THE IMPACTS OF CORPORATE SOCIAL RESPONSIBILITY (CSR) ON CORPORATE FINANCIAL PERFORMANCE EVIDENCE FROM CHINESE PHARMACEUTICAL INDUSTRY

——BASED ON A MODERATED MEDIATION MODEL

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ABSTRACT

Debate on the relationship between corporate social responsibility (CSR) and corporate financial performance (CFP) has been a hot topic. Existing studies, however, have yet to reach a consistent conclusion on the relationship between the two. Pharmaceutical industry is closely related to people's livelihood issues, and all sectors of society have attached great importance to its development. Recent years, drug safety problems have become increasingly serious, revealing a lack of social responsibility of pharmaceutical companies. The public calls for pharmaceutical companies to actively fulfill their social responsibility, expecting to improve the quality of medicines and solve the drug safety problems, but fulfilling social responsibility

can lead to short-term outflow of production factors. On the other hand, negative information also affects pharmaceutical corporate reputation, market, thus affecting their financial performance. How pharmaceutical corporations can find a balance between fulfilling social responsibility and maximizing corporate performance has become the focus of current research.

The current research on CSR on CFP, from the content point of view, mainly focuses on the internal role of corporate, lack of research on the external impact on corporate; from the research object point of view, mostly focuses on the manufacturing enterprises in developed countries, and lacks the research on Chinese pharmaceutical enterprises. Scholars focus on the transmission mechanism based on the basis that CSR affects CFP, which makes it easier to explain how CSR affects CFP. Therefore, this research takes technological innovation, media coverage and organizational slack as entry points to explore the transmission mechanism of CSR into CFP using Chinese pharmaceutical corporations as research subjects.

Focusing on the research theme, the following research work has been carried out: (1) this article has systematically sorted out the representative literature in the field of CSR, technological innovation and financial performance research, and clarified the orientation of the research to provide theoretical support for the research. (2) A conceptual framework of CSR and CFP of pharmaceutical corporations is constructed with technological innovation as the mediating variable and media coverage and organizational slack as the moderating variables. (3) The conceptual framework and hypotheses are optimized and validated through expert interviews. (4) The panel data of Chinese A-share listed pharmaceutical corporations from 2010 to 2020 are regressed using two-way fixed effects models, and the regression results are tested for robustness using the alternative variable method, the instrumental variable method, and the

Bootstrap method. (5) Summarize the full research and point out the shortcomings of the research and directions for further research.

Through the above research, this article draws the following conclusions: (1) positive correlation exists between CSR and CFP, and technological innovation plays a partly mediating role in the relationship between CSR and CFP. (2) Positive and negative media coverage and unabsorbed slack weaken the effect of CSR on CFP, while absorbed slack strengthens this effect. (3) Positive and negative media coverage weakens the mediating effect of technological innovation on the relationship between CSR and CFP, while absorbed slack and unabsorbed slack strengthens this effect.

This article analyzes the relationship between CSR and CFP of Chinese pharmaceutical corporations, examines the effects of technological innovation, media coverage and organizational slack on the relationship. Providing new perspectives on how companies can balance the relationship between CSR and CFP. Meanwhile, the gap of theoretical and empirical research related to the social responsibility of Chinese pharmaceutical corporate is filled. In addition, theoretical support and empirical support are provided for the optimization of the incentive mechanism of Chinese pharmaceutical CSR, the regulation and promotion of CSR by industry associations, and the practice of CSR.

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CHAPTER 1

INTRODUCTION

1.1 Background and Significance

With the development of society and economy, the role and influence of companies in modern social development is increasing, corporate social responsibility "CSR" is becoming more and more accepted and valued by companies, and CSR-related issues are widely concerned by the society (Boubaker et al., 2020; Ervits, 2021; Kao et al., 2018; Roth, 2021; Sharma & Chakraborty, 2024; Yang et al., 2022). . CSR is the integration of environmental and social factors into the business activities of companies on a voluntary basis, as well as in their interactions with stakeholders (Ankersmit, 2020). Through CSR, sustainable growth conditions are created for long-term corporate development (Çera & Ndou, 2024; Chhaparia & Jha, 2022), and improved financial, environmental, and social performance (Ahmad et al., 2023; Coelho et al., 2023; Zhang et al., 2019). CSR has been used as part of a company's business strategy (Bae *et al.*, 2022; Hadj *et al.*, 2020). However, CSR capitalization may also have a negative impact on corporate profitability (Ahmad *et al.*, 2023; Barnett & Salomon, 2012; Lin *et al.*, 2020). In short, the active fulfillment of social responsibility by companies can send a signal to the outside world that they are strong and operate well, and the results of quality social responsibility fulfillment can play a positive role in promoting corporate performance.

As the Chinese pharmaceutical industry continues to grow rapidly, the evolution of CSR and its potential impact on the financial performance of the pharmaceutical industry is

becoming more prominent (Li et al., 2021). Social responsibility of pharmaceutical companies is increasingly becoming a central issue of public concern (Azim & Azam, 2013; Demir & Min, 2019). Recent years have seen cases of social irresponsibility in China related to illness, healthcare quality, and occupational injuries (Yang et al., 2021), and major problems with the quality and safety of Chinese medicines (Huang et al., 2023), which have exposed a lack of CSR among Chinese pharmaceutical companies. According to China's 2020 Annual Report on Drug Supervision and Administration Statistics, in 2020 alone, drug supervision and administration authorities investigated and handled 61,700 drug cases, involving a total of 734 million yuan; 26,700 medical device cases were investigated and handled, involving 383 million yuan (China Drug Administration, 2020). In addition to pharmaceutical safety accidents, the pharmaceutical industry has also experienced a succession of emergencies related to corporate social responsibility, such as low drug quality, commercial bribery, counterfeit drugs, excessive drug prices, and environmental pollution (Demir & Min, 2019; Shengtian & Zhang, 2014). Since pharmaceutical products play a critical role in public life, it also makes pharmaceutical companies bear a higher social responsibility than other industries (Qiang & Fei, 2020) . However, will corporate financial performance “CFP” be enhanced or harmed when companies fulfill their social responsibility? Researchers have reached different conclusions in response to this question (Baboukardos, 2018; Li et al., 2024; Partalidou et al., 2020; Roth, 2021). Therefore, how to balance the social and financial performance of pharmaceutical companies is an important practical issue before pharmaceutical companies.

Innovation is considered as a way for CSR to balance financial performance and societal performance which in turn leads to the goal of sustainable corporate development (Luo & Du,

2015; Zhang et al., 2019). CSR as a strategy for business operations helps to improve the innovative performance of companies (Bocquet *et al.*, 2013; Costa & Fonseca, 2022; Huanyong *et al.*, 2019). For example, sustainable innovation for the economy, society and the environment (Delmas & Pekovic, 2018; Rosca *et al.*, 2017). Innovation for survival and development has become a must for pharmaceutical companies, but currently Chinese pharmaceutical companies still face the problem of insufficient innovation. According to China's Annual Drug Review Report 2020, a total of 1989 applications for listing and registration of chemical drugs were reviewed and approved in that year, of which 1700 were generic drug listing applications, accounting for 85.47% of the total number of approved listing applications for chemical drugs (China Drug Administration, 2020). Intangible assets in CSR fulfillment, such as innovation, are important and ultimately affect company performance as well as company value when they are associated with corporate competition (Wagner, 2010; Zahid *et al.*, 2021; Zanjirchi *et al.*, 2019). CSR activities are recognized as long-term investment and innovation drivers that create competitive advantage and increase financial performance for corporations (Fosu *et al.*, 2023). CSR as a strategy for business operations is a driver for firms to engage in green innovation (Chen et al., 2023) , which helps to improve firms' innovation performance (Bocquet *et al.*, 2013; Huanyong *et al.*, 2019).

The media has a significant impact on public opinion in the context of CSR (Pérez *et al.*, 2019). The media acts as an information intermediary, spreading information to the public through newspapers, magazines, radio, television, movies, books, and the Internet (Zou et al., 2020) , reducing the level of information asymmetry between the public and firms (Bushee et al., 2010; Chang et al., 2019; Guo & Lu, 2020) . Media coverage can influence the stock market

and achieve corporate goals by enhancing corporate reputation(Lu et al., 2020; Pérez et al., 2018; Tang, 2012). Ahern *et al.* (2015) found that relevant media coverage can increase public confidence and improve corporate reputation, but false coverage can have a negative impact on corporate reputation (McConnell, 2013). In addition, the media, as an important extra-legal institution, is one of the ways to promote sustainable innovation of enterprises, and its public opinion monitoring role is more effective in enhancing the technological innovation of companies (Li & Ling, 2020; Luo & Liu, 2020; Shilei et al., 2021; Zhou et al., 2016). Media coverage is a double-edged sword (Qing *et al.*, 2023), the complex market environment makes the media coverage not only does not stimulate firms to optimize their management model, but also may lead to lower financial performance. In China, the media is considered a trusted source of information (Lu et al., 2020) , therefore, the research explores the moderating role of media coverage in CSR relationships and examine the impact of pharmaceutical industry CSR fulfillment on corporate innovation and firm performance..

Corporate technological innovation and improvement of firm performance require not only new ideas and underlying technologies, but also financial and human resource support (Asamoah, 2019; Stuart & Sanjay, 2004). According to resource-based view (RBV), organizational slack is a potential resource that allows firms to respond effectively to internal and external changes (Barney, 1991; Dang *et al.*, 2019; George, 2005b). Resource slack allows firms to experiment with new strategic options and so exploit the potential of team diversity (Daniel *et al.*, 2004; Lin *et al.*, 2020; Moses & Douglas, 1992). At the same time, corporate social responsibility needs to be supported by a large amount of idle resources, first by ensuring the availability of financial surplus and second by other surplus resources (Asamoah, 2019).

Organizational slack is a resource that is controlled and maintained by the organization internally and it is not included in the daily operational needs of the company (Josep *et al.*, 2018; Laffranchini & Braun, 2014). This allows organizational slack to provide additional available resources for the sustainable development of the company and ensure the support of the company's strategy (Duan et al., 2020; Huang & Li, 2012). Redundant resources as tangible resources can play a complementary role in the process of fulfilling social responsibility and adding value to the company through increased capital investment, in-kind donations and employee benefits (Yin *et al.*, 2020). Therefore, the research explores the moderating role of organizational slack in CSR relationships and examines the impact of CSR fulfillment on corporate innovation and firm performance in the pharmaceutical industry.

In this context, the special nature of pharmaceutical companies also determines that they must take social responsibility of ensuring public life safety and physical health as the basic value orientation of their business operations. In the current studies of CSR on financial performance, the relationship between the two still has no consistent conclusion (Li et al., 2024; Lin et al., 2020; Roth, 2021), adding mediating variables can clarify the mechanism and clarify the logic, and improve the CSR-CFP influence mechanism.

China as the second largest pharmaceutical market location, controlling 10% of the world market (Li et al., 2021) , Chinese pharmaceutical companies are the target of this research. This research adds technological innovation as mediating variables, media coverage and organizational slack as moderating variables to the research content based on the research of the direct impact of CSR fulfillment on CFP of Chinese pharmaceutical companies, which is used to solve the realistic problems faced by Chinese pharmaceutical companies and to

compensate for the theoretical deficiencies of academic research. In addition, most of the studies on CSR and CFP have taken developed countries as the research context. Therefore, as a developing country, data from China can refine the results on CSR in a global context, while further enriching the literature on the relationship between CSR and CFP.

1.2 Research Questions

The Blue Book on Corporate Social Responsibility: China CSR Research Report (2019) published by the Chinese Academy of Social Sciences shows that in 2019, the Social Responsibility Development Index of China's top 300 enterprises is 32.7 points, and the overall is at the starter stage; about 50% of enterprises have a development index below 20 points and are still "on the sidelines". Among the 10 key industries, electric power, banking and special equipment industries have higher social responsibility development index scores; the daily chemical industry has the lowest score for two consecutive years, and social responsibility management and information disclosure capabilities need to be improved. If companies are to actively fulfill their social responsibility, they must be made aware that socially responsible investment can bring tangible profits to corporate enterprises - or at least, their existing profits will not shrink as a result.

So can CSR generate tangible cash flow and improve financial performance? No consensus has been reached to date. There are three contrasting views on this issue in the academic field. First, based on Freeman (1984) stakeholder theory, there is a significant positive relationship between CSR fulfillment and financial performance (Hawn *et al.*, 2018; Mishra,

2017; Yang *et al.*, 2019), which means that the better the CSR fulfillment, the better the financial performance; conversely, the worse the CSR fulfillment, the worse the financial performance. Second, the fulfillment of CSR is negatively related to financial performance (Hirigoyen & Poulain-Rehm, 2015; Shahbaz *et al.*, 2020; Yichun *et al.*, 2018). The fulfillment of CSR not only occupies shareholders' resources, but also increases the operational burden of enterprises, which is not beneficial to the achievement of financial objectives (Hirigoyen & Poulain-Rehm, 2015; Inoue et al., 2011). Third, is that CSR fulfillment is not substantially correlated with financial performance (Bauer *et al.*, 2007; Dhrymes, 1998; Han *et al.*, 2016). Currently, the mechanisms of how CSR improves corporate performance are not fully explained (Doh *et al.*, 2010), which implies that further research on the impact of CSR on corporate performance is needed.

The link between CSR and innovation has only been developed in the last two decades (Rexhepi *et al.*, 2013). From an empirical point of view, previous literature acknowledges a clear link between CSR and innovation (Jaime et al., 2018; Luo & Du, 2015). However, studies have also identified negative effects of innovation (Gallego-Alvarez *et al.*, 2011). Research on the mediating role of intangible resources and capabilities is still in its infancy and there are inconsistent empirical results (Grewatsch & Kleindienst, 2017). Some scholars have empirically tested the mediating role of innovation (Martinez-Conesa *et al.*, 2016; Reverte *et al.*, 2015), which ultimately affects the performance and value of firms (Cantele & Zardini, 2018; Zanjirchi *et al.*, 2019). Therefore, further research is needed on the relationship between CSR and innovation and the mediating role of innovation.

In the digital age, where information dissemination by media is becoming faster, more

convenient, and more diverse(Burke, 2021; Graf-Vlachy et al., 2019; Wang & Zhang, 2021), media play an essential role in CSR fulfillment (Abdillah *et al.*, 2020; Chu *et al.*, 2020; Xiong & Luo, 2021), for the following reasons. Firstly, the media can act as a communication channel to communicate their CSR fulfillment to the public through reporting, thus reducing information asymmetry (Yuan *et al.*, 2018); secondly, the media can also be an independent watchdog to monitor the company's behavior through reporting, thus protecting the interests of stakeholders (Dhaliwal *et al.*, 2011); finally, the media can also be a stakeholder in CSR performance (Tang, 2012) . Ahern *et al.* (2015) found that targeted media coverage can boost public confidence and improve corporate image, but exaggerated and maligned false reports can negatively affect the reputation of companies (Liu & McConnell, 2012). Currently, further research is needed on the role of media coverage in the relationship between CSR fulfillment, technological innovation and corporate performance.

Enterprises need to spend a lot of financial resources to fulfill their social responsibility, and there are roughly two channels for internal resources to provide reliable financial supply for their social responsibility: first, continuous financial performance provides continuous financial support, which is the regular cash flow guarantee for enterprises to fulfill their social responsibility; second, slack resources provide effective financial guarantee, which is the additional resource replenishment for enterprises to fulfill their social responsibility (Sun & Song, 2021). Some scholars believe that organizational slack will lead to internal agency conflicts, decrease the efficiency of enterprise resource utilization, affect the normal production and operation activities, and reduce enterprise performance (Eddleston *et al.*, 2010); some scholars believe that it will broaden the sources of scarce resources, guarantee the effective

implementation of strategies, and accelerate the growth of enterprise performance (Voss *et al.*, 2008). Since companies prioritize their internal resource allocation to meet their daily economic activities before considering other parties such as fulfilling social responsibility (Xu *et al.*, 2013), slack resources within the company that are reallocated to fulfill social responsibility can greatly improve the level of CSR and become an effective financial guarantee for fulfilling social responsibility (Arora & Dharwadkar, 2011). Camisón and Villar-López (2014) found through their research that organizational slack leads to the growth of redundant resources, when companies are unable to apply all their resources to innovative R&D activities, which ultimately has an impact on their operating profitability.

In summary, this article examines the following issues with pharmaceutical companies in China:

(1) What is the impact of CSR fulfillment on corporate performance?

(2) What is the mediating role of technological innovation in the relationship between CSR fulfillment and corporate performance?

(3) What is the moderating role of media coverage in the relationship between CSR fulfillment, technological innovation, and corporate performance?

(4) What is the moderating role of organizational slack in the relationship between CSR fulfillment, technological innovation, and corporate performance?

1.3 Research Objectives

Since most managers believe that fulfilling social responsibility puts the company at risk

of increased costs (Lange & Washburn, 2012; Shahbaz *et al.*, 2020). Therefore, pharmaceutical companies do not pay attention to this behavior that has the potential to reduce corporate performance due to the consideration of maximizing corporate profit. However, it is known from the relevant literature that fulfillment of corporate society has a positive impact on corporate performance. Thus, this article investigates the impact of CSR fulfillment on corporate financial performance of Chinese pharmaceutical companies through empirical analysis. The paths and mechanisms of CSR impact on corporate performance are revealed. It expands the research related to CSR and enriches the theoretical research of corporate performance. Useful for guiding Chinese pharmaceutical companies to actively fulfill CSR. The research objectives of this article are specified as follows.

(1) To explore the impact of CSR on corporate performance of Chinese pharmaceutical companies.

(2) To explore the role of technological innovation in mediating the relationship between CSR fulfillment and corporate performance of Chinese pharmaceutical companies.

(3) To explore the moderating role of media coverage in the relationship between CSR fulfillment, technological innovation and corporate performance in Chinese pharmaceutical companies.

(4) To explore the moderating role of organizational slack in the relationship between CSR fulfillment, technological innovation, and corporate performance of Chinese pharmaceutical companies.

Table 1. 1 Alignment between objectives, research questions, and hypotheses

Objective	Research Question	Hypothesis
To explore the impact of CSR on corporate performance of Chinese pharmaceutical companies.	What is the impact of CSR fulfillment on corporate performance?	H1: CSR by Chinese pharmaceutical companies can increase CFP
To explore the role of technological innovation in mediating the relationship between CSR fulfillment and corporate performance of Chinese pharmaceutical companies.	What is the mediating role of technological innovation in the relationship between CSR fulfillment and corporate performance?	H2: CSR by Chinese pharmaceutical firms enhance technological innovation. H3: Technological innovation plays a mediating role in the CSR-CFP relationship of Chinese pharmaceutical companies.
To explore the moderating role of media coverage in the relationship between CSR fulfillment, technological innovation and corporate performance in Chinese pharmaceutical companies.	What is the moderating role of media coverage in the relationship between CSR fulfillment, technological innovation, and corporate performance?	H4a: Positive media coverage has a negative moderating effect on the impact of CSR on CFP in Chinese pharmaceutical companies. H4b: Negative media coverage has a negative moderating effect on the impact of CSR on CFP in Chinese pharmaceutical companies. H5a: Positive media coverage of Chinese pharmaceutical companies negatively moderates the process by which CSR affects CFP through technological innovation. H5b: Negative media coverage of Chinese pharmaceutical companies negatively moderates the process by which CSR affects CFP through technological innovation.
To explore the moderating role of organizational slack in the relationship between CSR fulfillment, technological innovation, and corporate performance of Chinese pharmaceutical companies.	To explore the moderating role of organizational slack in the relationship between CSR fulfillment, technological innovation, and corporate performance of Chinese pharmaceutical companies.	H6a: Unabsorbed slack plays a negative moderating role in the CSR-CFP relationship in Chinese pharmaceutical companies. H6b: Absorbed slack plays a positive moderating role in the CSR-CFP relationship in Chinese pharmaceutical companies. H7a: Unabsorbed slack positively moderates the process by which CSR affects CFP through technological innovation in Chinese pharmaceutical firms. H7b: Absorbed slack negatively moderates the process by which CSR affects CFP through technological innovation in Chinese pharmaceutical companies.

1.4 Research Hypotheses

This research examines the mechanism of CSR's influence on CFP by combing the relevant literature and interviewing management employees in the pharmaceutical industry through three related empirical studies. The research hypotheses are as follows:

H1: CSR by Chinese pharmaceutical companies can increase CFP.

H2: CSR by Chinese pharmaceutical firms enhance technological innovation.

H3: Technological innovation plays a mediating role in the CSR-CFP relationship of Chinese pharmaceutical companies.

H4a: Positive media coverage has a negative moderating effect on the impact of CSR on CFP in Chinese pharmaceutical companies.

H4b: Negative media coverage has a negative moderating effect on the impact of CSR on CFP in Chinese pharmaceutical companies.

H5a: Positive media coverage of Chinese pharmaceutical companies negatively moderates the process by which CSR affects CFP through technological innovation.

H5b: Negative media coverage of Chinese pharmaceutical companies negatively moderates the process by which CSR affects CFP through technological innovation.

H6a: Unabsorbed slack plays a negative moderating role in the CSR-CFP relationship in Chinese pharmaceutical companies.

H6b: Absorbed slack plays a positive moderating role in the CSR-CFP relationship in Chinese pharmaceutical companies.

H7a: Unabsorbed slack positively moderates the process by which CSR affects CFP through technological innovation in Chinese pharmaceutical firms.

H7b: Absorbed slack negatively moderates the process by which CSR affects CFP through technological innovation in Chinese pharmaceutical companies.

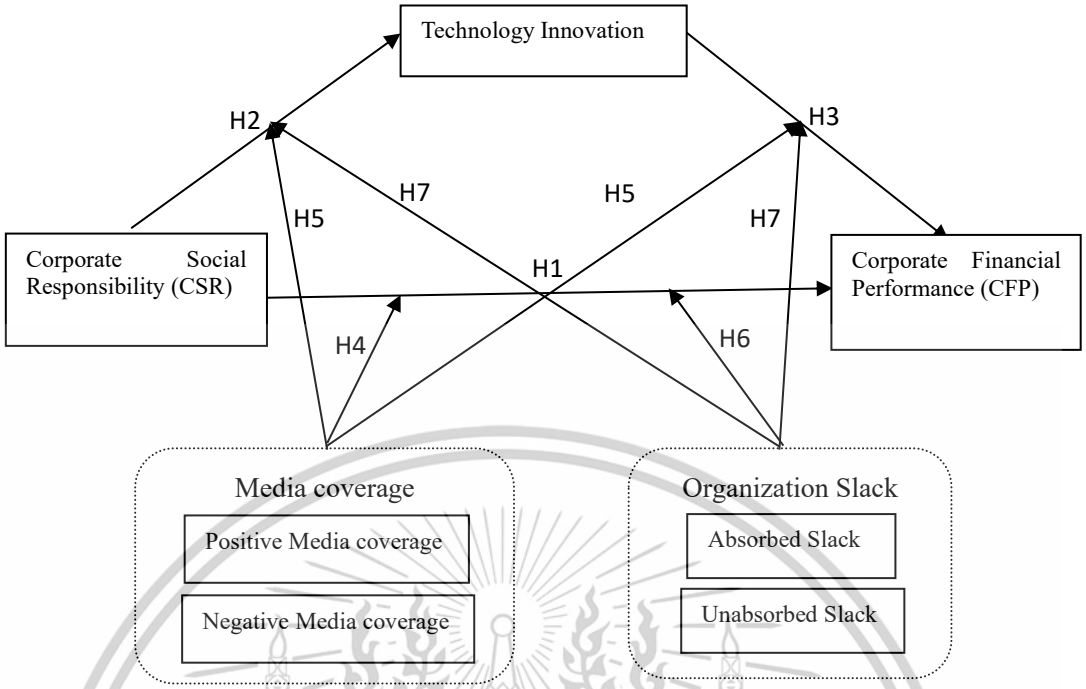

Figure 1.1 The overall framework of the thesis

1.5 Research Benefits

In terms of theory, firstly, it enriches the theoretical research related to the fulfillment of CSR and its economic consequences. It reveals the mechanism of the role of fulfilling CSR more clearly and comprehensively, and lays a theoretical foundation for the subsequent research on the implementation of CSR. Second, the empirical research of the relationship between CSR and CFP is enriched with technological innovation as a mediating variable, and the relationship between CSR, technological innovation and CFP is clarified. Finally, media coverage and organizational slack are used as moderating variables to study the relationship between CSR and CFP, which combines resource-based theory, signaling theory and agency theory and other related theories to improve the mechanism of CSR on CFP and enrich the research in this field.

In terms of practice, pharmaceutical companies should bear a heavier social responsibility than general enterprises because they are related to people's life safety. By studying the impact

of CSR on the financial performance of enterprises, it can enhance the awareness of the entire Chinese pharmaceutical industry on the fulfillment of social responsibility, which has very important practical significance. Firstly, this research will provide guidance for pharmaceutical companies in fulfilling their social responsibility, help them to weigh the relationship between the fulfillment of social responsibility and financial performance, and make them realize the importance of fulfilling social responsibility. Secondly, enterprises should combine technological innovation and social responsibility, innovate while fulfilling social responsibility and ensuring stakeholders' interests, and promote the improvement of financial performance through the mutual promotion of the two. Thirdly, we call on stakeholders to pay more attention to the social responsibility of pharmaceutical enterprises and play the role of external supervision. This will encourage enterprises to insist on producing drugs with conscience and selling drugs with confidence, and provide safe and reliable drugs for patients for the benefit of the people. Lastly, enterprises can make reasonable and efficient use of their existing resources, which can further promote the long-term sustainable development of pharmaceutical enterprises and bring them higher performance.

1.6 Scope of Research

1.6.1 Qualitative study

According to the research theme, the interviewees must be limited to those who are in management positions of social responsibility planning and implementation or have a deep understanding of the process and meaning of social responsibility implementation. Therefore, this research selected the middle management leaders of Chinese listed pharmaceutical companies as interviewees. Referring to Baxter and Chua (1998) study, two gatekeepers were identified as intermediaries for the initial contact and approach. In this research, 5 middle managers from 5 listed pharmaceutical companies were initially identified for interviews.

1.6.2 Quantitative study

This research uses Chinese listed pharmaceutical companies according to the research objectives. The 262 listed pharmaceutical companies publicly listed on the Shenzhen Exchange and Shanghai Exchange in China from 2010 to 2020 were used as the primary sample. The sample was screened according to the following criteria: (1) exclude the sample of companies with special treatment (ST[1], *ST[2]) during the study period because their operating conditions and financial performance became irregular for 2-3 consecutive years; (2) exclude the sample of companies that no longer belong to the pharmaceutical industry due to industry changes during the study period; (3) exclude companies with less than five years of sample observations during the study period to ensure the time-series of the sample; (4) exclude the data unavailable; (5) Winsorize treatment at 1% level for continuous variables to avoid the effect of extreme values on the study results. The final sample of 128 corporations with 1367 observations was obtained through the screening process.

The relevant financial data sources include annual reports text analysis, China Stock Market and Accounting Research (CSMAR) database, and China Research Database (CNRDS). CSR data are obtained from Hexun.com (Li *et al.*, 2021; Shilei *et al.*, 2021; Yang *et al.*, 2019), which is based on the social responsibility reports and financial reports of Chinese listed companies, and the ratings are based on five aspects: shareholder responsibility, employee responsibility, supplier, customer and consumer responsibility, environmental responsibility and public responsibility. The score is based on the information of social responsibility reports and financial reports of listed companies in China, and can reflect the social responsibility performance of enterprises in a more comprehensive and objective way by setting up 13 secondary indicators and 37 tertiary indicators in five aspects, respectively. For

[1] ST: other risk warning. Situations of ST: 1. failure to publish the first annual report after resumption of listing or relisting; 2. production and operation activities are seriously affected and not expected to resume normal within three months; 3. the company's main bank account is frozen; 4. the board of directors is unable to hold a normal meeting and form a board resolution, etc.

[2] *ST: delisting risk warning. Situations of *ST: 1. the net profit of the two most recent fiscal years is negative; 2. the net assets of the most recent fiscal year is negative; 3. the operating revenue of the most recent fiscal year is less than RMB 10 million; 4. the financial report of the most recent year is issued with an unexpressed or negative opinion, etc.

Source: Shanghai Stock Exchange Stock Listing Rules (2018)

media-related data, drawing on Shilei *et al.* (2021), the CNRDS database is selected (Tao & Jin, 2012), which contains more than 600 newspaper media and can ensure the authority, comprehensiveness and accessibility of media data.

1.7 Definition of Terms

There are five main variables in this research, they are CSR, CFP, technology innovation, media coverage and organizational slack, and the others are control variables.

Corporate Social Responsibility (CSR): refers to a company's commitment to actively achieve satisfaction for other stakeholders in addition to satisfying the interests of shareholders and owners and maximizing corporate value (Wu et al., 2021; Yang et al., 2019).

Corporate financial performance (CFP): refers to a company's ability to use all of its capital to make a profit (Lu et al., 2020).

Technology innovation (Inn): refers to the value of the innovation in the marketplace as a whole, including innovation in products, knowledge, the way factors are allocated, and management techniques (Duan et al., 2020).

Media coverage (Med): refers to the creation of new information in the form of news writing and packaging, thus forming the external information environment of the company (Xiong & Luo, 2021).

Organizational slack (OS): is the internal resources that the company has more than necessary to maintain the current level of production and is divided into unabsorbed slack and absorbed slack (Symeou et al., 2019).

Firm age (Age): the age of the firm since its establishment (Okafor et al., 2021).

Firm size (Size): The delineation of the scope of the firm's production, operations, etc (Luo et al., 2019).

Firm leverage (Lev): the ratio of a company's total liabilities to its total assets, reflecting the total resources owned by the company and at its disposal as well as the amount of external

borrowing (Chang et al., 2019).

Cash flow ratio (CFO): the ratio of net cash flow from operating activities to total assets, reflecting the financial elasticity of the company (Wu et al., 2021).

Sales growth rate (Growth): the ratio of the difference between the company's current year sales revenue minus the previous year's sales revenue and the previous year's sales revenue, reflecting the company's growth opportunities (Hasan et al., 2018).

Intangible assets ratio (Intan): the ratio of a company's net intangible assets to its total assets (Surroca et al., 2010).

Number of staff (Staff): The total number of employees of the company (Wu et al., 2021).

Equity concentration (Top10): The percentage of shares held by the company's top ten shareholders (Mengmeng et al., 2019).

State-owned enterprise (SOE): The nature of the enterprise based on the nature of the largest shareholder with absolute control, divided into state-owned enterprises and non-state-owned enterprises (Lu et al., 2020).

CHAPTER 2

LITERATURE REVIEW

2.1 Theoretical basis

2.1.1 Resource-based theory

Wernerfelt (1984) systematically articulated the idea of resource-based theory in the Strategic Management Journal, where he argued that valuable, hard-to-imitate firm resources and capabilities are a key source of sustained competitive advantage (Aragon-Correa & Sharma, 2003; Russo *et al.*, 1997; Wernerfelt, 1984). Resource-based view (RBV) mainly focuses on the enterprise internal resource acquisition and maintain competitive advantage. Among management scholars, there is a continuous debate on whether the acquisition of sustained competitive advantage by a firm depends on factors external to the firm's environment or internal to the firm (Prahalad & Hamel, 1993). There is also evidence that both internal and external factors are critical for firms to gain competitive advantage (Aragon-Correa & Sharma, 2003).

Then how to determine the valuable resources of the enterprise? Barney (1991) defined valuable strategic resources as knowledge, capabilities and special assets controlled or owned by the enterprise, which can be categorized as organizational resources, human capital and physical resources. Grant (1991) divided the types of resources in more detail, adding reputation, technological resources and innovation resources, etc. Resources of enterprises are difficult to identify and manage in practical operation. Grant (1997) simply divides resources into tangible assets, intangible assets and organizational capabilities, and classifies employees' knowledge, professional expertise and experience into strategic resources of enterprises, and the unique knowledge, heterogeneous resources and dynamic capabilities of enterprises constitute the competitive advantage of enterprises, and the types of resources are divided as shown in Table 2.1. Therefore, CSR can be used by organizations as an intangible resource.

Companies can use CSR to improve consumers' willingness to buy and financial performance, build brand image, and promote technological innovation.

Table 2.1 Types of resources

Types of resources	**Main content**
Tangible assets	Physical assets such as production equipment and technical equipment
Intangible assets	Assets without physical form such as human resources, reputation resources, trademarks, brands and proprietary knowledge
Organizational capability	Organizational coordination and integration ability to transform inputs into outputs, which is difficult for competitors to imitate, such as special field expertise, organizational learning ability, and enterprise dynamic ability

Source: Compilation of related literature including Grant (1991) and Grant (1997)

Orlitzky *et al.* (2003) used a meta-analysis of more than 1200 articles to find that CSR can improve financial performance and bring competitiveness to companies. The impact model of "CSR - intangible resources - corporate performance" is proposed by Surroca *et al.* (2010). Martinez-Conesa *et al.* (2016) also finds that socially responsible SMEs perform better in terms of innovation performance. Gallego-Alvarez *et al.* (2011) using a sample of firms from 2003 to Using a sample of firms from 2003-2007, and he found that CSR can promote technological innovation and that CSR as a competitive strategy for differentiation can increase a firm's technological R&D output, leading to improved performance. Mishra (2017) analyzed public companies with high levels of innovation in the U.S. and found that companies with high levels of social responsibility fulfillment have more innovative output and market value, while innovation leads to higher growth potential.

From the resource-based theory, CSR, as an important resource for companies, can bring competitive advantage and improve financial performance indicators.

2.1.2 Stakeholder theory

Freeman (1984) in “Strategic Management: A Stakeholder Approach” defines stakeholders as individuals or groups who can influence the performance of the firm or are influenced by the achievement of the firm's goals. The concept of stakeholders was introduced and many scholars have included it in their research, for example, in the areas of agency problems (Charles *et al.*, 1992), CSR (Buysse & Verbeke, 2003), and resource-based view (Frooman, 1999). The core principle of stakeholder theory is that companies should make business judgments and conduct their production operations effectively in a prudent and responsible manner with stakeholders at the center, while stakeholders influence corporate behavior by controlling access to key resources (Frooman, 1999). According to the stakeholder theory, the survival and development of any enterprise depends to a certain extent on the input and participation of various stakeholders. In the face of changing stakeholder expectations and needs, enterprises should improve the quality of their responses, take into account the interests of all parties, and ensure effective access to strategic resources held by stakeholders.

According to the pyramid hierarchy model proposed by Carroll *et al.* (1979), stakeholders related to corporate economic responsibility are at the first and most important level of the pyramid. First of all, as a profit-oriented organization, the primary task of a company is to satisfy public demand through production and sales, and in the process, to make profits to sustain its operations. If an enterprise fails to assume economic responsibility, that is, if it fails to make profits, all other dimensions of social responsibility will be meaningless. Second, the second layer of stakeholders related to the legal responsibility of enterprises. The production and operation activities of the enterprise should be carried out within the scope allowed by the laws and regulations of the local government where it is located, and should meet the standards proposed by the relevant industry associations to act, otherwise the enterprise will lose its legitimacy. Then, the third layer of stakeholders related to corporate ethical responsibility, compliance with laws, regulations and industry rules is the minimum requirement for enterprises to act, and enterprises should regulate and guide their own behavior with higher ethical standards, as a benchmark for promoting positive social energy. Finally, the top level relates to the stakeholders of corporate philanthropic responsibility, which means that

enterprises should actively carry out public welfare undertakings and devote themselves to promoting the well-being of the whole society.

Freeman (1984) argues that the influence of stakeholders on a firm depends on the resources they hold. Depending on the characteristics of the resources they hold, stakeholders are classified as ownership stakeholders (including board members, managers, etc.), economically dependent stakeholders (including employees, creditors, consumers, suppliers, etc.), and socially interested stakeholders (including government, media, and other special interest groups).

Savage *et al.* (1990) and Clarkson (1995) classify stakeholders into direct and indirect categories based on whether there is a formal exchange relationship between the stakeholders and the firm. Direct stakeholders include employees, suppliers, customers, and public service management organizations that have a formal relationship with the firm, while indirect stakeholders include special interest groups such as government, media, and community.

Carroll (1991) argues that stakeholder theory has adequately guided the direction of CSR research. And Clarkson (1995) also considered that correlating the development of CSR research with stakeholder theory was an important breakthrough achieved in this research area. Oikonomou *et al.* (2014) based on stakeholder theory, using a sample of corporate bonds from 17 industries in the United States from 1999 to 2008, verified that undertaking corporate social responsibility not only reduces the conflict of interest with employees but also reduces the financing cost of the company. Corporate social responsibility meets the expectations of stakeholders and improves the relationship between the company and them, thus enhancing the goodwill and competitiveness of the company (Waddock & Graves, 1997). Corporate social responsibility can even alleviate the problem of information mismatch between companies and stakeholders and make the public have more confidence in the company (Verrecchia, 2001), according to the different stakeholders of stakeholder theory, different directions of research have been born, making the research more framework-oriented.

In summary, stakeholder theory is significant in the field of corporate responsibility research. It has important applications in exploring the motivations and consequences of CSR

implementation by companies and the impact of CSR on corporate value.

2.1.3 Signaling Theory

Signaling theory was developed from Spence's contribution to labor economics by incorporating the idea of "information asymmetry" into economic models of decision making (Bergh *et al.*, 2014). Signaling theory focuses on the reduction of "information asymmetry" between two parties, variables or factors (Connelly *et al.*, 2011; Spence, 2002; Taj & Saud, 2016). Some of the key concepts related to signaling theory that need to be understood include "signalers", which are the executives or managers of the organization (Michael, 1973); "signals", which are the people within the organization (internal stakeholders) who may have a positive or negative influence on what will happen in the organization positive or negative information about what is going to happen in the organization; "receivers", people associated with the outside of the organization, usually lack information (Basuroy *et al.*, 2006; Lester *et al.*, 2006; Y. Zhang & Wiersema, 2009). People outside the organization can be considered as external stakeholders of the organization and they tend to get more information about internal operations through "signals". Therefore, how the "signal" is interpreted is critical, and the outcome of the signal interpretation may differ from the intention of the signaler (Perkins & Hendry, 2005; Srivastava, 2001).

The main contributors to signal theory and social constructs have been used in human interaction, which also implies that this function can be used in companies (Nyagadza *et al.*, 2020). Nyagadza *et al.* (2020) argue that companies can use corporate activities to signal strategic developments as it describes the actions taken by the organization. Active corporate social responsibility and disclosure of its social responsibility information requires the use of signaling mechanisms to communicate this information across inadequate and opaque markets to all stakeholders so that they can be fully informed about this social responsibility information. Companies can use CSR as a signal to convey a positive image to the public society, thus helping them to build a good reputation and gaining resources and legitimacy from different stakeholders, as well as support from the community and government.

According to Harmoni (2011), the media is a resource for environmental information. According to Munif and Prabowo (2010), companies can disclose their CSR activities through various media. The disadvantage of signaling theory is that when the information is unreliable, signaling theory becomes an "accomplice" to disrupt the decision making of the receiver of the signal, so effective signaling becomes the key to signaling theory. Wheeler and Sillanpää (1997) suggest that media attention affects corporate social image, reputation and status based on signaling theory. The media follow and report the various economic behaviors of enterprises for commentary, resulting in public opinion to monitor the behavior of enterprises.

2.1.4 Agency Theory

The separation of ownership and control of a firm is an inevitable product of social development, will help to further improve the productivity of the firm, and is considered one of the main drivers of the country's economic development (Chandler, 1962). Berle and Means (1932) point out that due to a certain degree of divergence in goal interests and risk preferences between executives and shareholders, when corporate executives have When corporate executives have too much control power, they may pursue their own private goals to the detriment of the potential interests of shareholders, thus creating a principal-agent problem. On this basis, Jensen and Meckling (1976) further proposed the concept of agency costs by drawing on contract theory. They argue that agency costs arise from the separation of ownership and control of a firm, and specifically include the gap and loss between the decision-making behavior of the agent (corporate executives) and the optimal decision of the principal (corporate shareholders) to maximize the interests of the principal, as well as the monitoring cost of the principal and the guarantee cost of the agent in the process of contract performance. Beatty and Zajac (1994) stated that the difference in attitude towards risk between the principal and the agent may lead to opportunistic risk-averse behavior of the agent, which generates additional agency costs (Barney & Hesterly, 2006).

CSR is a formal or informal institutional arrangement and a code of ethical corporate behavior that can effectively restrain managers' opportunistic behavior, and CSR fulfillment

can alleviate agency problems between company owners and managers, reduce the agency costs of companies, and improve company performance. Organizational slack plays an important role in CSR (Shahzad *et al.*, 2016), agency problems can have an impact on corporate R&D investment decisions and resource allocation efficiency, and agents as supervisors have a great deal of disposition over organizational slack and are therefore likely to use it to satisfy self-interest, their own ambitions and strategic areas of interest without considering maximizing corporate value, to the detriment of using organizational slack to improve operational efficiency.

2.1.5 Other Theories

Above, this article reviews the main theories applied to CSR and corporate performance, including resource-based theory, stakeholder theory, signaling theory, and agency theory. In addition, there are other theories that have received relatively low frequency of application, which are briefly summarized here.

(1) Corporation reputation theory

Fombrun and Rindova (1996) define reputation as a perceptual representation of a firm's past behavior and future prospects, depicting the firm's attractiveness to all key principals (Walker & Kent, 2010); Weiss *et al.* (1999) consider reputation as a global perception that an organization is highly respected; Roberts and Dowling (2002) suggest that corporate reputation is a generic organizational attribute that reflects the degree to which stakeholders consider the firm. Corporate reputation is a valuable intangible asset (Aula & Mantere, 2008), which allows a company to achieve sustained profitability or to have superior performance. Corporate reputation leads to a significant shift in public psychological perceptions and gradual social recognition by stakeholders, which not only allows companies to gain external support in terms of resources and opportunities, but also helps to improve their ability to create value (Smith, 1987). From the perspective of fulfilling social responsibility, corporate reputation theory has three major bases: psychological value effect, information effect, and capital effect theory. Schnietz and Epstein (2005) also argue that social responsibility is a key dimension of reputation (Tucker & Marshall, 2005). From the media's perspective, the media, as an

information medium, can transmit information about the internal development and personnel changes of a company to the outside world. The more attention the media pays to the company, the stronger the motivation of the company to maintain its reputation, which will stimulate the initiative of the company to actively perform social responsibility work (Luo & Liu, 2020), and also help the company to use the media to solidify its high-value reputation position. Corporate reputation theory answers the question of how the media can play a monitoring and governance function.

(2) Institutional theory

Institutional theory is an important perspective in the study of relationship between organizations, which originates from the idea that "organizations are deeply embedded in social and political contexts" (Brammer, 2008). Institutional theory is rooted and derived from organizational sociology, and it breaks away from the traditional assumptions of corporate decision making behavior based on economic interest trade-offs and provides a new explanatory idea based on institutional rationality. Powell (1983) proposed that organizations can achieve isomorphic pressure through three mechanisms: coercive, mimetic, and normative (Mazutis, 2018). In the institutional environment, organizational behavior is evaluated not only through criteria such as the organization's operational efficiency and financial performance, but also in relation to whether the organization establishes structures, modes of operation, and processes that are compatible with the institutional environment, and organizations that comply and obey institutional rules receive broader social acceptance (Scott, 1987). The news media, as an important part of the corporate "institutional environment" (Nikolaeva & Bicho, 2011), exerts influential institutional pressure on firms by evaluating them and their behavior (Bednar *et al.*, 2012; Graf-Vlachy *et al.*, 2019; Nikolaeva & Bicho, 2011).

(3) Organizational behavior theory

Organizational behavior theory, one of the most influential theories in management theory, studies resource allocation and distribution (Devine, 1964) and emphasizes the positive functions of organizational slack. Cyert and March (1963) argued that there are idle resources in firms, and one of the organizational slacks can alleviate organizational conflicts and balance

the benefits gained by groups. Scholars who use the behavioral theory of the firm as a starting point for their research agree that there are several functions of organizational slack that benefit the firm. First, slack can induce managers to use additional resources to invest in either internal innovation or external market expansion (Bourgeois, 1981). Second, slack can help firms resolve internal and external conflicts and dilemmas (Gulati, 1996; Voss *et al.*, 2008). Third, slack is a buffer that reduces losses from environmental changes. The firm's own business can proceed relatively smoothly in a bad economy (March & Shapira, 1987).Fourth, slack is a backstop and catalyst for the smooth implementation of change in corporate strategy and corporate innovation (Tan & Peng, 2003).

2.2 Research variables

2.2.1 Corporate social responsibility

Many scholars agree that CSR originated in the United States in the 20th century, when the American scholar Thompson and Sheldon (1924) first proposed the concept of Corporate Social Responsibility “CSR”. Bowen (1953) gave an initial definition of CSR to business people: "Business people have an obligation to society to implement policies, make decisions, and take actions that are consistent with the goals and values of society as a whole". Many scholars have further refined and developed the concept based on this definition (Brandt & Li, 2002). For details, as mentioned in table 2.2.

Table 2.2 The previous research on the definition of corporate social responsibility

Researcher (year)	Definition
Davis (1960)	The decisions and actions of businessmen should go at least partly beyond the direct economic or technical profits of the enterprise, and social responsibility needs to be commensurate with its social rights.

Researcher (year)	Definition
Friedman (1962)	CSR is the use of corporate resources and engaging in conduct aimed at increasing corporate profits to the extent permitted by business rules, which means open and free competition in a context free of fraud and deception.
Davis and Blomstrom (1975)	CSR is the obligation of decision makers to act for the protection and improvement of social welfare and to integrate with their interests as a whole.
Carroll (1979)	CSR is the consideration of the impact of corporate actions on society.
Clarkson (1995)	CSR should focus on the responsibility to stakeholders and be implemented into daily business activities.
McWilliams and Siegel (2001)	CSR is the act of going beyond corporate interests and legal requirements to further certain social good.
Kotler and Lee (2005)	A commitment to improve community welfare through discretionary corporate activities and the donation of corporate resources.
Basu and Palazzo (2009)	CSR is the process by which managers of companies think about and discuss their relationships with stakeholders, their own roles in the public interest, together with their behavioral tendencies to fulfill and achieve these roles and relationships.
Panda (2014)	CSR is a behavior in which a company should not only focus on the interests of its shareholders, but should also take into account the interests of its stakeholders, such as consumers, business partners and the environment, in its decisions.
Beschorner and Hajduk (2017)	CSR should not only focus on high-profile corporate social responsibility programs, but also on social responsibility issues specific to each industry, taking into account the characteristics of the industry.

During the development and evolution of CSR thinking, the dimensions of CSR have been divided into different dimensions due to different research perspectives. The U.S. Economic Development Commission uses the "concentric circles" model to divide CSR into three dimensions, namely, the basic responsibility to perform economic functions; the responsibility

to protect the environment, manage the relationship between employers and employees, and protect consumers' right to access information and other values; and the commitment of enterprises to participate in more new and unspecified responsibilities to maintain the social environment. responsibilities, as shown in Figure 2.1.

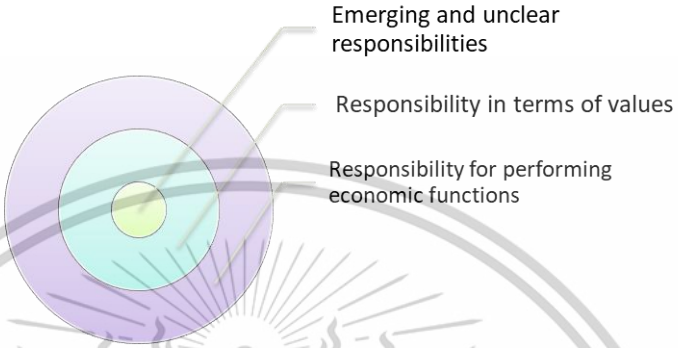

Figure 2.1 "Concentric circle" model of corporate social responsibility

Source: U.S. Economic Development Commission (1971)

The pyramid hierarchy model (Carroll, 1991), which believes that the content of CSR includes economic responsibility, legal responsibility, ethical responsibility and charitable responsibility (or voluntary responsibility), as shown in Figure 2.2.

Source: The pyramid of corporate social responsibility: Toward the moral management of

Figure 2.2 "Pyramid" model of corporate social responsibility

organizational stakeholders (Carroll, 1991)

Schwartz and Carroll (2003), however, pointed out through empirical studies that no level of social responsibility is special in the concept of CSR; they are not important or unimportant,

they are independent of each other, and there are only small places where there are some hidden deeper connections. They divided CSR into three dimensions of economic responsibility, ethical responsibility and legal responsibility, and called this composition as the IC model of CSR, as shown in Figure 2.3.

Figure 2.3 IC model of corporate social responsibility

Source: Corporate Social Responsibility: A Three-Domain Approach (Schwartz & Carroll, 2003)

"Triple Bottom Line" proposed by Elkington (1998) is also representative, which believes that the content of CSR includes economic responsibility, social responsibility (in a narrow sense), and also includes environmental responsibility. Freeman (1984), from the stakeholder perspective, argues that CSR is to promote the interests of the company's stakeholders, focusing not only on the interests of shareholders and stockholders, but also considering social stakeholders such as the government and the media. The previous studies on the composition of CSR dimensions are summarized into the following categories through collation, and the details are shown in Table 2.3.

According to the different theories of CSR, it can be summarized into the following four categories (Garriga & Melé, 2004). (1) Instrumental theories, which consider CSR activities as a mechanism for companies to achieve their long-term financial goals, with the aim of creating wealth for shareholders (Donaldson & Preston, 1995; Jamali, 2008; Jensen, 2010; Jones, 1995). (2) Political theory, which believes that CSR comes from the social power that companies have and that companies participate in community activities in order to maintain the social

contractual relationship between society and companies. (3) Integrative theory, which suggests that companies need to incorporate social responsibility into their business models because their existence, growth and sustainability depend on society. (4) Morality theory, which argues that companies should implement morally and ethically acceptable practices in their operations because they have a fiduciary responsibility to their stakeholders and society at large (Crane *et al.*, 2009). Thus, as Garriga and Melé (2004) state, "companies should accept CSR as a moral obligation above any other consideration".

Table 2.3 The previous research on the dimensions of corporate social responsibility

Category	Representative People	Dimensional Components
"Concentric Circles" Model	U.S. Economic Development Commission，1971	Inner circle, basic responsibility for economic functions; middle circle, responsibility for values such as environmental protection; outer circle, emerging and undefined responsibilities.
Stakeholder Responsibility	Freeman, 1984	Companies must be accountable to all stakeholders, including government, employees, society, shareholders and consumers.
"Pyramid" model	Carroll，1991	Corporate social responsibility encompasses four types of responsibilities: economic, legal, ethical and philanthropic.
"Triple Bottom Line"	John Elkington, 1997	CSR components include economic responsibility, social responsibility and environmental responsibility
Three Classification Model	Lantos, 2001	Ethical, philanthropic and strategic responsibility together form CSR.
IC Model	Schwartz，2003	Consists of economic, ethical and legal responsibilities that are independent of each other and only partially linked.
Two types of nature	Jamali, 2007	Mandatory and non-mandatory are the two basic types of corporate social responsibility.

2.2.2 Corporate financial performance

In the direction of management, corporate performance is a multilevel and important indicator that can measure the actual operational effectiveness of the organization, and is a collective term for the results obtained from all production and operation activities of the enterprise. Scholars in various fields define and classify the dimensions of business performance from different perspectives, but there is no unified standard (Christmann, 2000; Wagner, 2010). Elkington (1998) classifies corporate performance into financial, environmental, and social performance based on the "triple bottom line" principle. Financial performance refers to the evaluation of the allocation of funds and resources, as well as the efficiency and effectiveness related to the use of resources (Brulhart *et al.*, 2017); environmental performance refers to the measurable results of environmental management (Kao *et al.*, 2010; Li *et al.*, 2016); and social performance refers to the social outcomes of corporate behavior.

2.2.3 Technological Innovation

The concept of innovation was first introduced by the economist Schumpeter in 1912, in his book "The theory of Economic Development", he proposed that innovation is a recombination or transfer of the production function with the aim of capturing potential excess profits. Leonard-Barton (1995), in his book "Wellsprings of Knowledge: Building and Sustaining the Sources of Innovation", pointed out that technological innovation capabilities should have an implementation agent, an operational platform and a more inclusive corporate culture. Teece (1996) also argues that technological innovation capabilities are not only related to the improvement and application of existing technologies, but also encompass the technical staff, R&D management structure and innovation culture of the firm. Moreover, innovation is considered to be the most fundamental and important factor in improving the proficiency of firms and enhancing their social performance (Ho *et al.*, 2018; Hou *et al.*, 2019; Kostopoulos *et al.*, 2011; Levine & Prietula, 2013).

Innovation is the key to maintaining competitive advantage; however, not all innovations deliver benefits, and only innovations that are accepted by the market and deliver outputs that exceed costs are successful (Chakravarthy, 2010). The core of a firm's innovation performance, which is a measure of the effectiveness of its innovation, is to achieve value creation. Innovation in any firm is caused by the formation of new products, new knowledge, ways of allocating factors, and better management techniques (Zahid *et al.*, 2021), which will facilitate their production by reducing inputs and ultimately lead to an increase in their profits (Chaudhry *et al.*, 2019). Surroca *et al.* (2010) argued that the intangible assets of a firm may include innovations that continuously strengthen the link between CSR and CFP. Currently, firms need to focus more on intangible resources rather than tangible assets when gaining competitive advantage. Firms that implement CSR strategies have a higher propensity to innovate (Bocquet *et al.*, 2013; Vishwanathan *et al.*, 2019), and the more involved in CSR activities the more significant the innovation capacity of firms (Gallardo-Vázquez *et al.*, 2019; Luo & Du, 2015).

2.2.4 Media Coverage

The media is often seen as the most important channel and intermediary in information dissemination, acting as a bridge between information sources and information receivers. The media can simply deliver, or process and interpret the original information, or explore the information themselves. The media creates new information in the form of news writing and packaging, thus forming the external information environment of the company and reducing the degree of information asymmetry of listed companies (Bushee *et al.*, 2010; Deephouse, 2000). Numerous academic studies have proven that media coverage constitutes an important strategic asset (Deephouse, 2000), which can significantly influence firm performance (Ahern & Sosyura, 2014; Rogers *et al.*, 2016), as well as resource allocation decisions (Desai, 2014).

In terms of type, media can be divided into financial media and non-financial media. In this article, financial media, defined as professional media that report and analyze social and economic phenomena. In terms of content, financial media coverage can be either a reprint of major news or an exclusive disclosure, or an in-depth interpretation and analysis of certain

events. Media coverage of enterprises is expressed as media attention, and the level of media attention is expressed as the number of media reports (Fang & Peress, 2009; Shilei *et al.*, 2021; Tao & Jin, 2012; Wang *et al.*, 2021). The higher the number of media reports on a company, the more attention the company receives.

2.2.5 Organizational slack

Slack is the pool of resources that exceeds the minimum required to produce a given output (Nitin *et al.*, 1997). Cyert and March (1963) defined organizational slack as resources that are temporarily idle in the organization and is the difference between the resources being used by the organization and the total resources it has. Organizational slack can respond to market fluctuations in a fast and efficient manner (Fabio & Zona, 2012; Josep *et al.*, 2018); can be used to mitigate various conflicts due to resource scarcity; can provide firms with additional available resources to support strategy formulation (Huang & Li, 2012); and can provide opportunities for innovation, such as research and development of new products or expansion into new markets (Liu *et al.*, 2017; Tan & Peng, 2003). Child (1972) defined organizational slack as the excess of all the resources that an organization actually has over what it actually needs, which can be used by the organization as a buffer and can bring satisfaction to the organization. Dimick and Murray (1978) defined organizational slack as the accumulation of underutilized resources and unutilized potential opportunities that can be used at the organization's discretion and can provide some cushion in the face of organizational difficulties (Bourgeois, 1981). Gulati (1996) considered organizational slack as a waste of resources, including excess manpower, unused funds, and potential opportunities to increase performance, and so on.

Bourgeois (1981) was the first to propose the use of financial indicators to quantify organizational slack, while Bourgeois and Singh (1983) classified organizational slack into three categories based on the ease of recovery, which include available slack, recoverable slack and potential slack. Singh (1986) classified organizational slack into two categories, that is, "absorbed slack" and "unabsorbed slack", according to whether it can be utilized or absorbed

by the enterprise's production and operation behavior. The former are resources that are difficult to reconfigure and cannot be further absorbed and utilized, while the latter are mobile resources that can be easily redeployed and utilized by the organization through certain methods. Sharfman *et al.* (1988) classifies organizational slack into two categories, namely "easily identifiable slack" and "hard-to-identify slack", based on whether it can be effectively identified by corporate executives. Hui *et al.* (2007) classifies organizational slack into "internally generated slack" and "externally generated slack" based on how the redundancy is generated.

2.3 Corporate social responsibility and corporate financial performance

2.3.1 Overview of corporate social responsibility research

In section 2.2.1, this article has already elaborated on the conceptual definition and constitutive dimensions of CSR, and this section focuses on the measurement aspects of CSR. For different research objects and research objectives, scholars have chosen different measurement methods according to the behavior of enterprises in fulfilling social responsibility, and there are mainly the following evaluation measurement methods at present.

First, the reputation index method. Moskowitz was the first to use the reputation index method to measure CSR performance, which uses quantitative indicators related to corporate reputation to measure CSR. Preston and O'Bannon (1997) selected the three dimensions of "employee welfare, product quality, and environmental responsibility" in the Fortune Reputation Index to evaluate corporate responsibility to employees, consumers, and the environment, respectively. Because of the one-dimensional evaluation and the subjectivity of the evaluation results, it is not common to use this method for CSR measurement in recent years.

Second, the objective evaluation method (Christmann, 2000; Tang, 2012; Yu & Liang, 2020). The objective evaluation method is to analyze the real data on CSR fulfillment and establish a corresponding index system to reflect the social responsibility undertaken by enterprises using data monitoring. The analysis can be carried out by collecting data from

annual reports such as annual corporate reports, annual sustainability reports, and annual social responsibility reports. However, this involves the commercial secrets of the technical information and business information of the subjects' enterprises, and it is difficult to obtain these data in the actual study, making the use of this method limited.

Third, the KLD evaluation method (Feng *et al.*, 2017; Jo & Harjoto, 2011; Mishra, 2017) is a method of evaluating CSR using the KLD index, which is a rating scale established by KLD Corporation based on a study of the environmental, social, governance, and controversial industry performance of listed companies. The KLD Index is a rating standard established by KLD to evaluate the responsibility of companies to their stakeholders based on research on environmental, social, governance and controversial industries. The data for this method in China are mainly obtained from the Shanghai and Shenzhen stock exchanges, the China Listed Company Information Website, Juchao Information Website and the official websites of companies, while the social responsibility information data can be selected from Hexun.com (Li *et al.*, 2021; Yang *et al.*, 2019) and RKS (Runling Global CSR Rating) data (Dang *et al.*, 2019; Wu *et al.*, 2020). This method has been applied more often due to its advantages such as a complete index system and easy way of assigning values.

Fourth, questionnaire method (Hadj *et al.*, 2020; Rhee *et al.*, 2018; Zhou *et al.*, 2020; Zhu *et al.*, 2019). Questionnaires were created for the enterprises' commitment to social responsibility, and the quantitative scores of the enterprises' fulfillment of each social responsibility behavior were obtained through statistical analysis of the questionnaire results. The advantage of this method is that the objectives are clear and to some extent more realistic, but there are some realistic difficulties in this way in the distribution and retrieval of questionnaires, and false feedbacks may be received for some relatively sensitive topics.

2.3.2 A review of research on corporate social responsibility and corporate financial performance

The relationship between CSR and financial performance has been a controversial issue in the field of CSR research. From the perspective of sociology, enterprises are responsible for

earning profits for their shareholders as well as paying attention to people's livelihood, social welfare protection and ecological construction (Li *et al.*, 2023). From the perspective of economics, the biggest responsibility of enterprises is to continuously pursue profit maximization within the legal limits (Friedman, 2007).The great theoretical divergence has stimulated the interest of empirical researchers and a large number of empirical studies have been conducted, but the findings from the 1990s to the present show that the relationship between CSR and financial performance is ambiguous and uncertain, and the conclusions that the two are positively, negatively, and irrelevantly related exist simultaneously.

Table 2.4 Summary of the reviewed literature on the relationship between CSR and financial performance

Authors (year)	**Number of literatures cited**	**Cited literature Study period**	**Research conclusion**
Griffin *et al.* (1997)	51	1972-1994	Positive correlation 33; negative correlation 20; other 9
Walsh (2003)	109	1972-2002	Positive correlation 54; negative correlation 7; no correlation 28; mixed relationship 20
Orlitzky *et al.* (2003)	52	1970-2002	Meta-analysis: positive correlation
Allouche and Laroche (2005)	82	1972-2003	Positive correlation 75; negative correlation 7
Margolis *et al.* (2007)	167	1972-2007	Meta-analysis: positive correlation
Van Beurden and Gössling (2008)	34	1990-2008	Positive correlation 23; negative correlation 2; no correlation 9

Authors (year)	Number of literatures cited	Cited literature Study period	Research conclusion
Peloza（2009）	128	1972-2008	Positive correlation 76; negative correlation 18; other 34
Qammar (2012)	76	1972-2012	Positive correlation 48; negative correlation 8; no correlation 16; mixed relationship 4
Vishwanathan *et al.* (2019)	344	1978-2016	Meta-analysis: positive correlation

(1) Positive association between CSR and corporate performance

Many studies have concluded that the fulfillment of CSR is positively associated with financial performance (Godfrey *et al.*, 2009; Kanji *et al.*, 2010; Pava & Krausz, 1996). Walsh (2003) in his study mentioned that by reviewing 109 published studies on the relationship between corporate social responsibility and financial performance. Orlitzky *et al.* (2003) analyzed 52 empirical research articles to reach similar conclusions as Walsh (2003). Allouche and Laroche (2005) based on 82 studies on the relationship between social performance and financial performance of firms, conducted a comprehensive analysis of the relationship between social and financial performance by conducting a meta-analysis. Beurden and Gössling (2008) used a meta-analysis of a representative sample of 34 studies on CSR and financial performance and found that 23 studies supported a positive relationship between the two.

McGuire *et al.* (1988) conducted an empirical analysis of the relationship between CSR and financial performance of listed companies and demonstrated a positive relationship between CSR behavior and financial performance, and the same findings were found in the study of Preston and O"Bannon (1997).

Samy *et al.* (2010) analyzed the relationship between CSR and financial performance using earnings per share (EPS) as a measure of financial performance. They selected 20 UK

companies and used regression analysis to investigate whether strategic investments in CSR can increase corporate profits while meeting the needs of all stakeholders. The results of the study show that there is a positive relationship between CSR and EPS.

Callan and Thomas (2010) showed that greater CSR is associated with greater business performance, with a clear positive correlation between the two. Inoue *et al.* (2011) found in an empirical study of social responsibility and financial performance that companies that are active in social responsibility from multiple perspectives have a positive contribution to financial performance. Deng *et al.* (2013) conducted an empirical study using data from a number of listed companies in order to investigate whether the fulfillment of social responsibility by merged and acquired (M&A) companies can enhance the shareholder value of the companies. The results of the study showed that firms that actively fulfill social responsibility spend less time in the process of M&A and receive more benefits in the process of mergers and acquisitions relative to those firms that do not fulfill social responsibility. Yang *et al.* (2019) used a sample of Chinese pharmaceutical firms as a study to verify the impact of five dimensions of CSR performance, such as shareholders, employees, customers and suppliers, environmental practices, and society, respectively, on corporate financial performance. The study found that CSR have a significant positive impact on financial performance, and also found that although all dimensions of CSR have a positive relationship with financial performance, CSR has the most profound impact on corporate performance in terms of environment, followed by customers, suppliers and employees, and finally shareholders and social dimensions.

(2) Negative association between CSR and corporate performance

Many scholars have reviewed the existing empirical research literature by means of descriptive analysis of content or meta-analysis, and the statistical results of the review literature suggest a negative association between CSR and corporate performance (Walsh (Allouche & Laroche, 2005; Griffin *et al.*, 1997; Peloza, 2009; Walsh, 2003).

Galaskiewicz (1997) argued that when companies undertake social responsibility, resources may be ineffectively used due to inadequate internal management mechanisms,

resulting in a waste of resources and negatively affecting firm performance. Corporate social responsibility activities may be a means for executives to beautify their personal image, resulting in the waste of limited corporate resources and negatively affecting corporate financial performance (Wang & Bansal, 2012). Sen and Bhattacharya (2001), through an intrinsic analysis of CSR issues, product quality, and individual-specific factors, showed that under certain conditions, the fulfillment of social responsibility can reduce product quality and weaken customers' intention to purchase the company's products, which in turn has a negative impact on corporate performance. Lange and Washburn (2012) used attribution theory to show that social activities increase the cost of the company and to some extent reduce the performance of the company (Balabanis *et al.*, 1998; Rubin *et al.*, 2005).

Zhu (2009) explored the relationship between CSR and corporate performance using selected companies listed on the Shanghai Stock Exchange as a sample for his study. The results showed that the corporate performance of most of the firms declined with the fulfillment of CSR. Abiodun (2012) used 10 firms listed on the Nigerian Stock Exchange during 1999-2008 as the study population. By using ordinary least squares regression model to analyze the relationship between two variables CSR and financial performance, the findings showed that CSR activities were negatively related to profitability. Rabia *et al.* (2013) analyzed the effect of donation on financial performance of 19 listed companies in Pakistan using return on equity (ROE), net income and revenue as indicators to measure financial performance and the results were negative. Hirigoyen and Poulain-Rehm (2015) examined the causal relationship between CSR and financial performance using multidimensional dimensions of CSR using 329 companies in three geographical regions of US, Asia Pacific and Europe from 2009 to 2010. The findings revealed a negative relationship between CSR and financial performance. Shahbaz *et al.* (2020) examined the relationship between board attributes and CSR involvement and the relationship between CSR involvement and corporate performance using the global energy sector as an example. The study found that higher CSR performance does not guarantee higher financial performance, either in terms of market performance or accounting performance.

(3) Other associations between CSR and corporate performance

The impact of social responsibility on performance is not significant because stakeholders themselves are heterogeneous, their perceptions of social responsibility are uncertain and the frequency of response varies. The fulfillment of CSR is influenced by various factors such as firm size, research capability, and industry, so there is uncertainty in the relationship between the two (McWilliams & Siegel, 2001; Newman *et al.*, 2015; Parsa *et al.*, 2015;Wu & Shen, 2013). Moore (2001) proposed the need for nonlinear models, which would compensate for the lack of linear positive and linear negative profiles of the CSR-CFP relationship. Baird *et al.* (2012) find that the relationship between CSR scores and share prices of listed companies is not fixed and varies by industry. Becchetti *et al.* (2013), on the other hand, finds that the relationship between CSR scores and EPS is closely related to the size of the firm, with the relationship oscillating at different sizes. Han *et al.* (2016) examined the relationship between CSR disclosure and profitability of 30 Indonesian firms by testing the ESG of Korean stock market listed firms between 2008 and 2014 performance scores to investigate the relationship between CSR and corporate profitability. The results of the study showed that there was no statistically significant evidence or relationship between CSR performance scores and financial performance.

Other scholars argue that the relationship between the two is inverted "U" or "U" shaped because the effect of social responsibility on financial performance depends on the firm's ability to translate social responsibility into corporate performance (Brammer & Millington, 2008). Wagner *et al.* (2004) concluded a "U" shaped relationship between CSR and profitability in a sample of manufacturing firms in the European Union, and Makni *et al.* (2009) reached a consistent conclusion in a study with a 12-year sample of more than 800 listed companies in Canada. Barnett and Salomon (2012) argue that there is a U-shaped relationship between corporate social performance and financial performance, meaning that firms with low corporate social performance have higher financial performance than firms with moderate corporate social performance, but firms with high corporate social performance do not have the highest financial performance.

Table 2.5 Summary of the empirical analysis of CSR and corporate performance

Authors(year)	Title	Method	Result
Waddock and Graves (1997)	The Corporate Social Performance Financial Performance Link.	Multiple regression analysis	Positive
Wagner *et al.* (2004)	Curative resection is the single most important factor determining outcome in patients with pancreatic adenocarcinoma.	Univariate model, Multivariate model	U-shape
Ruf *et al.* (2001)	An Empirical Investigation of the Relationship Between Change in Corporate Social Performance and Financial Performance: A Stakeholder Theory Perspective.	Regression analysis	Positive
Brammer and Millington (2008)	Does It Pay to Be Different? An Analysis of the Relationship Between Corporate Social and Financial Performance.	Regression analysis	U-shape
Becchetti *et al.* (2008)	The Relationship between Corporate Social Responsibility and Shareholder Value: An Empirical Test of the Risk Management Hypothesis.	Event study methodology, Regression analysis	Positive
Makni *et al.* (2009)	Causality Between Corporate Social Performance and Financial Performance: Evidence from Canadian Firms.	Two-variable regression mode	Non-significant / U-shape
Peters and Mullen (2009)	Some evidence of the cumulative effects of corporate social responsibility on financial performance.	Time series analysis	Positive
Zhu (2009)	Empirical test on the relationship between corporate social responsibility and financial performance.	Multiple regression analysis	Negative

Authors(year)	Title	Method	Result
Jaepil *et al.* (2009)	Research notes and commentaries stakeholder relations and the persistence of corporate financial performance.	Regression analysis	Positive
Chung *et al.* (2009)	Ambition Versus Conscience, Does Corporate Social Responsibility Pay off? The Application of Matching Methods.	Matching approach, Regression analysis	Positive
Cheung *et al.* (2010)	Does Corporate Social Responsibility Matter in Asian Emerging Markets?	Regression Analysis	Positive
Samy *et al.* (2010)	Corporate social responsibility: a strategy for sustainable business success.	Regression Analysis	Positive
Jiao (2010)	Stakeholder Welfare and Firm Value.	Regression Analysis	Positive
Inoue and Lee (2011)	Effects of different dimensions of corporate social responsibility on corporate financial performance in tourism-related industries.	Multiple regression analysis	Positive
Abiodun (2012)	The impact of corporate social responsibility on firms' profitability in Nigeria.	Ordinary least square regression	Negative
Ziegler (2012)	Is it Beneficial to be Added in a Sustainability Stock Index? A Panel Data Study for European Firms.	Panel data, Regression analysis	Increase-Addition
Baird *et al.* (2012)	Corporate Social and Financial Performance Re-Examined: Industry Effects in a Linear Mixed Model Analysis.	Linear mixed model	Different industry conclusions: positive/negative

Authors(year)	Title	Method	Result
Barnett and Salomon (2012)	Does it pay to be really good? Addressing the shape of the relationship between social and financial performance	Panel analysis	U-shape
Rabia *et al.* (2013)	Relationship Between Financial Performance and CSR Activities in Companies in Pakistan.	Least square method	Negative
Becchetti *et al.* (2013)	Corporate social responsibility and earnings forecasting unbiasedness.	Regression analysis	Different company size conclusions: positive/negative
Hirigoyen and Poulain-Rehm (2015)	Relationships between Corporate Social Responsibility and financial performance: What is the Causality?	Linear regression analysis , Granger causality test	Negative
Lyon and Shimshack (2015)	Environmental Disclosure: Evidence from Newsweek's Green Companies Rankings.	Event Study Methodology, Regression analysis	Positive
Kappou and Oikonomou (2016)	Is There a Gold Social Seal? The Financial Effects of Additions to and Deletions from Social Stock Indices.	Event Study Methodology, Regression analysis	Non-significant/ Positive/ Negative
Han *et al.* (2016)	Empirical study on relationship between corporate social responsibility and financial performance in Korea.	Panel regression model	Non-significant
Su *et al.* (2016)	The signalling Effect of Corporate Social Responsibility in Emerging Economies.	Regression Analysis	Positive
Zalloum (2016)	Corporate social responsibility and market value: evidence from Jordan.	Regression Analysis	Positive

Authors(year)	Title	Method	Result
Feng *et al.* (2017)	Corporate social responsibility and firm financial performance: Comparison analyses across industries and CSR categories.	Regression Analysis	Positive
Du *et al.* (2017)	The Business Case for Sustainability Reporting: Evidence from Stock Market Reactions.	Event Study Methodology, Regression analysis	Positive
Mishra (2017)	Post-innovation CSR Performance and Firm Value.	Regression Analysis	Positive
Yichun *et al.* (2018)	The effect of mandatory CSR disclosure on firm profitability and social externalities: Evidence from China.	Matching approach, Regression analysis	Negative
Hawn *et al.* (2018)	Do investors actually value sustainability? New evidence from investor reactions to the Dow Jones Sustainability Index (DJSI).	Event Study Methodology, Regression analysis	Positive
Yang *et al.* (2019)	Does CSR Influence Firm Performance Indicators? Evidence from Chinese Pharmaceutical Enterprises	Panel-based regression model， Fixed-effects model，Random-effects model	Positive
Shahbaz *et al.* (2020)	Board attributes, CSR engagement, and corporate performance: What is the nexus in the energy sector?	OLS regression analysis, Fixed effects regression	Negative

This study examines CSR based on stakeholder perspective, and suggests that CSR is the responsibility that companies fulfill to various stakeholders, including shareholders, employees, consumers, suppliers, government, and other social groups (Cantele & Zardini, 2018; Park &

Park, 2015). Stakeholder involvement in CSR activities can help companies optimize their relationships with stakeholders (Ankersmit, 2020; Athar *et al.*, 2023). By undertaking CSR, enterprises gain social legitimacy while benefiting their financial performance (Li *et al.*, 2023). Corporations pay taxes in law and participate in public welfare donations, which enables them to establish a positive image (Yang *et al.*, 2019) and is conducive to obtaining government support (Li *et al.*, 2021). Corporations provide employees with a good working environment, perfect compensation and benefits, which is conducive to improving the effectiveness of employees' work (Akremi *et al.*, 2018). Enterprises actively enhance customer satisfaction, which is conducive to improving business performance (Bhardwaj *et al.*, 2018). Corporations actively fulfill their responsibilities to investors, which can attract more investment and ensure the stability of the enterprise's operating capital (Li *et al.*, 2021). All of which indirectly contribute to the enhancement of the enterprise's financial performance. Yang *et al.* (2021) took Chinese pharmaceutical companies as a research sample, and respectively from the performance of five dimensions of CSR, such as shareholders, employees, customers and suppliers, environmental practices, and society, and found that all dimensions of CSR are positively correlated with CFP. Li *et al.* (2024) found a positive correlation between CSR and CFP by using a panel of listed companies in China.

From the perspective of RBV, CSR can help companies to obtain the necessary tangible or intangible resources to form a long-term competitive advantage (Greening & Turban, 2000; Mohtsham & Arshad, 2012; Yi *et al.*, 2020). Performing CSR can bring moral capital to a company and reduce the negative impact on corporate value when negative events occur, which reduces corporate risk (Jo & Na, 2012). Also, CSR practices can increase consumers' willingness to purchase and sales revenue (Bhardwaj *et al.*, 2018; Lev *et al.*, 2010), which contributes to the increase in financial performance of the firm.

According to the “social impact hypothesis”, companies that satisfy social responsibility attract more customers, gain higher employee identification and sense of belonging, leading to improved performance (Chen *et al.*, 2023).Based on agency theory, corporate investment in social responsibility reduces corporate risk (Sun & Cui, 2014), effectively reduces agency costs,

and CSR creates risk management benefits for the company (Kim *et al.*, 2021) , which is also enhances corporate performance. Based on the risk management perspective CSR can also be viewed as a tool to protect the value of corporate reputation (Husaini *et al.*, 2023).

In summary, the following hypotheses are proposed in this article:

H1:CSR by Chinese pharmaceutical companies can increase CFP.

2.4 Mediation mechanism of the relationship between CSR and corporate performance

Simply considering the direct relationship between CSR and firm performance does not account for the positive, negative or uncertainty of the relationship, as these results may be influenced by a number of other factors, which has also been confirmed by various studies (Flammer, 2016; Hasan *et al.*, 2018; Lev *et al.*, 2010; Liang *et al.*, 2022; Stuart & Sanjay, 2004; Wang *et al.*, 2023). Vishwanathan *et al.* (2019) used meta-analytic structural equation model and found that CSR affects corporate financial performance mainly through the following four aspects: corporate reputation, stakeholder returns, corporate risk, and corporate innovativeness, however, these four mechanisms can only explain 20% of the CSR-CFP relationship. Therefore there are other factors that influence the relationship between CSR-CFP, and the next paper will review the relevant literature in terms of technological innovation, media coverage, and organizational slack.

2.4.1 Researches related to technological innovation

According to the stakeholder theory, through social responsibility activities, enterprises can help balance and meet the needs of stakeholders, effectively maintain the relationship among stakeholders, and thus obtain more social capital and information resources. The support of corporate stakeholders is indispensable in all aspects of the innovation process, and CSR promotes technological innovation of enterprises mainly through alleviating financing constraints (Ramana *et al.*, 2013) and acquiring external information knowledge (Luo & Du,

2015; Wang *et al.*, 2014). The responsibility of the corporation to various stakeholders can attract more resources to support the technological innovation of the corporation (Canh *et al.*, 2019). Corporations protect employees' salary and pay attention to employees' training of vocational skills to stimulate their innovation potential (Ruan *et al.*, 2022), and improve the business's financial performance (Zhou *et al.*, 2020). CSR can influence the behavior of suppliers (Labahn & Krapfel, 2000), and make full use of the advanced technology owned by the suppliers to develop new products. Corporations actively improve the information asymmetry between managers and investors (Cook *et al.*, 2019), reduce the agency costs between managers and potential investors, and corporations invest more money in the R&D activities of the corporation. Enterprises focus on producing green products and developing green technology, which is conducive to obtaining support from the government and universities ((Zhang *et al.*, 2019), and promotes the innovation ability and sales volume of enterprises (Yannan *et al.*, 2021). Wang *et al.* (2023) studied Chinese hi-tech enterprises and found that both external and internal CSR promotes corporate innovation performance.

Based on the resource-based theory, resources are any assets in a firm that demonstrate its core competence, including tangible and intangible assets. The fulfillment of CSR promoted the development of intangible assets of the firm while enabling the firm to gain a sustainable competitive advantage (Murat & Baki, 2011). The essence of a firm's competitive advantage comes from heterogeneous resources (Wernerfelt, 2016), and technological innovation is the main way for firms to increase their heterogeneous resources, which is one of the key factors affecting financial performance. Technological innovation cannot be separated from excellent talents, and technological talents are more concerned about corporate social responsibility (Graafland, 2020), and corporate social responsibility can help companies attract more technological talents (Lis, 2012).Therefore, corporate social responsibility can enhance innovation and contribute to the competitive advantage of firms (Luo & Du, 2015).

Clyde *et al.* (2008) demonstrated that the level of innovation and differentiation made the positive relationship between CSR and performance more significant. Cegarr *et al.* (2016) found that innovation factors mediated the relationship between CSR and firm performance,

and that CSR showed a positive innovation-organizational performance for all group companies correlation (Zanjirchi *et al.*, 2019). Chao and Pu (2017) studied 31 Chinese companies and they found that technological innovation mediates the relationship between CSR and corporate growth. Zahid *et al.* (2021) explored the manufacturing industry in Pakistan and found that innovation capability plays a significant mediating role between CSRA and CF. Bahta *et al.* (2020) found that CSR has a significant positive effect on financial performance and innovation capability and that innovation capability plays a partially mediating effect between CSR and corporate performance. Innovation is necessary for CSR practices to contribute to corporate performance (Cegarr *et al.*, 2016; Zhou *et al.*, 2020). Wagner (2010) found a significant positive relationship between fulfilling CSR and technological innovation. CSR may influence innovation performance directly, rather than indirectly (Zhu *et al.*, 2019). Using innovation as a mediator is helpful in understanding the link between CSR and corporate financial performance (Bahta *et al.*, 2020; McWilliams & Siegel, 2001).

In summary, the following hypothesis is proposed in this article:

H2: CSR by Chinese pharmaceutical firms enhance technological innovation.

H3: Technological innovation plays a mediating role in the CSR-CFP relationship of Chinese pharmaceutical companies.

2.4.2 Researches related to media coverage

According to signaling theory, the media acts as an intermediary in the information dissemination process and firms can intervene in media coverage by performing certain activities (Ahern & Sosyura, 2014). Repeated media coverage helps build better corporate reputation and financial performance (Lu *et al.*, 2020). Kiousis *et al.* (2007) classified media coverage explicitly into positive and negative coverage based on byte characteristics and found that positive news coverage of firms promotes firm profitability, while negative news coverage has a substantial weakening effect on the firm's operating earnings. Cahan *et al.* (2015) argued that CSR fulfillment can increase media coverage. When the media released favorable information about a company, positive evaluations by the public or potential investors increased

(Chen *et al.*, 2018). Wang and Ye (2015) confirmed that objective and neutral reports of listed companies in the Chinese news media had a significant contribution to the increase in the market value of the company, while negative reports had a weakening effect. Lu *et al.* (2020) used Chinese companies as study samples found that media coverage was more favorable to firms with higher social responsibility index (Xiang *et al.*, 2020), and firms used media coverage as a tool to disclose their social responsibility (Gupta *et al.*, 2021). Chen *et al.* (2022) found that positive coverage played a more important role in promoting green innovation by classifying the tone of media coverage. Pérez *et al.* (2018) found that positive and negative CSR news usually have a significant impact on a company's stock market value. Shilei *et al.* (2021) found that increased positive coverage significantly promotes corporate innovation, while negative coverage limits corporate innovation.

Media coverage is also closely related to reputation mechanisms (Li *et al.*, 2021). Corporate reputation theory suggests that corporate reputation is a valuable intangible asset (Aula & Mantere, 2008), which allows a company to achieve sustained profitability. Corporate reputation can also play a key role in the positive relationship between CSR and corporate financial performance (Beurden & Gössling, 2008). Corporations use CSR to build reputational capital, which contributes to financial performance through reputation (Bahta *et al.*, 2020). Cahan *et al.* (2015) suggested that CSR engagement can increase media coverage and moreover shapes the media image of the corporation. A good corporate image prevents the loss of a company's reputation due to negative public opinion. There is a strong relationship between corporate image and CSR (Fosu *et al.*, 2023) and CSR significantly affects corporate image (Kim *et al.*, 2020). However, the media also magnifies the impact of CSR behavior, and companies choose to take on excessive social responsibility in order to maintain a good image (Li *et al.*, 2023), which increases the cost of responsibility and enhances the pressure of corporate operations, resulting in a decline in financial performance and restricting the investment in corporate innovation (Duan *et al.*, 2020). Also, irresponsible positive coverage of false disclosure, exaggeration or false propaganda of greenwashing behavior, although it improves corporate reputation in a short period of time, it will eventually lead to corporate

image and reputation degradation (Li *et al.*, 2022), and ultimately damage the company's financial performance (Walker & Wan, 2012). Negative press coverage also causes damage to corporate reputation (Gama *et al.*, 2022), and firms spend money on public relations and paying fines to redeem their corporate image, which leads to a decline in financial performance.

According to institutional theory, the media, as an important component of the institutional environment (Vlachy *et al.*, 2019), transmits social norms to firms (Scott, 2013). The supervision effect generated by media coverage has a deterrent effect on managers (Luo & Liu, 2020), which can solve the problem of managers neglecting their responsibilities for personal interests (Dai *et al.*, 2021). The external governance role of the media on firms affects firms' technological innovation (Alexander *et al.*, 2008; El Ghoul *et al.*, 2019; Liang *et al.*, 2022), and this governance role is realized by creating an innovative environment and by monitoring effects on the other hand. Through R&D innovation, firms would contribute to the enhancement of market competitiveness and thus improve financial performance (Navarrete *et al.*, 2021; Tariq *et al.*, 2019). Aghion *et al.* (2015) confirmed that the effective competitive environment in the external market could stimulate the innovative behavior of firm managers and promote the overall level of innovation performance of firms. He and Zhao (2018) found that media coverage had a positive impact on firm innovation by using Chinese data tested.

From the stakeholder theory, the media belongs to the stakeholders of enterprises and plays an important role in the behavior of enterprises in fulfilling social responsibility. Xu *et al.* (2011) found that the media played an active role as a supervisor of social activities in guiding public opinion, focusing on CSR events, and timely exposing corporate fraud and illegal behavior. Media coverage would reduce market frictions and alleviate information asymmetry problems (Bushee *et al.*, 2010; Chang *et al.*, 2019; Guo & Lu, 2020). He and Zhao (2018) found that media coverage had a positive effect on firm innovation through data testing in China. Media coverage on firm's technological innovation increased investors' and consumers' favorable perceptions of the firm, which not only reduced the pressure to finance the firm's innovation, but also broadened the product market, which was beneficial to the long-term development of the firm (Li & Ling, 2020). However, Liang *et al.* (2022) found that negative media coverage

weakened the contribution of technological innovation to environmental performance, and revealed the "dark side" of media coverage on the environmental management of energy firms.

The corporate governance hypothesis has argued that the media, as disseminators of information, enhanced the transparency of market information and corporate information, and that media coverage increased investors' attention to corporate information (Wang & Mao, 2016; Zhang & Peng, 2020). However, negative coverage leads to external public opinion pressure (Li & Ling, 2020), which restricts firms' innovation (Shilei *et al.*, 2021). Because the media amplifies the negative impact of R&D failures, leading to firms becoming the target of public criticism (Luo & Liu, 2020), firm managers will adopt a cautious attitude towards innovative behavior. Negative media coverage will make firms more inclined to improve short-term performance rather than long-term performance related to firm innovation (Dai *et al.*, 2021).

In summary, the following hypotheses are proposed:

H4a: Positive media coverage has a negative moderating effect on the impact of CSR on CFP in Chinese pharmaceutical companies.

H4b: Negative media coverage has a negative moderating effect on the impact of CSR on CFP in Chinese pharmaceutical companies.

H5a: Positive media coverage of Chinese pharmaceutical companies negatively moderates the process by which CSR affects CFP through technological innovation.

H5b: Negative media coverage of Chinese pharmaceutical companies negatively moderates the process by which CSR affects CFP through technological innovation.

2.4.3 Researches related to organizational slack

According to RBV, organizational slack as a potential resource for firms enabled them to adapt the internal and external environment and make strategic adjustments to achieve organizational goals (Daniel *et al.*, 2004; George, 2005a; Vanacker *et al.*, 2016). Kang *et al.* (2016) found that CSR fulfillment had mechanisms of slack resources, good management, penalties, and insurance, by which CSR investments contributed to the improvement of the company's financial performance. According to the existence state of slack resources in the

organization (Singh, 1986), divided organizational slack into absorbed slack and unabsorbed slack. Absorbed slack resources include idle human resources, production equipment, salaries, overheads and other significant non-current assets (Voss *et al.*, 2008). Absorbed slack was embedded within the organization, associated with the operations of the firm (Zhu *et al.*, 2022), and was difficult to recover and rearrange quickly into new business (Mishina *et al.*, 2004), and tended to have a negative impact on the social performance of the company (Xu *et al.*, 2014). However, some scholars have argued that absorbed slack has high organizational specificity, is the most absorbed slack, and has a stronger strategic value than unabsorbed slack (Vanacker *et al.*, 2016). Absorbed financial slack is critical for firms to eliminate shocks, stabilize performance, and sustain growth (Nguyen *et al.*, 2019). Absorbed slack can help firms reduce the cost of fulfilling CSR and increase the efficiency of resource utilization, with companies donating inventory rather than cash in the event of an earthquake (Xu *et al.*, 2015). Yaquan *et al.* (2018) argued that unabsorbed slack could help companies adapt to internal and external pressures, respond quickly to strategic adjustments and changes, which gave managers higher autonomy to equip firms with the ability to explore innovation, develop products, and lead the market. Social responsibility required to meet the different requirements of different stakeholders of the company, proactively increased socially responsible investment in unabsorbed slack, balanced the interests among stakeholders, provided a buffer space for the company to achieve social responsibility, and generated more obvious competitive advantage the more (Yin *et al.*, 2020). Organizational slack could be used to support innovation and promote strategic behavior, thus to increase corporate performance and value (Nitin *et al.*, 1997; Scott, 2013). However, the boundary conditions for how and when unabsorbed slack affects the outcome remain unclear (Minola *et al.*, 2021; Vanacker *et al.*, 2016), and it may have a positive or negative impact on the outcome (Tabesh *et al.*, 2019).

According to organizational behavior theory, slack resources were considered to be an important catalyst for innovation (Kim *et al.*, 2018) and had a positive impact on firm performance (Quan *et al.*, 2020). Organizational slack could provide additional available resources and improve the innovation performance of firms (Bahta *et al.*, 2020; Tan & Peng,

2003). Organizational slack could support a firm's strategy formulation, such as to develop new products, diversify products, and enter new markets, as well as managers could freely decide whether to start new projects and provide resources for firm innovation (Huang & Li, 2012), which would enhance firm competitiveness. Organizational slack could help firms avoid crises, improve their adaptability and responsiveness, and enable them to try more innovations. Even when firms faced with dynamic environments, organizational slack could protect their technological core from infringement (Josep *et al.*, 2018) and reduce the impact on firm performance. Firms with slack financial resources have greater flexibility to invest in CSR-related activities (Cheng *et al.*, 2014). CSR investment not only provided protection against external pressures, but also facilitated internal strategic choices for future development and growth (Lin *et al.*, 2020). Absorbed financial slack through technological innovation may have a positive impact on firm performance (Chen *et al.*, 2012). Unabsorbed financial slack, which allows for greater realization of discretionally, may have an unclear impact on firm performance (Josep *et al.*, 2018).

According to agency theory, organizational slack was a waste of resources that had a negative impact on firm innovation (Camisón & Villar-López, 2014; S. Chen *et al.*, 2016) and hindered firm performance (Cyert & March, 1963; Jensen & Meckling, 1976). These surplus resources are left idle in the firm, which increases costs and reduces operational efficiency. Heavey *et al.* (2010) believed that the impact of organizational slack on firm performance is not due to organizational slack itself, but rather to how it is used by firm managers. Organizational slack could lead to the accumulation of non-essential productive resources, which might eventually lead to diminishing economy of scale (Lin *et al.*, 2020). The gradual increase in redundant resources could lead to an increase in management decisions, decreased overall resource utilization efficiency, compromised technological innovation, and failed to effectively perform as a performance driver.

In summary, the following hypotheses are proposed:

H6a: Unabsorbed slack plays a negative moderating role in the CSR-CFP relationship in Chinese pharmaceutical companies.

H6b: Absorbed slack plays a positive moderating role in the CSR-CFP relationship in Chinese pharmaceutical companies.

H7a: Unabsorbed slack positively moderates the process by which CSR affects CFP through technological innovation in Chinese pharmaceutical firms.

H7b: Absorbed slack positively moderates the process by which CSR affects CFP through technological innovation in Chinese pharmaceutical firms.

2.5 Chinese pharmaceutical industry

2.5.1 Pharmaceutical Industry Characteristics

First challenge for the pharmaceutical industry to social responsibility is the high demand of product quality. The products of pharmaceutical companies are related to the life and safety of every patient, and if they do not strictly control the quality of products, it will directly jeopardize the life and health of consumers (Craven *et al.*, 2021). Pharmaceutical companies should pay more attention to CSR than other industries.

Second, pharmaceutical industry is characterized by "high investment and high consumption" (DiMasi *et al.*, 2016). The production process of pharmaceuticals is complex, relying on many precision instruments and advanced technology, and requires high upfront capital investment. Meanwhile, drug research and development require research and development, preclinical research, multi-phase clinical trials and through the testing and approval before being marketed, the process cycle is so long that a lot of scientific research talents and financial investment are needed during the period.

Finally, pharmaceutical industry is highly polluting (Berg & Lan, 2020). Statistically, pharmaceutical corporations account for 2.5% of the country's total industrial output value, while their total pollution emissions amount to 6%. In 2022 alone, 15 pharmaceutical corporations in China were fined for environmental violations, with fines totaling more than 3 million yuan. Speeding up green transformation, positive environmental governance, and fulfillment of environmental responsibility according to the law are major issues that

pharmaceutical companies cannot bypass in their development.

2.5.2 Chinese and foreign pharmaceutical corporations

2.5.2.1 Listed Chinese pharmaceutical corporations

Listed Chinese pharmaceutical company means a pharmaceutical company headquartered in China and publicly listed on a recognized stock exchange, such as the Shanghai Stock Exchange (SSE), the Shenzhen Stock Exchange (SZSE) or the Stock Exchange of Hong Kong (SEHK). Listed Chinese pharmaceutical sector is a collective term for all listed Chinese pharmaceutical companies and is a distinct sub-sector of the Chinese capital market. Chinese listed pharmaceutical companies, with low market concentration (Ding *et al.*, 2020), operate in an environment that is highly sensitive to policy (Chen *et al.*, 2022). These companies have a high degree of segmental specialization, a strong focus on generics, and a growing but still limited capacity for innovation (Shuyong, 2025). In terms of CSR and ESG, there has been some improvement, but it is still inadequate compared to global standards.

2.5.2.2 Chinese and foreign pharmaceutical corporations

Chinese pharmaceutical companies often emphasize “national mission” and “family and country sentiment” in CSR. CSR activities of Chinese pharmaceutical companies are more policy-oriented and social image building needs, and CSR activities often focus on charity, donations and responding to government calls, with little strategic integration (Zhou *et al.*, 2022). For example, Hengrui and Fosun Pharmaceuticals have been actively promoting drug accessibility and overseas health programs in recent years, such as Fosun's COVID-19 vaccine export program in cooperation with BioNTech, but the overall approach is still mainly stage-by-stage and responsive, with a lack of quantifiable long-term goals and systematic evaluation (Yu *et al.*, 2023).

In contrast, foreign pharmaceutical companies are more focused on legal compliance, corporate governance and transparent accountability. Foreign pharmaceutical companies generally regard CSR as part of their corporate sustainability strategy, see CSR as an important component of competitive advantage and brand equity, and emphasize its integration with

business models and global value chains (Porter & Kramer, 2006). For example, Pfizer and AstraZeneca have set up well-established patient assistance mechanisms in China and regularly publish GRI-compliant ESG reports.

2.6 Literature Review Summary

The above literature review shows that with the continuous development of CSR practice, scholars have conducted in-depth analysis of the relationship between CSR and corporate performance, which provides a better research basis for the analysis in this article. However, deep-seated questions such as the mechanism of CSR to enhance corporate performance and whether there is a difference in the mechanism of action of its different mediators need to be deciphered by empirical research.

(1) Whether CSR can enhance corporate performance requires evidence from empirical studies, and existing studies have mainly been conducted in the context of developed countries in Europe and the United States. CSR in China has been developing rapidly since 2006, but there is still a significant gap between the level of CSR development and that of developed countries, and it has different development characteristics. In recent years, as China's economic development has entered a new normal, corporate manager have become more demanding in their social responsibility decisions that fulfillment activities can provide real returns to the company. Therefore, in the context of China's economic system environment, it is relevant to study how the fulfillment of CSR affects corporate financial performance.

(2) The existing literature on the impact of CSR on corporate performance has resulted in different findings by scholars based on different research perspectives, research objects, and research regions and time intervals. Drawing on previous research experience, most of them believe that CSR can enhance financial performance, but there are other contradictory views. More diversified studies on the mediating and moderating effects should be investigated. Therefore, it is necessary to conduct a more in-depth investigation of its intermediary mechanism. By combing through the relevant literature, this article investigates the impact of

CSR on firm performances in the Chinese pharmaceutical industry using technological innovation, media coverage and organizational slack as intermediate mechanisms to provide an empirical basis for CSR research.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Research Design

Qualitative analysis method is to achieve the purpose of understanding and revealing the inner rules through the use of induction, deduction, abstraction and generalization. Quantitative analysis is a method to explain and reveal research phenomena more accurately and scientifically with the help of mathematical and statistical methods. On the one hand, this article analyzes the influence of technological innovation, media coverage and organizational slack on the relationship between CSR and CFP based on qualitative analysis. On the other hand, on the basis of qualitative analysis, the five relationships are specifically analyzed quantitatively using statistical analysis and empirical tests with Chinese listed pharmaceutical companies as the research sample. The research process is shown in Figure 3.1.

Firstly, on the basis of existing theoretical studies, interviews are conducted with mid-level executives in the pharmaceutical industry using qualitative analysis. Through recording and analysis, the main purpose is to understand their perceptions of social responsibility, their willingness to fulfill social responsibility, whether fulfilling CSR affects company performance, and whether fulfilling CSR promotes company innovation.

Secondly, on the basis of qualitative analysis, quantitative analysis is used. In turn, the relationship between CSR, technological innovation and CFP; the moderating role of media coverage between CSR, technological innovation and CFP; and the moderating role of organizational slack between CSR, technological innovation and CFP are explored.

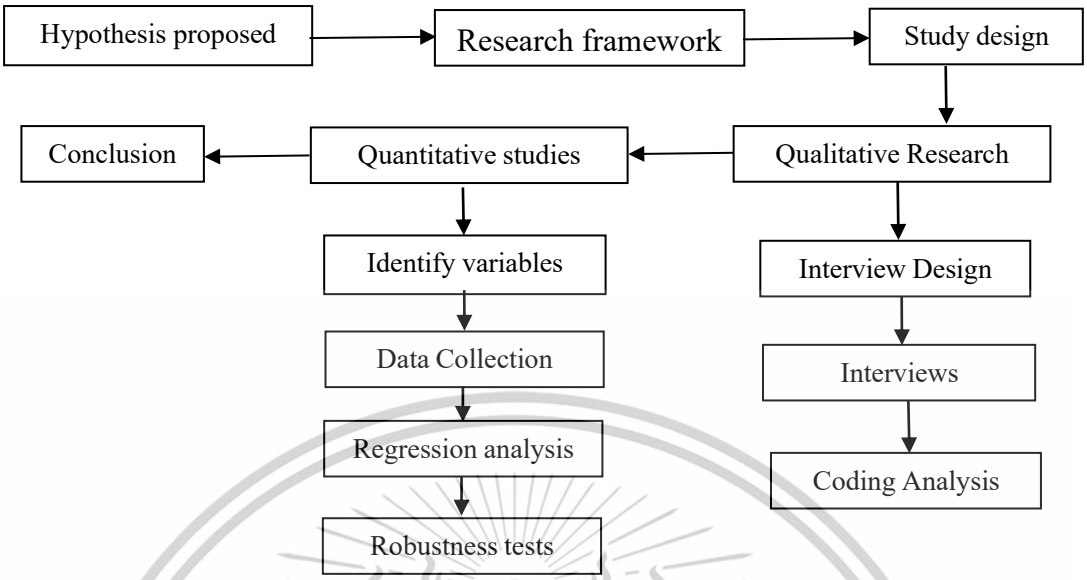

Figure 3.1 Process of Research Methodology

3.1.1 Qualitative study

3.1.1.1 Interview design

The interview method is derived from interpretive science in sociological research and is a more commonly used qualitative research method in sociology (Moyeen & West, 2014; Nastasi & Schensul, 2005; Raj *et al.*, 2020). The interview method is used to collect data on the psychological perceptions and attitudes and behaviors of the interviewees by asking them questions on relevant topics through a verbal conversation with the research subject using an outline designed by the interviewer beforehand (Todd *et al.*, 2004).

Interview procedure：

First, following the methodology of Baxter and Chua (1998) study, two gatekeepers were identified as intermediaries for initial contact and engagement.

Second, after the gatekeepers introduced the interviewees, the researcher briefly contacted the interviewees, communicated with them by phone, SMS and email, and introduced the questions and considerations of the study in detail, in order to establish a rapport with the interviewees and ensure the smooth conduct of the formal interview.

Third, the researcher needs to be well prepared before the formal interview, familiar with the outline and content of the interview, and choose a time that does not interfere with the interviewee's work to conduct the interview in order to eliminate the interference of unfavorable factors.

Finally, the researcher finished communication with each interviewee to organize the interview data and form a more complete interview result.

3.1.1.2 Interviewees

According to the research theme, the interviewees should be limited to those who are in the management positions of social responsibility formulation and implementation or have a deep understanding of the process and meaning of social responsibility implementation. The interviewees need to understand the operational processes and difficulties encountered by the corporate, as well as the actual operation and difficulties in the implementation of the corporate CSR strategy. Therefore, we selected middle management leaders (department managers) of listed Chinese pharmaceutical companies as interviewees. It is more difficult to identify the interviewees directly due to the limitation of social relationships. Referring to Baxter and Chua (1998) study, two gatekeepers were identified as intermediaries for the initial contact and approach. In this study, five middle managers from five listed pharmaceutical companies were initially identified for interviews.

3.1.1.3 Interview method

This research used in-person or telephone interviews, and the questions asked in each interview needed to be semi-structured (Moyeen & West, 2014; O'Dwyer, 2002), maintaining two-way communication throughout, avoiding question and answer rigidity, and maintaining the initiative of the exchange of opinions.

3.1.1.4 Interview objectives and outline

The main objectives of this interview are as follows:

(1) To understand the interviewees' perceptions of CSR and to learn their views on the relationship between CSR and CFP through the interview.

(2) To listen to the interviewees' perceptions of the existence of a link between CSR and innovation, and the impact of innovation on the relationship between CSR and CFP, whether it has a positive or negative effect, or no relationship.

(3) To try to find out the interviewees' perceptions of the impact of media coverage and organizational slack on the relationship among CSR, innovation, and CFP, and whether the effect is positive or negative, or no relationship. Exploration of the relationship and path between core concepts from the interview process.

In summary, the outline and content of the individual interviews were designed as follows, with extensions or deletions made accordingly to the actual situation on site.

(1) Do you know the status of fulfilling social responsibility in your company? What do you think CSR should include?

(2) Do you think the fulfillment of social responsibility will affect the operation and development of the corporate? Does it affect corporate profits? How does it affect?

(3) Do you think the active fulfillment of CSR affects corporate innovation? Does innovation have a positive effect on the improvement of corporate profits? Why?

(4) Do you think media coverage can influence companies to fulfill their social responsibility and their reputation? Does media coverage affect a company's innovation and profitability? Why?

(5) Do you think companies will use idle resources to fulfill CSR? Do idle resources of the company affect the innovation and profit increase of the company? Why?

3.1.2 Quantitative study

This article takes the listed pharmaceutical companies in Shanghai and Shenzhen in China from 2010 to 2020 as the research object. Referring to the literature closely related to this study, the corresponding variables are selected from them, and the corresponding research hypotheses are verified by constructing specific regression models. The design framework of the study is shown in Figure 3.2.

The impact of CSR on corporate financial performance is empirically tested using a two-fixed effects model; the mediating role of technological innovation is empirically verified using a mediating effects model; and the moderating effect of media coverage and organizational slack is empirically verified using a moderating effects model. In this study, besides the basic empirical methods such as descriptive statistics and correlation coefficient analysis, the two-stage least squares method (2SLS) and the systematic generalized method of moments estimation (GMM) are also used to solve the endogeneity problem. Furthermore, the Bootstrap model is used to examine the path mechanism by which social responsibility fulfillment affects the financial performance of the company.

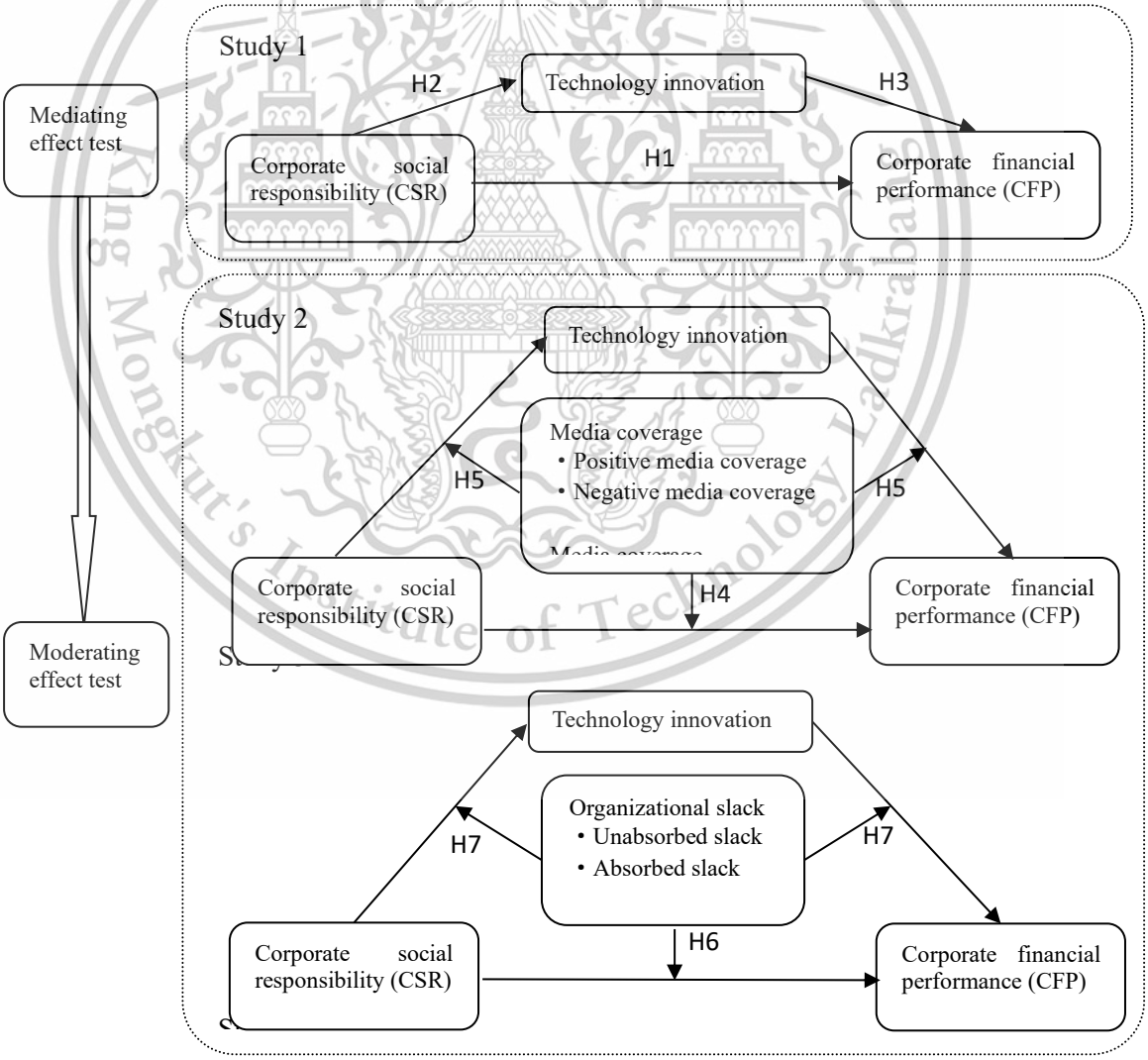

Figure 3.2 Quantitative analysis framework

3.2 Research Variables

3.2.1 Corporate Financial Performance (CFP)

This study uses financial data to measure the financial performance of firms. Currently, there are two main types of financial performance measures: market earnings indicators and accounting indicators. Accounting indicators are mainly derived from the historical data of enterprises and focus on evaluating the profitability, solvency, operating capacity and risk resistance of enterprises in the current period, commonly used indicators include return on assets (ROA) (Jo & Harjoto, 2011; Lu *et al.*, 2020), return on net assets (ROE), etc.; market revenue indicators are financial performance indicators based on the market value of enterprises, reflecting the future business development of enterprises in the economic market. The common measures include Tobin's Q value (Kao *et al.*, 2018; Yang & Basile, 2021) , market net ratio, etc. Ruf *et al.* (2001) elected corporate economic performance measures including ROE and return on sales (ROS) when studying the impact of CSR on corporate performance. Arbogast and Agrawal (2019) studied the relationship between the main components of CSR and the financial performance of the firm using operating profit margin to measure the financial performance of the firm. Yuan *et al.* (2018) used ROA and Tobin's Q (Yang *et al.*, 2022) to study the impact of CSR on corporate economic performance. The ways of measuring the financial performance of firms based on financial data are shown in Table 3.1.

In this article, ROA is used as a variable to measure financial performance and Tobin's Q and operating profit margin are selected as replacement variables for ROA in the robustness test for analysis.

Table 3.1 Financial data for CFP measurement

Financial Indicators	Researchers (years)
Return on assets (ROA)	Lu *et al.* (2020) , Wu *et al.* (2020), Shahbaz *et al.* (2020), Feng *et al.* (2017), Chen (2018)), Ziegler (2012), Jo and Harjoto (2011), Jaepil *et al.* (2009), Chung *et al.* (2009)
Tobin's Q	Yang and Basile (2021), Shahbaz *et al.* (2020) , Yang *et al.* (2019) , Mishra (2017) , Su *et al.* (2016) , Zalloum (2016) ,Jiao (2010), Jaepil *et al.* (2009)
Stock Return	Zou *et al.* (2019), Du *et al.* (2017) , Hawn *et al.* (2018) et al.(2018), Lyon and Shimshack (2015)
Return on equity (ROE)	Chen (2018), Leonardo Becchetti *et al.* (2008)
Earnings Per Share (EPS)	Kappou and Oikonomou (2016) , Chung *et al.* (2009)
Return on Sales (ROS)	Ruf *et al.* (2001), Waddock and Graves (1997)
Operating profit ratio	Orlitzky *et al.* (2003), Dharmaratne and Rathnayaka (2016), Arbogast and Agrawal (2019), X. Yu (2022)

3.2.2 Corporate Social Responsibility (CSR)

In this article, CSR is used as the variable symbol for CSR fulfillment. The methods for evaluating CSR level include: content analysis method, reputation index method, KLD index method, etc. Among them, the content analysis method is to assign scores to the relevant contents of the annual reports published by enterprises, determine the weights through principal component analysis and other methods, and finally sum up to obtain the quantitative score of CSR level (Yu & Liang, 2020); the reputation index method is to obtain relevant information through the distribution of CSR questionnaires for evaluation (Hadj *et al.*, 2020; Husted & Allen, 2007) ; the KLD index method relies on relevant databases to measure CSR performance by assigning different index weights to different stakeholders and then by comprehensive evaluation (Dhaliwal *et al.*, 2011; Hasan *et al.*, 2018). Considering the lack of authoritative databases similar to the KLD index in China, and the subjective factors of content analysis and

reputation index method, this article selects "Hexun - CSR data" to measure the level of social responsibility (Shilei *et al.*, 2021; Yang *et al.*, 2019), and uses Python crawlers to obtain relevant data.

Table 3.2 Hexun CSR evaluation framework

Dimension of CSR Performance	Second-Class Measures	Third-Class Measures
Shareholders (weight ratio: 30%)	Profitability (10%)	ROE (2%)
		ROA (2%)
		Return of sales (2%)
		Cost margin (1%)
		EPS (2%)
		Retained earnings per share (1%)
	Debt paying (3%)	Quick ratio (0.5%)
		Liquidity ratio (0.5%)
		Cash ratio (0.5%)
		Equity ratio (0.5%)
		Asset-liability ration (1%)
	Return (8%)	Dividend capital ratio (2%)
		Dividend yield (3%)
		Bonus share allocation ratio of profit (3%)
	Credit (5%)	Number of penalties by stock exchange (5%)
		Innovation (4%)
	R & D expenditure (1%)	Concept of technological innovation (1%)
		The number of items of technological innovation (2%)
Employees (weight ratio: 15%, 10% in consumption sector)	Performance (5%)	Per capita incomes of workers (4%)
		Training of staff (1%)
	Safety (5%)	Periodic security check (2%)
		Safety training (3%)
	Caring for employees (5%)	Policy of caring (1%)
		Number of caring (2%)
		Caring payments (2%)
Customers and suppliers (weight ratio: 15%, 10% in consumption sector)	Product quality (7%)	Policy of quality management (3%)
		Quality management system certificate (4%)
	Customer service (3%)	Customer satisfaction survey (3%)
	Mutual good faith (5%)	Vendor fair competition (3%)
		Anti-bribery training (2%)

Dimension of CSR Performance	Second-Class Measures	Third-Class Measures
Environment (weight ratio: 20%, 30% in manufacturing sector, 10% in service sector)	Environmental governance (20%)	Policy of environmental protection (2%)
		Environmental management system certificate (3%)
		Environmental investment amount (5%)
		Number of types of sewage (5%)
		Number of types of green energy (5%)
Society (weight ratio: 20%, 30% in service sector, 10% in manufacturing sector)	Contribution (20%)	Tax (10%)
		Donation amount (10%)

Source: Yang *et al.* (2019)

Hexun has constructed a professional evaluation system for social responsibility reports of listed companies as shown in Table 3.2, using the social responsibility reports and annual reports issued by enterprises as the data source. The evaluation system is divided into five categories: shareholder responsibility, employee responsibility, supplier, customer and consumer rights responsibility, environmental responsibility and social responsibility, with 13 secondary indicators and 37 tertiary indicators. In terms of weight setting, the default shareholder responsibility accounts for 30%, employee responsibility 15%, supplier, customer and consumer rights responsibility 15%, environmental responsibility 20% and social responsibility 20%. The exceptions are: 10% weighting for employee responsibility, 20% weighting for supplier, customer and consumer rights and interests responsibility in the consumer industry, and no change in the weighting of other indicators; 30% weighting for environmental responsibility, 10% weighting for social responsibility, and no change in the weighting of other indicators in the manufacturing industry; 10% weighting for environmental responsibility, 30% weighting for social responsibility, and no change in the weighting of other indicators in the service industry.

In consideration of the small values of indicators such as ROA, this thesis uses the total social responsibility score from the CSR report published by Hexun.com multiplied by 0.01 to measure CSR (Lu & Zhao, 2021).

3.2.3 Technology Innovation

Firms can develop technological advantages within the firm and enhance firm value through innovation. In this article, innovation performance is used as an indicator to measure technological innovation, and Inn is used as the variable symbol for technological innovation. There have been many studies on the measurement of indicators of innovation performance, most of which are measured by the number of invention patents and new product sales revenue. However, innovation performance should reflect not only the novelty or scientific quality of the product, but also the marketability and value of the product. However, the number of invention patents and the sales revenue of new products can only reflect the innovation performance reflecting individual patents or new products; it cannot reflect the overall innovation performance of a company. In addition, manufacturing enterprises should be innovation-oriented, and they widely apply new patents and technologies to produce innovative products mainly with high R&D intensity and high innovation (Pan *et al.*, 2018). And these products are mostly intangible assets, which can bring continuous profit to the company (Cozza *et al.*, 2012). The return on intangible assets can explain to some extent the innovation performance of firms, representing both the funds that can be invested in innovation projects and managers' decisions on investment and innovation strategies (Bartoloni, 2011). Therefore, this article uses the return on intangible assets (net profit/net intangible assets) as a measure of innovation performance, which provides a comprehensive picture of the novelty of the innovation and the value of the new product in the market (Duan *et al.*, 2020).

3.2.4 Media coverage

Commonly used methods to measure media coverage include the dummy variable method and logging the number of news reports. The former quantitative method is more intuitive, but

it will have an impact on the regression results, and most experts and scholars use the latter method (Du *et al.*, 2015; Li *et al.*, 2016; Zheng & Chen, 2019). The number of news reports was logarithmically processed as a measure of media coverage, which was also chosen for this research. This research uses Med1 as the variable sign for positive media coverage and Med2 as the variable sign for negative media coverage. To ensure the normal distribution of the data, in this article, positive media coverage (Med1) is measured by the natural logarithm of the number of positive newspaper reports plus one, and negative media coverage (Med2) is measured by the natural logarithm of the number of negative newspaper reports plus one (Shilei *et al.*, 2021; Xiong & Luo, 2021).

3.2.5 Organizational Slack

Organizational slack can be divided into absorbed slack and unabsorbed slack (Daniel *et al.*, 2004; Stan *et al.*, 2014). Among them, unabsorbed slack represents liquid resources that are not being used and can also be seen as available slack (Bourgeois & Singh, 1983), indicating that the firm has resources available to meet new needs and opportunities in the short term (Finkelstein & Hambrick, 1990). Cash flow is typically unabsorbed slack. Absorbed slack means that the business is spending more than it actually needs, and is a resource that has been absorbed by the business but can be restored when needed. For example, inventory represents absorbed redundancy. In this article, the research used US as the variable symbol for unabsorbed slack and AS was used as the variable symbol for absorbed slack. Based on the experience of previous studies, this article uses the "current ratio", i.e., current assets divided by current liabilities (Suzuki, 2018; Symeou *et al.*, 2019), to measure US, which represents the liquidity and short-term solvency of a firm's assets and indicates that the firm ability to fulfill its obligations with liquid resources. The "ratio of selling, general and administrative expenses to total sales" (Luo *et al.*, 2019; Suzuki, 2018; Symeou *et al.*, 2019) is used to measure the firm's AS, which is an effective measure of the firm's equipment, labor and other cost costs.

3.2.6 Control variable

In order to adequately measure the relationship between corporate social responsibility, technological innovation, and firm performance, this article controls for important factors that affect corporate technological innovation and financial performance by referring to previous empirical studies. The specific control variables selected in this article are as follows: firm age (Age), firm size (Size), financial leverage (Lev), cash flow ratio (CFO), sales growth rate (Growth), intangible assets ratio (Intan), number of staff (Staff), equity concentration (Top10), and state-owned enterprise (SOE).

Firm age (Age): firm age may affect firm technological innovation (Liu *et al.*, 2017) and firm performance (Jun & Guo., 2017). Therefore, it is necessary to consider the age of the firm since its establishment. In general, as the age of a firm increases, the level of organizational slack increases, which will affect the firm's innovation performance. In turn, firm age is closely related to firm size, the larger the firm, the more reasonable the equity structure, the higher the profitability and the proportion of liquid assets, the better the financial performance of the firm will be. Age in this article is measured as the natural logarithm of the sample year minus the year the company was founded (Okafor *et al.*, 2021; Shilei *et al.*, 2021; Suzuki, 2018).

Firm size (Size): corporate performance can benefit from economies of scale and scope. Firms of the same size tend to vary in financing costs, capital strength, market competitiveness, and economies of scale, and thus the financial performance of the firm varies. According to the theory of scale economy of Marshall (1920), too large or too small company size is not conducive to business development. Before reaching the optimal size, with the expansion of the enterprise scale, under the effect of scale economy, the cost of the enterprise keeps decreasing and the revenue tends to increase. In this article, the natural logarithm of the book value of total assets is used to measure Size (Luo *et al.*, 2019; Yeguang & Bo, 2018).

Financial leverage (Lev): financial leverage involves a firm's total liabilities and total assets, the ratio of which reflects the total resources owned by the company and at its disposal, and the amount of external borrowing. Chen (2018) argues that the size of the gearing ratio has a significant impact on financial performance. Low financial leverage indicates that the firm is well-capitalized and solvent, and creditors do not have to worry about uncollectible loans at

maturity. Thus there will be a large number of investors will be willing to invest in the firm, reducing financing costs and enhancing financial performance. Therefore, Lev is used as a control variable in this article (Chang *et al.*, 2019; Kao *et al.*, 2018; Lu *et al.*, 2020; Yeguang & Bo, 2018)。

Cash flow ratio (CFO): this indicator reflects the financial elasticity of the enterprise, when the higher the ratio of cash flow from operating activities, it indicates that the enterprise has a strong ability to generate cash from operating activities, and the cash flow is relatively abundant, which is a good guarantee of the profitability of the enterprise (Atanassov *et al.*, 2020). This article measures CFO by the net cash flow from operating activities divided by the total assets of the enterprise (Shilei *et al.*, 2021).

Sales growth rate (Growth): sales growth rate is considered as the main driver of long-term sustainability of a firm and to some extent reflects the growth opportunities of the firm. Odalo *et al.* (2016) argues that Growth has a significant positive impact on the financial performance of firms, and his empirical analysis found that for every 1% increase in sales growth rate, the financial performance of firms improved by 11% using agricultural companies listed on the Nairobi Stock Exchange as a sample for his study. This article measures Growth by calculating by dividing the difference between the current year's sales revenue minus the previous year's sales revenue by the previous year's sales revenue (Hasan *et al.*, 2018; Mengmeng *et al.*, 2019).

Intangible asset ratio (Intan): Surroca *et al.* (2010) suggests that CSR affects CFP through the accumulation of intangible assets, and that both the multiplier effect of intangible asset diffusion and the acceleration effect of intangible asset property rights competition increase the contribution of intangible assets to technological innovation. Therefore, the research controls for the mediating role of intangible assets by the ratio of net intangible assets to total assets.

Number of staff (Staff): in theory, keeping the number of employees in a firm at zero HR redundancy results in the highest firm performance, but in practice it is difficult to achieve. Although HR redundancy is often associated with firm inefficiency, in fact, moderate HR slack

can facilitate short-term market expansion (Mishina *et al.*, 2004). In this article, the natural logarithm of a firm's total number of employees is used to measure Staff (Shilei *et al.*, 2021).

Equity concentration (Top10): higher shareholding of major shareholders affects the decision-making process and management's resolutions of the firm, which has an impact on the financial performance of the firm. Therefore, this article controls for the shareholding ratio of the top 10 shareholders at the corporate governance level, which is calculated as the ratio of the number of shares held by the firm's top 10 shareholders to the total number of shares in the firm (Kao *et al.*, 2018; Mengmeng *et al.*, 2019).

State-owned enterprise (SOE): the nature of the enterprise is determined by the nature of the first largest shareholder who has absolute control and is divided into types of enterprises such as state-owned, collective, private, wholly foreign-owned, and Sino-foreign ventures (Karyawati *et al.*, 2020). Ervits (2021) argues that SOEs have a special status and need to take more responsibility compared to other nature of enterprises. The high social attention and easy access to resources will therefore ultimately enhance financial performance. Different nature of enterprises will have different governance instruments and management objectives, which in turn will affect the financial performance. Therefore, in this article, the nature of the enterprise is included as a dummy variable, and since state-owned enterprises are more special, they are assigned a value of 1 and other enterprises are taken as 0 (Lu *et al.*, 2020; Zheng & Chen, 2019).

The definitions related to each variable are shown in Table 3.3.

Table 3.3 Variable settings and definitions

Variables	**Symbol**	**Definition**
Corporate Financial Performance (CFP)		
Return on assts	ROA	Net profit / total asset
Corporate Social Responsibility (CSR)		
CSR index	CSR	CSR score from Hexun CSR database*0.01

Variables	**Symbol**	**Definition**

Technology Innovation (TI)		
Innovation performance	Inn	Net profit / net intangible assets
Media coverage		
Positive media coverage	Med1	The natural logarithm of the number of positive newspaper reports about enterprise in the CFND database plus 1.
Negative media coverage	Med2	The natural logarithm of the number of negative newspaper reports about enterprise in the CFND database plus 1.
Organizational Slack		
Unabsorbed slack	US	Current assets/current liabilities
Absorbed slack	AS	Selling, general and administrative expenses/ total sales
Control variable		
Firm age	Age	The natural logarithm of the sample year minus the year the company was founded
Firm size	Size	The natural logarithm of the book value of total assets
Firm leverage	Lev	Ratio of debt to firm assets in book value
Cash flow ratio	CFO	Net cash flows from operating activities of enterprises / total assets
Sales growth rate	Growth	(Sales revenue for the current year-Sales revenue for the previous year) / Sales revenue of the previous year
Intangible assets ratio	Intan	Net intangible assets / total assets
Number of staff	Staff	Natural logarithm of the total number of staff in the company
Equity concentration	Top10	The sum of the shareholdings of the top ten shareholders
State-owned enterprise	SOE	A dummy variable that equals 1 if the firm is state owned, otherwise, 0

3.3 Population and Sample

Griffin *et al.* (1997) point out that multi-industry studies may confuse the relationship between CSR and performance, and by studying a single industry, it is possible to see how solving the same social problems will have The focus on a single industry also allows for the identification of the impact of a single industry. A focus on a single industry also allows for the identification of specific patterns of CSR implementation specific to that industry, making it easier to analyze the heterogeneity of performance among companies in different contexts within that industry.

This thesis uses Chinese listed pharmaceutical companies as the research object. The 262 listed pharmaceutical companies publicly listed on the Shenzhen Exchange and Shanghai Exchange in China from 2010 to 2020 were used as the primary sample. The sample was screened according to the following criteria: (1) exclude the sample of companies with special treatment (ST, *ST) during the study period because their operating conditions and financial performance became irregular for 2-3 consecutive years; (2) exclude the sample of companies that no longer belong to the pharmaceutical industry due to industry changes during the study period; (3) exclude companies with less than five years of sample observations during the study period to ensure the time-series of the sample; (4) exclude the data unavailable; (5) Winsorize treatment at 1% level for continuous variables to avoid the effect of extreme values on the study results. The final sample of 128 corporations with 1367 observations was obtained through the screening process.

3.4 Research Method

3.4.1 Interview study

The semi-structured interview is a preliminary validation of the research ideas identified in the literature (Moyeen & West, 2014; O'Dwyer, 2002; Robinson, 2013), and the main lines of research can be clarified through in-depth communication with the interviewees. The basic principle of interviewing is "simple beginnings, complex endings". Therefore, only a few

questions were fixed in the outline of the questions, which served as a milestone to change the topic from top to bottom, while the other questions were random and open-ended.

Each interview was divided into 3 stages. The interviewer should start the interview with a brief introduction of the background and significance of the study as an opening statement, which should not be too long in the formal interview because it was covered in the preliminary contact.

The main questions in the first phase of the interview were: (1) What is the status of the company's fulfillment of social responsibility? What should CSR include? (2) Whether the fulfillment of social responsibility will affect the operation and development of the company? Whether it affects corporate profits? Since the interviewees are not academic theoreticians, they should avoid jargon such as "heterogeneity," "agency problems," and "financial performance" when asking questions. This phase focuses on understanding the interviewees' attitudes towards CSR and whether, in their opinion, this behavior has an impact on corporate performance.

The main purpose of the second stage question was to explore the impact of innovation on corporate performance in fulfilling corporate social responsibility. The main questions were: Does active CSR affect corporate innovation? Does innovation have a positive effect on corporate profitability? This phase of the discussion revolves around innovation and verifies the mediating role of innovation in the relationship between CSR and CFP.

The third phase of the interviews explored the role of media attention and corporate idle resources, with the main questions being: (1) Does media coverage affect the fulfillment of CSR and does it affect the reputation of the company? Does media coverage affect corporate innovation and profits? (2) Do companies use idle resources to fulfill CSR? Do idle resources affect the innovation and profits of the company? This phase focuses on understanding the role of media coverage and organizational slack in the triad of CSR, technological innovation and CFP, and verifying whether media coverage and organizational slack moderate the effect.

3.4.2 Study of the mediating effect of technological innovation

This study uses the recursive test of mediating effects proposed by Baron and Kenny (1986)

to examine the mediating role of technological innovation in the CSR- CFP relationship, a method that has been widely used in research in the field of corporate finance. Zhonglin and Baojuan (2014a) summarized this approach in the following three steps.

First, the total effect of the independent variable X on the dependent variable Y is tested, and the model can be set as follows:

$$Y = cX + \varepsilon \tag{1.1}$$

Second, to test the effect of the independent variable X on the mediating variable M, the model can be set as follows:

$$M = aX + \varepsilon \tag{1.2}$$

Finally, to test the joint effect of the independent variable X and the mediating variable M on the dependent variable Y, the model can be set as follows:

$$Y = c'X + bM + \varepsilon \tag{1.3}$$

The test procedure for the causal step approach (Zhonglin & Baojuan, 2014a):

(1) Test whether the coefficient c in model (1.1) is significant, and c is significant as a prerequisite for the existence of mediating effects.

(2) Test the coefficient a of model (1.2) and the coefficient b of model (1.3) in turn. If both are significant, then the indirect effect is significant; if at least one is not significant, use the Bootstrap method (Fritz *et al.*, 2012; Hayes & Scharkow, 2013) to directly test H_0:ab=0, with significant indirect effect if significant.

(3) Test the coefficient c' of model (1.3). If it is not significant, it means that the direct effect is not significant, indicating that there is only a mediating effect. If it is significant, it means that the direct effect is significant, and then compare the sign of ab and c', which is partly mediating effect if the sign is the same, and "suppressing effect" (Kenny *et al.*, 2003; MacKinnon *et al.*, 2002; Shrout & Bolger, 2002) if the sign is different.

This study is designed to explore the relationship between CSR, technological innovation and CFP, to verify H1, H2 and H3. Models (1.4), (1.5) and (1.6) are constructed based on the mediating effects test described above, and the models are specified as follows:

$$ROA_{it} = \alpha_0 + \alpha_1 CSR_{it} + \alpha_2 \sum Controls_{it} + \mu_i + \gamma_t + \varepsilon_{it} \tag{1.4}$$

$$Inn_{it} = \beta_0 + \beta_1 CSR_{it} + \beta_2 \sum Controls_{it} + \mu_i + \gamma_t + \varepsilon_{it} \quad (1.5)$$

$$ROA_{it} = \gamma_0 + \gamma_1 CSR_{it} + \gamma_2 Inn_{it} + \gamma_3 \sum Controls_{it} + \mu_i + \gamma_t + \varepsilon_{it} \quad (1.6)$$

In which, ROA represents firm's financial performance; Inn represents technological innovation; CSR represents corporate social responsibility; μ_t is individual fixed effect; γ_t is time fixed effect; ε is random disturbance term; Controls are control variables, including firm age, firm size, firm leverage, cash flow ratio, sales growth rate, intangible assets ratio, number of staff, equity concentration and state-owned enterprise.

3.4.3 Study of the moderating effects of media coverage and organizational slack

Edwards and Lambert (2007) discussed models with both moderation and mediation, put moderation into the context of mediation analysis and combined eight models according to whether the front half path, the back half path, and the direct path of the mediation process were moderated or not. Zhonglin and Baojuan (2014b) divided the models into two categories: moderating only indirect effects; moderating both indirect and direct effects. In this article, the moderating effect hierarchical regression test proposed by Baron and Kenny (1986) is used to test the moderating effect of media coverage and organizational slack. Combined with (Zhonglin & Baojuan, 2014b) test method of mediating models with moderation, the test method as follows:

First, to test whether the direct effect of the independent variable X on the dependent variable Y is influenced by the moderating variable U, the model can be established as：

$$Y = c_0 + c_1 X + c_2 U + c_3 XU + \varepsilon \quad (2.1)$$

Second, to test whether the mediating effect of the independent variable X on the dependent variable Y through the mediating variable M is influenced by the moderating variable U, models are as follows:

$$W = a_0 + a_1 X + a_2 U + a_3 UX + \varepsilon \quad (2.2)$$

$$Y = c_0' + c_1' X + c_2' U + b_1 W + b_2 UW + \varepsilon \quad (2.3)$$

$$Y = c_0' + c_1' X + c_2' U + c_3' UX + b_1 W + b_2 UW + \varepsilon \quad (2.4)$$

The test methods are as follows:

(1) Test the significance of the coefficients c_1 and c_3 of model (2.1). If c_1 is significant, then the direct effect is significant; if c_3 is significant, then the direct effect is moderated by U.

(2) First, test whether a_1 and a_3 are significant in model (2.2), and then test whether b_1 and b_2 are significant in the model (2.3) in which the direct effect is not moderated or in the model (2.4) in which the direct effect is moderated. If $a_1 \neq 0$ and $b_2 \neq 0$, the back path is moderated; if $a_3 \neq 0$ and $b_1 \neq 0$, the front path is moderated; if $a_3 \neq 0$ and $b_2 \neq 0$, the front and back paths are moderated. If at least one of the above three combinations are true and the coefficients are significant, the mediating effect is moderated. If none of the stepwise regression results are significant, then the Bootstrap method (Fritz *et al.*, 2012; Hayes & Scharkow, 2013; Preacher *et al.*, 2007) is used to do an interval estimation for the coefficient products a_1b_2, a_3b_1 and a_3b_2, and at least one interval does not contain 0, then the mediation effect is moderated. If the interval estimation results of the coefficient products all contain 0, then test the significant of the difference between the maximum and minimum values of the mediating effect $(a_1+a_3U)(b_1+b_2U)$. If the difference between the maximum and minimum values is significant, the mediating effect is moderated; if it is not significant, the mediating effect is not moderated.

3.4.3.1 Moderating role of media coverage

This article studies the moderating role of media coverage among CSR, technological innovation, and CFP. Based on the previous hypotheses, regression models are developed：

$$ROA_{it} = \alpha_0 + \alpha_1 CSR_{it} + \alpha_2 Med_{it} + \alpha_4 CSR_{it} \times Med_{it} + \alpha_3 \sum Controls_{it} + \mu_i + \gamma_t + \varepsilon_{it} \quad (2.5)$$

$$Inn_{it} = \beta_0 + \beta_1 CSR_{it} + \beta_2 Med_{it} + \beta_3 CSR_{it} \times Med_{it} + \beta_3 \sum Controls_{it} + \mu_i + \gamma_t + \varepsilon_{it} \quad (2.6)$$

$$ROA_{it} = \gamma_0 + \gamma_1 CSR_{it} + \gamma_2 Med_{it} + \gamma_3 CSR_{it} \times Med_{it} + \gamma_4 Inn_{it} + \gamma_5 Inn_{it} \times Med_{it} + \gamma_6 \sum Controls_{it} + \mu_i + \gamma_t + \varepsilon_{it} \quad (2.7)$$

Where ROA represents corporate financial performance; Inn represents technological innovation; Med represents media coverage and is validated with positive media coverage

(Med1) and negative media coverage (Med2), respectively; CSR represents corporate social responsibility; μ_i is an individual fixed effect; γ_t is a time fixed effect; ε is a random disturbance term; and Controls are control variables.

3.4.3.2 Moderating role of organizational slack

This article examines the moderating role of organizational slack among CSR, technological innovation, and CFP in the same way as the study of media coverage. Based on the previous hypotheses, regression models are developed:

$$ROA_{it} = \delta_0 + \delta_1 CSR_{it} + \delta_2 OS_{it} + \delta_3 CSR_{it} \times OS_{it} + \delta_4 \sum Controls_{it} + \mu_i + \gamma_t + \varepsilon_{it} \quad (2.8)$$

$$Inn_{it} = \theta_0 + \theta_1 CSR_{it} + \theta_2 OS_{it} + \theta_3 CSR_{it} \times OS_{it} + \theta_4 \sum Controls_{it} + \mu_i + \gamma_t + \varepsilon_{it} \quad (2.9)$$

$$ROA_{it} = \varphi_0 + \varphi_1 CSR_{it} + \varphi_2 OS_{it} + \varphi_3 CSR_{it} \times OS_{it} + \varphi_3 Inn_{it} + \varphi_4 Inn_{it} \times OS_{it} + \varphi_5 \sum Controls_{it} + \mu_i + \gamma_t + \varepsilon_{it} \quad (2.10)$$

There, ROA represents the financial performance of the company; Inn represents technological innovation; OS represents the group organizational slack, which is verified by unabsorbed slack (US) and absorbed slack (AS), respectively; CSR represents corporate social responsibility; μ_i is an individual fixed effect; γ_t is a time fixed effect; ε is a random disturbance term; and Controls are control variables.

3.5 Research Instrument

Interview research generates a large amount of textual information, and this study used coding methods to collate the interview data systematically. Anselm Strauss and Corbin (1990) outlined three coding methods associated with theoretical sampling: open coding, axial coding, and selective coding. This study follows the analytical steps and processes of grounded theory research (Sun *et al.*, 2019; Pandit, 1996), shown in Figure 3.3. Open coding refers to the conceptualization and categorization of the collected scattered data based on word frequency

analysis (Glaser & Strauss, 1967). Axial coding, which means the correlation analysis of independent concepts and categories in open coding based on logical relationship analysis and the research question as the axis (Corbin & Strauss, 2015). Selective coding, means selecting the core categories based on the relationships between categories derived from axial coding and systematically comparing them with other categories to verify the subordination between them (Charmaz, 2006).

Quantitative analysis, firstly, the study obtained CSR data from " Hexun.com - CSR Data" website through Python software. Secondly, the collected data were summarized in Excel for collation. Finally, the cleaned-up data were imported into Stata17 software for data analysis.

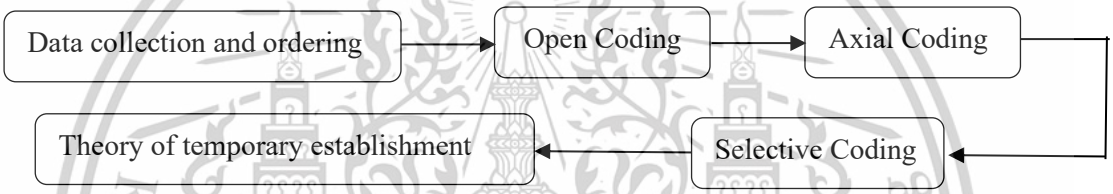

Figure 3.3 The research process of grounded theory

3.6 Data Collection

The sample of this study includes pharmaceutical companies listed on the Shanghai and Shenzhen stock exchanges from 2010 to 2020, and the relevant listed companies' data and financial data are mainly obtained from the China Securities Market and Accounting Research (CSMAR) database (Duan *et al.*, 2020; Yi *et al.*, 2020), and some missing data in the database are obtained by consulting the companies' annual reports and CSMAR database is a research-oriented and accurate database in the field of economy and finance developed by Shenzhen Sigma Data Technology Co. Through 21 years of continuous accumulation and improvement, CSMAR database has covered 18 series such as factor research, character characteristics, green economy, stock, company, overseas, information, fund, bond, industry, economy, commodity futures, etc., containing 160+ databases, more than 4000 tables and more than 50,000 fields.

CSMAR database can be said to be the authoritative database used to study China's economy, therefore the financial data and data related to listed companies in this article are taken from this database.

The CSR data in this article are mainly from Hexun (Li *et al.*, 2021; Pan *et al.*, 2014; Shilei *et al.*, 2021; Yang *et al.*, 2019). The public online CSR database published by Hexun.com covers the CSR assessment and ranking of all listed companies in China. This article obtains the relevant data by using Python software, through which the CSR data needed for this article can be obtained from Hexun.com.

The data of media reports in this article are obtained from the Chinese Research Data Services Platform (CNRDS) and are not collected manually, thus the data are collected more objectively. The CNRDS database is widely used for corporate social responsibility (Orzes*, et al.*, 2019), corporate finance (Ru, 2018), accounting (Li *et al.*, 2022) and innovation (Chen*, et al.*, 2019) and other areas of research. In this article, the study will refer to Xiong *et al.* (2021) and Shilei *et al.* (2021) and use the CNRDS news media database as the media data source. CNRDS data are widely sourced and include more than 600 newspapers with financial news, such as China Securities Journal, Shanghai Securities Journal, First Financial Daily, 21st Century Business Herald, China Business News, Economic Observer, Security Daily and Securities Times. These eight financial newspapers are characterized by timely coverage, high quality and influence, and are the most frequently used data sources for research on media issues in Chinese economics, management and business studies.

3.7 Statistical Data Analysis

3.7.1 Qualitative analysis

First, open coding was performed on the textual material obtained from the semi-structured interviews. In this research, a unique number was set for each interviewee, and the coding was done according to the interviewee number-question number, such as number 1-2

indicated that the first interviewee answered the second question. The collected information was conceptualized and categorized at this stage, and 1-4 raw statements selected as representative for each category were presented.

Second, axial coding was conducted based on open coding. The core question of "the mechanism of CSR on CFP" was used to find potential correlations among the independent concepts and categories formed by the open coding.

Finally, selective coding was performed in conjunction with interview research projects. All phenomena and findings are explained by the categories, relationships and relationship structures found. Since this study focuses on the relationship between CSR and CFP, the main effect line of CSR-technology innovation-CFP and the moderating line of media coverage and organizational slack are gradually constructed.

3.7.2 Quantitative analysis

Firstly, descriptive statistical analysis and correlation analysis were performed for each variable in this research.

Second, the variables were tested for multicollinearity to further ensure that there is no multicollinearity between the variables and to prevent the phenomenon of pseudo-regression.

Third, regression analysis of mediation effects. In this article, a fixed effects model was applied to eliminate the bias caused by individual fixed effects (Allison, 2005), while annual dummy variables were included in the fixed effects model to exclude the effect of time trends (Certo & Semadeni, 2006), which constituted a two-way fixed effects model. Then, using causal step approach (Baron & Kenny, 1986), it was tested for the mediating role of technological innovation. Last, the robustness tests: (1) Alternative variable method (Li *et al.*, 2017; Suzuki, 2018). Using Tobin's Q (Kao *et al.*, 2018; Yang & Basile, 2021) as a replacing variable for the dependent variable ROA, to test the robustness of the empirical results. (2) Instrumental variables approach (Li *et al.*, 2017). Wintoki *et al.* (2012) argue that the sources of endogeneity include associativity, unobservable heterogeneity and dynamic endogeneity. To exclude the problem of endogeneity from interfering with the purpose of this article, this article

uses two-stage least squares method (2SLS) for regression analysis (Gupta *et al.*, 2021; Liang *et al.*, 2022). According to the paper on the selection and construction of instrumental variables (IV) published in Econometrica (Lewbel, 1997), this article used the average of the total CSR scores of other firms in the province where the firm was located in the current year *0.01 and the one-period lagged CSR (Suzuki, 2018) as the instrumental variable for CSR in the 2SLS regression. (3) the Bootstrap method (Fritz *et al.*, 2012; Hayes & Scharkow, 2013; Preacher *et al.*, 2007) was used to further test the mediating role of technological innovation.

Finally, regression analysis of moderation effects. Similar to the mediation regression, first, sequential tests using a double fixed effects model was conducted to test the moderating effect of media coverage and organizational slack. Then, the regression results were used to graph the moderating effects. Finally, the robustness tests: (1) Alternative variable method. The operating profit ratio is used as a replace variable for the dependent variable ROA, and the empirical results are tested for robustness. (2) Instrumental variable method. The one-period lagged ROA was added to the model as an instrumental variable to build a dynamic panel model and used systematic generalized method of moments estimation (SYS-GMM) for regression analysis (Shahbaz *et al.*, 2020). The lagged dependent variable was used as a GMM-type instrument, while all explanatory variables were used as standard instruments (Roodman, 2009). (3) Use Bootstrap method to further explain the moderating effect of media coverage and organizational slack.

CHAPTER 4

ANALYSIS RESULTS

4.1 Qualitative Analysis

4.1.1 Open coding

This research utilized grounded theory research methodology with open coding as the basis for interview analysis. The research eliminated the initial concepts with less than three repetitions, retained only the initial concepts with more than three repetitions, and repeatedly compared the similarity and heterogeneity of each initial concept and category. In addition, the research also eliminated individual inconsistent concepts, and finally abstracted 14 categories and 34 initial concepts from the textual information, as shown in Table 4.1.

4.1.2 Axial coding

Axial coding of textual information on the basis of open coding. Based on the analysis of logical relationships and centered on the research questions, the independent concepts and categories formed by the open coding were linked to each other by categories. The research categorized different factor characteristics according to their logical associations at the conceptual level, forming 5 major main categories with 14 corresponding subcategories. As shown in Table 4.2.

Table 4.1 Open coding formed initial concepts and categories

Categories	Initial Concepts	Original statement (excerpts)
Social responsibility	Philanthropic donations Society welfare Community participation Taxation	Donation is not only an act of love, but it also creates its own brand image. (1-4) In the "Winter Support Day" meeting, we went door-to-door to deliver rice, flour, cooking oil, clothing, cash, and other items needed for the winter to the recipients of our support. (5-1) The Company implemented the "NICU Western Tour" and the "Rainbow Plan", in which we provided targeted and personalized assistance and training to primary care pediatricians through offline and online means, respectively. (4-1) During the epidemic, our company centered its work around resumption of work to ensure supply and assistance against the epidemic. We fully invested in the battle against the epidemic, took the initiative to assume social responsibility, and embodied the role of a state-owned enterprise. (2-1) Therefore, enterprises cannot be separated from the society, all our resources come from the society, we should realize mutual assistance with the community. (3-5) Our company pays taxes on time and maintains a good relationship with the government to win a more relaxed development environment for the enterprise. (4-1) Our company strictly follows the relevant national tax laws and regulations to declare and pay taxes on time. (3-1)
	Environmental protection	I think that if a company is very environmentally friendly in its production process, both in terms of the inputs it produces and the way it produces them, then it is fulfilling its social responsibility. (2-1)

Categories	Initial Concepts	Original statement (excerpts)
Environmental responsibility	Capital investment Environmental protection measures	Our company actively improves the production process, introduces new equipment, and promotes new technologies with the purpose of controlling the generation of pollutants to the greatest extent possible. (1-3) Under the goal of "double carbon", we strengthen the management of fossil energy, promote the use of clean energy, increase the capital investment in energy-saving technological reform, and reduce energy loss through process improvement and innovation. (4-3) Our company takes the development of green products, the strengthening of clean production, the devotion to pollution prevention and control, and the promotion of resource recycling as one of the key tasks, and constantly increases the investment in green factories. (5-3) In production, we take appropriate energy-saving prevention and control measures, actively carry out green innovation, implement sustainable development strategies, and reduce the risk of pollution to the environment. (3-3)
Employee Responsibility	Employee rights Employee benefits Employee training	In personnel management, we fulfill democratic procedures to fully protect the legitimate rights and benefits of our employees in all aspects of recruitment, promotion, dismissal, working hours, holidays, salary and benefits, and so on. (2-1) Our company regularly arranges health checkups for our employees every year. (2-2) Our company adheres to the " human-oriented", has established a systematic and standardized performance evaluation and assessment system, carries out a comprehensive, objective and fair evaluation and assessment of the staff selection, employment, education and retention, and regularly raises the salary of the staff. (4-1)

Categories	Initial Concepts	Original statement (excerpts)
	Working environment	The company puts training into the daily management work and strives to improve the professional and occupational quality of the employees. (3-1) In my opinion, it is a virtuous circle for the company to take social responsibility, such as welfare and training for the employees, and the employees in turn will recognize the company, which will certainly promote the company's efficiency. (1-1) In addition to paying their employees, companies should also provide a safe and fair working environment for their employees. (4-1)
Shareholder responsibility	Information disclosure Return on investment	Our company establishes a multi-channel communication platform, actively promotes investor relations maintenance, and strives to protect the legitimate rights and interests of investors. (5-1) In my opinion, the first social responsibility that a company should fulfill is to satisfy shareholders' requirements and disclose corporate information in timely and accurately. (2-1) Our company has always emphasized the protection of shareholders' rights and interests and insisted on cash dividends in return for shareholders and investors. (1-1) We have always insisted on public and transparent disclosure of information, with the aim of ensuring the general shareholders' and investors' right to know, and are committed to giving shareholders long-term stable investment returns. (4-2)
	Product quality	Only with products of good quality can you capture the market forever. (2-2) Winning by quality is the attitude of the enterprise to the products, and the main responsibility of the enterprise is to produce high quality products.(4-2)

Categories	Initial Concepts	Original statement (excerpts)
Supplier and consumer responsibility	Customer service Supplier relationship maintenance	Our company always adheres to the concept of "Responsible marketing", which is guided by customers' needs and customers' satisfaction. (5-2) We promote digital marketing through online academic conferences, online clinics, online market research, and other innovative methods, and fully utilize online methods to provide attentive services to medical workers and patients. (1-3) Our company brings the concept and requirement of fulfilling social responsibility into the whole process of corporate procurement to ensure that procurement of products and services is "responsible" and procurement transaction behavior is "responsible". (3-3)
Financial performance	Operating costs Stock price	Implementing CSR activities, such as philanthropic donations, increases a company's operating costs. (1-2) Taking more responsibility will lead to more cost, and the management cost of the enterprise will increase to some extent, but the implementation of CSR can help the enterprise to obtain high-quality and favorable raw materials, so as to reduce the inventory cost and compress the production cycle. (2-2) Employees' rich knowledge, skills, and experience can increase work efficiency and output level, and reduce production costs. (3-2) Firms can improve productivity by increasing the level of innovation in the firm. (4-2) For pharmaceutical companies, if there is a product safety problem, it must be a heavy blow to the share price of the listed company. (2-4) Fulfillment of CSR will help create sustainable comparative advantage and contribute to corporate profitability. (3-2)

Categories	Initial Concepts	Original statement (excerpts)
	Financial indicators	Low leverage allows companies to have sufficient earnings flexibility and the ability to raise external financing to support new and promising R&D projects and maintain stable operation of the projects, which in turn enables new product development and creates a competitive advantage in the future. (3-3) Through active fulfillment of corporate social responsibility, it can build a positive image for the company and attract investors' attention, thus enhancing our company's solvency. (5-4)
Non-financial performance	Non-financial indicators	A good working environment and welfare benefits can improve the efficiency of employees, attract quality people, and directly contribute to the innovation and performance of the company. (4-3) The fulfillment of CSR can enhance consumer satisfaction with the enterprise and help stabilize the customer sources, thus improving the performance of the enterprise. (5-2)
Multi innovation	Marketing and management innovation Staff Innovation Technology innovation	Regarding innovation, innovation is the first productive force of enterprise development, and our company advocates all forms of innovation, whether it is technological innovation or innovation in marketing and management. (5-3) Our company has established a new channel of "Internet+Health", and is actively carrying out the new marketing method of "Live commerce", so as to make Chinese medicine popular with the help of modern technology and marketing method. (1-3) The fulfillment of social responsibility by enterprises will retain excellent employees and attract high-quality R&D personnel, which is beneficial to the innovative development of enterprises. (2-3) Innovation is the most important responsibility in the sustainable development of pharmaceutical enterprises. In the future development process, we will firmly take the road of innovation and transformation to provide patients with more and more affordable new treatments. (1-3)

Categories	Initial Concepts	Original statement (excerpts)
		Our company has clearly defined the path of advancement in R&D and innovation, accelerating product acquisition through self-research overlaid on external M&A, and dual-pronged approach to meet the public's demand for excellent products and to build a core driving force for business growth. (3-3) In recent years, according to the existing equipment mechanization status of each production base, combined with the practical situation of each base, our company has been exploring new processes for the production of traditional Chinese medicines, carrying out technological renovation of tooling, improving the level of product quality, lowering the cost of labor, and increasing the level of automation of the production of traditional Chinese medicines. (4-3)
Innovative investment	R&D investment	Converting R&D investment into results is conducive to improving the core competitiveness of enterprises. (2-3) CSR, as a non-market competitive strategy, can help enterprises gain recognition from the government, consumers and other stakeholders, which in turn can obtain more critical resources for R&D investment and improve technological innovation. (3-3) When technological innovation investment is recognized by the internal staff of the enterprise, technological innovation investment can bring higher efficiency to the enterprise, and then improve the financial performance of the enterprise. (5-3)
Reputation	Reputation Popularity	Unfavorable news reports can aggravate the reputational risk of the enterprise, which will bring negative impacts such as plummeting product sales, damage to the enterprise's reputation, withdrawal of capital by investors, and reduction in the credibility of banks and other financial institutions to pharmaceutical manufacturing enterprises, which will ultimately affect the performance of the enterprise . (2-4) Media is conducive to improving our company's popularity and brand image, enhancing consumer recognition of us, attracting more consumers and expanding product sales. (3-4)

Categories	Initial Concepts	Original statement (excerpts)
		We will actively go to charity because it will form reputation, which is the value of the intangible assets of the enterprise, and also enhances the enterprise's ability to resist risks, corporate reputation is the core of corporate value creation. (1-4) If the reported information is negative, it will affect the company's reputation and make the public lose trust in the company, and then affect the sales of products as well as the stock price. (5-4)
Corporate image	Corporate image Brand impact	In my opinion, the fulfillment of social responsibility can be said to be one of the important signs of high-quality development of enterprises, and at the same time, it is also an important measure to build and enhance the image of enterprises. (2-1) Media coverage of public service activities gives the brand a deeper character full of human concern and emotion, allowing consumers to create a deeper link with the company through deeper emotional resonance, and effectively enhancing the company's brand influence. (4-4) We have established a variety of cooperation with various media outlets to keep abreast of hot spots, increase brand heat, and respond positively to negative public opinion to establish a favorable corporate image. (3-4) Keeping honest cooperation with the media, we continuously improve our brand influence and spread the responsible corporate image of our company. (5-4)
Attention	Attention	Good reporting may increase the public's favorable opinion of the company and want to follow it further, such as to see what it produces and how it operates or the like. (5-4) Media coverage of green technology innovation can increase the attention of green investors and environmental consumers to the company, which not only reduces the pressure of corporate innovation financing, but also broadens the market for green products, which is beneficial to the long-term development of the company. (3-4)

Categories	Initial Concepts	Original statement (excerpts)
Media monitoring	Monitoring Disclosure	Sometimes pressured by media supervision, we tend to avoid violations of the law and improve the level of corporate governance, and subsequently the better the performance of the company. (4-4) We also pay special attention to the relevant information disclosed by the media, and to actively take improvement measures according to the media reports, and earnestly fulfill our social responsibility, in order to improve our corporate performance. (5-4)
Slack resources	Voluntary resources Finance resources Human resources Operating costs	When business performance is bad, idle resources can be used to provide a buffer against sudden cuts in R&D expenditures, allowing managers to support the normal operation of R&D and without fear of failure.(3-5) Firms' innovative R&D activities require substantial financial support, thus the state of resources within a firm affects its innovative activities. (2-5) When a firm has enough financial resources at its disposal , it can invest in CSR as an intangible resource. (1-5) Socially responsible behavior can send a signal of corporate sustainability to shareholders and investors, easing the pressure of the capital market and investors' concerns, which in turn reduces the company's operating costs and obtains funding from shareholders and investors when needed. (5-5)

Table 4.2 Axial coding formed main categories

Main category	Subcategory	Context of category
Corporate social responsibility	Social responsibility	Enterprises should give back to society by making charitable donations to public services, actively helping communities and promoting their harmonious development; they should pay taxes by law and should take up other responsibilities and obligations as stipulated by the government.
	Environmental responsibility	Enterprises should pay attention to environmental protection in production, adopt corresponding energy-saving control measures, and reduce pollution to the environment and consumption of natural resources.
	Employee responsibility	Enterprises should pay attention to the interests and treatment of employees, provide appropriate skills training and safe working environment, so that employees can fully feel the care of the enterprise.
	Shareholder responsibility	Enterprises should pay attention to the rights and interests of shareholders, timely and accurate disclosure of corporate information to ensure that shareholders have a long-term stable return on investment.
	Supplier and consumer responsibility	Enterprises should take responsibility for the quality of their products, be responsible for marketing, and conscientiously maintain cooperative relationships with their supply chain and partners both upstream and downstream.
Corporate performance	Financial Performance	Financial indicators such as operating costs, profitability, solvency, profitability and stock price of the firm itself.
	Non-Financial Performance	Non-financial indicators that affect the performance of the firm such as customer satisfaction, employee satisfaction and innovation.

Main category	Subcategory	Context of category
Technology innovation	Diversified innovation	Enterprises innovate at all stages, from production to marketing.
	Innovation investment	The transformation of R&D investment into results contributes to improving the core competitiveness of enterprises.
Media coverage	Reputation	Positive/negative media coverage can affect a company's reputation.
	Corporate image	Positive/negative media coverage can affect corporate image.
	Attention	Media coverage will make the public pay different levels of attention to the enterprise.
	Media monitoring	Media improve the business environment of enterprises through monitoring mechanism.
Organizational slack	Slack resources	Resources within the business that are not being maximized.

4.1.3 Selective Coding

Based on the axial coding, and with the purpose of the interviews, the text data were selectively coded. The research again repeatedly compared, integrated and refined the concepts, categories and logical relationships developed, and constructed the main effect line of "CSR - technological innovation - company performance", as well as the moderating line of media coverage and organizational slack. As shown in Table 4.3.

4.1.4 Interview data analysis

4.1.4.1 Specific dimension analysis of corporate social responsibility fulfillment

CSR itself is a broad concept, based on the stakeholder theory, all stakeholders of the organization belong to the conceptual scope of CSR. Initially, through one-on-one in-depth interviews with five middle-level managers of pharmaceutical companies, it was learned that the fulfillment of social responsibility by listed pharmaceutical companies mainly includes five aspects: social responsibility, environmental responsibility, employee responsibility, shareholder responsibility, supplier and consumer responsibility.

Specifically, when talking about enterprises' fulfillment of CSR, all interviewees mentioned the aspect of social responsibility, saying that enterprises should provide charitable assistance to public welfare causes within their means, and that they should pay taxes in accordance with the law, take up the responsibilities and obligations stipulated by the government, and actively promote the harmonious development of the community. On environmental responsibility, the interviewees all said that enterprises should pay attention to environmental protection, adopt appropriate environmental protection measures, and reduce pollution to the environment and consumption of natural resources. On employee responsibility, 4 respondents said that companies should pay attention to the rights and interests of employees, provide appropriate training and a safe working environment, and let employees feel cared for by the organization.

Table 4.3 Selective coding formed relational structures

Structural relations	Relationship connotations	Statements
Corporate social responsibility → Corporate performance	The fulfillment of corporate social responsibility has a positive impact on corporate performance.	Only with people-oriented, we can make the staff and the enterprise grow together; only with good quality products, we can occupy the market forever; only with responsible and moral, we can get greater benefits. (2-2) Apply the intangible resource of social responsibility to products and services, assume social responsibility by providing quality products and services, and then promote the growth of the enterprise and build up the competitive advantage of the enterprise. (1-2) Companies adhere to a strategy of responsible management, making it clear that responsibility is a benchmark for corporate value, with corporate social responsibility, value and future development in common, and that increased efficiency and social responsibility can be achieved at the same time. (5-1) An important indicator of corporate operations is to adhere to the "pursuit of sustainable development of talents and products", focus on CSR, through effective management of the impact of corporate operations on internal and external stakeholders, the rational allocation of resources, and the continuous creation of product and service value, in order to achieve the maximization of corporate profits. (4-2) Under the goal of "double carbon", we strengthen the management of fossil energy, promote the use of clean energy, increase the capital investment in energy-saving technological reform, and reduce energy loss through process improvement and innovation. (4-3) CSR, as a non-market competitive strategy, can help enterprises gain recognition from the government, consumers and other stakeholders, which in turn can obtain more critical resources for R&D investment and improve technological innovation. (3-3) The fulfillment of social responsibility by enterprises will retain excellent employees and attract high-quality R&D personnel, which is beneficial to the innovative development of enterprises. (2-3)

Structural relations	Relationship connotations	Statements
Corporate social responsibility → Technological innovation → Corporate performance	Enterprises promote the development of innovation through the fulfillment of social responsibility, which in turn enhances the core competitiveness of enterprises and improves their performance.	In my opinion, CSR is an investment rather than a cost, bringing benefits to the company while reducing its hidden costs, helping the company to attract excellent employees to join it, and favoring technological innovation and business growth. (1-2) Social responsibility behavior promotes our technical innovation, optimizes the efficiency of enterprise factor allocation by improving the production process, reduces production costs, and obtains green patent licenses, which improves economic performance. (4-3) When technological innovation investment is recognized by the internal staff of the enterprise, technological innovation investment can bring higher efficiency to the enterprise, and then improve the financial performance of the enterprise. (5-3) Our company has clearly defined the path of advancement in R&D and innovation, accelerating product acquisition through self-research overlaid on external M&A, and dual-pronged approach to meet the public's demand for excellent products and to build a core driving force for business growth. (3-3)
Corporate social responsibility → Technological innovation → Corporate performance (moderated by media coverage)	Media coverage affects the direct effect of CSR on corporate performance and the mediating effect of technological innovation.	We will actively go to charity because it will form reputation, which is the value of the intangible assets of the enterprise, and also enhances the enterprise's ability to resist risks, corporate reputation is the core of corporate value creation. (1-4) Media coverage of green technology innovation can increase the attention of green investors and environmental consumers to the company, which not only reduces the pressure of corporate innovation financing, but also broadens the market for green products, which is beneficial to the long-term development of the company. (3-4) Sometimes pressured by media supervision, we tend to avoid violations of the law and improve the level of corporate governance, and subsequently the better the performance of the company. (4-4)

Structural relations	Relationship connotations	Statements
		Keeping honest cooperation with the media, we continuously improve our brand influence, spread our corporate image of responsible enterprise, and help our enterprise to obtain positive evaluation and high recognition from the government and the public, so as to create a sustainable competitive advantage for our enterprise. (5-4)
Corporate social responsibility → Technological innovation → Corporate performance ((moderated by organizational slack)	Organizational slack affects the direct effect of CSR on corporate performance and the mediating effect of technological innovation.	Enterprises can use these idle resources to fulfill their social responsibility, deeply improve the balanced relationship between social responsibility and high cost of innovative behavior, rationally arrange the use of these resources to reduce the cost of innovative behavior, enhance the enterprise's economic performance, and achieve sustainable development of the enterprise. (5-5) When the enterprise has enough financial resources at its disposal , it can invest in CSR as an intangible resource to balance the interests of stakeholders and generate more obvious competitive advantages. (1-5) Idle resources can provide financial support for R&D expenditures and can also provide a cushion when the business is not doing well, which has an impact on the innovative activities and performance of the company. (2-5)

On shareholder responsibility, 4 respondents indicated that companies should emphasize shareholders' rights and interests, disclose corporate information in a timely and accurate manner, and ensure long-term and stable investment returns for shareholders. On supplier and consumer responsibility, 4 respondents said that companies should take responsibility for the quality of the products and services they provide, and 3 respondents said that companies should practice "responsible marketing" and "responsible purchasing".

4.1.4.2 Analyze the relationship between the fulfillment of CSR by enterprises and corporate performance

Of the five interviewees interviewed, all agreed that CSR fulfillment would have a positive impact on corporate performance. Through sorting and summarizing the interviews, we learned that the reasons mainly include: (1) the company that actively undertakes social responsibility is more likely to obtain the recognition of stakeholders, and through effective management of the impact of corporate operations on internal and external stakeholders, rationally allocate resources and maximize corporate profits; (2) the intangible assets formed through the fulfillment of social responsibility by the enterprise create sustainable comparative advantages for the enterprise and enhance the competitiveness of the industry; (3) actively fulfilling social responsibility and adhering to the people-oriented approach can improve the efficiency of employees, attract high-quality talents, and enhance corporate performance; (4) actively undertaking social responsibility, capturing the market with high-quality products and services, and building the core competitiveness of the enterprise.

However, three of the interviewees also indicated that fulfilling social responsibility would increase the operating cost of the enterprise.

4.1.4.3 Analyze the relationship between CSR and technological innovation, and between technological innovation and corporate performance

The relationship between CSR and technological innovation, all the interviewees believe that the fulfillment of CSR by enterprises positively influences the technological innovation of enterprises. The main reasons are as follows: (1) enterprises fulfill their environmental responsibility, actively carry out green innovation, reduce energy loss through process

improvement and innovation, and implement sustainable development strategies; (2) in the process of fulfilling their social responsibility, they put forward high standards and requirements for the company's products, production processes, and marketing methods, and they need to take the initiative to increase R&D investment in response; (3) the fulfillment of CSR by enterprises facilitates the retaining excellent employees and attracting high-quality R&D personnel, which promotes the innovative development of enterprises.

The relationship between technological innovation and company performance, the interviewees all indicated that technological innovation positively affects corporate performance. The main reasons are as follows: (1) innovation is the first productive force for enterprise development, through which enterprise productivity can be improved, thus improving corporate performance; (2) enterprises can improve corporate performance by green innovation, improving energy utilization, reducing pollution emissions, and realizing the growth of enterprise product sales; (3) increase in product sales and operating income through research and development activities such as process improvement and product innovation to improve the quality of product sales or services while obtaining positive evaluations from stakeholders.

4.1.4.4 Analyze the moderating role of media coverage

When the respondents were asked whether media coverage can affect the fulfillment of social responsibility and corporate reputation of enterprises, three respondents answered in the affirmative, while the other two respondents believed that it can affect corporate reputation but not necessarily affect the fulfillment of social responsibility of enterprises. For example, the third respondent thought that "media coverage is good for increasing our company's popularity and brand image, enhancing consumer recognition of us, attracting more consumers, and expanding product sales, but it does not have much impact on whether the company will go for social responsibility"; the first respondent thought that " whether the media report or not will not affect the enterprise to undertake social responsibility, we actively fulfill social responsibility, and not to attract media attention".

All respondents agreed that media coverage affects corporate innovation and performance.

The main reasons are as follows: (1) media coverage affects corporate image and reputation, which in turn affects stakeholders' attention to the enterprise, and has an impact on corporate financing, product sales and stock prices, ultimately affecting corporate innovation and performance improvement; (2) the role of media monitoring and governance, direct monitoring by the media, and the monitoring effect of the attention of investors and the general public caused by media news reports, which contributes to the improvement of corporate governance level and the creation of a friendly external environment for corporate competition and innovation.

4.1.4.5 Analyze the moderating role of organizational slack

The five interviewees were inconsistent in their views on whether slack resources would be used to fulfill CSR and the impact of slack resources on corporate innovation and performance. Two respondents indicated that they would use slack resources to fulfill CSR because they believe that they can invest in social responsibility as an intangible asset, which can send a signal to the outside world that the company is well-funded and well-managed, and is conducive to innovation and performance. The other three respondents did not give a definite answer as to whether they would utilize slack resources to fulfill their social responsibility. While they believe that slack resources have a buffer function, when the enterprise's operation is affected by internal and external environmental impacts, slack resources can provide a buffer and provide financial support for the enterprise to carry out innovative activities and improve economic performance.

4.1.5 Interview study summary

Interviews with middle managers of listed pharmaceutical companies helped the researcher to clarify the relationship between the concepts and laid the foundation for the next quantitative analysis. The semi-structured interviews preliminarily led to the following conclusions: (1) CSR has a positive impact on corporate performance, but there is also the possibility of a negative impact; (2) technological innovation plays a positive role in promoting

the relationship between CSR and corporate performance; (3) media coverage has a direct or indirect effect on the relationship of CSR-technological innovation-firm performance, and negative and positive media coverage have different effects; (4) organizational slack has a direct or indirect effect on the relationship of CSR-technological innovation-firm performance.

4.2 Quantitative Analysis

4.2.1 Descriptive statistical analysis

This research has chosen Chinese pharmaceutical companies listed in Shanghai and Shenzhen A-shares from 2010 to 2020 as the research sample. After screening and selecting 128 companies, stata17 software is used to statistically analyze the research data. This research uses unbalanced panel data, which both each company does not have all the observations at the same time, the details are shown in Table 4.4.

Table 4.4 The distribution of sample firms by year

Year	Frequency	Percentage（%）
2010	106	7.75%
2011	121	8.85%
2012	125	9.14%
2013	125	9.14%
2014	125	9.14%
2015	125	9.14%
2016	128	9.36%
2017	128	9.36%
2018	128	9.36%
2019	128	9.36%
2020	128	9.36%
Total	1367	100.00%

Table 4.5 reports the descriptive statistics of the variables. ROA, a measure of corporate financial performance, has an average at 0.070 with a standard deviation at 0.066, the maximum

is 0.252 and the minimum is -0.139. This indicates that the financial performance of the sample firms fluctuates and that the overall level of profitability needs to be improved. CSR is averaged at 0.274 with a standard deviation at 0.157, the maximum is 0.762 and the minimum is -0.032. This shows that there is a great difference in the fulfillment of social responsibility of the sample enterprises. The average value of technological innovation (Inn), which measures the technological innovation of enterprises, is 2.238, and the standard deviation is 3.151, with the maximum at 17.212 and the minimum at -3.715. This indicates that the level of innovation of the sample enterprises varies widely.

Table 4.5 Descriptive statistics of sample firms

Variables	N	Unit	Mean	SD	Min.	Max.
ROA	1,367	%	0.070	0.066	-0.139	0.252
CSR	1,367	score	0.274	0.157	-0.032	0.762
Inn	1,367	%	2.238	3.151	-3.715	17.212
Med1	1,367	ln	3.039	1.183	0	6.324
Med2	1,367	ln	2.311	1.168	0	5.521
AS	1,367	%	0.339	0.165	0.080	0.785
US	1,367	%	3.930	4.988	0.654	32.022
Age	1,367	ln	2.802	0.353	1.609	3.367
Size	1,367	ln	22.003	0.923	19.979	24.288
Lev	1,367	%	0.319	0.182	0.030	0.817
CFO	1,367	%	0.063	0.061	-0.112	0.230
Growth	1,367	%	0.155	0.272	-0.425	1.507
Intan	1,367	%	0.051	0.036	0.003	0.200
Staff	1,367	ln	7.759	0.980	5.659	9.942
Top10	1,367	shareholding	0.563	0.154	0.207	0.907
SOE	1,367	-	0.292	0.455	0	1

Positive media coverage (Med1) has the maximum at 6.324 and the minimum at 0, with an average at 3.039 and a standard deviation at 1.183; negative media coverage (Med2) has the maximum at 5.521 and the minimum at 0, with an average at 2.311 and a standard deviation at 1.168. This can reflect that there is a significant difference in the news media's coverage of listed Chinese pharmaceutical companies. Absorbed slack (AS) has the maximum at 0.785 and the minimum at 0.08, with an average at 0.339 and a standard deviation at 0.165; unabsorbed

slack (US) has the maximum at 32.022 and the minimum at 0.654, with an average at 3.93 and a standard deviation at 4.988. This suggests that there are also large differences in the degree of organizational slack of listed pharmaceutical companies in China, in which the differences in unabsorbed slack are more significant. This means that some enterprises have sufficient organizational slack, and making full use of these resources is conducive to better corporate financial performance in the future.

Among the control variables, the average gearing ratio (Lev) is 0.319, the average cash flow ratio (CFO) is 0.063, the average sales growth rate (Growth) is 0.155, and the average intangibles ratio (Intan) is 0.051. The values are reasonable, and the overall even distribution satisfies the regression model.

4.2.2 Correlation analysis

Table 4.6 displays the Pearson's correlation coefficients and significance levels of the variables. Among them, the correlation coefficients of ROA with CSR and Inn are 0.486 ($p<0.01$) and 0.629 ($p<0.01$) respectively, which means that active fulfillment of social responsibility and active innovation of enterprises can contribute to improve the financial performance of enterprises, supporting H1 and H3. The correlation between Inn and CSR is 0.300 ($p<0.01$), which indicates that active fulfillment of social responsibility contributes to the innovative development of enterprises, supporting H2. In terms of control variables, largely there is a significant correlation at the 1% level between each control variable and the independent or dependent variable, indicating that the sample selection and model setting are reasonable.

In addition, the absolute values of the correlation coefficients of the variables are mostly less than 0.5, and the overall variance inflation factor (VIF) of the variables is no more than 2, which indicates that there is no serious multicollinearity problem among the variables, as shown in Table 4.7 and Table 4.8.

Table 4.6 Correlation matrix

	ROA	CSR	Inn	Med1	Med2	AS	US	Age
ROA	1							
CSR	0.486***	1						
Inn	0.629***	0.300***	1					
Med1	0.220***	0.311***	0.127***	1				
Med2	0.201***	0.294***	0.141***	0.807***	1			
AS	-0.033	-0.116***	0.001	-0.108***	-0.135***	1		
US	0.263***	0.122***	0.311***	-0.072***	0.017	-0.02	1	
Age	-0.100***	-0.076***	0.015	0.073***	-0.057**	0.069**	-0.275***	1
Size	0.034	0.149***	0.023	0.506***	0.348***	-0.124***	-0.213***	0.429***
Lev	-0.433***	-0.202***	-0.339***	0.134***	0.117***	-0.209***	-0.593***	0.231***
CFO	0.542***	0.253***	0.285***	0.075***	0.043	0.027	0.113***	0.004
Growth	0.290***	0.118***	0.142***	0.107***	0.101***	-0.024	-0.022	-0.123***
Intan	-0.073***	-0.059**	-0.444***	-0.012	0.014	0.062**	-0.167***	-0.064**
Staff	0.056**	0.190***	-0.041	0.545***	0.429***	-0.081***	-0.345***	0.331***
Top10	0.300***	0.163***	0.147***	0.149***	0.141***	-0.009	0.298***	-0.296***
SOE	-0.044	0.121***	-0.046*	0.151***	0.157***	-0.229***	-0.166***	0.175***

	Size	Lev	CFO	Growth	Intan	Staff	Top10	SOE
Size	1							
Lev	0.267***	1						
CFO	0.034	-0.273***	1					
Growth	-0.024	-0.03	0.042	1				
Intan	-0.078***	0.091***	0.075***	-0.019	1			
Staff	0.788***	0.333***	0.104***	-0.032	0.065**	1		
Top10	0.073***	-0.289***	0.141***	0.144***	-0.016	0.041	1	
SOE	0.160***	0.220***	-0.011	-0.092***	0.049*	0.287***	-0.067**	1

Note: *** p<0.01, ** p<0.05, * p<0.1.

Table 4.7 Variance Inflation Factor (VIF) test for ROA

Variable	VIF	1/VIF
CSR	1.34	0.746
Inn	1.71	0.585
Med1	3.58	0.279
Med2	3.18	0.315
AS	1.20	0.834
US	1.88	0.531
Age	1.60	0.624
Size	3.42	0.293
Lev	2.07	0.483
Growth	1.09	0.913
CFO	1.27	0.785
Staff	3.63	0.275
Intan	1.38	0.722
Top10	1.33	0.753
SOE	1.23	0.811
Mean VIF	2.00	

Table 4.8 Variance Inflation Factor (VIF) test for Inn

Variable	VIF	1/VIF
CSR	1.31	0.766
Med1	3.58	0.279
Med2	3.15	0.318
AS	1.20	0.834
US	1.86	0.537
Age	1.58	0.634
Size	3.41	0.293
Lev	2.03	0.493
Growth	1.08	0.929
CFO	1.20	0.836
Staff	3.63	0.275
Intan	1.09	0.914
Top10	1.33	0.753
SOE	1.23	0.811
Mean VIF	1.98	

4.2.3 Regression of mediation effects

In this research, regressions are conducted using a two-way fixed effects model with panel data, and cluster robust standard errors are used to avoid the possible effects of heteroskedasticity and autocorrelation. Table 4.9 displays the regression results of the mediating effect of technological innovation on CSR and CFP.

Table 4.9 Results of regression analysis of mediation effects

VARIABLES	(1) ROA	(2) Inn	(3) ROA
CSR	0.1056***	2.3055***	0.0815***
	(6.36)	(2.96)	(6.33)
Inn			0.0104***
			(8.82)
Age	-0.0369	-0.5990	-0.0306
	(-1.16)	(-0.35)	(-1.10)
Size	-0.0002	0.4118	-0.0045
	(-0.04)	(1.21)	(-0.75)
Lev	-0.0864***	-3.9727***	-0.0449***
	(-4.23)	(-4.26)	(-2.75)
CFO	0.2681***	9.3520***	0.1706***
	(6.97)	(4.30)	(5.91)
Growth	0.0490***	1.1824***	0.0367***
	(8.86)	(4.31)	(9.02)
Intan	-0.1146*	-35.2745***	0.2533***
	(-1.82)	(-6.93)	(5.06)
Staff	-0.0004	-0.6302	0.0062
	(-0.05)	(-1.59)	(1.03)
Top10	0.0498*	-1.1964	0.0623**
	(1.80)	(-0.71)	(2.48)
SOE	-0.0085	0.4273	-0.0130
	(-0.74)	(0.71)	(-1.47)
Constant	0.1323	2.3724	0.1075
	(0.99)	(0.27)	(0.87)
Observations	1,367	1,367	1,367
Company FE	YES	YES	YES
Year FE	YES	YES	YES
R-squared	0.408	0.287	0.601
F	24.55***	7.484***	46.19***

Note: Robust t-statistics in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

In Table 4.9, column (1) is the regression result of CSR on CFP, CSR coefficient is 0.1056

($p<0.01$), which indicates that there is a significant positive correlation between CSR and CFP, and the fulfillment of CSR by corporate can increase the financial performance of corporate, thus H1 is supported. Column (2) shows the regression results of CSR on technological innovation, CSR coefficient is 2.3055 ($p<0.01$), which indicates that corporate fulfillment of social responsibility can promote the enhancement of corporate technological innovation, H2 is proved. Results of regression in column (3) show that both CSR ($\beta=0.0815, p<0.01$) and Inn ($\beta=0.0104, p<0.01$) significantly and positively affect CFP. Further comparing columns (1) and (3), it can be seen that the significance level of CSR does not change after adding technological innovation, but the explanatory power of CSR on ROA decreases from 0.1056 to 0.0815, declining by 22.82%. According to the method of testing the mediation effect by Baron and Kenny (1986), it is clear that in this paper, in the promotion effect of pharmaceutical companies' fulfillment of social responsibility on corporate financial performance, technological innovation plays a partly mediating role in it, and H3 is verified.

4.2.4 Robustness tests for mediation effects

Robustness test is a method to ensure that the results of the study are true and reliable, this article focuses on the robustness test by replacing the dependent variable, using instrumental variables and Bootstrap method.

4.2.4.1 Alternative dependent variables

In this article, Tobin's Q (Shahbaz *et al.*, 2020; J. Yang & Basile, 2021) is used to replace ROA for robustness test and the regression results are shown in Table 4.10. The correlation coefficient of CSR in column (1) is 0.8229 ($p<0.05$), which verifies H1 as true. Column (2) has CSR and Inn correlation coefficients are 0.6225 ($p<0.1$) and 0.0869 ($p<0.01$), respectively. Combining columns (1) and (2), CSR's coefficient decreases from 0.8229 to 0.6225, which indicates that technological innovation plays a partially mediating role in the relationship between corporate fulfillment of social responsibility and CFP, and verifies H3 is true.

Table 4.10 Results of regression by replacing the dependent variable

VARIABLES	(1) Tobinq	(2) Tobinq
CSR	0.8229**	0.6225*
	(2.59)	(1.93)
Inn		0.0869***
		(2.80)
Age	1.6982**	1.7503***
	(2.59)	(2.77)
Size	-0.7815***	-0.8173***
	(-4.09)	(-4.24)
Lev	0.3820	0.7274
	(0.67)	(1.27)
CFO	2.4917***	1.6786*
	(2.62)	(1.88)
Growth	0.2829*	0.1801
	(1.97)	(1.32)
Intan	-0.2583	2.8086*
	(-0.17)	(1.82)
Staff	0.2129	0.2677
	(1.18)	(1.62)
Top10	-0.0059	-0.0048
	(-0.79)	(-0.68)
SOE	-0.0288	-0.0660
	(-0.12)	(-0.29)
Constant	13.7737***	13.5674***
	(3.66)	(3.65)
Observations	1,367	1,367
Company FE	YES	YES
Year FE	YES	YES
R-squared	0.270	0.295
F	15.20***	17.83***

Note: Robust t-statistics in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

4.2.4.2 Instrumental variables (2SLS)

CSR has been proved to positively affect CFP in the previous paper, while Vani Tanggamani (2018) suggested that there is a virtuous loop between CSR and CFP, in which CSR promotes the improvement of CFP meanwhile CFP also provides more financial resources for the fulfillment of CSR, thus the causal relationship between the two needs more identification. To solve the possible reverse causality between the two, this article chooses instrumental variables with two-stage least square method (2SLS) for robustness test. In this article, using the product of the average of the total CSR scores of other corporate in the

province where the corporate is located in the current year and 0.01 (vi_CSR) and one period lagged CSR as the instrumental variables of CSR. The regression using the xtivreg2 command and the results are shown in Table 4.11.

Table 4.11 Results of 2SLS regression

	(1)	(2)
VARIABLES	ROA	ROA
CSR	0.0831***	0.0719***
	(0.027)	(0.022)
Inn		0.0108***
		(0.001)
Age	-0.0312	-0.0273
	(0.024)	(0.020)
Size	0.0053	-0.0007
	(0.007)	(0.005)
Lev	-0.0893***	-0.0409***
	(0.016)	(0.013)
CFO	0.2531***	0.1650***
	(0.032)	(0.026)
Growth	0.0494***	0.0371***
	(0.006)	(0.005)
Intan	-0.1148**	0.2621***
	(0.052)	(0.045)
Staff	-0.0039	0.0035
	(0.007)	(0.005)
Top10	0.0002	0.0004**
	(0.000)	(0.000)
SOE	-0.0142*	-0.0166***
	(0.008)	(0.006)
Observations	1,239	1,239
Company	Control	Control
Year	Control	Control
R-squared	0.382	0.593
Underidentification test-LM	85.43***	82.39***
Weak identification test-Wald-F	61.12	58.91
Hansen J statistic - P-value	0.968	0.330

Note: Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

From the results, in the test of instrumental variables, LM statistics are 85.43 (p<0.01) and 82.39 (p<0.01), respectively, which rejects the original hypothesis of "unrecognizable", indicating that the instrumental variables are related to the endogenous variable CSR; Wald-F statistics are 61.12 and 58.91, which are greater than all critical values, indicating that the choice

of instrumental variables is reasonable; Hansen-J statistic p-values are 0.968 and 0.330 respectively, both greater than 0.1, which accepts the original hypothesis of " over-identification", indicating that the instrumental variables are exogenous.

In Table 4.11, CSR's coefficients are 0.0831 ($p<0.01$) and 0.0719 ($p<0.01$) respectively; Inn's coefficient is 0.0108 ($p<0.01$). The regression results above indicate that under the use of instrumental variable test, the relationship between CSR and CFP still shows a significant positivity, and the fulfillment of CSR by corporate contributes to the improvement of financial performance, at the same time, technological innovation plays a mediating role between the two. The conclusion is consistent with the previous regression results, indicating that the findings remain unchanged after controlling for endogeneity issues.

4.2.4.3 Mediated effects test

The previous study used the causal step approach to test the mediating effect of technological innovation, but the method has the limitation of low total confidence, so this section uses the Bootstrap method to test the mediating effect of technological innovation. The Bootstrap method is not only able to test the coefficients α_1 and β_1 sequentially, but also able to test the coefficients γ_3 product directly, which can improve the effectiveness of the test. This study draws on Hayes' (2013) analysis and application of the principles of the Bootstrap method, adopts the bias-corrected Bootstrap method, and uses Stata software to conduct Process regression, and the test results as shown in Table 4.12.

In Table 4.12, ROA is used as the dependent variable, Inn as the mediator variable, and CSR as the independent variable. Under the 95% confidence interval, direct effect (CSR→ROA) test result does not include 0 (BootLLIC=0.0665, BootULIC=0.1003), indicating that the direct effect is significant, and the direct effect is 0.0815; mediation effect (CSR→Inn→ROA) does not include 0 (BootLLIC=0.0126, BootULIC=0.0384), indicating that the mediation effect of technological innovations is significant, and the mediation effect is 0.0240. When replacing the dependent variable with Tobin's Q, at 95% confidence interval, direct effect (CSR→Tobinq) test result does not contain 0 (BootLLIC=0.1202, BootULIC=1.1140), indicating that the direct

effect is significant; mediation effect (CSR→Inn→Tobinq) test result does not contain 0 (BootLLIC=0.0909, BootULIC=0.3929), indicating that the mediation effect of technological innovation is significant. It can be concluded that corporate technological innovation has a partial mediating effect in both the impact of CSR on financial performance, so H3 is verified again.

Table 4.12 Mediation effect test of Bootstrap analysis

Model	Effect	Observed coefficient	Bootstrap std. err.	BootLLIC	BootULIC
CSR→Inn→ROA	Mediation effect	0.0240	0.0062	0.0126	0.0384
	Direct effect	0.0815	0.0088	0.0665	0.1003
	Total effect	0.1056			
CSR→Inn→Tobinq	Mediation effect	0.2004	0.0695	0.0909	0.3929
	Direct effect	0.6225	0.2673	0.1202	1.1140
	Total effect	0.8229			

4.2.5 Regression of the moderating effect of media coverage

The previous section has explored the impact effects between CSR, technological innovation and CFP. To further explore the moderating role of media coverage on these impact effects, this section adds the CSR&Med and Inn&Med interaction terms to explore possible moderating effects of media coverage on the direct path through which CSR affects CFP, and the indirect path through which technological innovation acts. The interaction terms increase the covariance between explanatory variables, and this article reduces the covariance through variable centering (C. Robinson & Schumacker, 2009) to enhance the stability and reliability of the model.

The regression results are shown in Table 4.13. Columns (1) and (4) of the table verify the moderating effect of positive and negative media coverage on the CSR-CFP relationship, and the coefficients of the interaction terms c_Med1*c_CSR and c_Med2*c_CSR are -0.0340 ($p<0.01$) and -0.0292 ($p<0.05$), respectively. It indicates that the impact of CSR on financial

performance is reduced when there is an increase in the number of positive media coverage or negative media coverage. To verify H4a and H4b. In order to better understand the interaction term results, the study in this section plotted the moderating effects (Hayes & Scharkow, 2013). Figures 4.1 and 4.4 show a negative interaction with CSR for positive and negative media coverage, respectively, which means that with high CSR, a low amount of media coverage is more likely to contribute to CFP.

In Table 4.13, columns (2) and (5) verify the moderating effects of positive and negative media coverage on CSR and technological innovation, respectively. Interaction terms c_Med1*c_CSR and c_Med2*c_CSR have coefficients are -1.4425 ($p<0.05$) and -1.4034 ($p<0.01$), respectively. It indicates that the impact of CSR on technological innovation is weakened when the number of positive media coverage or negative media coverage increases. In addition, as shown in Figures 4.2 and 4.5, a higher number of positive or negative media coverage promotes the impact of CSR on technological innovation, while the promotion of CSR on technological innovation is weakened as the number of media coverage increases.

Column (3) verifies the co-moderating effect of positive media coverage on the before and after paths of the mediating effect of technological innovation, the interaction term c_Med1*c_CSR has a coefficient at -0.0223 ($p<0.05$), and the interaction term c_Med1*c_Inn is not significant. Combined with the regression results in column (2), the coefficient of the interaction term c_Med1*c_CSR ($\beta=-1.4425$, $p<0.05$) in column (2) and the coefficient of c_Inn ($\beta=0.0103$, $p<0.01$) in column (3) are both significant and not equal to 0, thus the front half of the path of the mediating effect is moderated; c_CSR ($\beta=3.0656$,$p<0.01$) is significantly non-zero in column (2), but the interaction term c_Med1*c_Inn is not significant in column (3), so back half of the path of the mediation effect is not moderated. In summary, the mediating effect of technological innovation is moderated by positive media coverage, but serves to weaken the mediating effect, supporting H5a.

Table 4.13 Results of regressions of media coverage moderating effects

	Positive media coverage			Negative media coverage		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	ROA	Inn	ROA	ROA	Inn	ROA
Age	-0.0397	-0.7322	-0.0334	-0.0348	-0.5070	-0.0312
	(-1.28)	(-0.44)	(-1.22)	(-1.10)	(-0.30)	(-1.11)
Size	-0.0045	0.1980	-0.0069	-0.0030	0.2501	-0.0058
	(-0.68)	(0.58)	(-1.14)	(-0.46)	(0.76)	(-0.97)
Lev	-0.0826***	-3.8085***	-0.0439***	-0.0828***	-3.8068***	-0.0438***
	(-4.03)	(-4.09)	(-2.66)	(-4.09)	(-4.13)	(-2.67)
CFO	0.2576***	8.8745***	0.1665***	0.2595***	8.8892***	0.1677***
	(6.70)	(4.05)	(5.79)	(6.64)	(4.08)	(5.76)
Growth	0.0485***	1.1519***	0.0366***	0.0488***	1.1712***	0.0366***
	(8.99)	(4.23)	(9.22)	(8.96)	(4.31)	(9.10)
Intan	-0.1151*	-35.2962***	0.2432***	-0.1153*	-35.2933***	0.2486***
	(-1.84)	(-7.00)	(4.90)	(-1.86)	(-7.04)	(5.01)
Staff	-0.0007	-0.6520*	0.0057	-0.0008	-0.6550*	0.0059
	(-0.10)	(-1.70)	(0.99)	(-0.11)	(-1.69)	(1.00)
Top10	0.0393	-1.6361	0.0554**	0.0432	-1.4799	0.0576**
	(1.47)	(-1.01)	(2.34)	(1.60)	(-0.89)	(2.39)
SOE	-0.0089	0.4081	-0.0124	-0.0095	0.3769	-0.0129
	(-0.79)	(0.71)	(-1.42)	(-0.82)	(0.64)	(-1.46)
Constant	0.2703**	8.4653	0.2210*	0.2219*	6.6099	0.1879
	(2.03)	(0.97)	(1.81)	(1.68)	(0.78)	(1.56)

	Positive media coverage			Negative media coverage		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	ROA	Inn	ROA	ROA	Inn	ROA
c_CSR	0.1236***	3.0656***	0.0943***	0.1239***	3.2050***	0.0926***
	(6.12)	(3.62)	(5.60)	(6.05)	(3.98)	(5.42)
c_Inn			0.0103***			0.0103***
			(9.30)			(8.99)
c_Med1	0.0039	0.2485	0.0011			
	(1.61)	(1.64)	(0.57)			
c_Med1*c_CSR	-0.0340***	-1.4425**	-0.0223**			
	(-2.70)	(-2.52)	(-2.15)			
c_Med1*c_Inn			0.0007			
			(0.78)			
c_Med2				0.0013	0.1393	-0.0003
				(0.71)	(1.18)	(-0.20)
c_Med2*c_CSR				-0.0292**	-1.4034***	-0.0173
				(-2.45)	(-2.95)	(-1.61)
c_Med2*c_Inn						0.0005
						(0.66)
Observations	1,367	1,367	1,367	1,367	1,367	1,367
Company FE	YES	YES	YES	YES	YES	YES
Year FE	YES	YES	YES	YES	YES	YES
R-squared	0.424	0.301	0.607	0.418	0.299	0.604
F	24.44***	8.264***	43.09***	23.94***	8.293***	43.28***

Note: Robust t-statistics in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

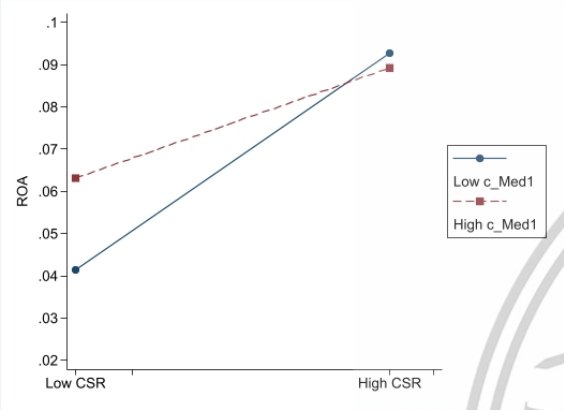

Figure 4.1 The interaction of positive media coverage and CSR on CFP

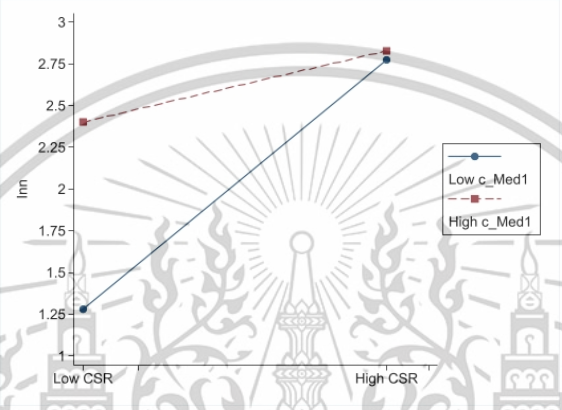

Figure 4.2 The interaction of positive media coverage and CSR on innovation

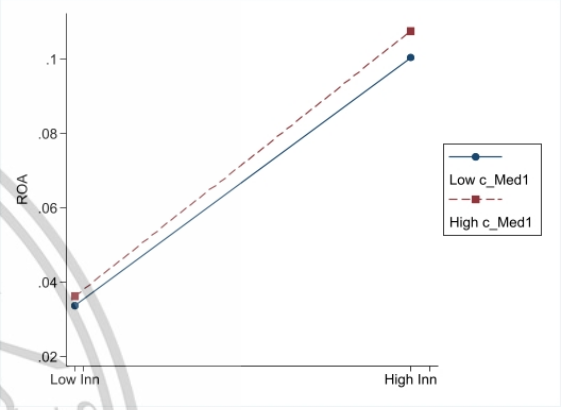

Figure 4.3 The interaction of positive media coverage and innovation on CFP

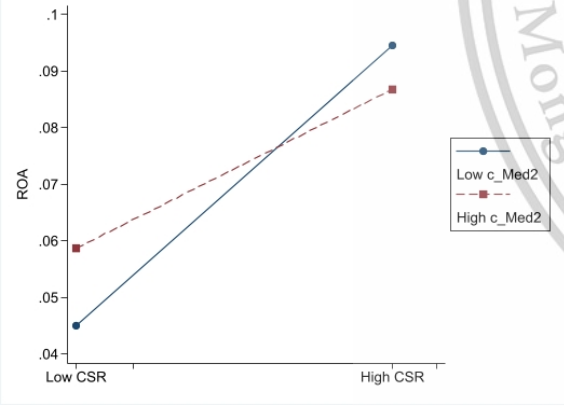

Figure 4.4 The interaction of negative media coverage and CSR on CFP

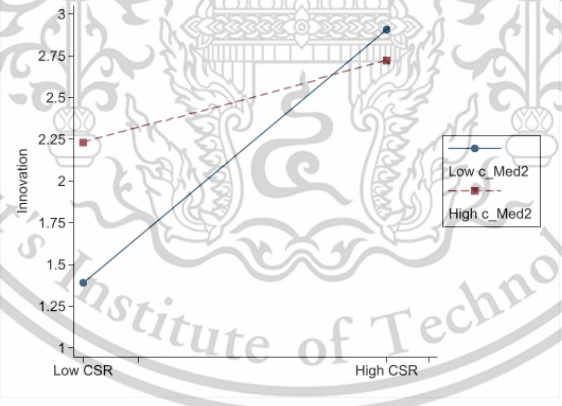

Figure 4.5 The interaction of negative media coverage and CSR on innovation

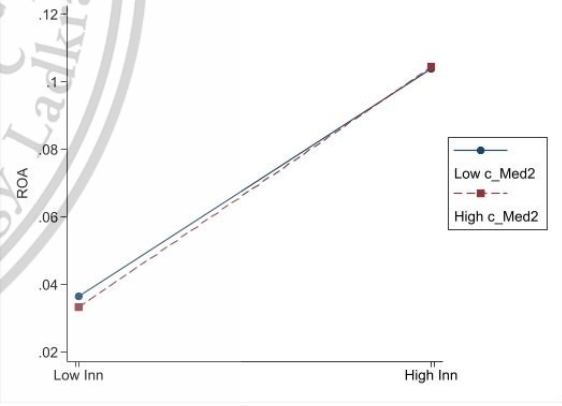

Figure 4.6 The interaction of negative media coverage and innovation on CFP

Column (6) verifies the co-moderating effect of negative media coverage on the front and back paths of the mediating effect of technological innovation, which is not significant for c_Med2, the interaction term c_Med2*c_CSR and c_Med2*c_Inn. Combining the regression results in column (5) shows that the coefficients of the interaction term c_Med2*c_CSR (β=-1.4034, p<0.01) in column (5) and c_Inn (β=0.0103, p<0.01) in column (6) are significantly and non-zero, so the front half of the path of mediation effect is moderated; and c_CSR (β=3.2050, p< 0.01) in column (5) is significantly non-zero, but the interaction term c_Med2*c_Inn in column (6) is not significant, so the back half of the path of the mediation effect is not moderated. In summary, the mediating effect of technological innovation is moderated by negative media coverage, but serves to weaken the mediating effect, validating H5b.

Additionally, as Figures 4.3 and 4.6 show, the positive impact of technological innovation on financial performance remains essentially the same regardless of positive or negative coverage or the amount of media coverage. This shows that positive or negative media coverage has no impact on the back half of the path of the mediating effect of technological innovation.

4.2.6 Robustness test for the moderating effect of media coverage

4.2.6.1 Alternative dependent variables

In this article, operating profit ratio (Arbogast & Agrawal, 2019; X. Yu, 2022) is used as a substitute for ROA in robustness test and the results are shown in Table 4.14. From the regression results, it can be seen that the interaction terms c_Med1*c_CSR in column (1) and c_Med2*c_CSR in column (3) have correlation coefficients at -0.1202 (p<0.01) and -0.1106 (p<0.01), respectively, which support H4a and H4b. Interaction term c_Med1*c_CSR in column (2) has coefficient at -0.0884 (p<0.01), and c_Med1*c_Inn is insignificant, which supports H5a. Interaction term c_Med2*c_CSR in column (4) has coefficient at -0.0753 (p<0.05), and c_Med2*c_Inn is insignificant, moderating the mediation effect in the front half, which is consistent with the previous results and verify the H5b holds.

Table 4.14 Results of regression by replacing the dependent variable

	Positive media coverage		Negative media coverage	
	(1)	(2)	(3)	(4)
VARIABLES	Profit	Profit	Profit	Profit
Age	-0.0746	-0.0585	-0.0580	-0.0440
	(-0.97)	(-0.84)	(-0.75)	(-0.63)
Size	0.0520**	0.0478**	0.0561***	0.0511**
	(2.56)	(2.49)	(2.71)	(2.59)
Lev	-0.3420***	-0.2595***	-0.3404***	-0.2572***
	(-6.12)	(-5.24)	(-6.22)	(-5.27)
CFO	0.4066***	0.2143***	0.4137***	0.2204***
	(5.00)	(2.72)	(4.97)	(2.79)
Growth	0.0893***	0.0644***	0.0885***	0.0632***
	(6.16)	(5.02)	(6.02)	(4.86)
Intan	-0.3227*	0.4427***	-0.3257*	0.4427***
	(-1.89)	(3.00)	(-1.93)	(3.04)
Staff	-0.0421***	-0.0279*	-0.0430***	-0.0285*
	(-2.81)	(-1.90)	(-2.81)	(-1.91)
Top10	0.0397	0.0752	0.0484	0.0824
	(0.61)	(1.20)	(0.76)	(1.33)
SOE	-0.0191	-0.0281	-0.0213	-0.0304
	(-0.63)	(-1.19)	(-0.69)	(-1.27)
Constant	-0.3986	-0.5365	-0.5263	-0.6417
	(-0.98)	(-1.42)	(-1.25)	(-1.64)
c_CSR	0.3194***	0.2525***	0.3214***	0.2484***
	(5.44)	(5.00)	(5.33)	(4.85)
c_Inn		0.0217***		0.0218***
		(7.00)		(6.79)
c_Med1	0.0008	-0.0046		
	(0.16)	(-0.94)		
c_Med1*c_CSR	-0.1202***	-0.0884***		
	(-3.35)	(-2.97)		
c_Med1*c_Inn		-0.0001		
		(-0.06)		
c_Med2			-0.0063	-0.0091*
			(-1.25)	(-1.92)
c_Med2*c_CSR			-0.1106***	-0.0753**
			(-3.24)	(-2.50)
c_Med2*c_Inn				-0.0009
				(-0.43)
Observations	1,367	1,367	1,367	1,367
Company FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
R-squared	0.368	0.494	0.366	0.494
F	10.47***	12.86***	11.70***	14.78***

Note: Robust t-statistics in parentheses; *** p<0.01, ** p<0.05, * p<0.1

4.2.6.2 Instrumental variables (SYS-GMM)

In order to solve the possible endogeneity problem in the model, this study adopts the SYS-GMM model, using one-period lagged dependent variables CFP and Inn as instrumental variables, and using xtabond2 to regress them, and the results are shown in Table 4.15. The table tests for serial correlation of instrumental variables by AR(1) and AR(2). If the instrumental variables are valid, the first order series should be correlated while the second order series should be uncorrelated, both the p-value of AR(1) should be less than 0.1, while at the same time the p-value of AR(2) should be more than 0.1. The results show that the instrumental variables pass the serial correlation test. In addition, the p-value of Hansen's test is greater than 0.1, then the instrumental variable passes the over-identification test.

The regression results in Table 4.15 show that c_Med1*c_CSR (β=-0.0355,$p<0.01$) in column (1) and c_Med1*c_CSR (β=-0.9969,$p<0.01$) in column (2)，suggesting that positive media coverage plays a negative moderating role in the paths of CSR-CFP and CSR-Inn. The c_Med2*c_CSR (β=-0.0319,$p<0.05$) in column (4) and c_Med2*c_CSR (β=-0.9251,$p<0.05$) in column (5) indicate that negative media coverage plays a negative moderating role in the paths of CSR-CFP and CSR-Inn. Neither c_Med1*c_Inn in column (3) nor c_Med2*c_Inn in column (6) is significant, indicating that neither positive nor negative media coverage plays a moderating role in the path of Inn-CFP. The above findings are consistent with those previously drawn, indicating robust conclusions.

Table 4.15 The results of the SYS-GMM regression of the moderation effect by media coverage

	Positive media coverage			Negative media coverage		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	ROA	Inn	ROA	ROA	Inn	ROA
Age	0.0119*	0.8414***	-0.0030	0.0117*	0.8701***	-0.0033
	(0.007)	(0.249)	(0.007)	(0.006)	(0.235)	(0.007)
Size	-0.0038	0.1653	-0.0015	-0.0033	0.1347	-0.0007
	(0.004)	(0.194)	(0.004)	(0.004)	(0.178)	(0.004)
Lev	-0.0623***	-2.2818***	-0.0283**	-0.0599***	-2.2092***	-0.0268**
	(0.013)	(0.586)	(0.012)	(0.013)	(0.572)	(0.012)
CFO	0.2242***	4.3598***	0.1557***	0.2211***	4.3790***	0.1556***
	(0.030)	(1.246)	(0.023)	(0.034)	(1.195)	(0.023)
Growth	0.0465***	0.5766	0.0391***	0.0480***	0.5874	0.0399***
	(0.007)	(0.386)	(0.005)	(0.007)	(0.356)	(0.005)
Intan	-0.0990*	-19.5114***	0.3209***	-0.0935*	-18.6868***	0.3241***
	(0.053)	(4.534)	(0.057)	(0.050)	(4.234)	(0.059)
Staff	0.0027	-0.2772	0.0030	0.0035	-0.2903	0.0037
	(0.004)	(0.188)	(0.004)	(0.004)	(0.183)	(0.003)
Top10	0.0128	-0.3058	0.0155	0.0132	-0.2766	0.0161
	(0.014)	(0.565)	(0.013)	(0.013)	(0.532)	(0.013)
SOE	-0.0019	0.1941	-0.0007	-0.0019	0.2051	-0.0007
	(0.004)	(0.171)	(0.004)	(0.004)	(0.177)	(0.004)
Constant	0.0637	-1.5127	0.0365	0.0435	-0.8188	0.0122
	(0.068)	(3.514)	(0.074)	(0.069)	(3.121)	(0.072)

	Positive media coverage			Negative media coverage		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	ROA	Inn	ROA	ROA	Inn	ROA
L.ROA/L.Inn	0.3437***	0.3807***	0.2296***	0.3632***	0.3923***	0.2399***
	(0.062)	(0.075)	(0.050)	(0.059)	(0.068)	(0.050)
c_CSR	0.0960***	3.1259***	0.0708***	0.0962***	3.1558***	0.0679***
	(0.023)	(0.792)	(0.021)	(0.024)	(0.788)	(0.020)
c_Inn			0.0114***			0.0116***
			(0.001)			(0.001)
c_Med1	0.0053***	0.1197	0.0025*			
	(0.002)	(0.086)	(0.001)			
c_Med1*c_CSR	-0.0355***	-0.9969***	-0.0221**			
	(0.011)	(0.374)	(0.010)			
c_Med1*c_Inn			-0.0000			
			(0.001)			
c_Med2				0.0037*	0.1966**	0.0007
				(0.002)	(0.086)	(0.002)
c_Med2*c_CSR				-0.0319**	-0.9251**	-0.0169
				(0.012)	(0.362)	(0.010)
c_Med2*c_Inn						-0.0003
						(0.001)
Observations	1,239	1,239	1,239	1,239	1,239	1,239
Company	Control	Control	Control	Control	Control	Control
Year	Control	Control	Control	Control	Control	Control

	Positive media coverage			Negative media coverage		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	ROA	Inn	ROA	ROA	Inn	ROA
AR(1)- P-value	0.000	0.001	0.000	0.000	0.000	0.000
AR(2)- P-value	0.145	0.355	0.383	0.138	0.364	0.369
Hansen test-P-value	0.202	0.388	0.251	0.608	0.446	0.299

Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

4.2.6.3 Moderated mediation effects test

In this section, Bootstrap method is used to test the moderating mediation effect in the model, and the conclusion is shown in Table 4.16 and Table 4.17. When the moderate variable Med1 is at the low and high different values, the mediating effect of technological innovation are 0.0369 (BootLLIC=0.0213, BootULIC=0.0532) and 0.0149 (BootLLIC=0.0048, BootULIC=0.0264), which suggests that with the increase in the number of positive media coverage, the mediating effect of technological innovation also gradually decreases. Moreover, the moderated mediation effect exerted by positive media reports is significant, with an effect value of 0.0278 (BootLLIC=0.0042, BootULIC=0.0591). The above results indicate that positive media coverage reverse moderates the mediating effect of technological innovation between CSR and CFP. Therefore, H5a is supported.

Table 4.16 The Conditional Indirect Effect of Bootstrap (Med)

Model	Moderator variable	Observed coefficient	Bootstrap std. err.	BootLLCI	BootULCI
CSR→Inn→ROA	Min Med1	0.0369	0.0086	0.0213	0.0532
	Mean Med1	0.0269	0.0059	0.0158	0.0392
	Max Med1	0.0149	0.0056	0.0048	0.0264
	Min Med2	0.0386	0.0096	0.0226	0.0600
	Mean Med2	0.0288	0.0064	0.0162	0.0419
	Max Med2	0.0174	0.0059	0.0072	0.0296

When the moderator variable Med2 is at the low and high different values, the mediating effect of technological innovation are 0.0386 (BootLLIC=0.0226, BootULIC=0.0600) and 0.0174 (BootLLIC=0.0072, BootULIC=0.0296), which suggests that as the number of negative media coverage increases, the mediating effect of technological innovation also gradually decreases. Moreover, the moderated mediation effect exerted by negative media coverage is significant, with an effect value of 0.0278 (BootLLIC=0.0042, BootULIC=0.0591). The above results indicate that negative media coverage reverse moderates the mediating effect of

technological innovation between CSR and CFP. Therefore, H5b is supported.

Table 4.17 Moderated Mediation effect test of Bootstrap (Med)

Model	Moderator variable	Observed coefficient	Bootstrap std. err.	BootLLCI	BootULCI
CSR→Inn→ROA	Med1	0.0278	0.0136	0.0042	0.0591
	Med2	0.0265	0.0132	0.0018	0.0540

4.2.7 Regression of the moderating effect of organizational slack

This section adds organizational slack to the model by adding the interaction terms CSR&OS and Inn&OS to explore the possible moderating effects of organizational slack on both the direct path through which CSR affects CFP and the indirect path through which technological innovation acts. This section similarly uses variable centrality to reduce covariance and enhance the stability and reliability of the model.

The results are shown in Table 4.18. The table columns (1) and (4) verify the moderating effect of unabsorbed slack and absorbed slack on the CSR-CFP relationship, respectively. The interaction term c_US*c_CSR (β=-0.0058, $p<0.01$) in column (1) indicates that when unabsorbed slack increases will weaken the facilitating effect of CSR on CFP. In column (4), interaction term c_AS*c_CSR (β=0.2639, $p<0.01$), indicating that the effect of CSR on CFP can be promoted when absorbed slack increases. H6a and H6b are supported. To better understand the moderating effect of organizational slack, the moderating effect is plotted as shown in Figure 4.7 and Figure 4.10. From Figure 4.7, it is clear that there is a negative interaction between US and CSR, which means that low US is more likely to contribute to CFP under higher CSR. From Figure 4.10, there is a positive interaction between AS and CSR, which means that high AS is more likely to promote CFP with higher CSR.

Table 4.18 Results of regressions of organizational slack moderating effects

	Unabsorbed slack			Absorbed slack		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	ROA	Inn	ROA	ROA	Inn	ROA
Age	-0.0380	-0.4436	-0.0286	-0.0270	-0.4186	-0.0221
	(-1.24)	(-0.26)	(-1.08)	(-0.88)	(-0.26)	(-0.84)
Size	-0.0012	0.3269	-0.0047	-0.0039	0.3303	-0.0073
	(-0.19)	(0.98)	(-0.79)	(-0.60)	(0.95)	(-1.25)
Lev	-0.0829***	-3.3045***	-0.0460***	-0.0749***	-3.6460***	-0.0387**
	(-4.02)	(-3.55)	(-2.71)	(-4.00)	(-4.05)	(-2.52)
CFO	0.2679***	9.3176***	0.1702***	0.2448***	8.7354***	0.1566***
	(6.93)	(4.26)	(5.97)	(6.45)	(4.07)	(5.40)
Growth	0.0484***	1.2292***	0.0357***	0.0435***	1.0275***	0.0333***
	(8.95)	(4.34)	(8.91)	(8.23)	(3.64)	(8.58)
Intan	-0.1082*	-34.3873***	0.2517***	-0.0940	-35.0138***	0.2549***
	(-1.72)	(-6.71)	(4.97)	(-1.36)	(-6.86)	(4.35)
Staff	-0.0001	-0.5715	0.0061	-0.0022	-0.6769	0.0044
	(-0.02)	(-1.43)	(0.99)	(-0.29)	(-1.63)	(0.71)
Top10	0.0488*	-1.2810	0.0643***	0.0573*	-1.0953	0.0680***
	(1.82)	(-0.77)	(2.79)	(1.94)	(-0.63)	(2.62)
SOE	-0.0098	0.4137	-0.0141*	-0.0090	0.4044	-0.0129*
	(-0.88)	(0.70)	(-1.72)	(-0.91)	(0.68)	(-1.71)
Constant	0.1829	3.7233	0.1528	0.2207	4.5264	0.1995
	(1.40)	(0.44)	(1.28)	(1.56)	(0.51)	(1.60)

	Unabsorbed slack			Absorbed slack		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	ROA	Inn	ROA	ROA	Inn	ROA
c_CSR	0.1066***	2.3473***	0.0808***	0.1070***	2.4530***	0.0833***
	(6.58)	(3.04)	(6.28)	(5.95)	(3.13)	(5.61)
c_Inn			0.0107***			0.0100***
			(8.06)			(8.94)
c_US	0.0002	0.0390	0.0000			
	(0.58)	(1.66)	(0.05)			
c_US*c_CSR	-0.0058***	-0.0894	-0.0045*			
	(-2.63)	(-0.54)	(-1.87)			
c_US*c_Inn			-0.0001			
			(-1.07)			
c_AS				-0.0840***	-1.6639	-0.0674***
				(-3.19)	(-1.29)	(-3.34)
c_AS*c_CSR				0.2639***	9.9835***	0.1740*
				(2.78)	(2.74)	(1.88)
c_AS*c_Inn						-0.0012
						(-0.20)
Observations	1,367	1,367	1,367	1,367	1,367	1,367
Company	Control	Control	Control	Control	Control	Control
Year	Control	Control	Control	Control	Control	Control
R-squared	0.413	0.289	0.607	0.448	0.300	0.622
F	23.33***	7.68***	43.92***	30.41***	8.87***	63.72***

Note: Robust t-statistics in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

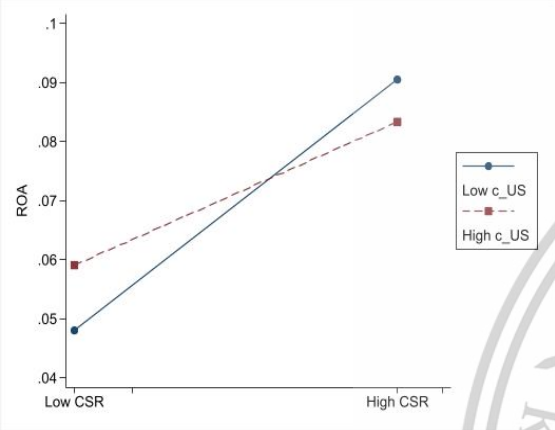

Figure 4.7 The interaction of unabsorbed slack and CSR on CFP

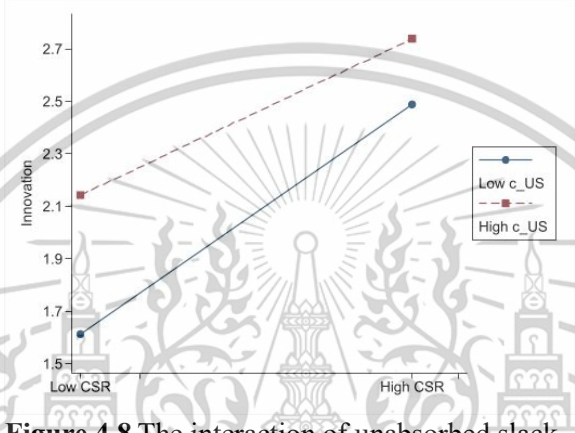

Figure 4.8 The interaction of unabsorbed slack and CSR on innovation

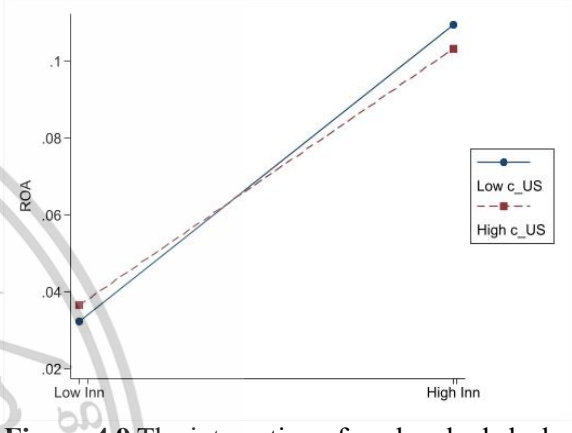

Figure 4.9 The interaction of unabsorbed slack and innovation on CFP

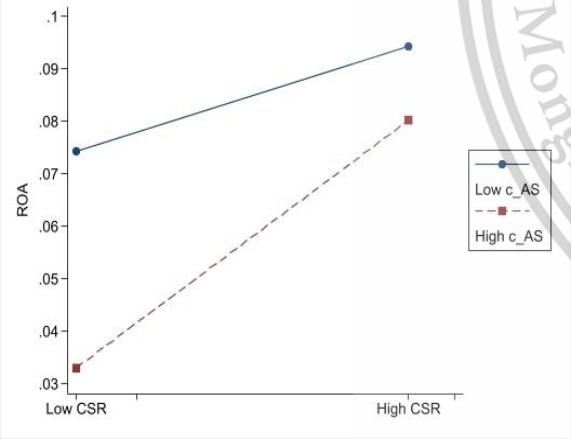

Figure 4.10 The interaction of absorbed slack and CSR on CFP

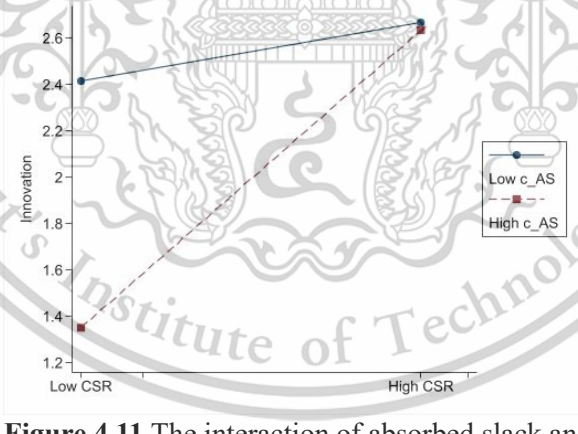

Figure 4.11 The interaction of absorbed slack and CSR on innovation

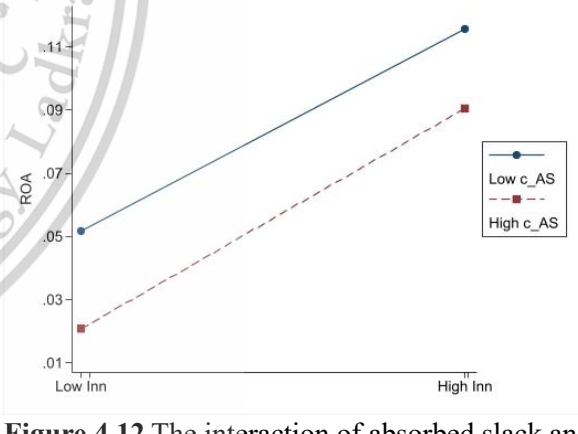

Figure 4.12 The interaction of absorbed slack and innovation on CFP

In Table 4.18, columns (2) and (5) verify the moderating effects of absorbed and unabsorbed slack on CSR and technological innovation, respectively. The interaction term c_US*c_CSR in column (2) is not significant, indicating that unabsorbed slack fails to play a moderating role in the effect of CSR on technological innovation. The interaction term c_AS*c_CSR (β=9.9835,p<0.01) in column (5), indicates that absorbed slack promotes the effect of CSR on technological innovation. In addition, Figure 4.8 and Figure 4.11 explain the moderating effect of unabsorbed slack and absorbed slack on the relationship between CSR and technological innovation further.

Columns (2)-(3) jointly validate the moderating effect of unabsorbed slack on front and back paths of the mediating effect of technological innovation. In particular, c_Inn (β=0.0107, p<0.01) is significant in column (3), while the interaction term c_US*c_CSR in column (2) is not significant, so the front half path of the mediation effect is not moderated. The interaction term c_US*c_Inn in column (3) is not significant and c_CSR (β=2.3473, p<0.01) in column (2) is significant, thus the back half path of the mediation effect is not moderated. In summary, the mediating effect of technological innovation is not moderated by unabsorbed slack, H7a is rejected.

Columns (5)-(6) jointly validate the moderation of absorbed slack on the front and back paths of the mediating effect of technological innovation. In particular, c_Inn (β=0.0100, p<0.01) in column (6) and the interaction term c_AS*c_CSR (β=9.9835, p<0.01) in column (5) are significant, so the front half path of the mediation effect is moderated. The interaction term c_AS*c_Inn in column (6) is not significant, and c_CSR (β=2.4530, p<0.01) in column (2) is significant, so the back half path of the mediation effect is not moderated. In summary, the mediating effect of technological innovation is moderated by absorbed slack and plays a role in promoting the mediating effect, supporting H7b.

Furthermore, as shown in Figures 4.11 and Figure 4.12, there is essentially no significant impact on the positive impact of technological innovation on financial performance, whether slack has been absorbed or not.

4.2.8 Robustness test for the moderating effect of organizational slack

4.2.8.1 Alternative dependent variables

As before, operating profit margin is used as a replacement for ROA for the robustness test and the results of the study are shown in Table 4.19. From the regression results, the interaction terms c_US*c_CSR (β=-0.0143, p<0.05) and c_AS*c_CSR (β=1.0922, p<0.01) in columns (1) and (3) are significant, supporting H6b and H6c. The interaction terms c_US*c_Inn and c_AS*c_Inn in columns (2) and (4) are both insignificant, and the back half of the mediation effect is not moderated, consistent with the previous regression results.

Table 4.19 Results of regression by replacing the dependent variable

	Unabsorbed slack		Absorbed slack	
	(1)	(2)	(3)	(4)
VARIABLES	Profit	Profit	Profit	Profit
Age	-0.0544	-0.0267	-0.0265	-0.0344
	(-0.71)	(-0.41)	(-0.36)	(-0.54)
Size	0.0537***	0.0463**	0.0472**	0.0431**
	(2.76)	(2.47)	(2.36)	(2.35)
Lev	-0.2925***	-0.2097***	-0.3073***	-0.2296***
	(-5.26)	(-4.17)	(-6.92)	(-5.50)
CFO	0.4362***	0.2273***	0.3442***	0.1898***
	(5.31)	(2.90)	(4.77)	(2.87)
Growth	0.0932***	0.0663***	0.0673***	0.0462***
	(5.98)	(4.83)	(5.01)	(3.91)
Intan	-0.2365	0.5312***	-0.2380	0.4808***
	(-1.50)	(3.70)	(-1.33)	(2.95)
Staff	-0.0370**	-0.0233	-0.0499***	-0.0338**
	(-2.34)	(-1.51)	(-2.79)	(-2.27)
Top10	0.0694	0.1060*	0.1080	0.1351**
	(1.11)	(1.80)	(1.61)	(2.12)
SOE	-0.0210	-0.0303	-0.0205	-0.0324*
	(-0.69)	(-1.32)	(-0.84)	(-1.85)
Constant	-0.5725	-0.6605*	-0.4168	-0.4997
	(-1.49)	(-1.83)	(-1.00)	(-1.34)
c_CSR	0.2598***	0.2027***	0.2614***	0.1962***
	(5.64)	(5.34)	(4.90)	(4.36)
c_Inn		0.0231***		0.0203***
		(6.92)		(6.56)
c_US	0.0036**	0.0036**		
	(2.27)	(2.53)		
c_US*c_CSR	-0.0143**	-0.0108*		
	(-2.03)	(-1.70)		

	Unabsorbed slack		Absorbed slack	
	(1)	(2)	(3)	(4)
VARIABLES	Profit	Profit	Profit	Profit
c_US*c_Inn		-0.0004		
		(-1.37)		
c_AS			-0.3403***	-0.3071***
			(-4.91)	(-4.96)
c_AS*c_CSR			1.0922***	0.6715**
			(3.28)	(2.28)
c_AS*c_Inn				0.0274
				(1.46)
Observations	1,367	1,367	1,367	1,367
Company FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES
R-squared	0.354	0.49	0.448	0.566
F	10.60***	13.72***	15.03***	18.02***

Note: Robust t-statistics in parentheses； *** p<0.01, ** p<0.05, * p<0.1

4.2.8.2 Instrumental variables (SYS-GMM)

In this section, the SYS-GMM model is also used, the lagged one-period dependent variables CFP and Inn are used as instrumental variables which are regressed using xtabond2 and the regression results are shown in Table 4.20. In the table, the p-values of AR(1) are all less than 0.1, meanwhile the p-values of AR(2) are all greater than 0.1, indicating that the instrumental variables pass the serial correlation test. In addition, the p-values of Hansen's test are all greater than 0.1, indicating that the instrumental variables pass the over-identification test.

From Table 4.20, c_US*c_CSR (β=-0.0035, p<0.1) is significant in column (1) and c_US*c_CSR is not significant in column (2), indicating that the unabsorbed slack plays a negative moderating role in the CSR-CFP pathway and not in the CSR-Inn pathway. The c_AS*c_CSR (β=0.2892, p<0.05) in column (4) and c_AS*c_CSR (β=9.2468, p<0.05) in column (5) indicate that absorbed slack plays a positive moderating role in the pathways of CSR-CFP and CSR-Inn. Neither c_US*c_Inn in column (3) nor c_AS*c_Inn in column (6) is significant, indicating that both absorbed slack and unabsorbed slack do not play a moderating role in the Inn-CFP pathway. The above conclusions are consistent with those drawn previously, suggesting that the conclusions are robust.

Table 4.20 The results of the SYS-GMM regression of the moderation effect by organizational slack

	Unabsorbed slack			Absorbed slack		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	ROA	Inn	ROA	ROA	Inn	ROA
Age	0.0119	0.8634***	0.0059	0.0113	0.9179***	-0.0003
	(0.007)	(0.226)	(0.007)	(0.007)	(0.261)	(0.007)
Size	-0.0014	0.1593	0.0018	-0.0012	0.1284	-0.0005
	(0.004)	(0.196)	(0.004)	(0.004)	(0.189)	(0.004)
Lev	-0.0633***	-1.9158***	-0.0548***	-0.0682***	-2.0773***	-0.0307**
	(0.015)	(0.656)	(0.013)	(0.014)	(0.580)	(0.012)
CFO	0.2538***	4.4952***	0.1829***	0.2383***	4.4071***	0.1565***
	(0.029)	(1.276)	(0.027)	(0.031)	(1.249)	(0.022)
Growth	0.0475***	0.6500*	0.0405***	0.0448***	0.7629**	0.0377***
	(0.007)	(0.382)	(0.005)	(0.008)	(0.351)	(0.006)
Intan	-0.0950*	-18.2860***	0.1637**	-0.0977*	-18.2629***	0.3272***
	(0.049)	(4.245)	(0.064)	(0.056)	(4.580)	(0.064)
Staff	0.0039	-0.1951	0.0031	0.0046	-0.1778	0.0035
	(0.004)	(0.194)	(0.003)	(0.004)	(0.216)	(0.004)
Top10	0.0183	-0.2124	0.0106	0.0251*	-0.1734	0.0207
	(0.013)	(0.531)	(0.013)	(0.015)	(0.546)	(0.014)
SOE	-0.0005	0.1684	0.0016	-0.0032	0.1818	-0.0021
	(0.004)	(0.177)	(0.004)	(0.004)	(0.177)	(0.004)
Constant	-0.0075	-2.4537	-0.0609	-0.0127	-2.0517	0.0001
	(0.061)	(3.337)	(0.062)	(0.072)	(3.181)	(0.070)

	Unabsorbed slack			Absorbed slack		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	ROA	Inn	ROA	ROA	Inn	ROA
L.ROA/L.Inn	0.3549***	0.4036***	0.3370***	0.3203***	0.4151***	0.2310***
	(0.063)	(0.068)	(0.064)	(0.065)	(0.059)	(0.050)
c_CSR	0.0691***	2.5423***	0.0169	0.0758***	2.8458***	0.0609***
	(0.014)	(0.661)	(0.012)	(0.021)	(0.848)	(0.018)
c_Inn			0.0072***			0.0114***
			(0.002)			(0.001)
c_US	-0.0001	0.0310	-0.0004			
	(0.001)	(0.028)	(0.001)			
c_US*c_CSR	-0.0035*	-0.1117	-0.0022			
	(0.002)	(0.077)	(0.002)			
c_US*c_Inn			-0.0002			
			(0.000)			
c_AS				-0.0087	0.3809	-0.0075
				(0.014)	(0.631)	(0.013)
c_AS*c_CSR				0.2892**	9.2468**	0.1809*
				(0.128)	(4.586)	(0.107)
c_AS*c_Inn						0.0036
						(0.007)
Observations	1,239	1,239	1,239	1,239	1,239	1,239
Company	Control	Control	Control	Control	Control	Control
Year	Control	Control	Control	Control	Control	Control

	Unabsorbed slack			Absorbed slack		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	ROA	Inn	ROA	ROA	Inn	ROA
AR(1)- P-value	0.000	0.001	0.000	0.000	0.001	0.000
AR(2)- P-value	0.158	0.397	0.109	0.296	0.456	0.558
Hansen test-P-value	0.633	0.388	0.359	0.145	0.225	0.264

Note: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1.

4.2.8.3 Moderated mediation effects test

In this section, the Bootstrap method is used to test the moderated mediation effect of the model and the results are shown in Table 4.21 and Table 4.22. When the moderating variable US is at the low and high different values, the mediating effect of technological innovation is 0.0234 (BootLLIC=0.0067, BootULIC=0.0387) and 0.0275 (BootLLIC=0.0130, BootULIC=0.0455), which suggests that as the unabsorbed slack increases, the technological innovation mediating effect tends to increase, but the change is not significant. The moderated mediation effect exerted by unabsorbed slack is significant with an effect value of 0.0246 (BootLLIC=0.0109, BootULIC=0.0379). The above results indicate that unabsorbed slack positively moderates the mediating effect of technological innovation between CSR and CFP. Therefore, H7a is valid.

Table 4.21 The Conditional Indirect Effect of Bootstrap (OS)

Model	Effect	Observed coefficient	Bootstrap std. err.	BootLLCI	BootULCI
CSR→Inn→ROA	Min US	0.0234	0.0082	0.0067	0.0387
	Mean US	0.0259	0.0058	0.0144	0.0364
	Max US	0.0275	0.0085	0.0130	0.0455
	Min AS	0.0137	0.0063	0.0026	0.0274
	Mean AS	0.0254	0.0058	0.0149	0.0379
	Max AS	0.0361	0.0086	0.0203	0.0534

When the moderator variable AS is at the low and high different values, the mediating effect of technological innovation is 0.0137 (BootLLIC=0.0026, BootULIC=0.0274) and 0.0361 (BootLLIC=0.0203, BootULIC=0.0534), which suggests that with the increase in absorbed slack, the technological innovation mediating effect of technological innovation increases gradually. The moderated mediation effect of absorbed slack is significant with an effect value of 0.0170 (BootLLIC=0.0022, BootULIC=0.0564). The above results indicate that absorbed slack positively moderates the mediating effect of technological innovation between

CSR and CFP. Thus, H7c is supported.

Table 4.22 Moderated Mediation effect test of Bootstrap (OS)

Model	Moderator variable	Observed coefficient	Bootstrap std. err.	BootLLCI	BootULCI
CSR→Inn→ROA	US	0.0246	0.0072	0.0109	0.0379
	AS	0.0170	0.0130	0.0022	0.0564

4.3 Summary of the chapter

This chapter studies the relationship between CSR and corporate financial performance using A-share listed pharmaceutical companies in China's Shanghai and Shenzhen markets as the research sample. Based on the literature review, this chapter firstly interviews the middle managers of pharmaceutical companies to lay the theoretical foundation for the subsequent empirical model. Second, empirical models are established based on the findings of the previous research to study the relationship between CSR, innovation and CFP, and analyze the impact of CSR on CFP and the mediating effect of innovation through the two fixed-effects model and the robustness test. Again, based on the results of the previous study, media coverage variables are added to the previous model to analyze the potential moderating role of media coverage between CSR, innovation and CFP. Finally, organizational slack variables are added to the mediation model to analyze the potential moderating role of organizational slack between CSR, innovation and CFP.

The study finds that: (1) CSR positively affects CFP; (2) CSR positively affects innovation; (3) innovation plays a partial mediating role in the relationship between CSR and CFP; (4) positive and negative media coverage plays a negative moderating role in the relationship between CSR and CFP; (5) positive and negative media coverage plays a negative moderating role in the relationship between CSR, innovation, and CFP; (6) unabsorbed slack plays a negative moderating role in the relationship between CSR and CFP, and absorbed slack plays

a positive moderating role in the relationship between CSR and CFP; (7) unabsorbed slack and absorbed slack play a positive moderating role in the relationship between CSR, innovation and CFP. The hypothesis test results are shown in Table 4.23.

Table 4.23 Results Summary

Hypothesis	Relationship	Result
H1	CSR (+)→CFP	Supported
H2	CSR (+) → Technological innovation	Supported
H3	CSR → Technological innovation(+)→ CFP	Supported
H4a	CSR →Positive media coverage×CSR(-)→ CFP	Supported
H4b	CSR →Negative media coverage×CSR(-)→ CFP	Supported
H5a	CSR →Positive media coverage×CSR(-)→ Technological innovation→ CFP	Supported
H5b	CSR →Negative media coverage×CSR(-)→ Technological innovation→ CFP	Supported
H6a	CSR →Unabsorbed slack ×CSR(-)→ CFP	Supported
H6b	CSR →Absorbed slack ×CSR(+)→ CFP	Supported
H7a	CSR →Unabsorbed slack ×CSR(+)→ Technological innovation→ CFP	Supported
H7b	CSR →Absorbed slack ×CSR(+)→ Technological innovation → CFP	Supported

Note: (+) indicates positive impacts; (-) indicates negative impacts.

CHAPTER 5

CONCLUSION AND DISCUSSION

5.1 Conclusion

This research focuses on the practical issues of social responsibility and financial performance of pharmaceutical enterprises, and establishes the research theme of the impact of corporate social responsibility on the financial performance of pharmaceutical enterprises based on the research results of related theories such as the RBV, the stakeholder theory, the signaling theory and the agency theory. On the basis of analyzing a large amount of literature and interview data, we constructed fixed-effects models with the research path of " CSR-corporate innovation-CFP", and used multiple regression, 2SLS, and SYS-GMM to conduct regression analysis. This article selects A-share pharmaceutical companies listed in China's Shanghai and Shenzhen stock markets from 2010 to 2020 as the research sample, and studies the relationship between CSR, innovation and CFP of pharmaceutical companies in depth. The following research conclusions are drawn after the research in the above chapters:

1. CSR is positively related to CFP, which means that active fulfillment of CSR by pharmaceutical companies enhances their financial performance. And this finding remains after the robustness test using the replacement measures of CFP and CSR.

2. Innovation plays a partial mediating role between CSR and CFP, which means that the fulfillment of social responsibility by pharmaceutical companies can indirectly enhance CFP by improving corporate innovation capability. The study obtains the same result by constructing a three-step mediation effect model and using the Bootstrap test.

3. Positive and negative media coverage negatively moderates the impact of CSR on CFP, which means that regardless of positive or negative media coverage, pharmaceutical companies with more media coverage will weaken the effect of CSR on CFP. In addition, the impact of media coverage on the mediating effect of corporate innovation is also considered, and the

moderating effect is examined using hierarchical regression methods and with the Bootstrap test. It was found that both positive and negative media reports negatively moderated the mediation path of “CSR-technological innovation-CFP”, and both moderated the front half of the mediation effect.

4. Unabsorbed slack plays a negative moderating role on the impact of CSR and CFP, which means that the more unabsorbed slack a pharmaceutical company has, the less significant the effect of CSR on the enhancement of financial performance is. Absorbed slack positively moderates the effect of CSR on CFP, which means that the more absorbed slack a pharmaceutical company has, the more significant the effect of CSR on financial performance is. In addition, the impact of organizational slack on the mediating effect of corporate innovation is further considered. First, the moderating effect of unabsorbed slack is tested using the hierarchical regression method and the Bootstrap test, but different conclusions are obtained. The hierarchical regression method found that unabsorbed slack did not moderate the mediation path of “CSR-technological innovation-CFP”. However, the Bootstrap test finds that unabsorbed slack has a positive moderating effect on the mediation path of “CSR-technological innovation-CFP”, although the effect is relatively small. Since the test power of sequential test is lower (MacKinnon *et al.*, 2002) , and the test power of Bootstrap method is higher (MacKinnon, 2012), this article concludes that unabsorbed slack positively moderates the mediating effect of corporate innovation. Secondly, the moderating effect of absorbed slack was tested, and the two tests reached the same conclusion that absorbed slack positively moderates the mediation path of "CSR-technological innovation-CFP". It shows that the more absorbed slack a company has, the more it can promote the improvement of CSR on CFP.

5.2 Discussion

5.2.1 Impact of corporate social responsibility on corporate financial performance

According to the conclusion of this study, it is known that the fulfillment of social responsibility by enterprises can help to improve the financial performance of enterprises. Although some studies have shown that there is a negative relationship between CSR and CFP (Ahamed & Tripathi, 2023), this research using panel data and multiple econometric methods with Chinese pharmaceutical companies as research samples proves that CSR promotes the growth of financial performance (Ahmad et al., 2023; Li et al., 2023). Combined with stakeholder theory, RBV and agency theory, corporations obtain more social resources while reducing corporate agency costs, forming a competitive advantage for corporations, and increasing profits while helping them control costs. Pharmaceutical manufacturers should incorporate the fulfillment of social responsibility into their business strategy (Bae et al., 2022), which not only creates intangible assets for the enterprise, but also helps the enterprise to avoid risks, thus realizing a high level of financial performance.

5.2.2 The mediating role of technological innovation between CSR and CFP

Innovation is the root of enterprises to improve their core competitiveness, enterprises actively fulfill social responsibility will promote the enterprise's R&D activities, increase enterprise innovation, and contribute to the increase of financial performance (Zahid *et al.*, 2021). This research tested the positive effect of CSR on technological innovation through a three-step regression analysis(Wang et al., 2023) and confirmed the existence of the mediating effect of technological innovation (Bahta et al., 2020). Pharmaceutical companies are oriented to research and development innovation due to the fulfillment of social responsibility. Companies' participation in social responsibility activities through technological innovation can reduce their financial costs and negative impacts, enhance their innovation initiatives, and increase their profits. For example, optimizing the production process, which not only saves resources and reduces costs, but also improves the quality of the product and establishes a good relationship with stakeholders, which creates a competitive advantage and improves the financial performance of the company (Zhou et al., 2020).

5.2.3 The moderating role of media coverage in CSR, technological innovation and CFP

Positive and negative media coverage produce a negative moderating effect between CSR, technological innovation and CFP. Prior studies have argued that positive CSR news has diminishing marginal effects (Flammer, 2012), and that positive news may not have an effect (Capelle-Blancard & Petit, 2019), and may even harm firm value (Philipp, 2015). The negative moderating effect of positive media coverage is due to the fact that positive media coverage over-exaggerates a firm's innovation achievements or CSR performance, and the firm has to bear additional liability costs to maintain its image and reputation, which increases the firm's operating costs and ultimately affects the firm's financial performance (Li et al., 2023; Li et al., 2022; Walker & Wan, 2012). Negative media coverage negative moderating effect is due to the negative coverage may lead to the public's questioning of the CSR or innovation ability of the enterprise, the enterprise may be forced to reduce the CSR or innovation investment in the face of the pressure of negative coverage, or to use the funds to restore the corporate image and reputation conveniently, which will lead to a decline in the financial performance of the enterprise (Gama et al., 2022; Li & Ling, 2020; Liang et al., 2022). Media reporting is a double-edged sword (Qing et al., 2023), a little carelessness, the complex market environment will instead exacerbate the business risk or even increase the cost consumption of CSR fulfillment for Chinese pharmaceutical companies, in which case media coverage will not only not stimulate companies to optimize their management mode, but may also lead to lower financial performance.

5.2.4 The moderating role of organizational slack in CSR, technological innovation and CFP

Based on the results of this article, it can be seen that unabsorbed slack plays a negative moderating role in the impact of CSR on CFP, and a positive moderating role in the path of

"CSR -technological innovation-CFP". Based on agency theory, unabsorbed slack is more flexible than other resources of the enterprise (Voss *et al.*, 2008), so managers may use the idle resources of the enterprise to satisfy their own requirements for private purposes (Li *et al.*, 2017), instead of always actively pursuing the maximization of the interests of the enterprise (Duan *et al.*, 2020). Even if the funds are not used for self-interest, the benefits of idle funds will be much less than if the funds are used in the business environment of the firm, because the root cause of organizational slack is inefficiency (Huang & Li, 2012). Therefore, when firms have high unabsorbed slack, they may invest in dubious projects and activities such as unrelated acquisitions and measures to whitewash their books (Li *et al.*, 2017), which can be detrimental to the firm's interests and not used to enhance firm performance. However, the high flexibility of unabsorbed slack allows it to be quickly changed in use or invested in new R&D projects, easing resource constraints and improving innovation performance (Wan *et al.*, 2023), which in turn enhances firm financial performance (Zahid *et al.*, 2021).

According to the findings of this article, it is clear that absorbed slack plays a positive moderating role among CSR, technological innovation and CFP. Although absorbed slack lacks flexibility, absorbed idle capital can still provide flexibility to help firms cope with environmental uncertainty ((Shang *et al.*, 2022) and enhance the efficiency and effectiveness of existing management practices (Kovach *et al.*, 2015). Absorbed slack human resources are particularly important for firms to maintain a competitive advantage (Vanacker *et al.*, 2016), by relieving pressure from human resource shortages in other departments and maintaining firm stability ((Welbourne & Cyr, 1999). Absorbed slack can help business decision makers to solve problems effectively by allowing them to accomplish additional strategic tasks, which can have a positive impact on the fulfillment of CSR (Mattingly & Olsen, 2018). Absorbed slack has helped to reduce the cost of CSR, increase the efficiency of resource utilization, and reduce agency costs to cope with corporate emergencies (Shang *et al.*, 2022). During COVID-19, Chinese firms contributed to society by reallocating redundant personnel, idle equipment capacity, and inventory backlogs to effectively cope with staff shortages and raw material shortages. Absorbed slack can be used to drive development activities, thereby enhancing

corporate financial performance (Luo *et al.*, 2019).

5.3 Implications and Recommendations

This article takes corporate social responsibility as the research entry point, focusing on pharmaceutical enterprises. This article emphasizes on the influence mechanism of pharmaceutical corporate social responsibility on innovation and financial performance, and analyzes the relationship between pharmaceutical corporate social responsibility, innovation and financial performance, which has certain theoretical exploratory, and there is also corresponding verification space in the practice of enterprise operation. Based on the current situation of social responsibility fulfillment in the pharmaceutical industry, this article puts forward suggestions from the three dimensions of corporate, society and government.

First, the corporate level. As the pharmaceutical industry is responsible for safeguarding people's health, the government, media and consumers have great expectations of it. Pharmaceutical companies should correct their attitude, change the previous misconception that assuming social responsibility will reduce the value of the enterprise, and refrain from speculation. The pharmaceutical manufacturing industry needs to realize the positive effects of taking on social responsibility in enhancing corporate image, gaining market support, and improving financial performance. Although undertaking social responsibility will cost some money, the benefits the corporation gets will be far greater than the cost it invests. Pharmaceutical corporations should adapt to the direction of the national strategy, pay attention to the fulfillment of social responsibility issues, and improve the consciousness of the enterprise to undertake social responsibility. The combination of improving the level of innovation and social responsibility, through the effective integration of resources to prevent the waste of resources, in order to reduce non-essential production costs to a certain extent. Innovation is not only conducive to the development of pharmaceutical products with independent intellectual property rights in China, reducing the dependence on other countries' products, but

also helps to meet the growing demand for a healthy life of the Chinese people. Rational allocation of absorbed and unabsorbed organizational slack in enterprises, scientifically and efficiently become a possible source of enterprise development and innovation, help enterprises to carry out various activities successfully, so as to increase the value of the enterprise. At the same time, incentive and supervision mechanisms for managers should be established to curb their self-interested behavior, improve the efficiency of the use of idle resources, and promote the realization of enterprise value maximization.

Second, the social level. Correctly recognize the positive role of the media in corporate governance and social responsibility information disclosure. Increase publicity and guidance to create an atmosphere of "active participation of the public in monitoring and voluntary fulfillment of social responsibility by corporations" to form a good environment for disclosure of CSR information and supervision. Make full use of the powerful communication power of the media, and seriously and strictly do a good job in supervising pharmaceutical manufacturing enterprises, so that companies can change from passively fulfilling their social responsibility to actively undertaking their social responsibility. For pharmaceutical companies that fulfill their social responsibility very well, the news media should increase the intensity of their publicity, and spread positive energy widely into society. For pharmaceutical companies with poor performance of social responsibility, the news media can strengthen the role of public opinion on their supervision, forcing them to correct improper behavior.

Finally, the government level. As an external stakeholder in the development of enterprises, the government should make overall planning for its social responsibility issues according to the characteristics of the pharmaceutical manufacturing industry. Improve the implementation of corporate social responsibility laws and regulations, standardize the implementation of social responsibility in the pharmaceutical industry, and strengthen the third-party institutions to audit the implementation of its social responsibility. For the relevant enterprises that actively fulfill their social responsibility, the government can give them policy or economic rewards through public praise, tax reductions and other ways to appropriately reduce the financial pressure on pharmaceutical manufacturing enterprises. This will help to form the enthusiasm of enterprises

to actively take responsibility and create a fair and harmonious market environment in the pharmaceutical manufacturing industry.

5.4 Limitation of the Research

This article takes Chinese pharmaceutical listed companies as the research object, and theoretically analyzes and empirically tests the impact of listed companies' fulfillment of CSR on CFP. The mediating transmission effect of technological innovation in the relationship between CSR and CFP, and the moderating effect of media coverage and organizational slack in the relationship between CSR and CFP are examined. The conclusions of the study have certain theoretical significance and practical value, but due to time, capacity and data availability, there are still some inadequacies in this paper's study, which need to be improved in future studies.

First, the limitation of indicator selection. The indicators selected by the thesis in the study of corporate social responsibility come from the Hexun.com social responsibility rating. Although it has a certain degree of scientifically and comprehensively, the differences in CSR measurement methods may also lead to different research results. Therefore, it is still necessary to further explore and improve the CSR indicator system in the future.

Second, the limitations of the research samples. The empirical research of the thesis selects the data of Chinese pharmaceutical listed companies, and only selects the data samples within the time range of 2010 to 2020, and does not cover other industries and non-listed companies. Therefore, there are certain limitations in data selection, and there are certain limitations in the generalizability of the research conclusions, while the generalizability in other industries still needs to be improved.

Finally, the limitations of the mediation mechanism. The article mainly discusses the mediating role of technological innovation, reveals the path of CSR mediated by technological innovation and then affects financial performance, and considers the influence of media

coverage and organizational slack moderating variables. Whether there are other mediating factors in the relationship between the two, and whether they may be moderated and influenced by many other factors, it is worth further expanding and exploring in the future.

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APPENDIX

APPENDIX A

List of listed pharmaceutical companies

NO.	Symbol	Corporate name	Equity nature
1	000153	Anhui Fengyuan Pharmaceutical Co.,Ltd.	Non-state-owned
2	000423	Dong-E-E-Jiao Co., Ltd.	State-owned
3	000513	Livzon Pharmaceutical Group Inc.	Non-state-owned
4	000518	Jiangsu Sihuan Bioengineering Co.,Ltd.	Non-state-owned
5	000538	Yunnan Baiyao Group Co.,Ltd.	State-owned
6	000566	Hainan Haiyao Co.,Ltd.	State-owned
7	000597	Northeast Pharmaceutical Group Co.,Ltd.	Non-state-owned
8	000623	Jilin Aodong Pharmaceutical Group Co.,Ltd.	Non-state-owned
9	000650	Renhe Pharmaceutical Co.,Ltd.	Non-state-owned
10	000661	Changchun High-tech Industries(Group) Inc.	State-owned
11	000739	Apeloa Pharmaceutical Co.,Ltd	Non-state-owned
12	000756	Shandong Xinhua Pharmaceutical Co.,Ltd	State-owned
13	000766	Tonghua Golden-Horse Pharmaceutical Industry Co,Ltd.	Non-state-owned
14	000788	PKU HealthCare Corp.,Ltd.	State-owned
15	000790	Chengdu huasun technology group Inc.,LTD.	Non-state-owned
16	000915	Shandong Shanda Wit Science And Technology Co., Ltd	State-owned
17	000919	Jinling Pharmaceutical Co.,Ltd.	State-owned
18	000931	Beijing Centergate Technologies(Holding) Co.,Ltd.	Non-state-owned
19	000952	Hubei Guangji Pharmaceutical Co.,Ltd.	State-owned
20	000989	Jiuzhitang Co.,Ltd.	Non-state-owned
21	000999	China Resources Sanjiu Medical & Pharmaceutical	State-owned

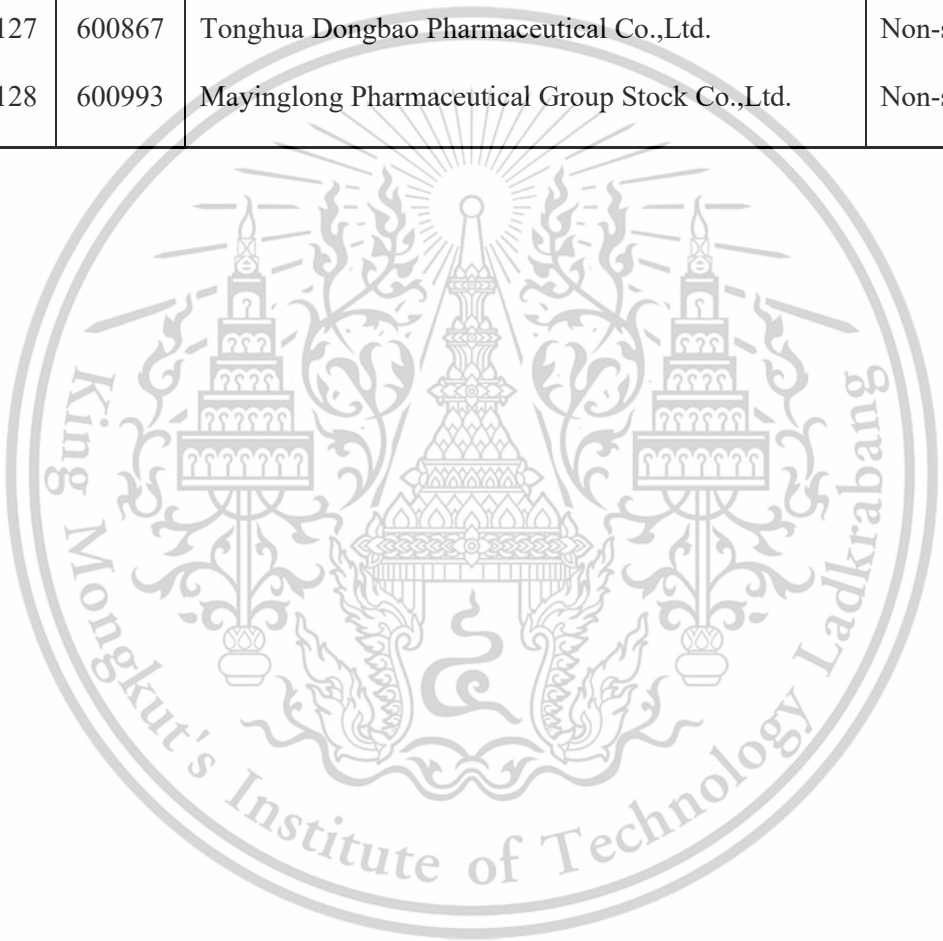
		Co., Ltd.	
22	002001	Zhejiang NHU Company Ltd.	Non-state-owned
23	002007	Hualan Biological Engineering,Inc.	Non-state-owned
24	002020	Zhejiang Jingxin Pharmaceutical Co.,Ltd.	Non-state-owned
25	002030	Daan Gene Co.,ltd.	State-owned
26	002038	Beijing SL Pharmaceutical Co.,Ltd.	Non-state-owned
27	002099	Zhejiang Hisoar Pharmaceutical Co.,Ltd.	Non-state-owned
28	002107	Shandong Wohua Pharmaceutical Co.,Ltd.	Non-state-owned
29	002118	Jilin Zixin Pharmaceutical Industrial Co.,Ltd.	Non-state-owned
30	002166	Guilin Layn Natural Ingredients Corp.	Non-state-owned
31	002198	Guangdong Jiaying Pharmaceutical Co.,Ltd.	Non-state-owned
32	002252	Shanghai RAAS Blood Products Co.,Ltd.	Non-state-owned
33	002262	Jiangsu Nhwa Pharmaceutical Co.,Ltd.	Non-state-owned
34	002275	Guilin Sanjin Pharmaceutical Co.,Ltd.	Non-state-owned
35	002287	Tibet Cheezheng Tibetan Medicine Co., Ltd	Non-state-owned
36	002294	Shenzhen Salubris Pharmaceuticals Co.,Ltd.	Non-state-owned
37	002317	Guangdong Zhongsheng Pharmaceutical Co.,Ltd.	Non-state-owned
38	002332	Zhejiang Xianju Pharmaceutical Co.,Ltd.	State-owned
39	002349	Nantong Jinghua Pharmaceutical Co., Ltd.	State-owned
40	002365	Qianjiang Yongan Pharmaceutical Co., Ltd.	Non-state-owned
41	002370	Zhejiang Yatai Pharmaceutical Co.,Ltd.	Non-state-owned
42	002390	Guizhou Xinbang Pharmaceutical Co.,Ltd.	Non-state-owned
43	002393	Tianjin Lisheng Pharmaceutical Co.,Ltd.	State-owned
44	002399	Shenzhen Hepalink Pharmaceutical Group Co.,Ltd.	Non-state-owned
45	002412	Hunan Hansen Pharmaceutical Co.,Ltd.	Non-state-owned
46	002422	Sichuan Kelun Pharmaceutical Co.,Ltd.	Non-state-owned
47	002424	Guizhou Bailing Group Pharmaceutical Co.,Ltd.	Non-state-owned

48	002433	Guangdong Taiantang Pharmaceutical Co.,Ltd.	Non-state-owned
49	002437	Harbin Gloria Pharmaceuticals Co.,Ltd.	Non-state-owned
50	002550	Changzhou Qianhong Bio-Pharma Co.,Ltd.	Non-state-owned
51	002562	Brother Enterprises Holding Co.,Ltd.	Non-state-owned
52	002566	Jilin Jian Yisheng Pharmaceutical Co.,Ltd.	Non-state-owned
53	002581	Shandong Sinobioway Biomedicine Co.,Ltd.	Non-state-owned
54	002603	Shijiazhuang Yiling Pharmaceutical Co.,Ltd.	Non-state-owned
55	002644	Lanzhou Foci Pharmaceutical Co.,Ltd.	State-owned
56	002653	Haisco Pharmaceutical Group Co.,Ltd.	Non-state-owned
57	002675	Yantai Dongcheng Biochemicals Co.,Ltd.	Non-state-owned
58	002688	Jinhe Biotechnology Co.,Ltd.	Non-state-owned
59	002693	Hainan Shuangcheng Pharmaceuticals Co.,Ltd.	Non-state-owned
60	300006	Chongqing Lummy Pharmaceutical Co.,Ltd.	Non-state-owned
61	300009	Anhui Anke Biotechnology(Group) Co.,Ltd.	Non-state-owned
62	300016	Beijing Beilu Pharmaceutical Co.,Ltd.	Non-state-owned
63	300026	Tianjin Chase Sun Pharmaceutical Co.,Ltd.	State-owned
64	300039	Shanghai Kaibao Pharmaceutical Co.,Ltd.	Non-state-owned
65	300086	Honz Pharmaceutical Co.,Ltd.	Non-state-owned
66	300110	Huaren Pharmaceutical Co.,Ltd.	State-owned
67	300111	Zhejiang Sunflower Great Health Limited Liability Company	Non-state-owned
68	300119	Tianjin Ringpu Bio-Technology Co.,Ltd.	Non-state-owned
69	300122	Chongqing Zhifei Biological Products Co.,Ltd.	Non-state-owned
70	300142	Walvax Biotechnology Co.,Ltd.	Non-state-owned
71	300147	Guangzhou Xiangxue Pharmaceutical Co.,Ltd.	Non-state-owned
72	300158	Shanxi Zhendong Pharmaceutical Co.,Ltd.	Non-state-owned
73	300181	Zhejiang Jolly Pharmaceutical Co.,Ltd.	Non-state-owned

74	300194	Fuan Pharmaceutical(Group) Co.,Ltd.	Non-state-owned
75	300199	Hybio Pharmaceutical Co.,Ltd.	Non-state-owned
76	300204	Staidson(Beijing) Biopharmaceuticals Co.,Ltd.	Non-state-owned
77	300233	Shandong Jincheng Pharmaceutical Group Co.,Ltd.	Non-state-owned
78	300239	Baotou Dongbao Bio-Tech Co.,Ltd.	Non-state-owned
79	300254	Shanxi C&Y Pharmaceutical Co.,Ltd.	Non-state-owned
80	300255	Hebei Changshan Biochemical Pharmaceutical Co.,Ltd.	Non-state-owned
81	300267	Hunan Er-Kang Pharmaceutical Co.,Ltd.	Non-state-owned
82	300289	Beijing Leadman Biochemistry Co.,Ltd.	State-owned
83	300294	Boya Bio-Pharmaceutical Group Co.,Ltd.	Non-state-owned
84	300583	Shandong Sito Bio-Technology Co.,Ltd.	Non-state-owned
85	300584	Nanjing Hicin Pharmaceutical Co.,Ltd.	Non-state-owned
86	300601	Shenzhen Kangtai Biological Products Co.,Ltd.	Non-state-owned
87	600062	China Resources Double-Crane Pharmaceutical Co.,Ltd.	State-owned
88	600079	Humanwell Healthcare(Group) Co.,Ltd.	Non-state-owned
89	600085	Beijing Tongrentang Co.,Ltd.	State-owned
90	600129	Chongqing Taiji Industry(Group) Co.,Ltd.	State-owned
91	600161	Beijing Tiantan Biological Products Corporation Limited	State-owned
92	600195	China Animal Husbandry Industry Co.,Ltd.	State-owned
93	600196	Shanghai Fosun Pharmaceutical(Group) Co.,Ltd.	Non-state-owned
94	600200	Jiangsu Wuzhong Pharmaceutical Development Co.,ltd.	Non-state-owned
95	600201	Jinyu Bio-Technology Co.,Ltd.	Non-state-owned
96	600211	Tibet Rhodiola Pharmaceutical Holding Co.,Ltd.	Non-state-owned

97	600216	Zhejiang Medicine Co.,Ltd.	Non-state-owned
98	600222	Henan Taloph Pharmaceutical Stock Co.,Ltd.	State-owned
99	600227	Guizhou Salvage Pharmaceutical Co.,Ltd.	Non-state-owned
100	600252	Guangxi Wuzhou Zhongheng Group Co.,Ltd.	State-owned
101	600267	Zhejiang Hisun Pharmaceutical Co.Ltd.	State-owned
102	600276	Jiangsu Hengrui Medicine Co.,Ltd.	Non-state-owned
103	600285	Henan Lingrui Pharmaceutical Co.,Ltd.	Non-state-owned
104	600329	Tianjin Zhongxin Pharmaceutical Group Corporation Limited	State-owned
105	600332	Guangzhou Baiyunshan Pharmaceutical Holdings Company Limited	State-owned
106	600351	Yabao Pharmaceutical Group Co.,Ltd.	Non-state-owned
107	600380	Joincare Pharmaceutical Group Industry Co.,Ltd.	Non-state-owned
108	600420	Shanghai Shyndec Pharmaceutical Co.,Ltd.	State-owned
109	600422	Kpc Pharmaceuticals,Inc.	Non-state-owned
110	600436	Zhangzhou Pientzehuang Pharmaceutical Co.,Ltd.	State-owned
111	600479	Zhuzhou Qianjin Pharmaceutical Co.,Ltd.	State-owned
112	600488	Tianjin Zhongxin Pharmaceutical Group Corporation Limited	State-owned
113	600513	Jiangsu Lianhuan Pharmaceutical Co.,Ltd.	State-owned
114	600521	Zhejiang Huahai Pharmaceutical Co.,Ltd.	Non-state-owned
115	600535	Tasly Pharmaceutical Group Co.,Ltd.	Non-state-owned
116	600557	Jiangsu Kanion Pharmaceutical Co.,Ltd.	Non-state-owned
117	600566	Hubei Jumpcan Pharmaceutical Co.,Ltd.	Non-state-owned
118	600572	Zhejiang Conba Pharmaceutical Co.,Ltd.	State-owned
119	600594	Guizhou Yibai Pharmaceutical Co.,Ltd.	Non-state-owned
120	600613	Shanghai Shenqi Pharmaceutical Investment	Non-state-owned

		Management Co.,Ltd.	
121	600624	Shanghai Fudan Forward S&T Co.,Ltd.	State-owned
122	600664	Harbin Pharmaceutical Group Co.,Ltd.	State-owned
123	600750	Jiangzhong Pharmaceutical Co.,Ltd.	State-owned
124	600789	Shandong Lukang Pharmaceutical Co.,Ltd.	State-owned
125	600812	North China Pharmaceutical Company.,Ltd.	State-owned
126	600851	Shanghai Haixin Group Co.,Ltd.	State-owned
127	600867	Tonghua Dongbao Pharmaceutical Co.,Ltd.	Non-state-owned
128	600993	Mayinglong Pharmaceutical Group Stock Co.,Ltd.	Non-state-owned



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