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Corporate Social Responsibility, Financing Constraints and Innovation Investment

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Abstract: This paper takes the relevant data of China's A-share listed companies in Shanghai and Shenzhen from 2011 to 2019 as the research samples to explore the relationship among corporate social responsibility (CSR), financing constraints and innovation investment. The results show that CSR has a significant positive contribution to innovation investment. CSR is negatively correlated with financing constraints, and financing constraints play a partial mediating role between CSR and innovation investment.

Keywords: Corporate Social Responsibility; Financing Constraints; Innovation Investment.

1. Introduction

At present, China is at a critical stage of economic development and transformation, and innovation-driven has become the core driving force for promoting high-quality economic development. In recent years, China's investment in research and development (R&D) has ranked second in the world. Among them, enterprises' investment in R&D has become the leading force in guaranteeing the growth of the whole society's R&D funding, but compared with the world's scientific and technological powerhouses, China's enterprises still fall short in terms of the scale and intensity of their R&D investment.

The report of the 19th National Congress emphasized that the fulfillment of social responsibility has become an important part of enterprise development, and policy guidelines and widespread public attention have prompted more and more enterprises to actively engage in the cause of social responsibility. In the context of globalization of economic and social responsibility, the State encourages enterprises to actively fulfill their social responsibility. And all sectors of society call on enterprises not to focus only on the economic benefits of the moment, but to organically combine innovation and development with the assumption of social responsibility, so as to realize sustainable synergistic development of enterprises and stakeholders in all aspects.

However, both the fulfillment of social responsibility and innovative activities require long-term and large-scale investment in capital, manpower and other costs, which makes it easier for enterprises to fall into the predicament of shortage of capital. At the same time, active fulfillment of social responsibility can help enterprises establish a good positive image and gain the attention and trust of more internal and external stakeholders, which can help establish lasting customer relationships, attract excellent talents and obtain more investment opportunities, and to a certain extent alleviate the financing constraints brought about by innovation investment.

Therefore, this paper takes the relevant data of China's A-share listed companies in Shanghai and Shenzhen from 2011 to 2019 as the research samples to explore the intrinsic relationship among corporate social responsibility, financing constraints and innovation investment: whether active fulfillment of social responsibility promotes the innovation investment of enterprises; whether active fulfillment of social responsibility can alleviate the financing constraints faced by the enterprises; and whether there is a mediating effect of financing constraints between CSR and innovation investment.

2. Theoretical Analysis and Research Hypothesis

2.1. Corporate Social Responsibility and Innovation Investment

Based on the theory of stakeholders and resource acquisition, enterprises need to take responsibility for internal and external stakeholders, including shareholders, employees, suppliers, customers, consumers, as well as the government and society and other groups in the process of operation, and enterprises can obtain abundant resources for the enterprise by responding to their needs and expectations, and maintaining a good interactive relationship with them (Li Jinglin and Yang Zheng,2019). Zhu Naiping et al. (2014) argued that shareholders' trust and support is a key factor in improving innovation investment, and that firms' active commitment to shareholders' responsibility is conducive to enhancing shareholders' trust in the firm, thus making it easier to obtain more stable financial investment in innovation activities from shareholders. Li Shu and Xie Xiaoyan (2014) argued that investors and creditors are increasingly concerned about the social impact and sustainable development ability of enterprises, and an excellent and adequate record of social responsibility fulfillment can attract capital resources from investors and creditors. Firms' external social responsibility can increase R&D personnel's sense of organizational identity and enhance creativity (Zhang Xinguo and Lu Jingjing, 2014). Firms' internal fulfillment of social responsibilities such as work environment improvement (Hur et al., 2018) and increased welfare (John, 2019) can also attract more R&D-oriented talented people to join and improve employees' motivation to innovate and job stability (Leng Jianfei and Gao Yun, 2019).

The fulfillment of social responsibility by enterprises can

reduce the information asymmetry between stakeholders, thus establishing trust and consensus and reducing the uncertainty of innovation activities, allowing enterprises to establish effective communication and win-win cooperation with all stakeholders, thus promoting the benign return of economic benefits from all stakeholders to enterprises, attracting more human, material and financial resources to further invest in enterprise innovation activities, and increasing investment in R&D and innovation. In this way, it attracts more human, material and financial resources to be further invested in enterprise innovation activities and increases the investment in R&D and innovation. Therefore, this paper proposes hypothesis:

H1: The fulfillment of social responsibility by enterprises can promote the role of enterprise innovation investment.

2.2. Corporate Social Responsibility and Financing Constraints

Based on the stakeholder theory, the fulfillment of CSR can strengthen the ties with stakeholders, mitigate internal and agency conflicts caused by conflicts among stakeholders, especially reduce the agency conflicts between executives and shareholders, improve the efficiency and credibility of corporate governance, and thus alleviate financing constraints (Lei Zhenhua,2014). Corporate social responsibility helps to present a good image to the government, win government recognition and support, alleviate the information asymmetry between the enterprise and the government, and gain political affiliation (Li Shu and Xie Xiaoyan,2014), which makes it easier to enjoy tax incentives and government subsidies, and at the same time, sends favorable signals to the market, which in turn absorbs more social capital. (Li Sihai et al., 2015). Based on the signaling theory, active disclosure of good social responsibility performance by enterprises can not only build a good corporate image, but also enhance corporate value and gain reputation, which will make it easier for enterprises to obtain lower-cost financing support from external financial institutions (Gu Leilei et al.,2020). The active fulfillment of social responsibility by enterprises helps to show good business conditions to the external capital market, sends positive signals, and enhances the willingness of investors to invest (Li Zhixue and Du Peiyu,2021).

To summarize, enterprises can increase their credibility and image in the financing market by fulfilling their social responsibility, thus alleviating the problem of financing constraints. Therefore, this paper proposes hypothesis:

H2: CSR is negatively correlated with financing constraints.

2.3. The Mediating Effect of Financing Constraints between Corporate Social Responsibility and Investment in Innovation

Innovative activities are at the core of an enterprise's ability to sustain its growth, and they usually require significant financial investment to support them, whether for R&D equipment, human resources or marketing. In addition, as R&D is a long-term and uncertain process, insufficient funding may result in the R&D process being interrupted or not proceeding as planned, further affecting an enterprise's innovation capability and competitiveness. However, enterprises often have limited internal funds to meet the large-scale and sustained investment required for innovation. Both small and medium-sized enterprises as well as large listed companies generally face different degrees of financing and financial support problems. As a result, more and more enterprises are choosing to use external financing to bring in funds to support innovation activities.

In summary, the fulfillment of social responsibility by enterprises can mitigate the problems caused by financing constraints to a certain extent, while enterprises making innovative investments are limited by financing constraints. Therefore, combining H1 and H2, this paper proposes H3:

H3: Financing constraints have a mediating effect between CSR and innovation investment.

3. Research Design

3.1. Sample Election and Data Sources

In this paper, China's A-share listed companies in Shanghai and Shenzhen from 2011-2019 are taken as the research samples and processed as follows: (1) financial and insurance listed companies are excluded; (2) ST and *ST companies are excluded; (3) samples with missing data are excluded; (4) in order to avoid the interference of outliers, the samples outside the 1% and 99% of the observations for the main variables are were indented using the Winsorize method and data were processed using STATA 17.0. The financial data involved in the study were obtained from the CSMAR and the CSR data were obtained from Hexun Network.

3.2. Variable-definition

Explained Variable: innovation investment. Measured by firms' annual R&D expenditures, while logarithmic treatment of R&D expenditures (Kong Dongmin et al., 2017).

Explaining Variable: corporate social responsibility. Measurement of CSR fulfillment based on CSR scores published by Hexun Network (Li Jinglin and Yang Zheng, 2019). Compared with the ratings released by other organizations, Hexun Network evaluates the fulfillment of CSR in five aspects: shareholders' responsibility, employees' responsibility, suppliers' customers' and consumers' rights and interests' responsibility, environmental responsibility, and social responsibility. The data of this evaluation method is more credible, the ratings are more objective, and it is more capable of comprehensively considering the performance of the enterprise's social responsibility in different aspects.

Mediating Variable: financing constraints. Financing constraints can be assessed in two broad ways: univariate and composite variable index measures. Among them, comprehensive variable indexes include: KZ index, WW index, SA index, etc. This paper adopts KZ index as a proxy variable for enterprise financing constraints based on previous studies. Drawing on previous research, this paper adopts the KZ index as a proxy variable for corporate financing constraints, and the larger the KZ index, the higher the degree of financing constraints (Wei Zhihua et al., 2014).

Control Variables: the control variables selected in this paper are firm size, Tobin Q, return on assets, gearing ratio, and industry dummy variables and year dummy variables, as defined in Table 1.

Table 1. Variable Definition Table

type of variable	Variable name	symbol	variable-definition
Explained Variable	Enterprise Innovation Investment	RD	The R & D investment is log-taking
Explaining Variable	Corporate Social Responsibility	Csr	Hexun Network's overall CSR score
Mediating Variable	Financing Constraints	KZ	Financing constraint composite variable KZ index
Control Variables	Firm Size	Size	Total assets are logarithmic
	Tobin Q	Tobinq	Market value / total assets
	Asset-liability Ratio	Lev	Total liabilities / total assets
	Year	Year	Year virtual variable
	Industry	Ind	Industry virtual variables

3.3. Model Definition

In this paper, multiple regression model was used to study the above hypothesis. First, to test H1:

$$RD_{it} = \alpha_0+\alpha_1 Csr_{it}+\alpha_2 Control_{it}+\Sigma Ind+\Sigma Year+\varepsilon_{it} \quad (1)$$

Secondly, to test H2, build the model:

$$KZ_{it} = \beta_0+\beta_1 Csr_{it}+\beta_2 Control_{it}+\Sigma Ind+\Sigma Year+\varepsilon_{it} \quad (2)$$

Finally, as for the verification of the mediation effect of H3, draw on the mediation effect test idea proposed by Wen Zhonglin and Ye Baojuan (2014), and construct the model on the basis of model (1) and model (2):

$$RD_{it} = \gamma_0 + \gamma_1 Csr_{it} + \gamma_2 KZ_{it} + \gamma_3 Control_{it} + \Sigma Ind + \Sigma Year + \varepsilon_{it} \quad (3)$$

4. Description and Analysis of the Regression Results

4.1. Descriptive Statistics

From the descriptive statistics in Table 2, we can see that the mean value of innovation investment (RD) is 17.7, the maximum value is 21.67, the minimum value is 13.37, and the standard deviation is 1.494, which indicates that there is a big difference in the level of innovation investment among the enterprises in the sample; the mean value of CSR is 23.76, the maximum value is 74.45, the minimum value is -3.140, and the standard deviation is 15.22. The average value of CSR is 23.76, the maximum value is 74.45, the minimum value is -3.140, and the standard deviation is 15.22, which indicates that the overall performance of CSR in the sample is poor, with large differences, and the awareness of CSR among some enterprises is relatively weak; the average value of financing constraints index (KZ) is 1.162, with the maximum value of 6.343, the minimum value of -6.426, and the standard deviation of 2.381, which indicates that there is a general problem of financing constraints among listed companies in the sample, and there are significant differences in the degree of financing constraints faced by different enterprises are significantly different.

Table 2. Descriptive Statistics

Variable	N	Mean	SD	Min	Max
RD	20100	17.70	1.494	13.37	21.67
Csr	20100	23.76	15.22	-3.140	74.45
KZ	20100	1.162	2.381	-6.426	6.343
Size	20100	22.07	1.262	19.94	26.09
Lev	20100	0.400	0.202	0.0488	0.878
Tobinq	20100	2.015	1.191	0.881	7.767

4.2. Correlation Analysis

The variables were further analyzed for correlation and the correlation coefficients between the variables are given in Table 3. The Pearson test was used in this paper and the results obtained show that the correlation coefficients between the variables are small and all of them are significantly correlated at 1% level. Among them, there is a significant positive correlation between corporate social responsibility (CSR) and investment in innovation (RD) at the 1% level, indicating that the higher the CSR score, the higher the enterprise's investment in innovation activities, which preliminarily supports H1 of this paper; there is a significant negative correlation between CSR and financing constraints index (KZ) at the 1% level, i.e., the higher the CSR score, the lower the financing constraints of the enterprise, which preliminarily supports the hypothesis of this paper. the lower the financing constraints, preliminarily supporting the H2 of this paper.

Table 3. Correlation Analysis

	RD	CSR	KZ	SIZE	LEV	TOBQ
RD	1.0000					
CSR	0.130***	1.0000				
KZ	-0.027***	-0.195***	1.0000			
SIZE	0.514***	0.217***	0.194***	1.0000		
LEV	0.173***	-0.063***	0.633***	0.547***	1.0000	
TOBQ	-0.138***	-0.025***	-0.033***	-0.370***	-0.260***	1.0000

Note: *, * *, * * *, are significant at 10%, 5% and 1%, respectively.

4.3. Regression Results Analysis

In this paper, the three models are subjected to industry and year two-way fixed effects regression, and their regression results are shown in Table 4.

Firstly, according to the regression results of model (1), it can be seen that there is a significant positive correlation between corporate social responsibility (CSR) and innovation investment (RD) at the 1% level, with a coefficient of 0.0040, which indicates that the fulfillment of social responsibility by enterprises has a facilitating effect on their innovation inputs, i.e., the higher the score of CSR is, the higher the innovation inputs are, and the H1 has been verified.

Secondly, from the regression result of model (2), it can be seen that there is a significant negative correlation between CSR and the financing constraint index (KZ) at the 1% level, with a coefficient of -0.0301, and the fulfillment of social responsibility can alleviate the financing constraints of the enterprises. The higher the score of CSR, the lower the financing constraints of the enterprises, and the H2 has been verified.

Table 4. Analysis of the Regression Results

	(1)	(2)	(3)
	RD	KZ	RD
CSR	0.0040***	-0.0301***	0.0027***
	(0.0006)	(0.0008)	(0.0007)
KZ			-0.0428***
			(0.0046)
SIZE	0.8274***	-0.0876***	0.8237***
	(0.0091)	(0.0133)	(0.0091)
LEV	-0.6956***	8.3067***	-0.3401***
	(0.0523)	(0.0728)	(0.0659)
TOBQ	0.0454***	0.4509***	0.0647***
	(0.0081)	(0.0143)	(0.0084)
_cons	-2.0250***	1.7055***	-1.9520***
	(0.2040)	(0.2959)	(0.2038)
Ind	Control	Control	Control
Year	Control	Control	Control
R^2	0.4908	0.5635	0.4929
N	20093	20093	20093

Note: *, * *, * * *, are significant at 10%, 5% and 1%, respectively.

Lastly, the combination of models (1), (2) and (3) analyzes whether the financing constraints play a role in the relationship between them. Finally, combining models (1), (2) and (3) to analyze whether financing constraints play a mediating role in the relationship between the two. The coefficients of models (1) and (2) are significant, and the regression coefficient of the mediating variable of model (3), the financing constraint index (KZ), is significantly negative at the 1% level, which indicates that the higher the score of social responsibility, the lower the financing constraints of enterprises and the higher the innovation inputs of enterprises, i.e., the financing constraints play a partly intermediary role between the social responsibility of enterprises and the innovation inputs of enterprises, and H3 has been verified.

4.4. Stability Test

In addition to the above hypothesis testing, in order to ensure the robustness of the empirical results, further tests are to be done Hexun Network divides the CSR grade into five grades from A to E according to the total CSR score, on the basis of which this paper assigns grade A as 5, grade B as 4, grade C as 3, grade D as 2, and grade E as 1, which is used as a substitute for the explanatory variables for the stability test. The regression results are shown in Table 5, and the regression coefficients are all significant at the 1% level, and H1, H2, and H3 are verified again.

Table 5. Stability Test

	(1)	(2)	(3)
	RD	KZ	RD
CSR	0.0611***	-0.2151***	0.0509***
	(0.0167)	(0.0215)	(0.0167)
KZ			-0.0473***
			(0.0044)
SIZE	0.8390***	-0.2130***	0.8289***
	(0.0089)	(0.0132)	(0.0089)
LEV	-0.7587***	8.8757***	-0.3388***
	(0.0509)	(0.0723)	(0.0659)
TOBQ	0.0477***	0.4255***	0.0678***
	(0.0081)	(0.0148)	(0.0083)
_cons	-2.2934***	3.9630***	-2.1059***
	(0.1996)	(0.2920)	(0.1995)
Ind	Control	Control	Control
Year	Control	Control	Control
R^2	0.4900	0.5367	0.4926
N	20093	20093	20093

Note: *, * *, * * *, are significant at 10%, 5% and 1%, respectively.

5. Study Conclusion and Recommendations

5.1. Research Conclusion

Taking the relevant data of China's A-share listed companies in Shanghai and Shenzhen from 2011 to 2019 as the research sample, this paper finds that: CSR has a significant positive promotion effect on innovation investment; CSR is negatively correlated with financing constraints; and financing constraints play a partially intermediary role between CSR and innovation investment.

5.2. Suggestions

When an enterprise actively fulfills its social responsibilities, it is able to build better relationships of mutual trust and partnerships with various stakeholders. This effective interoperability helps to resolve communication barriers and enhance understanding and consensus between the two parties, while also providing enterprises with greater access to capital and resources and easing financing constraints.

Therefore, this paper puts forward the following suggestions: on the one hand, the government can formulate policies to guide enterprises to fulfill their social responsibility and enhance their awareness of social responsibility. The government can set up an incentive mechanism to provide certain preferential policies, tax incentives or other economic rewards for enterprises that actively fulfill their social responsibility. At the same time, the government can also set up standardized social responsibility assessment criteria, assess and rank enterprises, and publicize the results of the assessment, so as to promote active response and improvement. In addition, regulators should also play a role in improving the CSR information disclosure system, establishing a standardized information disclosure process, and clarifying the content of the CSR information that should be disclosed and the frequency of disclosure. Regulators should also strengthen the supervision of corporate disclosure information to ensure that corporate social responsibility information disclosure is true, accurate and complete. At the same time, a reporting system for inaccurate information should be established to encourage the public to actively participate in monitoring, and corresponding disciplinary measures can be taken for disclosing inaccurate information and violating disclosure behaviors, so as to enhance the credibility and effectiveness of information disclosure.

On the other hand, for enterprises, it is recommended that CSR values be integrated into their strategic planning. By viewing social responsibility as a driver of innovation, enterprises can stimulate the creativity and initiative of their employees and promote technological and business innovation. Innovative activities within enterprises can lead to more efficient operations and better products and services, further enhancing their competitiveness and sustainability. This strategic integration will bring dual benefits to the enterprise, both in terms of responding to social responsibility and promoting innovation.

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