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Research on the Relationship between Corporate Social Responsibility, R&D Investment and Financial Performance

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Abstract

In recent years, some social hot issues such as environmental pollution, false donations, food hygiene, employee safety hazards and other social hot issues have pushed CSR to the forefront. The issue of corporate social responsibility has aroused wide concern in the state and the public, and it has become an irreversible trend that enterprises should bear more or even exceed the economic level of social responsibility. On the background of encouraging enterprises to fulfill social responsibility, the paper based on social responsibility theory, resource-based theory, stakeholder theory and social contract theory, using Stata16.0 to conduct empirical analysis on the samples of listed companies in A-share pharmaceutical, computer, communication and equipment manufacturing industry in China from 2018 to 2020. This paper studies the impact of CSR and R&D on financial performance and the moderating role of R&D in the relationship between CSR and financial performance. Research findings: CSR and financial performance is significantly positive correlation; R&D investment has a significant negative correlation with the current financial performance, but has a positive effect in the lagging period. R&D investment plays a positive moderating role in the positive correlation between CSR and financial performance. Based on the results, this paper puts forward targeted policies and practical suggestions for enterprises and the government from different dimensions, so as to promote the sustainable development of our enterprises by making them pay attention to their social responsibility and technological innovation capabilities.

Keywords

Corporate Social Responsibility; R&D Investment; Financial Performance.

1. Introduction

Currently, China is at a critical stage of social and economic transformation. Enterprises, as important entities in market economic activities for creating material wealth, are continuously extending and deepening their influence on society and economy. While promoting social and economic development, enterprises face prominent contradictions in corporate social responsibility issues, causing adverse effects on the entire society, such as garbage pollution, quality defects, and high-intensity work for employees. This has made more and more corporate managers realize the importance of social responsibility in daily management and operations.

By actively fulfilling social responsibilities, enterprises can build their reputation, enhance consumer and investor confidence in the enterprise, increase the stickiness between them and the enterprise, and thereby increase the enterprise's market value.

It has become an irreversible overall trend for enterprises to bear more, even beyond the economic level of social responsibility, and this trend is gradually becoming legalized and globalized. However, at the same time, there is a clear duality in enterprises fulfilling their

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responsibilities. Actively fulfilling social responsibilities also means that enterprises need to invest more management costs, thereby increasing business operating expenses, which to some extent will not be conducive to corporate financial performance, so many enterprises will resist the fulfillment of social responsibility. At this time, some enterprises implement market differentiation strategies through technological innovation to compensate for the increased costs brought about by the fulfillment of corporate social responsibility. At the same time, with the support and help of new technologies, enterprises can better fulfill social responsibilities. Against this backdrop, what kind of impact will corporate social responsibility, innovation investment, and financial performance have on each other has become a concern for corporate managers.

The theoretical significance of this paper includes: exploring the relationship between corporate social responsibility and financial performance, which enriches related research. Currently, there is a lack of research on the moderating role of innovation investment, and this area is relatively uncharted. By incorporating the role of innovation investment into our study and empirically testing the relationship among the three, we provide new insights and further refine the existing theoretical research conclusions.

The practical significance of this paper includes: firstly, by selecting data from China's A-share listed companies from 2018 to 2020, it helps to inspire related enterprises to focus on the ways and strategies of fulfilling social responsibilities, enhance corporate social responsibility awareness, and encourage enterprises to consciously fulfill their social responsibilities. Secondly, while focusing on corporate social responsibility and financial performance, discussing the moderating role of innovation investment, motivates enterprises to increase R&D investment within a reasonable range. Lastly, based on the research, feasible suggestions are proposed to enterprises and governments, making technological innovation investment a complementary strategy for enterprises to practice social responsibility. This provides a certain reference value for enterprises to actively assume social responsibilities and improve corporate competitiveness. It also provides new ideas for enterprises on how to integrate social responsibility with technological innovation for coordinated development, helping enterprises to achieve social responsibility goals in a better way while improving corporate financial performance.

2. Literature Review and Hypothesis Development

2.1. The Impact of Corporate Social Responsibility on Financial Performance

Corporate social responsibility (CSR) is an activity that allows corporate managers to make decisions aimed at improving social welfare. From the perspective of multiple stakeholders, CSR covers four major categories: organizations (such as employees, consumers, shareholders, suppliers), communities (such as local residents, interests of special groups), regulatory agencies (such as autonomous regions, market supervision bureaus), and media stakeholders.

Previous studies have shown that social responsibility actions are an important way for companies to obtain more social resources and maintain their competitive advantage. Wirawan (2020)[1] believes that social responsibility management has become a strategic choice for companies to achieve sustainable development. Therefore, the impact of corporate social responsibility on corporate value has gradually attracted attention.

Most of the literature has focused on the relationship between corporate social responsibility and financial performance. Foreign scholars started relatively early, while research in our country began later, and there are mainly three aspects to the relationship between the two: positive, negative, and nonlinear.

From a quantitative analysis perspective, Harrison (2018)[2] conducted a quantitative study on twenty-seven pieces of literature related to the negative effects of corporate irresponsibility

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and corporate misconduct. The results show that both behaviors have a negative impact on the stock market, implying that fulfilling social responsibility has a positive effect on companies. Zhu Yongming and Li Jing (2021)[3], starting from an empirical analysis perspective, based on 124 pieces of domestic and international empirical literature from 1993 to 2019, used Meta-analysis to explore the impact of social responsibility on financial performance and found a significant positive correlation.

Most studies believe that corporate social responsibility has a positive impact on financial performance. Shahbaz Sheikh (2020)[4] used data from 2004 to 2015 and found that corporate social responsibility is positively correlated with market value. Luo Jiaqi et al. (2019)[5] and Yang Shanshan (2020)[6] believe that good social performance can help companies balance and meet the needs of stakeholders, effectively improve the efficiency of companies in responding to external demands, obtain more social capital and development opportunities, and thus promote the improvement of corporate financial performance.

A few studies believe that corporate social responsibility has a negative or lagging impact on financial performance. Guo Z (2020)[7] believes that corporate social responsibility reduces idiosyncratic risk and increases systematic risk, reducing company profits. Dong Qianli et al. (2017)[8] believe that the improvement or decline of financial performance in the current period is affected not only by the current social responsibility effect but also by the potential impact of previous social responsibility, that is, the impact of corporate social responsibility on financial performance has a certain lag.

2.2. The Relationship between Corporate Social Responsibility, Innovation Investment, and Financial Performance

Barnett (2007)[9] points out a potential limitation in previous studies, which failed to control the investment of companies in innovation, that is, the role of innovation investment was not explored.

At present, the combination of corporate social responsibility and innovative research and development practice is a new direction for companies to achieve sustainable development. When companies fulfill their social responsibilities, they also pursue differences in strategy and methods, including capital investment in technological patents, product research and development, and other projects (Williams, 2006)[10].In view of the current lack of research on the correlation between corporate social responsibility, innovation investment, and financial performance, there is no conclusion on whether innovation investment plays a mediating or moderating role in the relationship between corporate social responsibility and financial performance. In empirical results, the positive and negative effects of innovation investment on the relationship between the two have shown varying degrees of heterogeneity.

Most studies believe that innovation investment has a moderating effect between corporate social responsibility and financial performance. Zhu Naiping et al. (2014)[11] used a two-stage investment decision model and found that innovation investment moderated and enhanced the positive impact of social responsibility on financial performance. Jiang Jie and Li Zuozhi (2017)[12] showed that when companies increase innovation investment, they can positively moderate the positive impact of social responsibility on financial performance. Wang Zhengjun and Xie Xiao (2020)[13] found that innovation investment moderated and enhanced the positive effect of corporate social responsibility on financial performance, and high levels of innovation companies can more effectively enhance financial performance when undertaking social responsibilities.

A few studies believe that innovation investment has a mediating role between corporate social responsibility and financial performance. Chen Xu and Ha Jinhua (2021)[14] found that corporate social responsibility can promote innovation, and innovation investment mediated the relationship between social responsibility and corporate value.

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There are also studies that further subdivide social responsibility. Cui Yeguang and Li Bo (2018)[15] showed that innovation can enhance the promoting effect of strategic social responsibility on financial performance, but cannot enhance the promoting effect of altruistic social responsibility. In addition, Huang Jun and He Guoliang (2017)[16] considered the impact of property rights nature and found that compared with non-state-owned enterprises, the innovation investment of state-owned enterprises showed a negative moderating effect on the relationship between social responsibility and corporate value.

In summary, previous literature on the correlation between corporate social responsibility and financial performance has been relatively mature. However, research on the impact of innovation investment on financial performance has not yet formed a unified view due to different research objects and methods, and the research results show heterogeneity. At the same time, there is a scarcity of research on the moderating role of technological innovation between corporate social responsibility and financial performance. Therefore, this paper will take innovation investment as a starting point to analyze its moderating effect on the relationship between corporate social responsibility and financial performance, which has certain practical significance and can provide new references for subsequent research.

2.3. Corporate Social Responsibility and Financial Performance

In the fourth generation of value-driven business operations, the fulfillment of social responsibility is particularly important for promoting value creation. Actively responding to public opinion expectations and seeking solutions with added value can shape the brand image and bring economic growth. Advancing product iteration, providing employment assistance, and conducting charitable fundraising all help solve social problems, establish a good corporate image, and promote the enhancement of corporate value.

This paper argues that although the fulfillment of social responsibility by businesses is a cost expenditure, it is also a long-term investment that can bring sustained relative advantages, promote the social recognition of the business, and thereby enhance a series of corporate performances such as profitability and operational capability. At the same time, whether in terms of actions or credibility, people generally have higher expectations for businesses that perform better in social responsibility, thereby enhancing the reputation of the business and obtaining brand premium. Based on this, Hypothesis H1 is proposed.

H1: There is a positive correlation between the level of corporate social responsibility fulfillment and financial performance.

2.4. Innovation Investment and Financial Performance

In the competitive capital market, if businesses want to avoid being eliminated and continue to exist and develop for a long time, they need to increase their R&D intensity, continuously update their products, keep up with the continuous changes in consumer demands and standards of the times, attract new customers and retain existing customers, increase market share, and thereby improve financial performance. Therefore, the continuous improvement of financial performance brought by innovation investment will inevitably increase the value of the business. In addition, investors have a certain direct sense of identification with innovation investment, believing that the core competitiveness and value of the business will be greatly enhanced.

However, in reality, the impact of increased innovation investment on financial performance is not an overnight success but a gradual process. This is because the market in reality is not perfect, and various unreasonable factors can become obstacles. Businesses want to gain the trust and support of stakeholders through innovation, which requires going through the process from the generation, transmission to the final transformation into profit of innovation. At the same time, innovation research and development require a large amount of funds, but

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the results have temporal lag and uncertainty of success, making it difficult to reflect in current performance, but instead increasing operating costs and having an adverse impact on financial performance. However, good deeds go unpunished, and innovation investment will eventually promote business development. Therefore, the impact of innovation investment on financial performance has a lag and will only bring benefits after the lag period. Based on this, Hypotheses H2 and H3 are proposed.

H2: Innovation investment is negatively correlated with current financial performance.

H3: The impact of innovation investment on corporate financial performance has a lag effect.

2.5. Corporate Social Responsibility, Innovation Investment, and Financial Performance

With the continuous change of social demands, businesses want to fulfill social responsibilities and enhance business value, and they must innovate, combining social responsibility with innovation has become a practical need. Many aspects of corporate social responsibility investment will promote innovation in products and industry chains, so there is a positive correlation between intangible assets and corporate social responsibility. For example, manufacturing technology innovation can reduce pollutant emissions and meet low-carbon environmental social requirements, etc.

McWilliams (2006)[10] found that while businesses are actively participating in social activities, they are also seeking strategic differentiation, including increasing innovation investment. Luo and Bhattacharya (2006)[20] also showed that when consumers feel that corporate social responsibility investment is taking funds away from product quality or innovation, the investment will have a negative effect. This indicates that innovation investment can positively moderate the impact of corporate social responsibility on financial performance. Based on this, Hypothesis H4 is proposed.

H4: Innovation investment has a positive moderating effect on the relationship between corporate social responsibility and financial performance.

3. Research Design

3.1. Sample Selection and Data Sources

This paper selects 768 pharmaceutical manufacturing and computer, communication, and other electronic equipment manufacturing companies listed on the A-share market from 2018 to 2020 as the research sample according to the industry classification of the China Securities Regulatory Commission in 2012, excluding companies that have been delisted, ST companies, and samples with missing data. Due to some companies not disclosing relevant data on innovation investment in their annual reports, a total of 1059 valid samples available for research were ultimately obtained.Data on financial performance, innovation investment, and control variables in the sample come from the GTA Information Database.

Data on corporate social responsibility in the sample comes from the "Listed Company Social Responsibility Evaluation Report" on Hexun.com. This database covers a large number of companies, has a comprehensive index system, and adjusts the weighting according to different industry characteristics. It is considered to have high objectivity and authority among the social responsibility scoring data currently issued, so this paper uses it to quantify the fulfillment of corporate social responsibility.

3.2. Variable Description and Indicator Depiction

The dependent variable measurement indicator selected is aimed at quantifying corporate financial performance. Corporate financial performance represents the production and operation status and profitability of a company within a specific period. Methods for measuring

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financial performance have been relatively mature after research and improvement by numerous domestic and international scholars, mainly including two major categories. The first category selects accounting indicators, mainly based on accounting statements, reflecting the company's financial capabilities, generally including Return on Assets (ROA), Return on Equity (ROE), etc.; the second category selects market indicators, based on market data, reflecting the value recognition of companies by shareholders, creditors, and other stakeholders, with Tobin's Q value being the most representative.

After summarizing the research results of various scholars, it is found that using Tobin's Q value to quantify corporate financial performance has certain limitations because China's stock market is currently not perfect and there are many unknown volatile factors. The monetary policy issued is not fully utilized, so Tobin's Q value is not suitable for quantifying the financial performance of listed companies in China. Accounting indicators can better comprehensively reflect the financial performance of companies and have advantages among these two major categories of indicators. This paper draws on the research results of Zhang Jinsong and Li Muyao (2021)[21] and selects ROA as the measurement indicator of financial performance.

The independent variable in this paper is corporate social responsibility (CSR), which quantifies how companies fulfill their social responsibilities. This paper draws on the research methods of Zheng Pei, Li Yixiu, and He Yanhuan (2020)[22] and Zhong Peng, Wu Tao, and Li Xiaoyu (2021)[23], using the Hexun.com listed company social responsibility score to measure the fulfillment of corporate social responsibility. This data has been widely used in academic research.

The moderating variable in this paper is corporate innovation investment. The measurement of innovation investment generally uses absolute indicators (total R&D expenditure) or relative indicators (R&D intensity) for measurement. To eliminate the influence of factors such as company size, this paper draws on the research methods of Cui Yeguang, Jiang Xiaowen, and Qi Ying (2019)[24], using the relative indicator, which is the ratio of R&D expenses to operating income (R&D), as the measurement indicator of innovation investment.

When selecting control variables in this paper, the main consideration is the variables that affect corporate social responsibility, technological innovation, and financial performance.

Firstly, financial risk will affect the company's responsibility-bearing. Companies with higher financial risks often come with operational issues and financing difficulties, so the asset-liability ratio (LEV) is introduced to measure financial risk. Secondly, the listing age of a company will affect its reputation, operational stability, and brand premium, so this paper selects the listing age (AGE) as a control variable. Furthermore, the size of a company will affect the fulfillment of corporate social responsibility to a certain extent. Generally speaking, the larger the company, the better it will perform in terms of social responsibility and development operations, so the logarithm of the total assets at the end of the year is used to represent the company size. Finally, industry (IND) and year (YEAR) are introduced to respond to macro changes and industry fixed factors.

Table 1. Variable Definitions

Variable Type	Variable	Variable Definition
Dependent Variable	ROA	Net profit calculated based on total assets
Independent Variable	CSR	Hexun Listed Company Social Responsibility Score
Moderating Variable	R&D	R&D expenses/Operating income
Control Variable	LEV	Total liabilities at the end of the year/Total assets at the end of the period
	AGE	The current year of the enterprise - The year the enterprise was listed
	SIZE	Logarithm of total assets
	IND	Dummy variable
	YEAR	Dummy variable

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In summary, the control variables in this paper include: asset-liability ratio (LEV), listing age (AGE), company size (SIZE), industry (IND), and year (YEAR).The variables involved in this paper and their descriptions are shown in Table 1.

3.3. Model Construction

Based on the analysis and hypotheses in the previous text, combined with the selection of variables, a regression model is constructed.

Firstly, Model (1) is constructed to verify Hypothesis H1, with CSR as the independent variable and ROA as the dependent variable, to study the relationship between corporate social responsibility and financial performance.

$$ROA=\beta_0+\beta_1CSR+\beta_2LEV+\beta_3AGE+\beta_4SIZE+\sum IND+\sum YEAR+\varepsilon \quad (1)$$

Secondly, Models (2) and (3) are constructed to verify Hypotheses H2 and H3, with R&D as the independent variable and ROA as the dependent variable, to study the relationship between innovation investment and financial performance.

$$ROA_t=\beta_0+\beta_1R\&D_t+\beta_2LEV_t+\beta_3AGE_t+\beta_4SIZE_t+\beta_5IND_t+\varepsilon \quad (2)$$

$$ROA_t=\beta_0+\beta_1R\&D_{t-1}+\beta_2LEV_t+\beta_3AGE_t+\beta_4SIZE_t+\beta_5IND_t+\varepsilon \quad (3)$$

Lastly, Model (4) is constructed to verify Hypothesis H4, by adding the interaction term of corporate social responsibility and innovation investment (CSR*R&D), to study the moderating effect of innovation investment.

$$ROA=\beta_0+\beta_1CSR+\beta_2R\&D+\beta_3CSR*R\&D+\beta_4LEV+\beta_5AGE+\beta_6SIZE+\sum IND+\sum YEAR+\varepsilon \quad (4)$$

4. Empirical Testing

4.1. Sample Selection and Data Sources

This paper processes data through software such as Stata and Excel, and Table 2 summarizes the descriptive statistical results of the variables, with a sample size of 1059.

Table 2. Descriptive Statistical Results

Variable	N	Mean	Median	Standard	Minimum	Maximum
ROA	1059	0.043	0.046	0.091	-0.847	0.333
CSR	1059	19.730	22.01	9.305	-14.000	35.540
R&D	1059	0.068	0.054	0.052	0.001	0.573
LEV	1059	0.339	0.324	0.172	0.014	0.990
AGE	1059	7.329	6.000	6.035	0.000	28.000
SIZE	1059	21.890	21.790	1.031	19.690	25.150
IND	1059	0.439	0.000	0.497	0.000	1.000

Firstly, for the dependent variable financial performance (ROA), the maximum value is 0.333, the minimum value is -0.847, and the mean is 0.043, indicating that the overall level of corporate financial performance in the sample is relatively low.

Corporate social responsibility (CSR), as an independent variable, has a maximum value of 35.54, a minimum value of -14, and a mean of 19.73, indicating that there is significant room

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for improvement in the overall fulfillment level. The standard deviation reaches 9.305, showing a large difference in the fulfillment status among enterprises.

Secondly, for the moderating variable R&D intensity (R&D), the maximum value is 0.573, and the minimum value is only 0.001, with the mean of R&D expenditure as a proportion of business income being 0.052, indicating that corporate innovation investment is generally low.

For the control variables, the maximum value of the asset-liability ratio (LEV) is 0.99, the minimum value is 0.009, and the average value is 0.339, with a standard deviation of 0.172. The asset-liability ratio is used to measure the debt and risk of an enterprise, and it is generally considered appropriate to maintain between 0.4-0.6. In this paper's research sample, most enterprises are normal. The maximum value of the corporate listing age (AGE) is 28, the minimum value is 0, and the average value is 7.329, with a standard deviation of 6.035, and the median is 6. This shows that most enterprises in the sample have been listed for six to seven years, which is a relatively stable period of company development. The average value of the company size (SIZE) is 21.89, with a standard deviation of 1.031, also indicating that the scale is generally considerable and balanced. The number of companies in the pharmaceutical manufacturing and computer, communication, and equipment manufacturing industries in the sample is basically equal. Therefore, the sample has certain representativeness.

4.2. Correlation Analysis

The following is a correlation analysis. Table 3 shows the correlation coefficients and significance levels between the variables.

The analysis results show that, except for the correlation coefficient between corporate social responsibility (CSR) and financial performance (ROA) being 0.71, the absolute values of the correlation coefficients between the variables are all below 0.5. From the collinearity diagnosis results, the VIFs are all less than 2, indicating no serious multicollinearity, making it suitable for regression analysis.

Corporate social responsibility (CSR) is significantly positively correlated with financial performance (ROA) at the 1% level, indicating that the higher the degree of corporate social responsibility fulfillment, the better the financial performance. Hypothesis H1 is likely to pass the test. While innovation investment (R&D) is significantly negatively correlated with financial performance (ROA) at the 10% level, preliminarily verifying Hypothesis H2, that is, innovation investment has a negative impact on current financial performance.

At the same time, the correlation coefficient between corporate social responsibility (CSR) and innovation investment (R&D) is significant at the 1% level, indicating a strong correlation between CSR and R&D, which also indirectly confirms the theoretical analysis of Hypothesis H4. Therefore, regression analysis is conducted on the models constructed in the previous text.

Table 3. Correlation Analysis Results

Variable	ROA	CSR	R&D	LEV	AGE	SIZE	IND
ROA	1						
CSR	0.71***	1					
R&D	-0.05*	-0.11***	1				
LEV	-0.37***	-0.34***	-0.14***	1			
AGE	-0.14***	-0.08***	-0.15***	0.13***	1		
SIZE	0.03	0.07**	-0.11***	0.39***	0.49***	1	
IND	0.07**	0.23***	-0.12***	-0.18***	0.21***	0.07**	1
VIF		1.32	1.09	1.51	1.46	1.68	1.15

Note: *, **, and *** represent significant correlations at the 10%, 5%, and 1% levels, respectively.

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4.3. Model Regression Result Analysis

4.3.1. The Impact of Corporate Social Responsibility on Financial Performance

This paper summarizes the regression results of corporate social responsibility and corporate financial performance according to Model (1). As shown in Table 4, corporate social responsibility (CSR) is significantly positively correlated with financial performance (ROA) at the 1% level, that is, the higher the degree of corporate social responsibility fulfillment, the better the financial performance. Hypothesis H1 is verified.

At the same time, according to the regression analysis results, the correlation between corporate social responsibility and control variables is basically in line with expectations. The asset-liability ratio (LEV) is negatively correlated with the dependent variable (β=-0.101, p<0.01), and the corporate listing age (AGE) is negatively correlated with it (β=-0.002, p<0.01), and the corporate size (SIZE) is positively correlated with it (β=0.010, p<0.01). The above correlations are all significant, and the regression results of the control variables indicate that the regression model control is effective.

Table 4. The Impact of Corporate Social Responsibility on Financial Performance

Variable	ROA
	(1)
CSR	0.006***
	(0.000)
LEV	-0.101***
	(0.013)
AGE	-0.002***
	(0.000)
SIZE	0.010***
	(0.002)
Constant	-0.239***
	(0.048)
IND	Control
YEAR	Control
N	1059
F test	0
F	180.071
r2	0.545
r2_a	0.542

Note: Constant is the intercept variable, * p < 0.1, ** p < 0.05, *** p < 0.01 (two-tailed).

4.3.2. The Impact of Innovation Investment on Financial Performance

According to the Hausman test result (p-value 0.000), a double fixed-effect model is used to regress Model (2), and the results are presented in Table 5.

Innovation investment (R&D) is significantly negatively correlated with current financial performance (ROA) at the 1% level, with β being -0.799, indicating a significant negative correlation, that is, the higher the innovation investment, the lower the current financial performance. Hypothesis H2 is confirmed.

Innovation investment is significantly positively correlated with lagged financial performance at the 5% level, with β being 0.537, indicating a significant positive correlation, that is, innovation investment has a positive promoting effect on lagged financial performance. Hypothesis H3 is confirmed.

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Table 5. The Impact of Corporate Social Responsibility on Financial Performance

Variable	ROA	ROA
	(1)	(2)
R&D	-0.799***	
	(0.092)	
L.R&D		0.537**
		(0.213)
LEV	-0.391***	-0.378***
	(0.039)	(0.072)
AGE	0.003	0.004
	(0.003)	(0.007)
SIZE	0.010	0.006
	(0.013)	(0.026)
Constant	-0.002	-0.023
	(0.272)	(0.544)
CODE	Control	Control
YEAR	Control	Control
N	1059	706
F test	0	0
F	37.639	8.336
r2	0.212	0.087
r2_a	-0.190	-0.844

Note: Constant is the intercept variable, * p < 0.1, ** p < 0.05, *** p < 0.01 (two-tailed)

4.3.3. The Moderating Effect of Innovation Investment

Table 6. The Moderating Effect of Innovation Investment

Variable	ROA
	(1)
CSR	0.006***
	(0.000)
R&D	-0.138**
	(0.067)
CSR*R&D	0.006*
	(0.004)
LEV	-0.096***
	(0.013)
AGE	-0.002***
	(0.000)
SIZE	0.010***
	(0.002)
Constant	-0.233***
	(0.049)
IND	Control
YEAR	Control
N	1059
F test	0
F	152.846
r2	0.538
r2_a	0.534

Note: Constant is the intercept variable, * p < 0.1, ** p < 0.05, *** p < 0.01 (two-tailed).

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To test the moderating effect of innovation investment between corporate social responsibility and financial performance, this paper introduces the interaction term of CSR and R&D and regresses Model (4). The results are shown in Table 6.

Corporate social responsibility (CSR) is positively correlated with financial performance (ROA) at the 1% level, again verifying the regression results of Model (1) in Table 4. Innovation investment (R&D) is negatively correlated with financial performance (ROA) at the 5% level, again verifying the regression results of Model (2) in Table 5.

The interaction term of CSR and R&D with financial performance (ROA) is significantly positive at the 10% level, indicating that innovation investment has a positive moderating effect on the relationship between corporate social responsibility and financial performance, that is, companies with high innovation investment can better promote the improvement of financial performance when fulfilling social responsibilities. Hypothesis H4 is verified.

5. Conclusion and Suggestions

The regression results of this paper regarding corporate social responsibility and financial performance verify Hypothesis H1, indicating a significantly positive correlation between corporate social responsibility and financial performance. Companies that undertake social responsibilities and establish brand images can actively respond to public opinion expectations and bring new economic growth points.

The regression results concerning corporate innovation investment and financial performance verify Hypotheses H2 and H3, showing a significant negative correlation between innovation investment and current financial performance, but a positive effect on lagged financial performance. The funds required for innovation are substantial, but they have temporal lag and uncertainty, which can increase operating costs and adversely affect financial performance. However, innovation investment will eventually drive product improvements, attract new customers, expand market share, and enhance financial performance in the long term. Thus, the impact of innovation investment on financial performance is lagging and will yield benefits after the lag period.

The regression results regarding the moderating effect of innovation investment verify Hypothesis H4, demonstrating that innovation investment plays a positive moderating role in the positive correlation between corporate social responsibility and financial performance, thereby strengthening the positive relationship between the two. Companies that fulfill social responsibilities while pursuing strategic and methodological differentiation find that innovation-based corporate social responsibility strategies can balance the input and output of social responsibility and internalize it into the company's learning capabilities and core competitiveness, thereby improving financial performance.

In summary, a company's assumption of social responsibility and innovation investment both affect its financial performance, and innovation investment positively moderates the relationship between corporate social responsibility and financial performance.

In response to the significant changes in innovation-driven and social demands, companies should integrate global resources, combine social responsibility management with technological innovation, and point out a new direction for corporate sustainable development. At the same time, corporate innovation and research and development should be guided by social responsibility, providing higher-quality products or services, achieving economies of scale to reduce costs, and gaining more favor from external investors, thereby improving corporate financial performance and ensuring sustainable corporate development. For example, the pharmaceutical industry can independently develop and introduce advanced medical technology and products to benefit patients. The computer and communication equipment manufacturing industry can tackle the "bottleneck" technical areas in trade wars,

seize the innovative high ground in semiconductors, artificial intelligence, and the digital economy globally.

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