On the other hand, other scholars argue that CSR may lead to resource diversion and reduce investment in core business areas, ultimately weakening firm competitiveness (Masulis & Reza, 2014; Wang & Bansal, 2012)[3,4]. Some domestic studies further confirm that CSR has a positive effect on brand identity, purchase intention, and recommendation intention from the consumer perspective, thus indirectly contributing to business performance. However, most of these studies focus on traditional manufacturing or service-oriented firms, while research on high-tech enterprises remains relatively limited.

High-tech firms differ significantly from traditional

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enterprises in terms of business models, market structure, and customer relationships. Their products are primarily driven by technological innovation, and brand effects or advertising have relatively limited influence on consumer decision-making. Therefore, whether CSR can similarly promote performance in high-tech firms still requires further empirical investigation.

Based on the data of A-share listed high-tech firms in China from 2010 to 2020, this study constructs a panel regression model to examine the impact of CSR on firm performance, using firm size, leverage, and tax burden as control variables. Through empirical analysis, this paper aims to clarify the role of CSR in high-tech industries and provide practical insights for firms seeking to formulate effective CSR strategies and achieve sustainable long-term growth.

2. Theoretical Framework and Research Hypothesis

From a theoretical perspective, the core competitive advantage of high-tech enterprises lies in their research and development capabilities and the successful commercialization of innovative technologies. Compared with traditional firms, high-tech products tend to exhibit greater uniqueness and technological barriers, making brand influence less significant in shaping consumer decisions. Under such circumstances, the brand-related effects of corporate social responsibility (CSR), which are often observed in conventional industries, may not operate as effectively.

However, active engagement in CSR frequently reflects a company's strength in areas such as financial resource allocation, environmental management, regulatory compliance, and employee welfare. These capabilities not only signify a higher level of organizational quality but may also serve as important contributors to improved firm performance. Therefore, even if CSR does not enhance performance through traditional consumer-facing channels, the underlying institutional advantages and managerial competence it embodies may still exert a positive impact on corporate outcomes.

Based on this reasoning and the operational characteristics of high-tech firms, this study proposes the following research hypothesis:

H1: Corporate social responsibility has a significant positive effect on the performance of high-tech enterprises.

3. Research Design

To empirically examine the relationship between CSR and firm performance in the high-tech sector, this study defines firm performance as the dependent variable and CSR performance as the main independent variable. Firm performance refers to a company's operational outcomes over a specific period, commonly assessed by its profitability or return indicators. Following prior studies in the field, this paper uses return on assets (ROA) as a proxy for firm performance. As for CSR, it refers to the degree to which a firm voluntarily engages in activities beyond profit-seeking—such as complying with business ethics, protecting labor rights, and contributing to environmental sustainability. This variable is measured using CSR scores compiled from corporate social responsibility reports of listed firms; higher values indicate better CSR performance and is denoted as csr.

To improve the robustness of the model, several control variables are included, as suggested by previous literature. These are:

· Leverage (lev): This reflects the proportion of a company's total assets that is financed by debt and is an important indicator of financial risk.

· Firm Size (size): A firm's scale directly affects its market power and resource allocation capacity. In line with conventional approaches, this study uses total assets to represent firm size.

· Effective Tax Rate (tax): This is calculated as the ratio of actual tax payments to pre-tax profits in a given year, reflecting the firm's tax burden.

To test the relationship between CSR and firm performance among high-tech firms, the following baseline panel data regression model is established:

$$roa_{it} = C + \gamma 1 size_{it} + \gamma 2 tax_{it} + \gamma 3 lev_{it} + \mu_{it} \quad (1)$$

$$roa_{it} = C + \beta 1 csr_{it} + \beta 2 size_{it} + \beta 3 tax_{it} + \beta 4 lev_{it} + \mu_{it} \quad (2)$$

where subscript i refers to the firm and t refers to the year of observation. ROA represents firm performance; CSR denotes corporate social responsibility; Size, Tax, and Lev are the control variables as defined above.

The dataset used in this study comprises Chinese high-tech firms listed on A-share markets from 2010 to 2020. After rigorous data cleaning, a total of 2,857 firm-year observations were retained as valid samples. CSR data were obtained from reports compiled by Hexun.com, while financial and accounting data were sourced from the CSMAR (China Stock Market & Accounting Research) database.

4. Empirical Analysis

4.1 Descriptive Statistics

Table 1 Descriptive Statistics

Variable	N	Mean	Std. Dev.	Min	Max
roa	19461	0.035	0.271	-19.363	22.005
csr	19461	22.099	13.24	-18.45	84.03
size	19461	8.004e+09	3.356e+10	17008562	1.200e+12
tax	19461	0.11	2.4	-230.14	91.81
lev	19461	0.389	0.302	0.007	18.79

Table 1 presents the descriptive statistics of the main variables. The ROA ranges from -19.363 to 22.005, indicating significant variation in firm performance across the sample. The CSR score varies from -18.45 to 84.03, showing that firms differ substantially in their CSR engagement levels. Some firms even received negative scores due to poor practices such as financial losses, labor rights violations, or environmental harm. Notably, the minimum value of the tax rate is -230.14, which suggests that certain firms reported negative profits yet still paid taxes, possibly due to policy requirements or deferred tax treatments.

4.2 Regression Results

The regression results of the two baseline models are shown in Table 2. In Model (1), the explanatory power of the model is relatively limited, with an R^2 of 0.210. Although the model passes the F-test, the variables *size* and *tax* are statistically insignificant. Model (2) introduces the main independent variable *csr* and yields improved explanatory power, with the R^2 increasing to 0.214. In this model, the variables *csr*, *size*, and *lev* are all statistically significant. Notably, CSR is positively and significantly associated with ROA, with a coefficient of 0.002, supporting the hypothesis that CSR positively affects firm performance in the high-tech sector.

These results suggest that even in innovation-driven high-tech firms, CSR initiatives can contribute meaningfully to performance. CSR activities—such as improving employee welfare, complying with legal and ethical standards, enhancing environmental sustainability, and engaging in community service—may help build internal cohesion and external trust, ultimately leading to performance gains.

The control variables also show expected effects. *Size* is positively and significantly correlated with ROA, indicating that larger firms generally perform better. *Leverage (lev)* is negatively and significantly associated with ROA, suggesting that higher financial risk may reduce profitability. *Tax* remains statistically insignificant in both models, possibly because high-tech firms typically benefit from preferential tax policies, making the variation in tax rates less relevant to performance. Moreover, the volatility of profitability among high-tech firms—driven by differences in R&D outcomes—may weaken the observable effect of tax burden on performance.

Table 2 Regression Result

	(1)	(2)
	roa	roa
size	0.000	0.000**
	(1.270)	(2.036)
tax	0.000	-0.000
	(0.311)	(-0.195)
lev	-0.513***	-0.504***
	(-66.420)	(-65.046)
csr		0.002***
		(9.548)
_cons	0.234***	0.193***
	(65.429)	(34.573)
N	19461	19461
R^2	0.210	0.214
F	1470.721	1131.820

(* p<0.1, ** p<0.05, *** p<0.01)

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4.3 Robustness Check

To further validate the reliability of the baseline regression results, this study conducts a robustness check by trimming the top and bottom 1% of the extreme values for both the explanatory and dependent variables. The results, presented in Table 3, show that the coefficient of corporate social responsibility remains significantly positive at the 1% level after the adjustment. This finding reinforces the robustness of the main regression results reported earlier.

Table 3 Robustness Check Result

	(1)
	roa_w
csr_w	0.002***
	(60.967)
size	0.000***
	(4.171)
tax	-0.000**
	(-2.220)
lev	-0.052***
	(-31.278)
_cons	0.006***
	(4.776)
N	19461
R^2	0.239
F	1304.500

***p<0.01", "**p<0.05", "*p<0.1

5. Conclusion and Discussion

This study investigates the relationship between corporate social responsibility (CSR) and firm performance using panel data from A-share listed high-tech firms in China between 2010 and 2020. A fixed-effects regression model is employed, with firm size, leverage, and tax burden included as control variables. The empirical results reveal that CSR has a significant and positive impact on firm performance. Although high-tech firms primarily rely on technological innovation and are less influenced by brand perception in consumer decision-making, the findings suggest that active engagement in CSR can still enhance overall business performance. These results confirm the economic relevance of CSR in the high-tech sector and provide empirical support for firms aiming to integrate CSR into their strategic planning for sustainable growth.

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