

Article

Influence Mechanism between Corporate Social Responsibility and Financial Sustainability: Empirical Evidence from China

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Abstract: With the increasing public attention being paid to corporate social responsibility and global advocacy of sustainable development, corporate governance issues centered on corporate social responsibility, especially the relationship between corporate social responsibility and financial sustainability, are important topics of concern for managers. By taking companies listed in Shanghai and Shenzhen A-share indices between 2010 and 2020 in China as samples, this study investigated the effect and mechanism of corporate social responsibility implementation on financial sustainability, examined the intermediate roles of agency cost and green innovation on this effect, and explored the heterogeneity in different contexts. The results indicated that: (1) implementing corporate social responsibility has significantly promoted financial sustainability, and fulfilling responsibilities to shareholders showed the most significant effect; (2) active pursuit of corporate social responsibility objectives can alleviate corporate agency conflicts, increase green innovation, and thus promote corporate financial sustainability; and (3) the positive impact of implementing corporate social responsibility on financial sustainability is more significant in non-state-owned enterprises and non-heavily polluting enterprises. This study revealed the specific effect of fulfilling corporate social responsibility objectives for different stakeholders on financial sustainability, confirmed the mediating role of agency cost and green innovation on this effect, and discussed the intensity of the impact of fulfilling corporate social responsibility objectives on financial sustainability in different contexts. This study enhances the understanding of the effect and mechanism of fulfilling corporate social responsibility obligations on financial sustainability, which can guide the advancement of future theory-building in corporate governance.

Keywords: corporate social responsibility; financial sustainability; agency cost; green innovation



Citation: Tao, J.; Shan, P.; Liang, J.; Zhang, L. Influence Mechanism between Corporate Social Responsibility and Financial Sustainability: Empirical Evidence from China. *Sustainability* **2024**, *16*, 2406. <https://doi.org/10.3390/su16062406>

Academic Editor: Gaetano della Corte

Received: 17 February 2024

Revised: 8 March 2024

Accepted: 12 March 2024

Published: 14 March 2024



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1. Introduction

As participants in society, corporations not only need to focus on their own rights and interests but also need to fulfill their own obligations and fulfill their social responsibilities [1]. As major market players, enterprises take economic benefits to be the primary goal, while social demands and responsibility also need to be considered in their daily business activities. As a result, implementing corporate social responsibility (CSR) seems to be the major means for enterprises to care for society and meet social needs. However, a series of negative events, such as the Volkswagen scandal, Gulf of Mexico oil spill, and Wells Fargo scandal, indicate that not all enterprises can fulfill CSR obligations actively and successfully [2], which not only seriously undermines consumer confidence but also does great harm to the public and environment. Therefore, whether enterprises can fulfill their CSR goals has sparked widespread discussions.

Given the current global advocacy for sustainable development, enterprises also face the challenge of how to achieve this, that is, they should pursue corporate growth and economic benefits, or financial sustainability, while keeping in mind nonprofit social and

environmental benefits [3], which consist of the three pillars of sustainability [4]. In fact, as major market entities, enterprises can only better achieve social and environmental sustainability and serve economic and social development while maintaining their economic sustainability [5]. At the micro level, the economic sustainability of companies is mainly reflected in their financial sustainability (FS), which refers to the ability of enterprises to continuously maintain value creativity with current resource stocks and increments [6]. This reflects the long-term financial performance in terms of profitability and corporate return of an enterprise [7]. Strong financial sustainability helps improve the resource allocation capacity and promote the connotative growth of enterprises, and it measures the sustainable and healthy development of enterprises [8]. In addition, fulfilling CSR requires a certain economic foundation for enterprises. With limited economic resources in enterprises, will the economic investment in fulfilling CSR affect future business activities and financial sustainability? As an internal autonomous incentive tool, will implementing CSR improve a company's financial sustainability? [9,10]

In the context of China, there are no enforced CSR disclosure regulations. With the fast growth of China's economy, greater importance has been attached to environmental quality and sustainability [11]. Since the late 2000s, China's energy conservation and emission reduction work has entered a stage of deepening reform, and intensive market-oriented economic incentive policies have been introduced. In 2006, the Shenzhen Stock Exchange implemented the Corporate Social Responsibility Guidelines for listed companies. The Shanghai Stock Exchange followed suit in 2008, mandating that certain listed companies publish CSR reports. Although there is a lack of a clear and transparent reporting framework, these requirements highlight the importance of CSR in corporate operations [12]. In addition, the Green Credit Guidelines were implemented by the China Bank Regulatory Commission in 2012, linking the financing activities of enterprises to their energy-saving and emission reduction activities and forcing enterprises to undergo green transformation and take on more environmental responsibilities. Since then, Chinese enterprises have begun to participate in CSR activities due to increasing pressure from various stakeholders and the general public [12]. Presently, the corporate performance of listed companies in China is not only dependent upon its financial performance but also depends on the satisfaction of stakeholders and society during its operation [13]. Therefore, an investigation of the effect of CSR implementation on financial sustainability as well as the transmission mechanism between these two variables in the institutional context of China is a necessity.

Increasingly, enterprises are disclosing CSR information regularly, and there is also increasing research on the micro effects of CSR implementation, especially on the impact of CSR implementation on FS.

One view is that CSR activities can be seen as business opportunities, and fulfilling CSR can significantly improve corporate financial performance [11–17], enterprise value [18–20], and shareholders' interests [21,22]. According to the stakeholder theory, enterprises that have established mutual trust and cooperation with stakeholders are more competitive than those that have not, as they care about the interests of the stakeholders as business partners, which can help win the support of stakeholders in the business of enterprises. This mutually beneficial and cooperative relationship with stakeholders may win more favorable evaluations from financial analysts [23], better credit rating [24] and higher consumer trust [25]. Internally, it can also improve employee satisfaction and strengthen their trust in the organization [26], and effectively integrate stakeholders' interests with the strategies and operations of the enterprise to improve productivity [27]. Based on that, reputation is thought to be an important mechanism for CSR to promote corporate financial performance [17,28]. The instrumental stakeholder theory posits that CSR is a strategic tool for increasing shareholders' value [29], as well as establishing and maintaining a company's reputation to improve the information environment [30], as the disclosed CSR information can alleviate information asymmetry between enterprises and their stakeholders [31], thus significantly reducing the costs of enterprises to raise funds and expanding the financing channels [32]. The resource-based view believes that only heterogeneous resources can

improve corporate performance and bring sustained competitive advantages, while excellent CSR performance can provide heterogeneous resources for enterprises and is an important source of competitive advantage [33]. It has been proved that companies that fulfill CSR can help differentiate themselves from competitors and have a positive impact on corporate image, reputation, and human capital [34].

An opposite view point is that CSR is just a cost accumulator, and fulfilling CSR can harm the financial performance of enterprises. According to the agency theory, CSR is considered an expensive activity that does not create any added value, and companies have only one responsibility, which is to utilize their resources and engage in activities aimed at increasing their profits [35]. Due to the conflict of interests between shareholders and managers, managers may overinvest in other stakeholders at the expense of shareholder interests to benefit their personal reputation and career [36,37]. Thus, managers who use company resources for unprofitable CSR activities are seen as transferring economic benefits [38], which means managers may transfer wealth from shareholders to other stakeholders, including executives, leading to a decrease in shareholders' return on equity [39]. In addition, CSR is also believed to provide goodwill and insurance benefits for managers [20,40], leading to a positive correlation between CSR participation and managers' misconduct [41]. This belief also holds that stakeholders may not necessarily respond positively to better CSR of the enterprise, thereby bringing no positive impact on corporate financial performance [42], and it is believed that the impact of CSR on corporate performance depends on the degree of stakeholder response to CSR [43]. In addition, following this point of view, the commitment to CSR is expensive, requiring enterprises to spend the limited resources that can be invested in other more profitable projects [44], which reduces capital allocation efficiency and increases the daily operating costs [45].

There are also a few scholars think that the relationship between CSR implementation and corporate performance is not the same in different scenarios. By interpreting the role of reputation capital, Yu et al. found that in an effective information market, fulfilling CSR can promote its sustainable development; however, in an incomplete information market, undertaking CSR can do harm to the sustainable development of enterprises [46].

Although abundant studies have been conducted to explore the effects of CSR implementation on corporate financial performance, there are still some research gaps that need to be filled in. Firstly, the specific influential effect of CSR implementation on FS is still unclear. As multiple stakeholders have been involved in CSR activities, fulfilling responsibilities to different stakeholders may generate different impacts on the FS of a company. Secondly, if CSR implementation does have certain effects on FS, how does it happen? As CSR can bring multiple impacts on the activities of the enterprise, some could be positive, and some could be negative. Will these impacts further act on FS? Lastly, will there be any difference in the impacts of CSR implementation on FS for different types of enterprises? With thoughts on the above questions, this study tries to investigate the influential effect of CSR implementation on FS, examine the intermediate roles of agent cost (AC) and green innovation (GI) on this influential effect, and explore the heterogeneity of this effect in terms of different enterprise ownership and industrial nature.

By taking companies listed in Shanghai and Shenzhen A-share indices in China between 2010 and 2020 as the research sample, this study firstly examined the influential effect of CSR implementation on enterprises' financial sustainability (FS) from both the theoretical and empirical perspective. Then, from the perspective of different stakeholders in implementing CSR, it investigated the differences in the effect of adherence to CSR on different stakeholders on FS. After that, it explored the intermediate roles of agent AC and GI in the effect of enterprises' CSR implementation on their FS. Lastly, it analyzed the heterogeneity in the impact of CSR implementation on FS in terms of enterprise ownership and industry nature.

The rest of this paper is organized as follows. Section 2 presents the theoretical analysis and proposes the research hypotheses. Section 3 describes the variables and mathematic

models. The empirical results and analysis are given in Section 4, and the conclusions and policy implications are summarized in Section 5.

2. Theoretical Analysis and Research Hypotheses

2.1. CSR and FS

Corporate social responsibility (CSR) refers to the responsibility of enterprises towards stakeholders, such as shareholders, employees, customers, suppliers, communities, and the natural environment, to achieve coordination and unity between enterprise interests and sustainable economic and social development [9,47]. That is, enterprises need to care about and protect the rights and interests of other stakeholders while pursuing profit maximization, which is closely related to corporate financial sustainability reflected in continuous value creativity and long-term financial performance.

CSR may potentially impact FS of a company in multiple respects, as presented in Figure 1. Firstly, embedding CSR into daily business activities of enterprises can help obtain strategic and critical resources for sustainable development of enterprises [19], which is a win–win business activity for both the management and the stakeholders. Secondly, with the fast development of the internet and information technology, information disseminates rapidly with very low costs. In that case, enterprise actively pursuing CSR can reduce frictions and conflicts with stakeholders, enhance the public’s trust in and recognition of the enterprise, and create a good corporate image and reputation as a hidden asset to improve its market competitiveness [48–50]. Thirdly, the increase in corporate reputation can generate brand effects, enhance the soft power of enterprises, consolidate and expand market size, and thereby promote financial sustainability [51,52]. Lastly, under the guidance of value creation, mutually beneficial, responsible, and cooperative CSR behaviors can act on the combination of production factors and the value realization process, achieving value creation and promoting sustainable development of enterprises [53,54].

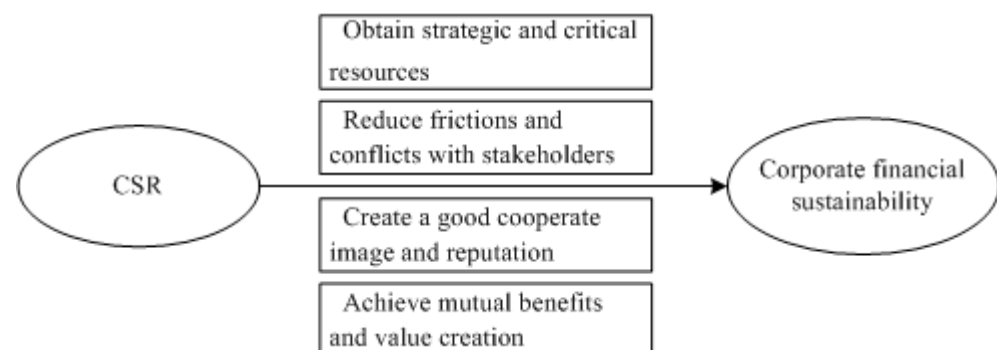


Figure 1. The direct impact of CSR implementation on corporate financial sustainability.

CSR can further be decomposed into five dimensions based on the involvement of different stakeholders, namely, CSR to shareholders, employees, suppliers and customers, environment, and society [55,56], and all these CSR dimensions could potentially exert an influence on FS. Specifically, CSR to shareholders manifests as being responsible for their funds and profits, providing true and reliable business information, striving to create investment returns for shareholders, and gaining their trust. Meeting shareholders’ needs can also enhance the enterprise’s social reputation and attract potential investors, thus enhancing the company’s financing ability, reducing the uncertainty of resource investment [57], and achieving capital accumulation. CSR to employees refers to caring for employees’ needs, providing them with benefits, learning opportunities, and life support, and enhancing their sense of satisfaction. The care of an enterprise of its employees can improve their motivation and loyalty through the dual effects of individual intrinsic drive and social network influence [58], hence realizing its business goals. CSR to suppliers and customers is reflected as no defaulting on payment, no maliciously lowering of raw material prices,

ensuring product quality, and meeting diverse consumer needs, thus winning the trust of upstream suppliers and downstream customers, bringing good reputation to the enterprise, establishing a good brand image, and increasing its visibility and reputation. In addition, fulfilling CSR to suppliers can ensure stable supply of materials, reduce transaction costs and risks, resist external environmental uncertainties, enhance enterprise sensitivity and flexibility [59], unveil business opportunities, accumulate organizational and management experience, and obtain unique social resources. Enterprises' implementation of CSR with regard to the environment can be as achieved by improving resource utilization efficiency, reducing pollutant emissions, using green and clean energy and equipment, and so on. Enterprises implementing CSR for the environment can not only enjoy tax exemptions and preferential policies provided by the government but also, with the deepening development of green finance, actively undertaking environmental responsibilities can obtain more bank loans [60], hence promoting financial sustainability. Implementing CSR to society can be reflected in paying taxes, providing job opportunities for the public, and actively participating in corporate humanitarian activities such as charity and social assistance. In addition, it can help build a good social and political reputation and increase corporate reputation returns [61], thus enhancing financial sustainability.

Based on the above analysis, the following hypothesis was developed.

H1: *Implementing CSR can significantly improve corporate financial sustainability.*

2.2. CSR, Agency Cost, and FS

The emergence of specialized labor division has separated the ownership and management of modern enterprises, which also leads to corporate governance issues due to the inconsistent interests between shareholders and agents and self-interest motives [62]. The core of corporate governance is to alleviate agency conflicts, and CSR that considers the interests of stakeholders can help alleviate agency conflicts and reduce agency costs [63].

Firstly, actively fulfilling CSR can reduce information asymmetry and the related agency costs. In fact, when there is information asymmetry between agents and investors, investors will increase the cost of corporate capital to cope with information disadvantage [64], while enterprises with better CSR performance usually exhibit higher transparency in financial reporting [23] and pay more attention to optimizing the information environment [10], which increases communication between agents and stakeholders and reduces information asymmetry, thereby alleviating agency conflicts. Secondly, implementing CSR can satisfy the interests of shareholders and help build and enhance the mutual trust between investors and agents. It is believed that by fulfilling their CSR to shareholders, managers as agents provide high returns to investors, which can win their trust and enhance their confidence in investment [65]. The implementation of CSR also indicates agents' commitments to stakeholders, reducing the probability of agents' opportunistic behavior, which is conducive to the sustainable development of the enterprise [3]. Fulfilling CSR can generate and strengthen trust relationships between enterprises and stakeholders, which can help reduce transaction costs for both parties involved in cooperation and avoid management's short-sighted behavior [66]. Once this trust relationship breaks down, it would greatly undermine the reputation of the enterprise and seriously affect the willingness of stakeholders to cooperate and the continuity of business activities. Lastly, implementing CSR can reduce the excessive investment behavior of agents and strengthen external supervision of enterprises. According to principal-agent theory, managers tend to invest excessively in the short term to achieve more personal gains, which may increase the financial and agency cost and affect resource allocation efficiency [44]. With multiple stakeholders involved, CSR places an onus on managers to consider allocating more resources to current and future CSR activities, thereby reducing management's excessive investment behavior. In addition, CSR implementation can not only shape a good corporate image but can also bring more public exposure and political visibility, which attract more public attention and supervision, thereby increasing the difficulty and cost for managers in terms of personal gains and improve the operation efficiency [67].

The mediating effect of agency cost on the impact of CSR implementation on corporate financial sustainability is illustrated in Figure 2. Based on the above analysis, we believed that agency cost could be a mediating role in the effect of CSR implementation on financial sustainability. Thus, the following hypotheses are developed.

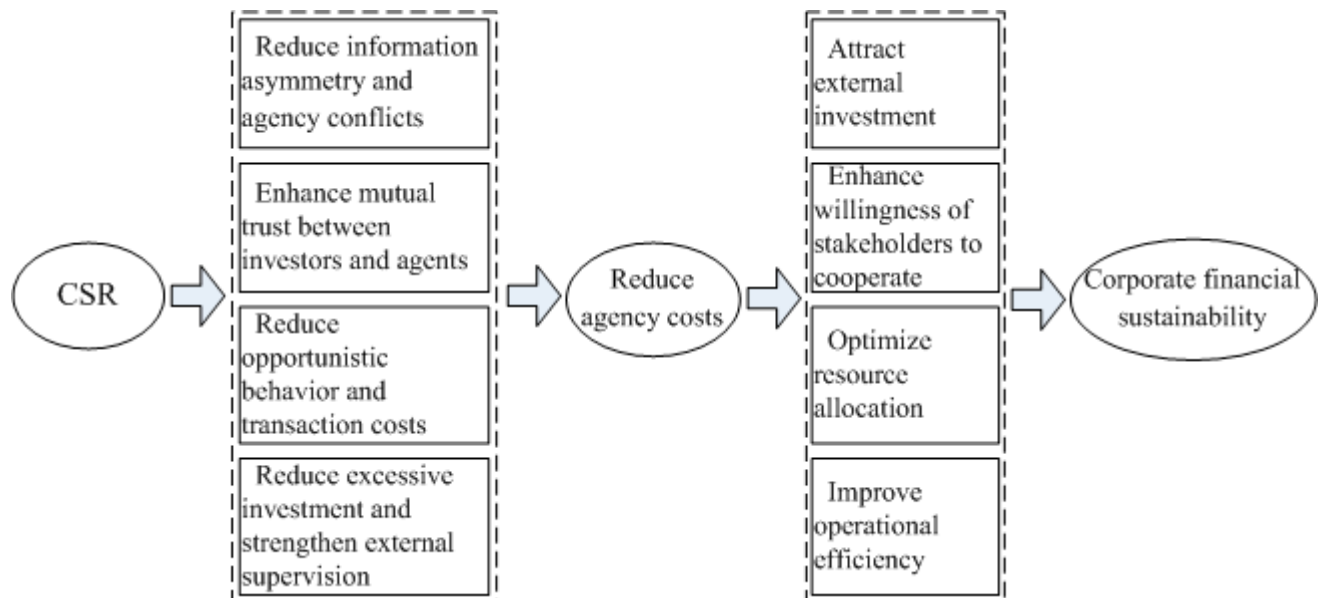


Figure 2. The mediating role of agency cost in the effect of CSR on corporate financial sustainability.

H2: *Implementing CSR can help reduce the agency cost of enterprises.*

H3: *Agency cost is a mediating variable in the effect of CSR implementation on financial sustainability.*

2.3. CSR, Green Innovation, and FS

With increasing competition around the globe, innovation has been a critical driver for both countries and enterprises to improve competitiveness, and CSR implementation could be a driving factor of green innovation. The mediating role of green innovation in the effect of CSR implementation on corporate financial sustainability can be explained by Figure 3.

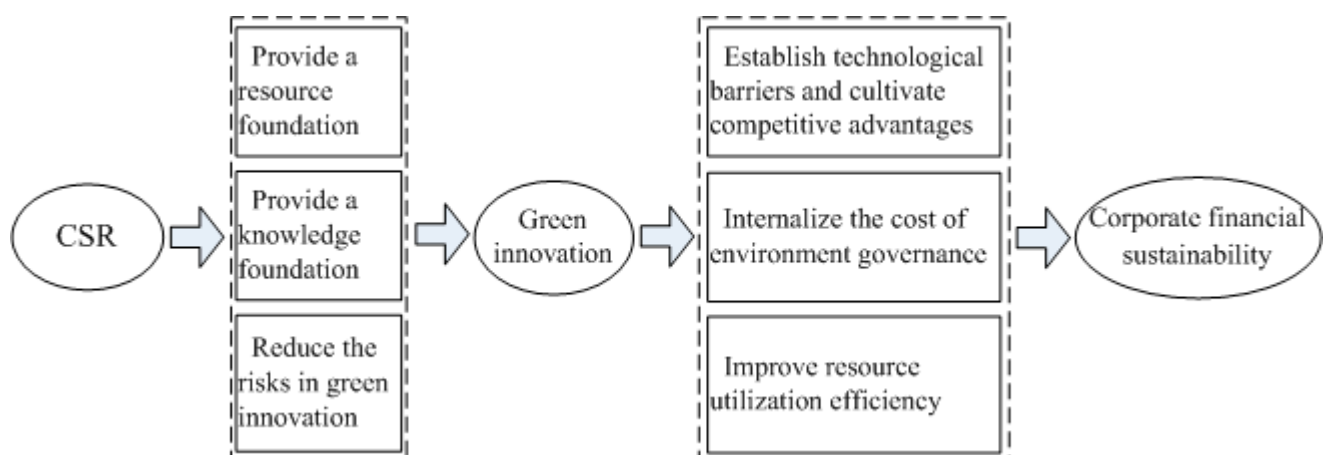


Figure 3. The mediating role of green innovation in the effect of CSR on corporate financial sustainability.

Firstly, CSR implementation provides a resource foundation for green innovation. Green innovation requires enterprises to internalize environmental and R&D costs, which relies on high-intensity and sustained R&D investment [68]. By fulfilling CSR, it would help

maintain a stable and harmony environment for green innovation activities. Specifically, it would increase the information transparency, break down information barriers in the financial market, reduce information-searching costs for external investors, and enhance their investment confidence [69], thereby alleviating resource constraints and reducing resource allocation risks in innovation activities. Implementing CSR sends a signal of goodwill to other stakeholders. It is also seen as a rent-seeking method for establishing political relationships, which can help win the favor of social and government capital and assistance with necessary resources, supporting green innovation in enterprises [70].

Secondly, CSR implementation provides a knowledge foundation for green innovation. According to value creation theory, innovation is a process from value capture to value transformation, and then to value realization [71]. In the value capture stage, CSR activities can increase the interactions between enterprise and stakeholders, and establish a deep and extensive social trust network and knowledge cooperation network [72], acquire new information and knowledge, promote knowledge exchange and sharing, and enrich the green knowledge stock of enterprises. These networks also reduce the sunk costs of enterprises and enable them to tap into the potential value of existing knowledge at a lower cost, thus enhancing the development momentum of green innovation through the combination of existing knowledge and external knowledge [73]. In the value conversion stage, practicing CSR can enhance employees' sense of organizational identity and attract high-quality and creative human resources [74], thus increasing knowledge spillover and exchange of the supply chain and incubating innovation. In the value realization stage, CSR implementation is conducive to establishing a reliable relationship with stakeholders, thereby expanding market channels, improving the success rate of product commercialization, and promoting green innovation.

Lastly, CSR implementation can reduce the risks in green innovation. Innovation activities are usually accompanied by high risks and uncertainty, which in turn suppress green innovation activities in enterprises. CSR implementation reduces the information asymmetry between shareholders and managers, which thereby reduces the heterogeneity risk of the enterprise [30]. The good reputation and close relationship with stakeholders brought by CSR implementation can reduce the impact of potential negative events on the innovation process as well as uncertainty. In addition, the communication network established in the implementation of CSR activities can facilitate the introduction of external information and knowledge, hence reducing risks in innovation.

Green innovation can only promote the long-term sustainable development of enterprises by transforming it into an endogenous driving force. It is believed that green innovation can help enterprises to establish technological barriers and cultivate long-term competitive advantages [75] so as to quickly integrate, construct, and allocate enterprise resources and respond to market changes when facing uncertain external environments. Meanwhile, green innovation can internalize the cost of environmental governance, improve resource utilization efficiency, and reduce manufacturing cost. Therefore, whether under external environmental pressure or as spontaneous corporate behavior, green innovation is beneficial for enhancing the financial sustainability of enterprises.

Based on that, the following hypotheses are developed.

H4: *Implementing CSR can promote the green innovation of enterprise.*

H5: *Green innovation mediates the effect of CSR implementation on financial sustainability.*

3. Variables and Models

3.1. Research Sample and Data

This article uses the A-share listed companies on the Shanghai and Shenzhen Stock exchanges of China between 2010 and 2020 as research samples. which were processed by the following procedures: (1) excluding 217 ST (special treatment) companies, 440 *ST (delisting risk warning) companies, and 32 PT (particular transfer) companies; (2) excluding

1252 companies with missing data, as well as 132 financial and insurance companies with accounting standards that differ from other industries; and (3) performing 1 percent and 99 percent winsorization to eliminate the impact of extreme values [76]. After undertaking the abovementioned procedures, a total of 25,797 observation points of 3470 listed companies were collected as an unbalanced data panel.

All data with respect to the research variables were obtained from publicly available datasets. To be specific, the data with respect to CSR are collected from Hexun (<https://www.hexun.com/> (accessed on 16 February 2024)), the data with respect to green innovation come from the Green Patent Database of the China Research Data Service (CNRDS) platform (<https://www.cnrds.com/> (accessed on 16 February 2024)), and the data with respect to other variables come from the CSMAR database (<https://data.csmar.com/> (accessed on 16 February 2024)). With all the data collected and pretreated, the research sample was analyzed using Stata SE16.

3.2. Variable Selection

3.2.1. Dependent Variable

The dependent variable is FS, which measures the ability of enterprises to continuously maintain value creation with current resource stocks and increments [6] and their long-term financial performance in terms of profitability and corporate return [7]. In this study, it is measured by sustainable growth rate (SGR), which is typically calculated by Equation (1) [77]:

$$SGR = \frac{ROE \times R}{1 - ROE \times R} \quad (1)$$

where *ROE* represents return on equity and *R* represents retention ratio.

3.2.2. Explanatory Variable

The explanatory variable is CSR, which is measured by the CSR score reported by Hexun. Specifically, it can be decomposed into five dimensions: responsibility to shareholders (ShCSR), responsibility to employees (EmCSR), responsibility to suppliers and customers (ScCSR), responsibility to the environment (EnCSR), and responsibility to society (SCSR) [55,56]. To eliminate the influence of different variable dimensions, the total and dimensional scores of CSR are divided by 100, and higher scores indicate better CSR performance.

3.2.3. Mediating Variables

Agency cost (AC) and green innovation (GI) are adopted as the mediating variables.

By referring to the literature [78], AC can be measured by management fee rate (MFR), asset turnover rate (ATR) and capital occupancy rate (COR), which were measured by Equations (2)–(4), respectively. MFR reflects agency costs such as on-the-job consumption and improper expenses, and a higher MFR rate indicates higher AC. ATR reflects the low operation efficiency of the management, and lower ATR represents higher AC. COR reflects the capital occupation of listed companies by controlling shareholders, and a higher COR value indicates more serious conflicts between shareholders and agents [78].

$$MFR = \frac{Mfee}{TR} \quad (2)$$

where *Mfee* represents management fees and *TR* represents total revenue.

$$ATR = \frac{TR}{TA} \quad (3)$$

where *TA* represents total assets.

$$COR = \frac{OR}{TA} \quad (4)$$

where *OR* represents other receivables.

Usually, *GI* can be measured in two ways. The first is by the number of green patents, and the second is by the ratio between sales revenue of new products and total energy consumption. However, the latter is usually used to measure the green innovation performance of industrial enterprise, and it cannot precisely describe the green innovation level of other types of enterprises. By referring to existing studies [79,80], the sum of the annual numbers of green invention and utility patents granted to an enterprise was used to characterize its green innovation performance. Due to the existence of zero values with respect to the sum number, we add one to the sum number and take then its logarithm as the measurement of *GI*, as presented in Equation (5) [79,80]:

$$GI = \ln(GIP + GUP + 1) \quad (5)$$

where *GIP* represents the number of green invention patents and *GUP* represents the number of green utility patents.

3.2.4. Controlling Variables

To identify the influence of enterprise characteristics, operations and governance on the investigated variables and relationships, the controlling variables are selected from these three aspects.

Finally, all variables are described and explained in Table 1.

Table 1. List of variables.

Variable Type	Variable Name	Abbreviations	Measurement
Dependent variable	Financial sustainability	FS	Equation (1)
Explanatory variable	Corporate social responsibility	CSR	CSR score/100
	Responsibility to shareholders	ShCSR	ShCSR score/100
	Responsibility to employees	EmCSR	EmCSR score/100
	Responsibility to suppliers and consumers	ScCSR	ScCSR score/100
	Responsibility to environment	EnCSR	EnCSR score/100
	Responsibility to society	SCSR	SCSR score/100
Mediating variables	Management fee rate	MFR	Equation (2)
	Asset turnover rate	ATR	Equation (3)
	Capital occupancy rate	COR	Equation (4)
	Green innovation	GI	Equation (5)
Controlling variables	Enterprise size	Size	Logarithm of total assets.
	Listing age	ListAge	Logarithm of listing age.
	Ownership of enterprises	SOE	If it is a state-owned holding enterprise, it takes value one, otherwise zero.
	Asset liability ratio	Lev	Ratio of total liability to total assets.
	Cash flow ratio	Cashflow	Ratio of net cash flow generated from operating activities to total assets.
	Revenue growth rate	Growth	Proportion of increased revenue this year to the previous year's revenue.
	Chairman serving as general manager	Dual	If yes, takes value one, otherwise zero.
	Shareholding ratio of the largest shareholder	Top1	Proportion of shares held by the largest shareholder in the total share capital.
	Shareholding ratio of institutional investors	Inst	Proportion of shares held by institutional investors in the total share capital.
	shareholding ratio of the management	Mshare	Proportion of shares held by the management to the total share capital.
	Audit quality	Big4	If it is audited by the biggest four auditing firms, takes value one, otherwise zero.

3.3. Research Models

In order to investigate the relationships among the variables and verify the proposed hypotheses, we established the direct effect and mediating effect models.

To verify H1, namely, the direct effect of CSR on FS, we established the benchmark regression model (1), as presented in Equation (6):

$$FS_{it} = \alpha_0 + \alpha_1 CSR_{it} + \sum control_{it} + \sum IND + \sum Year + \varepsilon_{it} \quad (6)$$

where FS_{it} represents the financial sustainability of enterprise i in year t , CSR_{it} represents the CSR performance of enterprise i in year t , $control_{it}$ represents the controlling variables, IND represents the industry fixed effect, $Year$ represents the year fixed effect, and ε_{it} represent the random error.

If CSR has a significant effect on FS in Equation (6), the following procedures can be conducted to discuss the existence of mediating effect of AC and GI.

To examine H2 and H3, namely, the mediating role of AC in the effect of CSR on FS, model (2) and model (3) are established as presented in Equations (7) and (8). According to [81], if CSR has a significant impact on AC in Equation (7) and AC has a significant impact on FS in Equation (8), then it indicates the existence of the mediating effect of AC. This mediating effect can be a complete mediating effect or a partial mediating effect, and it depends on the significance of SCR in Equation (8) and the sign of these coefficients [81].

$$AC_{it} = \beta_0 + \beta_1 CSR_{it} + \sum control_{it} + \sum IND + \sum Year + \varepsilon_{it} \quad (7)$$

$$FS_{it} = \delta_0 + \delta_1 CSR_{it} + \delta_2 AC_{it} + \sum control_{it} + \sum IND + \sum Year + \varepsilon_{it} \quad (8)$$

To verify H4 and H5, which investigate the mediating role of GI in the effect of CSR on FS, model (4) and model (5) are developed as represented by Equations (9) and (10).

$$GI_{it} = \theta_0 + \theta_1 CSR_{it} + \sum control_{it} + \sum IND + \sum Year + \varepsilon_{it} \quad (9)$$

$$SGR_{it} = \varphi_0 + \varphi_1 CSR_{it} + \varphi_2 GI_{it} + \sum control_{it} + \sum IND + \sum Year + \varepsilon_{it} \quad (10)$$

The method for determining the existence and nature of the mediating effect of GI is the same as the discussion of AC's mediating role.

4. Results

4.1. Statistical Description

Table 2 presents the statistical characteristics of the variables. Among the data variables, FS scores ranged from -0.4857 to 0.3453 with an average value of 0.0466 , indicating that Chinese enterprises have shown great variance in FS performance, and there was still significant room for improvement in FS performance. CSR scores varied between -0.0346 and 0.7424 , and the average score was 0.2393 , implying the uneven CSR performance among Chinese enterprises. Great divergence in ATR is also observed, with the highest value of 2.6282 and the lowest of 0.0753 , indicating the great difference in the efficiency of capital utilization. The MFR fluctuated between 0.0088 and 0.4559 , showing significant divergence in on-the-job consumption. COR ranged between 0.0002 and 0.1414 , indicating varying degrees of capital occupation among listed companies in China. GI had highest and lowest values of 3.9120 and 0.0000 , respectively, the average and median were 0.4533 and 0.0000 , respectively, and the standard deviation was 0.8678 , revealing the low level of and significant differences in green innovation capabilities of Chinese listed enterprises.

Table 2. Descriptive statistics of the variables.

Variables	N	Average	Standard Deviation	Minimum	Median	Maximum
FS	25,797	0.0466	0.1055	−0.4857	0.0489	0.3453
CSR	25,797	0.2393	0.1550	−0.0346	0.2181	0.7424
ATR	25,797	0.6504	0.4449	0.0753	0.5490	2.6282
MFR	25,797	0.0921	0.0738	0.0088	0.0738	0.4559
COR	25,797	0.0156	0.0232	0.0002	0.0077	0.1414
GI	25,797	0.4533	0.8678	0.0000	0.0000	3.9120
Size	25,797	22.1701	1.2800	19.8416	21.9956	26.1355
ListAge	25,797	2.1340	0.8009	0.0000	2.3026	3.2958
SOE	25,797	0.3549	0.4785	0.0000	0.0000	1.0000
Lev	25,797	0.4254	0.2062	0.0533	0.4180	0.8927
Cashflow	25,797	0.0466	0.0686	−0.1568	0.0460	0.2381
Growth	25,797	0.1743	0.4176	−0.5689	0.1075	2.7075
Dual	25,797	0.2700	0.4440	0.0000	0.0000	1.0000
Top1	25,797	0.3440	0.1478	0.0865	0.3220	0.7430
Inst	25,797	0.3907	0.2337	0.0005	0.3977	0.8801
Mshare	25,797	0.1371	0.2002	0.0000	0.0055	0.6876
Big4	25,797	0.0566	0.2311	0.0000	0.0000	1.0000

4.2. Correlation Analysis

Table 3 presents the Pearson correlation coefficients among the variables. Among them, it can be noticed that CSR, ATR and GI were positively related to the dependent variable, FS, while MFR and COR were negatively correlated with FS. The correlation coefficients between other pairs of variables were also less than 0.5, and the variance inflation factors were no more than 2.5, indicating no collinearity among the variables.

4.3. Direct Effect Analysis

According to Equation (6), the direct effect of CSR and its decomposed dimensions on FS can be identified, and the results are presented in Table 4. Notably, column (1) in Table 4 presents a significant impact coefficient (0.2188) of CSR on FS at a significance level of 1%, which indicates that a 1% increase in CSR would result in a 21.88% increase in FS.

Specifically, columns (2)–(6) in Table 4 report the regression results for the five dimensions of SCR, namely, ShCSR, EmCSR, ScCSR, EnCSR, and SCSR, in relation to FS. It can be noticed that except for EnCSR, the implementation of ShCSR, EmCSR, ScCSR and SCSR all had a positive effect on FS at the significance level of 1%, and the influence coefficients of these four dimensions were 1.1556, 0.1354, 0.0681 and 0.5841, respectively. Among them, the implementation of responsibility to shareholders (ShCSR) had the most significant effect on FS. A possible reason could be that fulfilling responsibility to shareholders can motivate shareholders' reinvestment behavior and to provide sufficient cash flow for the future development of the enterprise. A company's fulfilling its responsibilities to employees (EmCSR), suppliers and customers (ScCSR), and society (SCSR) can help establish a good corporate image and was of great significance for its business activities and financial performance. Although a positive correlation between fulfilling environmental responsibility (EnCSR) and FS was observed, the former had no significant influence on the latter. In fact, fulfilling environmental responsibility could take high initial investment cost, which may negatively affect the economic benefits of enterprises in the short term. However, in the long run, EnCSR might have a positive but delayed effect on FS [82]. Therefore, an insignificant effect of EnCSR on FS was observed in this study.

Table 3. Correlation coefficient matrix.

	FS	CSR	ATR	MFR	GI	Size	Lev	Cashflow	Growth	Dual	SOE	ListAge	Top1	Inst	Mshare	COR	Big4
FS	1																
CSR	0.411 ***	1															
ATR	0.184 ***	0.090 ***	1														
MFR	−0.216 ***	−0.153 ***	−0.423 ***	1													
GI	0.050 ***	0.051 ***	0.035 ***	−0.057 ***	1												
Size	0.116 ***	0.257 ***	0.053 ***	−0.365 ***	0.222 ***	1											
Lev	−0.111 ***	−0.022 ***	0.151 ***	−0.277 ***	0.085 ***	0.510 ***	1										
Cashflow	0.250 ***	0.179 ***	0.118 ***	−0.116 ***	0.025 ***	0.061 ***	−0.165 ***	1									
Growth	0.260 ***	0.102 ***	0.127 ***	−0.121 ***	0.001	0.040 ***	0.033 ***	0.008	1								
Dual	−0.006	−0.068 ***	−0.033 ***	0.061 ***	0.005	−0.171 ***	−0.137 ***	−0.009	0.025 ***	1							
SOE	−0.001	0.138 ***	0.056 ***	−0.138 ***	0.013 **	0.350 ***	0.297 ***	−0.010 *	−0.062 ***	−0.294 ***	1						
ListAge	−0.071 ***	0.001	0.015 **	−0.069 ***	−0.053 ***	0.399 ***	0.373 ***	−0.014 **	−0.068 ***	−0.243 ***	0.441 ***	1					
Top1	0.106 ***	0.158 ***	0.080 ***	−0.162 ***	0.010	0.194 ***	0.061 ***	0.087 ***	0.007	−0.047 ***	0.229 ***	−0.075 ***	1				
Inst	0.124 ***	0.209 ***	0.102 ***	−0.157 ***	0.058 ***	0.438 ***	0.216 ***	0.121 ***	−0.005	−0.191 ***	0.383 ***	0.336 ***	0.364 ***	1			
Mshare	0.045 ***	−0.060 ***	−0.051 ***	0.093 ***	0.015 **	−0.343 ***	−0.325 ***	0.013 **	0.060 ***	0.257 ***	−0.480 ***	−0.573 ***	−0.104 ***	−0.512 ***	1		
COR	−0.105 ***	−0.064 ***	−0.014 **	0.063 ***	−0.044 ***	0.067 ***	0.227 ***	−0.157 ***	−0.014 **	−0.035 ***	0.011 *	0.138 ***	−0.074 ***	−0.003	−0.086 ***	1	
Big4	0.052 ***	0.168 ***	0.041 ***	−0.086 ***	0.118 ***	0.347 ***	0.113 ***	0.076 ***	−0.012 *	−0.065 ***	0.132 ***	0.074 ***	0.138 ***	0.216 ***	−0.124 ***	0.011 *	1

Note: The significance levels for ***, **, and * are 1%, 5%, and 10%, respectively.

Table 4. Benchmark regression results.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	FS	FS	FS	FS	FS	FS
CSR	0.2188 *** (30.5344)					
ShCSR		1.1556 *** (62.4739)				
EmCSR			0.1354 *** (4.8314)			
ScCSR				0.0681 *** (3.9685)		
EnCSR					0.0266 (1.6376)	
SCSR						0.5841 *** (25.8034)
Size	0.0081 *** (7.4075)	−0.0037 *** (−3.9426)	0.0172 *** (14.8453)	0.0175 *** (15.2543)	0.0178 *** (15.4954)	0.0154 *** (13.8962)
Lev	−0.0726 *** (−10.7078)	0.0336 *** (5.8230)	−0.1060 *** (−14.5886)	−0.1065 *** (−14.6907)	−0.1068 *** (−14.7324)	−0.0986 *** (−14.3635)
Cashflow	0.2678 *** (18.9035)	0.0683 *** (5.6012)	0.3381 *** (23.4478)	0.3392 *** (23.5468)	0.3403 *** (23.6275)	0.3206 *** (22.7041)
Growth	0.0529 *** (26.6916)	0.0345 *** (21.8900)	0.0578 *** (27.3267)	0.0581 *** (27.4470)	0.0580 *** (27.3815)	0.0543 *** (25.9790)
Dual	0.0002 (0.1176)	0.0009 (0.6207)	−0.0001 (−0.0747)	−0.0002 (−0.0935)	−0.0002 (−0.0861)	0.0004 (0.2130)
SOE	−0.0015 (−0.6273)	0.0008 (0.3767)	0.0016 (0.6243)	0.0019 (0.7371)	0.0020 (0.7752)	0.0011 (0.4579)
ListAge	−0.0041 *** (−3.1630)	0.0124 *** (10.2114)	−0.0073 *** (−5.4313)	−0.0072 *** (−5.3253)	−0.0072 *** (−5.2843)	−0.0073 *** (−5.4665)
Top1	0.0120 * (1.9436)	−0.0102 * (−1.9120)	0.0157 ** (2.4190)	0.0155 ** (2.3828)	0.0151 ** (2.3257)	0.0087 (1.3706)
INST	0.0314 *** (7.6439)	0.0046 (1.3191)	0.0417 *** (9.6935)	0.0421 *** (9.7754)	0.0424 *** (9.8324)	0.0403 *** (9.5640)
Mshare	0.0282 *** (5.8856)	−0.0007 (−0.1465)	0.0382 *** (7.6873)	0.0384 *** (7.7031)	0.0384 *** (7.7028)	0.0349 *** (6.9788)
Big4	−0.0165 *** (−4.4414)	−0.0088 *** (−2.8632)	−0.0120 *** (−3.1045)	−0.0115 *** (−2.9750)	−0.0111 *** (−2.8829)	−0.0105 *** (−2.7590)
_cons	−0.1760 *** (−7.0798)	−0.0371 * (−1.7987)	−0.3138 *** (−11.6011)	−0.3192 *** (−11.8161)	−0.3234 *** (−11.9297)	−0.2845 *** (−10.6918)
Year	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
N	25,797	25,797	25,797	25,797	25,797	25,797
Adj. R ²	0.2881	0.4941	0.2166	0.2161	0.2156	0.2560

Note: The significance levels for ***, **, and * are 1%, 5%, and 10%, respectively. The t statistic is enclosed in parentheses.

4.4. Mediating Effect Analysis

Two mediating variables have been considered in this study, namely, AC and GI. The mediating effect of these two variables is examined in this section.

4.4.1. Mediating Role of AC

According to Equations (7) and (8), the mediating role of AC in the effect of CSR on FS can be examined, and the results are displayed in Table 5, where MFR, ATR and COR measure AC. Column (1) in Table 5 shows that CSR implementation had a negative effect on MFR at a significance level of 1%, indicating that CSR implementation could reduce the improper management expenses within the enterprise. Column (3) displays the positive effect of CSR on ATR at a significance level of 1%, implying that fulfilling CSR was beneficial for the improvement of fund utilization efficiency of enterprises. Column (5) illustrates

the negative effect of CSR implementation on COR, which suggests that by fulfilling CSR activities, enterprises suppressed the embezzlement of funds by major shareholders. All these three models indicated that CSR implementation had a significant inhibitory effect on agency costs, which means Hypothesis H2 has been validated by the empirical results.

Table 5. Mediating roles of AC and GI in the effect of CSR on FS.

Variables	(1) MFR	(2) FS	(3) ATR	(4) FS	(5) COR	(6) FS	(7) GI	(8) FS
CSR	−0.0465 *** (−9.9671)	0.2076 *** (29.3142)	0.2339 *** (7.5019)	0.2094 *** (29.4639)	−0.0077 *** (−5.4188)	0.2172 *** (30.3490)	0.1615 *** (2.9140)	0.2183 *** (30.5208)
MFR		−0.2410 *** (−15.4261)						
ATR				0.0401 *** (14.2765)				
COR						−0.2061 *** (−4.6705)		
GI								0.0031 *** (3.3000)
_cons	0.4760 *** (18.3161)	−0.0613 ** (−2.4906)	0.7153 *** (5.0932)	−0.2047 *** (−8.2456)	0.0344 *** (3.6495)	−0.1689 *** (−6.8263)	−3.9124 *** (−12.8694)	−0.1640 *** (−6.5799)
control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	25,797	25,797	25,797	25,797	25,797	25,797	25,797	25,797
Adj. R ²	0.3389	0.3069	0.3535	0.3066	0.1584	0.2898	0.2320	0.2886

Note: The significance levels for *** and ** are 1% and 5%, respectively. The t statistic is enclosed in parentheses.

The effect of AC on FS is shown in in Columns (2), (4) and (6) in Table 5, and MFR, ATR and COR proved to have significant effects on FS. Specifically, MFR had a negative effect on FS, ATR had a positive effect on FS, and COR had a negative effect on FS. In addition, the positive effect of CSR on FS has already been verified by models in Table 4. All these conclusions suggested that AC served a mediating role in the effect of CSR on FS, which means Hypothesis H3 has been supported by the empirical results. From the perspective of “money saving”, effective constraints on agency costs can reduce unnecessary improper management costs, improve the efficiency of capital operation, and prevent major shareholders from encroaching on corporate capital, thus enhancing the financial sustainability of enterprises.

4.4.2. Mediating Role of GI

The mediating role of GI in the effect of CSR on FS can be analyzed by Equations (9) and (10), and the results are presented in Columns (7)–(8) in Table 5. Column (7) shows that CSR had a positive influence on GI at a significance level of 1% with a regression coefficient of 0.1615, indicating that CSR implementation can promote the green innovation activities of enterprise, which supports Hypothesis H4. Column (8) reveals that GI positively affected FS at a significance level of 1%. Considering the significant impact of CSR on FS proved in Table 4, it can be concluded that GI mediated the effect of CSR on FS, i.e., Hypothesis H5 has been validated by the empirical results.

From the perspective of “revenue increasing”, green innovation activities can help improve the production process, and increase the “green” added value of the product. With the accumulation of green innovations and technologies, green transition and upgrading can be accelerated, thus fundamentally changing the production and operation modes of enterprises. In addition, achievements in green innovation can also attract investment and facilitate financing, thus further strengthening the financial sustainability of enterprises.

5. Discussion

To examine the effectiveness and robustness of the research conclusions presented in Section 4 in different contexts, we discuss the endogeneity, robustness, and heterogeneity of the results as well as the contributions and limitations of this study in this section.

5.1. Endogeneity Test

Usually, better financial sustainability means greater capacity to fulfil CSR for enterprises, especially for enterprises that are strong and willing, but possess insufficient strength to fulfill CSR. Therefore, the increase in the financial sustainability of enterprises may be conducive to the implementation of CSR. In order to avoid the endogeneity caused by this reverse causality, an exogenous instrumental variable that is highly correlated with the endogenous variable can be selected and used as the independent variable. By referring to [83], one company's CSR performance can also be measured by the mean CSR value of the other sample companies in the same industry (CSR_mean), which was taken as the instrumental variable. The two-stage least-squares method was used to reestimate the regression results, and the results are shown in Table 6. Column (1) shows the results at the first stage, which indicate that the instrumental variable (CSR_mean) is positively correlated with the endogenous variable (CSR). The Kleibergen–Paap rk Wald F statistic exceeds the critical value of the Stock–Yogo test at the 10% level, indicating that there was no problem of weakness of the instrumental variable. The Kleibergen–Paap rk LM statistics also showed a significance level of 1%, indicating the absence of instrumental variable unrecognizability. Both these tests indicated the effectiveness of the instrumental variable selection in this study. Column (2) displays the regression results of the instrumental variable, and it implies that the instrumental variable has a positive impact on FS at a significance level of 1% with a regression coefficient of 0.3971. This is in accordance with the results derived from the benchmark regression in Table 4, which confirms the robustness of this conclusion.

Table 6. Regression results of the instrumental variable.

	Stage 1	Stage 2
	(1)	(2)
	CSR	FS
CSR_mean	0.4444 *** (6.1055)	0.3971 *** (4.4699)
_cons	−0.7984 *** (−15.8569)	−0.0525 (−0.8057)
control	Yes	Yes
Year	Yes	Yes
Industry	Yes	Yes
N	25,789	25,789
Adj. R ²	0.2996	0.2394
Kleibergen–Paap rk LM		35.717 [0.0000]
Kleibergen–Paap rk Wald F		37.277 {16.38}

Note: The significance level for *** is 1%. The t statistic is enclosed in [], and the critical value for testing at the 10% significance level is enclosed in { }.

5.2. Robustness Test

The robustness test in regression analysis is usually conducted in three ways, as follows

(1) Using an alternative independent variable. By referring to [84], if a company has disclosed any of nine items in the CSR report—protection of shareholders' rights and interests, protection of creditors' rights and interests, protection of employees' rights and interests, protection of suppliers' rights and interests, protection of customers' and consumers rights' and interests, environmental protection and sustainable development,

public relations and social welfare undertakings, CSR system establishment and improvement measures, and safety production—then the value of CSR performance (CSR2) will be recorded as one point for each item. If the CSR report has also disclosed the specific expenditure on only of the above items, then one more point can be added to the value of CSR2. Therefore, CSR2 was a discrete variable with values between 0 and 18. The results for CSR2 as an alternative independent variable in the benchmark regression can be found in Column (1) in Table 7. It can be seen that CSR2 can positively affect FS at a significance level of 1%, which is also in accordance with the results derived in Table 4.

Table 7. Robustness test.

Variables	(1)	(2)	(3)
	FS	SGR	FS
CSR2	0.0009 *** (3.5052)		
CSR		0.0989 *** (19.7453)	
L.CSR			0.0800 *** (13.7132)
_cons	−0.3132 *** (−11.5051)	0.0050 (0.2260)	−0.3073 *** (−11.1941)
control	Yes	Yes	Yes
Year	Yes	Yes	Yes
Industry	Yes	Yes	Yes
N	25,797	24,389	21,765
Adj. R ²	0.2161	0.2427	0.2360

Note: The significance level for *** is 1%.

(2) Using an alternative dependent variable. By following the SGR calculation in [85], the dependent variable, FS, can also be measured by the static model of sustainable growth, namely, $SGR = \frac{NP \cdot R \cdot (1 + DER)}{T - NP \cdot R \cdot (1 + DER)}$, where *NP* represents net profit margin on sales, *R* represents earnings retention ratio, *DER* represents debt-to-equity ratio, and *T* represents asset-to-sales ratio. The regression results of using SGR as the alternative dependent variable in the benchmark regression model are shown in Column (2) in Table 7. The regression coefficient was 0.0989 with a significance level of 1%, also indicating a positive impact of CSR on SGR, and this is in line with the conclusion about the direct effect.

(3) Using the lag term of CSR as the independent variable. The lag term of CSR (L.CSR) can be used as the independent variable to investigate the robustness of the conclusions, and the results are shown in Column (3) in Table 7. It indicated that L.CSR has a positive effect on FS at a significance level of 1% and the regression coefficient is 0.08, which also confirms the benchmark regression results in Table 4.

5.3. Heterogeneity Analysis

5.3.1. Heterogeneity Effect of Enterprise Ownership

The ownership of enterprises may affect managers' decision on CSR investment and activities. Traditionally, in enterprises dominated by state-owned capital, the managers are more inclined to consider the demands of a relatively wide range of stakeholders when making decisions [86], while in non-state-owned holding enterprises, the managers are more inclined to pursue the maximum economic benefits. To investigate the impact of enterprise ownership on the effect of CSR on FS, the sample companies are divided into two groups: state-owned and non-state-owned enterprises.

The results of differences in the effect of CSR implementation on FS between state-owned and non-state-owned enterprises have been displayed in Columns (1)–(2) in Table 8. It can be seen that CSR has a positive influence on FS at a significance level of 1% for both state-owned and non-state-owned enterprises. However, the results of intergroup coefficient difference testing (Chow test = 26.89, *p*-value = 0.0000) indicated that there

was a significant difference between the two sets of samples. In fact, Columns (1) and (2) show that the regression coefficients for the effect of CSR on FS in state-owned or non-state-owned enterprises are 0.1705 and 0.2707, respectively, indicating that compared with state-owned enterprises, the fulfillment of CSR by non-state-owned enterprises has a greater impact on corporate financial sustainability performance. A possible explanation could be that one of the missions of state-owned enterprises is to fulfill corresponding social responsibilities, so the public has become more accustomed to state-owned enterprises fulfilling their responsibilities. Therefore, fulfilling CSR in state-owned enterprises is characteristic of a diminishing marginal utility. By contrast, CSR implementation in non-state-owned enterprises can stimulate stakeholders' goodwill towards the enterprises and enhance their support for the business and activities of enterprises.

Table 8. Results of heterogeneity analysis.

Variables	(1)	(2)	(3)	(4)
	FS	FS	FS	FS
	State-Owned Enterprises	Non-State-Owned Enterprises	Heavily Polluting Enterprises	Non-Heavily Polluting Enterprises
CSR	0.1705 *** (19.1533)	0.2707 *** (22.6874)	0.1611 *** (13.9809)	0.2419 *** (27.2097)
_cons	−0.1482 *** (−4.2714)	−0.2210 *** (−6.3381)	−0.6069 *** (−14.2413)	−0.1752 *** (−6.3775)
control	Yes	Yes	Yes	Yes

Note: The significance level for *** is 1%.

5.3.2. Heterogeneity Effect of Industrial Characteristics

With the gradual penetration of green development and the introduction of green finance policies, the increased financing constraints faced by high-pollution and high-energy-consuming enterprises [87] has forced them to undergo green transformation and take on CSR more actively. In such cases, heavily polluting enterprises may actively fulfill their CSR to meet the financing conditions of green finance policies, thereby promoting their financial sustainability. By referring to [88], this study defined high-pollution and high-energy-consuming industries as heavily polluting industries, and the others as non-heavily polluting industries. By doing this, we tried to explore whether there were any differences in the impact of fulfilling CSR on FS between heavily polluting and non-heavily polluting enterprises.

The results shown in Columns (3) and (4) in Table 8 distinguish the difference in the effect of CSR implementation on FS between heavily and non-heavily polluting enterprises. For both types of enterprises, CSR has a significant impact on FS at a significance level of 1%. Despite that, the results of intergroup coefficient difference testing (Chow test = 41.64, p -value = 0.0000) also indicated a significant difference between these two sets of samples. As such, it can be concluded that CSR implementation in non-heavily polluting enterprises (regression coefficient of 0.2416) has a larger impact on FS than that in heavily polluting enterprises (regression coefficient of 0.1611). This may be due to the higher cost of environmental compliance for heavily polluting enterprises and the higher risk of investment return brought about by fulfilling CSR. Thereby, the stakeholders tend to support the business and activities of enterprises in green industries. In addition, CSR implementation requires more capital investment, which intensifies financing constraints for heavily polluting enterprises and suppresses their investment in CSR activities. On the contrary, non-heavily polluting enterprises, due to their relatively low environmental pressure and loose credit financing constraints, are more likely to attract the support of investors and other stakeholders and promote financial sustainability by fulfilling their CSR.

5.4. Contributions and Limitations

The contributions of this study are threefold. (1) It identified the positive effect of CSR on corporate financial sustainability as a whole, and also discussed the specific effect of corporate responsibility to different stakeholders on corporate financial performance. (2) It confirmed the mediating role of agency cost and green innovation from the perspectives of “money saving” and “revenue increasing”, respectively. (3) It explored whether CSR implementation affected corporate financial sustainability in different contexts, and found that the positive impact of CSR implementation in promoting financial sustainable development is more significant in non-state-owned enterprises and non-heavily polluting enterprises.

There are also some limitations in this study, which could be investigated in future research. Firstly, although this study has confirmed the positive impact of CSR implementation on corporate financial sustainability, it did not discuss the possible threshold effect or nonlinear influence. Future research could be conducted to empirically examine the threshold effect or nonlinear influence of CSR implementation on financial sustainability. Secondly, this study did not find a significant impact of fulfilling environmental responsibility on financial sustainability, but there could be a significant effect in the long run. Therefore, this potential long-term impact of fulfilling environmental sustainability on financial sustainability should be explored in the following research.

6. Conclusions and Policy Implications

6.1. Conclusions

By taking A-share listed companies in the Shanghai and Shenzhen indices of China between 2010 and 2020 as research samples, this study investigated the influential effect and mechanism of CSR implementation on FS, and further explored the heterogeneity of this influence based on characteristics of sample individuals. The following conclusions have been derived.

Firstly, the fulfillment of CSR has a positive effect on FS. Specifically, fulfilling responsibilities towards shareholders, employees, suppliers and customers, and society can significantly promote FS, though implementing responsibility in terms of the environment did not have any significant impact on FS in the short term. CSR implementation of companies implies their willingness to take action on the issue, which sends positive signals to the stakeholders, thus providing multiple ways, for instance, of winning trust from shareholders, increasing investments and financing channels, maintaining and optimizing the supply chain, and expanding market size so as to enhance corporate financial sustainability. Although corporates’ practicing of CSR may generate negative impacts on FS in the short term, long-term positive effects of CSR on FS could still be expected.

Secondly, CSR implementation can help improve financial sustainability via two channels: boosting green innovation and reducing agency cost. From the perspective of “revenue increasing”, CSR implementation in enterprises is conducive to green innovation by establishing a strong cooperative relationship with investors and thus obtaining more R&D investment for innovation activities. The achievements of green innovation can produce green products to meet legal and public environmental demands and establishing a green threshold for products, thereby expanding long-term market size and further enhancing FS; From the perspective of “money saving”, fulfilling CSR can significantly reduce information asymmetry, alleviate agency conflicts between the management and internal and external stakeholders within enterprises, and reduce agency costs, thus improving FS.

Lastly, in terms of the heterogeneity effect at the individual level of enterprises, the positive effect of fulfilling CSR on FS is more significant in non-state-owned enterprises and non-heavily polluting enterprises. In the institutional context of China, people would take it for granted that state-owned enterprises should fulfill CSR. By contrast, in non-state-owned enterprises, the public has lower expectations for them to fulfill CSR, so the positive effects on FS are more significant when they fulfill their social responsibilities. Heavily polluting enterprises are the main emitters of environmental pollutants, which damage public interests. According to the principle of “whoever pollutes, whoever controls”,

they should take corresponding CSR and compensate for public interests. Therefore, the positive effect of CSR implementation on FS is less sensitive in heavily polluting enterprises. Meanwhile, the public has a better impression of non-heavily polluting enterprises that actively fulfill CSR, which to some extent is more conducive to improving their FS.

6.2. Policy Implications

Based on the above conclusions, the following implications for policy decision-making are provided.

Firstly, CSR should receive more attention at the corporate strategy management level. Those at this level need to realize that CSR implementation is not contradictory to achieving financial sustainability for enterprise decision-makers. Instead, CSR should be integrated into all aspects of corporate governance and short-sighted behaviors should be avoided. Managers could establish a regular disclosure system for CSR information to remove information barriers, increase information transparency through social media and public opinion, and reduce cognitive biases among stakeholders. Also, a CSR performance measurement system can be designed and introduced to motivate the CSR behaviors of the managers and employees as well as the green innovation investment within the enterprises. Although fulfilling environmental responsibility will not significantly improve present financial sustainability within enterprises immediately, it should also receive sufficient attention, as the cost of environmental violations will definitely harm the long-term development of enterprises and the absence of environmental responsibility may also bring negative impacts on corporate reputation, thereby inhibiting the financing and operating activities of enterprises.

Secondly, a complete external incentive and regulatory system for CSR fulfilling needs to be designed. On the one hand, more benefits can be provided by the government, such as honorary recognition, tax breaks, and financing facilities, to reward the CSR behaviors of enterprises and attract the attention of the market and stakeholders to enterprises' CSR activities. On the other hand, CSR activities should also be monitored and evaluated by related agencies. Specifically, companies that do not engage in CSR activities need to be focused on to prevent corporate governance issues, such as misappropriation of corporate funds or stakeholder assets, and to send the right signals to the capital market to reduce public equity losses. More importantly, the CSR legal and regulatory system needs to be improved to ensure that illegal CSR-related activities are punished while also preventing relevant departments from violating regulations and requiring enterprises to fulfill CSR obligations. Instead, CSR activities should be spontaneous and voluntary by enterprises and should be stimulated through market mechanisms rather than legal enforcement. Public awareness of CSR, environmental protection, and green development needs to be improved, public perceptions of CSR measures need to be enhanced, and public feedback on CSR behaviors of enterprises should be provided. Last but not least, an objective and fair review and disclosure system for CSR behavior of enterprises should be established to optimize the external environment required for enterprises to fulfill CSR and encourage them to actively participate in CSR activities.

Lastly, different types of enterprises should adopt different behavioral strategies when participating in CSR activities. In terms of enterprise ownership, the state-owned enterprises should reasonably design the boundaries and systems for CSR implementation. They should play a leading role in CSR implementation, but avoid excessive fulfillment of CSR and neglecting the development of their main business. The non-state-owned enterprises, by contrast, should actively embrace CSR, which is not only beneficial to the sustainable development of enterprises but also enhances their reputation through governments' preferential policies, such as tax incentives and public rewards, as well as the recognition and praise from the public and third-party rating agencies. For heavily polluting enterprises, fulfilling CSR can promote their green innovation and transition, which is conducive to relieving the financing constraints brought about by green finance policies. Heavily polluting enterprises should integrate CSR implementation and industrial

upgrading to create a new industrial chain with low pollution and energy consumption, demonstrate their CSR performance, and provide financial support for further green transformation and upgrading of enterprises.

Author Contributions: Conceptualization, J.T., P.S. and L.Z.; software, P.S.; validation, J.T., J.L. and L.Z.; formal analysis, P.S. and J.T.; data curation, P.S.; writing—original draft preparation, J.T., P.S., J.L. and L.Z.; writing—review and editing, L.Z. and J.T.; supervision, J.L. and L.Z.; project administration, J.L. and L.Z.; funding acquisition, J.L. and L.Z. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by National Natural Science Foundation of China (72304234), National Social Science Foundation of China (22BZZ039), Postgraduate Education Reform and Quality Improvement Project of Henan Province (YJS2022JD30), Henan Provincial Social Science Circles Federation (SKL-2023-2390), and the Nanhu Scholars Program for Young Scholars of XYNU (2020B-1-24).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data presented in this study is available on request.

Conflicts of Interest: The authors declare no conflict of interest.

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