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Research from Financial Crises Regarding Financial Flexibility, Company Investment, and Productivity

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Abstract

Purpose: Concerns concerning things like financial flexibility, investment efficacy, and efficient corporate governance frameworks have been voiced by stakeholders. However, there is a paucity of empirical evidence about how investment effectiveness and corporate governance frameworks jointly moderate the relationship between financial flexibility and firm performance. Financial flexibility is a critical strategy for attaining equitable growth in China's manufacturing sector in the face of challenges posed by globalisation and technological advancements. Businesses that possess financial flexibility are better equipped to manage internal cash flows, mitigate financing from outside constraints, and better absorb risks. Although Corporate Social Responsibility (CSR) is becoming increasingly essential, there is still much debate on how it impacts a company's worth.

Method: This study examines the moderating effects on CSR and business value of financial flexibility and expenditures on research and development. Utilising many historical data sets from 2311 firms between 2018 and 2024, our analysis comes to the conclusion that corporate social responsibility, or CSR, has a "double-edged weapon" influence on a company's value. To be more precise, CSR significantly increases systematic risk while simultaneously decreasing idiosyncratic risk and the Tobin's Q.

Results: Furthermore, the results demonstrate that the negative correlation between CSR and Tobin's q is considerably reduced by both financial freedom and R&D spending. The difference among the two is that although financial flexibility lowers the favourable relationship between CSR and system risk, R&D spending lowers the negative relationship among CSR and idiosyncratic risk. By offering fresh perspectives on the relationship between CSR and corporate value, the findings are relevant to both scholars and industry professionals.

Conclusion: Conclusions of this study have important implications for corporate social responsibility management tactics. The authors' creative contribution to the body of literature is shown in the conceptual framework that underpins this research and the fresh data that looks at how corporate governance procedures affect the connection between flexibility in finances and companies' success. The research offers a moderate and progressively intricate the macro-environment together with useful recommendations for maximising long-term sustainability in manufacturing enterprises. Additionally, by carefully altering the levels of financial flexibility, it offers a set of statistically backed suggestions for firm managers, governmental organisations, and investors that assist them increase profitable operations sustainably.

Keywords: Financial Flexibility, Corporate Social Responsibility (CSR), Governance Mechanisms, Multiple Archival, Sustainable Performance, Companies' Performance, and Financial Flexibility Levels, Company Investment, R&D, Idiosyncratic Risk, Firm Value, China's Manufacturing Sector.

Introduction

Several research endeavours have endeavoured to ascertain the correlation amongst Corporate Social Responsibility (CSR) and corporate value; nevertheless, the extant literature exhibits divergent perspectives. Research based on agency theory indicates that corporate social responsibility could lower a company's value. In addition to being expensive and prone to excessive investment, [1], Corporate Social Responsibility (CSR) detracts from the value of the company and is a waste of limited resources. On the other hand, [1] some studies contend that CSR could raise company value, drawing on the principle of stakeholders. Firm value will rise as a result of participation in CSR since it will lessen conflicts of interest between management and other stakeholders [1, 2]. To put it succinctly, it is still unknown how CSR and business value are interrelated [1, 2].

According to some academics, the reason for this ambiguous link might be that boundary effects were not taken into account at the corporate or consumers level; as a result, fresh approaches should be taken into account [2]. Despite much theoretical and empirical research on CSR, there are still many unanswered questions in the sector. First off, although while companies can acquire "moral assets" by upholding their social responsibilities, it is yet unclear how internal organisational capabilities, including financial flexibility, influence this benefit [2]. Second, while research on the relationship among R&D and CSR initiatives and business value is lacking, the two may fight for the company's spare resources. Third, research on CSR in the past has mostly ignored its significance for company risks in favour of focusing on how it affects financial outcomes [2, 3].

Effective management procedures and the effectiveness of investments have drawn the attention of stakeholders, particularly shareholders [3]. Shareholders are placing more and more pressure on boardrooms of companies to show that they are accountable for upholding efficient governance practices for managing and directing organisational resources [4]. The dedication of boardrooms to efficient governance procedures has been elevated in the process of making strategic investment decisions [4, 5]. Several contexts and settings have been used to investigate the connections between corporate governance procedures and the performance of businesses. The research that is now available, however, offers a variety of viewpoints regarding the connection between corporate governance procedures and business performance [5, 6].

Businesses are always reacting to difficult situations, which are frequently brought on by unforeseen shocks. Numerous studies demonstrate how financial flexibility enables businesses to overcome difficulties [6, 7]. For instance, during the Global Financial Crisis of 2008–2009, businesses with less financial resources were able to retain higher employment levels. More recently, businesses have raised money to avoid hardship in the wake of the COVID-19 pandemic [7, 8]. Although the value of financial flexibility has long been established, the extraordinary difficulties posed by the 2020 health crisis underscore the significance of other aspects of corporate flexibility, [7, 8], including the capacity to work remotely, in assisting businesses in navigating challenging situations [9, 10].

The long-term profitability of firms is significantly influenced by their strategic investment strategies. The company's financial health is reflected in its financial flexibility, which is a major factor in the strategy for allocating resources [9, 10]. As a result, boardroom concerns about preserving flexibility in finances and investment efficiency persist [10, 11]. Boardrooms can lessen the effect of investment crowding out by reducing finance constraints and quickly reacting to unfavourable shocks that can result from cash flow management, like the COVID-19 epidemic [11, 12]. Adopting financial flexibility as a policy might help organisations respond promptly to future possibilities for investment or minimise cash flow shortfalls during investment shocks like the financial meltdown and the COVID-19 pandemic [13]. Financial flexibility is essential, especially when businesses encounter unforeseen circumstances like cash flow problems and investment shock [12].

An indicator of a company's asset allocation is investment efficiency. But institutional investors have a significant influence on the business choices made by businesses [13, 14]. The results of the study show that institutional shareholders have a beneficial effect on investment efficiency and help to reduce issues related to under- or excessive investments. Examined the relationship between investment efficiency and firm value, [14, 15], taking into account the moderating influence on institutional shareholding and independence of boards, using data drawn from the stock exchange in Tehran [15, 16]. According to their study's findings, institutional ownership and board independence have a moderating effect on the link between investment efficiency and company value (as measured by Tobin's Q) [16, 17]. The literature provides ample evidence of the relationship between organisations' performance and the effectiveness of investments, financial flexibility, investment scale, and earnings excellence [17, 18].

One of the most pressing issues facing modern society is the pursuit of sustainable development as the global economy and technological advances advance quickly and environmental concerns worsen. This is especially noticeable in the industrial industry, [18, 19], where there is a large resource consumption and possible environmental impact. In light of this, [19, 20], China's "dual carbon" targets represent the country's high-level dedication to ecological and ecological preservation as well as increased expectations for the modernization and transformation of the manufacturing sector. In addition to implementing green practices and continuously improving product quality, manufacturing organisations must also be able to adapt quickly to sudden shifts in consumer demand and market conditions [20, 21]. For these organisations, this transformation frequently entails significant financial strain and danger [21, 22].

Therefore, in order to effectively handle these dangers and challenges and pursue sustainable development, firms must have flexible control of their financial resources. This makes it especially crucial to comprehend and evaluate the significance that financial flexibility plays in the long-term growth in manufacturing firms [22, 23]. Manufacturing businesses must have financial flexibility to adapt to changing market conditions and ecological problems. Emphasising the adaptability and versatility of capital leadership, it is considered a crucial instrument that allows companies to handle unpredictable market fluctuations and achieve environmentally friendly growth [23, 24]. As a strategy that improves a business's flexibility and responsiveness to market changes. By improving a company's capacity to adjust to changes in the market and by bolstering long-term viable investments, financial flexibility plays a major role in promoting sustainable growth [24, 25]. By providing the required funds for environmentally friendly inventions and developments, it not only assists businesses in successfully navigating economic fluctuations and risks but also promotes a green economy while safeguarding their financial well-being. Although academic circles generally agree on the significance of financial flexibility, [24, 25], there is currently comparatively little discussion on the precise function and mechanisms of this flexibility in attaining sustainable growth in organisations [25, 26].

Research that already exist frequently over emphasise the benefits of financial flexibility in assisting companies in adapting to market modifications and reducing financial hazards, [26, 27], but they fail to mention the possibility that a reliance on financial flexibility that is too great could cause companies to neglect the long-term growth of their most important skills, which would have a detrimental effect on their ability to grow sustainably. The financial flexibility theory contends that a company's long-term growth may be hampered if its level of financial flexibility rises above a particular point. A fundamental question concerning the propriety of financial flexibility is brought up by this [27, 28]. Overly flexible financial decisions could result from a lack of long-term strategic planning and a consistent growth direction, both of which could be detrimental to sustainable development. Therefore, the goal of this study is to determine the theoretical threshold and conduct a deeper analysis of the relationship between financial flexibility and the environmentally friendly growth of manufacturing enterprises [28, 29].

Driven by the epidemic and economic globalisation, [29, 30], modern businesses must adapt quickly to the ever-evolving market. A great deal of research has already been done on the best ways to quickly understand the benefits and drawbacks of corporate goods and services, and handling a variety of issues and obstacles is a crucial topic for businesses looking to achieve a competitive edge [31, 32]. According to contingency theory, management practices should focus on self-correction and adjustment in order to improve adaptability to environmental conditions. The social, economic, or culture outside factors that businesses must contend with are only a small part of the outside world that is discussed here; other elements are also "determined" by approaches to management or institutional standards.

Firm values and Corporate Social Responsibility

CSR is an initiative that gives managers of a company the freedom to decide how best to advance social welfare. Based to the multi-stakeholder perspective, corporate social responsibility (CSR) falls into four main categories: communities (local citizens, shareholders, and particular interest organisations, for example), regulators (self-sufficient regions, surveillance mechanisms, etc.), and mediums participants [29, 30].

The impact of corporate social responsibility on business value has received increasing attention. The literature currently in publication offers two different hypotheses regarding the connection between corporate value and CSR. The first is the authority theory-based excess investment hypothesis, which holds that managers may overextend in CSR to gain the reputation-building benefits while sacrificing some of the company's value. The second is the stakeholder theory-based resolution of disputes hypothesis, which holds that managers participate in CSR to address stakeholders informed conflicts [30]. Corporate value is positively impacted by conflict resolution. However, a substantial body of research offers evidence that Corporate Social Responsibility (CSR) enhances firm value.

In the present day of the digital economic benefits, organisations face challenges from external advertising stress and their own internal governance. These challenges include disruptions, risks, and unpredictability arising from financial system reform, improvements in economic independence, and an increase in capital investment. From the standpoint of market relations, businesses are not autonomous entities; rather, every aspect of their growth is dependent upon reference to and comparison with other businesses operating at the same level and in comparable markets, all of which have comparable strategic resources [30, 31]. Academic studies on sustainability competitive advantage typically place greater emphasis on financial results, technological advancements, and social responsibility in business.

Other People's Crisis Anxiety

According to social psychology information available, anxiety is a subjective, unfocused emotion that people experience when faced with potential threats or risky situations [31, 32]. A high level of anxiety can negatively impact a person's ability to function normally at work and in everyday situations. Anxiety may be broadly classified into two categories: anxiety related to traits and state anxiety. Trait anxiety is more stable then state anxiety and relies more on character features. The former describes a transient and diverse emotional state or reaction brought on by the impact of a particular circumstance. The State-Traits Anxiety Inventory Scale (STAI) is a widely used tool in experimental psychological treatment, psychological illness, psychological treatment and counselling that is frequently used to measure an individual's level of anxiety. In the real world, anxiety affects many different fields of study in addition to psychology [32, 33].

Crisis in the External Finances and State Anxiety

Anxiety is the first form of warning signal that minds of individuals will send out when they are in an abnormal setting. Anxiety in day-to-day operations management is typically caused by an amalgamation of both internal and external factors. The creation and execution of the system of internal control is considered to be an internal factor. On the other hand, external variables are those that are goals and cannot be changed by the business, such as the competitive corporate management style, the market for industrial goods surroundings, [33], and economic and manufacturing policies. The impact of both internal and external factors is most noticeable in the area of financial management at a company. In particular, businesses with inadequate internal oversight may experience irrational feelings when making economic choices, particularly fear, panic, and other unpleasant emotions that could influence how corporate plans are developed and carried out [33]. The financial structure issues of external firms may also have an impact on the company cash flow and investor turnover, perhaps leading to a debt crisis. Conversely, in industries with low levels of competition, market forces and monopolistic profits will be dispersed, increasing the danger of fluctuating cash flows and business insolvent status [34].

Finances Flexibility

When negative production shocks occur, the firm might be forced to sacrifice the welfare of its stakeholders in order to meet its target interests. This is because CSR limits the flexibility for responding to such shocks. Increasing financial freedom may help to solve this issue. The ability of a business to take advantage of unanticipated possibilities or inexpensively handle unforeseen calamities is referred to as financial flexibility [35]. Strong financial flexibility enables businesses to spend capital whenever profitable possibilities present themselves, protecting stakeholders' interests and avoiding financial hardship in the event of a shock. This essay provides a thorough explanation of it using the next three elements.

First, firms with higher financial flexibility are better able to satisfy their capital needs by entering the external capital marketplace. This helps enterprises better meet the requirements of many different stakeholders, which improves corporate earnings and facilitates relationships with them.

Second, affordability allows a business choose more and better expenditures, which will significantly increase the business's performance and help it stand out in the market. It also helps a business preserve its debt capacity and future borrowing capacity. These results will gradually boost investors' loyalty and trust in their investment decisions, lowering the firm's systemic risk.

Investments in R&D

Most people agree that firm growth is a knowledge-intensive endeavour. The ability to innovate is what propels a business in an ever-changing atmosphere to break through its own advancement bottlenecks, attain sustainable development, and generate satisfaction for communities of interest. For businesses, R&D and CSR initiatives can both produce products and

give them a competitive edge [35]. A noteworthy positive link has been shown between the intensity of R&D and CSR. The influence of R&D on the connection between CSR and corporate value will be further examined from the following three perspectives in order to gain a deeper understanding of it:

First, the requirements of all stakeholders can be incorporated into practice through knowledge sharing in R&D and CSR, increasing value for various stakeholders with related interests. Getting closer to the shareholders as a result will boost the company's profits.

Second, innovative goods and services that draw attention to marginalised areas can be created by fusing R&D expertise with a thorough grasp of social welfare. Stated differently, [36], R&D can contribute to the product's improvement of CSR features [37, 38]. This demonstrates that it lowers the overall cost of information while simultaneously enhancing the usefulness of CSR, which in turn fosters consumer adherence to CSR and ultimately lowers systematic risk [39, 40].

Objectives of the study

- Evaluate the response of several Chinese economic sectors (such as manufacturing, service industries, and innovation) to financial crises in terms of investment, productivity, and financial flexibility.
- Analyse how shifts in the banking industry affect business investment and output during hard times.
- In light of the results, offer businesses and legislators concrete policy suggestions to strengthen financial resilience and encourage long-term investment as well as productivity growth in the face of crises in the economy.
- Examine the effects of various government initiatives, including regulatory reforms, monetary policy tweaks, and fiscal stimulus.

LITERATURE REVIEW

(Ma, C. A., 2024) [41] In previous decades, academics and practitioners have paid close attention to the preservation of financial flexibility as a means of reducing competition in the product market. Through a thorough analysis of China's rapidly expanding capital market and a comparative analysis with the U.S. capital market, data from 2008 to 2020 demonstrates that flexibility in finances and competition in the product market are positively correlated, with firms experiencing higher investment-q sensitive when faced with more competition. Getting two different samples to test the hypotheses has the advantage of confirming that the relationships between market size, product competitors, flexibility in finances, and investment-q sensitivity are stable, and that various business features and complex financial environments are harmonised with comparable product markets. Thus, it may be said that pressure from competition compels businesses to become more financially flexible, and that businesses in highly competitive product markets are more likely to be alert to investment possibilities and to be more sensitive to them.

(Yumei, F. U., Liping, Z. H. A. N. G., 2019) [42] In an environment of economic unpredictability, the business's monetary choices and strategy have a significant impact on macroeconomic growth in addition to the business's eventual growth. This paper considers that, while diversification has decreased the flexibility of cash reserves, uncertain macroeconomic conditions have significantly increased the financial versatility of business entities based on liquidity demand, based on data samples of companies with A-shares in both Shenzhen and Shanghai in 2003–2016. The monetary constraints of macroeconomic uncertainties for company financial flexibility have been greatly reduced by diversification, according to additional research that takes into account both socioeconomic risks and diversification. The aforementioned findings continually show that, in the face of uncertain macroeconomic circumstances, small and medium-sized are able to actively respond to or avoid potential negative effects by making wise money and corporate strategy choices. These actions not only support the macro economy's steady growth but also enable small and medium-sized to continue growing.

(Jüttner, U., 2011) [43] This research aims to provide a Theoretical Framework of Supply Chain Resilient (SCRES) and to investigate its empirical link with Supply Chain Risk Management (SCRM) and Supply Chain Vulnerability (SCV). The mathematical domain of SCRES is defined by a literature review, and the suggested links with SCRM and SCV are deduced. Three supply chains' worth of data from a longitudinal investigation are provided for examining how the concepts relate to one another in light of the worldwide financial crisis.

(Han, M. 2013) [44] China officially broke into the top 10 residential economy for Foreign Direct Investment (FDI) after being the developing nation that received the most FDI for more than ten years (UNCTAD 2010). Chinese outbound Foreign Direct Investment (FDI) climbed from the amount of US$4 billion to US$317 billions of dollars between 2000 and 2010, with overall yearly flows rising from less than a billion dollars to US$68 billion (MOFCOM 2011).

(John, J. W. B. M. C., 2022) [45] We examine the direct and combined consequences of various organisational flexibility strategies on long- and short-term real company strategies using the COVID shock. We discover that: i) workplace flexibility—that is, the ability for workers to work remotely—is crucial for influencing employers' employment strategies during the medical crisis; ii) investments flexibility—which is influenced by workplace flexibility—enables employers to raise or lower capital expenditures in response to changing company conditions; and iii) financial flexibility strengthens both job creation and investment, especially in situations where fixed costs are high. Although work environment flexibility is a recent addition to the COVID crisis, CFOs are expecting long-term effects: high place of employment flexibility firms anticipate continued working from home, a stronger work recovery, and a move away from traditional capital investment, while low work flexibility firms place a greater emphasis on robotics as a means of replacing labour.

(Kayiira, J. 2021) [46] For many business executives, it has been a difficult responsibility to make and carry out finance decisions in order to fulfil corporate goals for many years. Important financing decisions to enhance shareholder value include achieving and sustaining flexibility in finances, making investments efficiently, and guaranteeing that money are available for investment through pay out plans. A company's financing, investments, and distribution policies are determined by its financial flexibility, and the quantity of capital readily available for investment is determined by the firm's pay out policy. However, because it mandates that expenditures in capital be limited to successful initiatives, investment efficiency is crucial for making strategy choices regarding investments. Since no research has looked at the effects of firm-specific factors and pay out policies on the firm's financial agility and efficiency of investment in Africa, particularly South Africa, it is imperative to understand the driving forces behind these financial leadership attributes.

(Adomako, S., 2024) [47] It is common practice to model financial understanding, financial capital availability, and resource flexibility as distinct antecedents of company performance. Nonetheless, in the case of poor nations where financial literacy has been deemed inadequate, the boundary requirements for these models are not as well investigated. Therefore, we investigated the effects of resource flexibility and availability of financial resources on the relationship between financial understanding and company performance for entrepreneurial firms operating in fewer developed sectors, using RBV as a framework. Utilising a survey-based methodology and OLS, we looked at 298 start-up companies in Ghana, a sub-Saharan African nation. According to our research, financial literacy enhances business success, especially in situations where finances are flexible and businesses may easily obtain financing.

(Kong, P. 2022) [48] Ongoing innovation is essential for businesses to sustain long-term competitive advantage and plays a significant role in fostering high-quality growth in the economy. As a comprehensive regulation competence, financial flexibility can mitigate risks and adjust to changing conditions in the environment. It also plays a significant role in promoting environmentally friendly innovation. This research investigates the moderating effect of finance limitation on corporate innovation environmental responsibility, using survey information of A-share listed businesses in both the Shanghai and Shenzhen Stock Exchanges from 2012 to 2020. According to the studies, there is a beneficial relationship between business sustainability creativity and total financial flexibility, as well as a positive correlation among innovation sustainable development and single cash and single debt flexibility and financial constraints. The beneficial effect of financial flexibility is higher in non-state-owned firms than in state-owned enterprises. The results of this study offer a decision-making framework for innovative business environmental sustainability.

(Li, W. Y., Chow, 2016) [49] The fashion sector is vulnerable to economic conditions, and two current challenges are Supplier Integrating (SI) and Green Sustainable Programmes (GSP). Without a doubt, SI and GSP both call for significant investments and ongoing dedication, which has an impact on the cash flows and allocation of resources of the fashion industry. Thus, it's crucial to consider how SI and GSP impact fashion companies' financial results during the global financial crisis. This research project aims to investigate the following empirically: (i) the effects of SI and GSP adoption on the financial health of fashion businesses; (ii) the potential of SI and GSP adoption to alleviate challenges owing to financial crisis; and (iii) the moderating effect brought by style material on the above interactions. The study has been inspired by the relationship mentioned above and is based on publicly available data.

(Nguyen, Q. K. 2023) [50] Since stock price crashes can have a negative impact on emerging markets' stability and constitute a serious threat to investors, they are of special concern to developing nations. With an emphasis on the COVID-19 pandemic, this paper examines how flexibility in finances reduces the danger of a stock market crash in Vietnam. Based on a sample of 645 Vietnamese listed companies from 2011 to 2021, this study used the fixed-effect, systemic GMM, and the quantile regression methods and discovered that being flexible financially significantly reduces the likelihood of a stock market drop. There was an increase in this effect during the COVID-19 pandemic. Additionally, this analysis discovered that the COVID-19 crisis had a lessening effect on the chance of a stock market crash due to financial

flexibility. The results have significant ramifications for how shareholders, investors, and company regulators should react to crises of a similar nature in future periods.

HYPOTHESIS

H1: *Companies Social Responsibility (CSR) lowers systematic hazards, idiosyncratic risk, and improves business earnings.*

H2: *The beneficial impact of Corporate Social Responsibility (CSR) on corporate earnings is reinforced by financial flexibility, which also minimises the negative effects on systematic risk and idiosyncratic risk.*

H3: *RR&D investment (a) increases the beneficial effect of Corporate Social Responsibility (CSR) on earnings and (b) reduces the detrimental effects on systematic risk and idiosyncratic risk.*

METHOD

Sampling and Data

A sample of Chinese companies established on the Shenzhen and Shanghai exchanges of stocks between 2018 and 2024—apart from financial services companies and companies issuing B- & H-shares—is used to evaluate the research's hypotheses [51]. The explaining variable's time range is 2018–2024, while the variable being explained variables is 2020–2024. Data for this article is taken from several trustworthy sources. First, information on Corporate Social Responsibility (CSR) was obtained from Hexun.com, a website that is frequently employed in academic studies. Data on the Fama-French three factor, [51, 52], risk-free rates of interest, and stocks return percentage were taken from the CSMAR database in order to compute the risk dimensions of the variable being studied. Aside from that, CSMAR also provides additional data on finances. Following the removal of observations with incomplete data, the final set of data comprises an unbalanced sample with 13,869 observations and 2311 firms [52].

Measures

- **Dependent variables:** Two different dimensions are used to quantify firm value. The first is the earnings dimension, denoted by the Tobin's q of a particular company. Tobin's q is determined in this paper using the formula (MVE+PS+DEBT)/TA, which is based on prior research. MVE is the product of a stock's each year closing price and the number of shares remaining of common stock; [53], PS is the preferred stock's estimated value at liquidation of the company; DEBT is the sum of both short- and long-term debts; and TA is the sum of all assets and book value of the business.
- **Independent variables:** Hexun.com's company social responsibility score, which takes into account the five factors (shareholders, staff members, manufacturer, client and customer rights and desires, and environment responsibilities) is used to quantify CSR.
- **Moderating variables:** Investments in R&D and the flexibility of finances are the two regulators. Cash and current ratios, or the debt-to-asset percentage, are commonly used to gauge financial flexibility. The former is preferred in this study for two reasons: first, businesses facing financial challenges are more likely to hoard cash on hand as a precautionary; and secondly, the asset-liability ratio is a predictive measure of a company's potential for financial difficulties in the future. A corporation will forgo present earnings and future revenue in order to pay down debts, which will decrease its future cash holdings.
- **Control variables:** We employed an extensive collection of control variables in order to eliminate competing hypotheses. First, we adjusted for a number of company-level variables (return on inventory, size, age, [52], and function of the firm, for example). Total assets are the mean amount of the very start and completion of all assets within a focal year. Return on Assets (ROA) is computed as a company's net revenue scaled by the total assets.

For each variable in this investigation, Table 1 provides basic statistical description, measurement techniques, and data sources.

Table 1 Variable Measurements and Data Sources.

Variables	Measurements	Data
TOBIN.Q	When MVE is the total amount of existing common stock shares, PS is the liquidated value of the company's outstanding preferred stocks, DEBT is the sum of short-term	CSMAR

	obligations, short-term possessions, and longer-term debts, and TA is the book worth of all assets, then Tobin's Q is determined.	
IRISK	Idiosyncratic Risk. The coefficients of regression based on market factors, such as the degree of similar variables between the business as well the entire market, are employed in the FAMA-French three-model.	CSMAR
SRISK	Systematic risk. The deviation from the mean of the remainder of the error of the model used for regression, which represents the data that the three components are unable to comprehend, is employed in the FAMA-French 3-model.	CSMAR
RD	Investments in R&D by Firm. The proportion of sales to R&D costs.	CSMAR
STATE	Interests held by the state. The portion of shares held by the state.	CSMAR
CSR	The social responsibility of corporations. The HexXun listed corporations' progressing score for corporate social responsibility.	CSMAR
RD	Investment in R&D by the firm. The proportion of revenue devoted to R&D costs.	CSMAR
SIZE	Substantial dimensions. Consider the algorithm used to determine the company's employment count.	CSMAR
ROA	Assets returns. Scaled net profit by entire components.	CSMAR
AGE	Solid Age. For how many years it has been since a listed company was established.	CSMAR
BIG 1	The biggest stakeholder. The squared shareholding ratios of the top shareholders.	CSMAR
YEAR	Six dummy variables represent seven years, while the control variables of the year are.	Calculated
SH	Dummy variables: 0 indicates that the business is listed on the Shenzhen stock exchange, and 1 indicates that it is listed on the Shanghai exchange of stocks.	CSMAR
COMP	Industry rivalry. The Herfindahl-Hirschman Index (HHI) measures a company's squared revenue percentage within the same sector. The value is deducted to 1 for ease of interpretation.	CSMAR
INDUSTRY	44 dummy variables that represent 45 industries and indicate the industry category.	Calculated

Modelling

To examine our hypothesis, we used a group a regression panel study with the cluster error environments, and we used the ordinary least squares approach to estimate our models. To evaluate hypothesis H1, the subsequent equations (1)–(3) were developed:

$$TOBINQ_{1(t+1)} = a_{10} + a_{11}CSR_{it} + \sum a_{1jCV_s+SH_i} \sum YEAR + \sum INDUSRTY_{i+\varepsilon_{1it}}$$

$$SRISK_{1(t+1)} = b_{10} + b_{11}CSR_{it} + \sum b_{1jCV_s+SH_i} \sum YEAR + \sum INDUSRTY_{i+\varepsilon_{2it}}$$

$$IRISK_{1(t+1)} = c_{10} + c_{11}CSR_{it} + \sum c_{1jCV_s+SH_i} \sum YEAR + \sum INDUSRTY_{i+\varepsilon_{3it}}$$

In this case, RD stands for firm investment in research and development, and CSR*RD is the item that illustrates the relationship between R&D and CSR [53]. The parameters were concentrated before multiplying to prevent multicollinearity from interfering with the outcome of the regression.

RESULTS

The correlation matrix and descriptive statistics for the major variables are shown in Table 2. According to the Variable Inflationary Factor (VIF), every figure is substantially lower than the recommended cut-off value of 10. Our VIF values, which vary from 1.096 to 2.982, show that multiple linearity is not a significant issue for our investigation [53]. The results show that there is potential for conflict between CSR and company value. Specifically, there is a −0.296 ($p < 0.05$) association between CSR and Tobin's q, −0.296 ($p < 0.05$) connection between CSR and systematic risk, and −0.896 ($p < 0.05$) connection between CSR and idiosyncratic risk.

Table 2 Correlation Factors and Descriptive Statistics.

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
TOBIN. Q	1.896	1.489	1												
SRISK	1.950	0.896	-0.796	1											
RD	1.096	2.896	-0.791	0.897	1										
STATE	25.891	19.8 96	-4.892	0.849	0.219	1									
CSR	-0.496	-0.890	0.849	0.549	0.214	0.956	1								
RD	-0.849	0.495	-0.296	-0.219	0.496	0.923	-0.329	1							
SIZE	-0.080	-0.986	-0.209	0.849	0.649	0.819	-0.289	0.892	1						
ROA	-0.012	0.819	-0.287	-0.289	0.892	-0.808	-0.849	-0.296	0.479	1					
AGE	0.896	1.089	0.596	0.890	0.998	0.649	0.896	0.719	1.095	-0.896	1				
BIG 1	-0.015	-0.041	0.890	-0.046	-0.949	-0.012	-0.089	-0.291	-0.590	-0.490	0.849	1			
YEAR	-0.490	-0.099	0.964	-0.989	-0.419	-0.089	0.019	-0.49	-0.989	0.549	-0.590	-0.089	1		
SH	0.989	-0.095	-0.890	-0.049	-0.089	-0.079	-0.041	-0.490	-0.097	-0.049	-0.049	-0.090	-0.041	1	
COMP	0.089	0.080	0.019	-0.089	-0.490	-0.099	-0.590	-0.849	-008 9	-0.009	-0.498	-0.290	-0.098	-0.049	1
INDUSTRY	0.195	0.149	0.059	0.895	0.098	0.080	0.808	0.089	0.008	0.089	0.095	0.790	0.090	0.080	0.084

Testing of Hypotheses

The primary result of CSR. According to Table 3 (Model 1) data, CSR has a significant and detrimental effect on Tobin's q ($\beta = -0.096$; $p < 0.01$). Furthermore, Models 5 and 9 indicate that CSR has a positive impact on systemic risk ($\beta = 0.086$; $p < 0.01$) and a negative impact on idiosyncratic risk ($\beta = -0.009$; $p < 0.01$). As a result, [53, 54], only H1(c) is accepted. When combined, these findings suggest that there is a "double-edged sword" effect between CSR and business value. The next part will go into more depth about those results.

The mitigating function of economic adaptability. Financial flexibility considerably attenuates the positive association among CSR and systemic risk ($\beta = -0.080$; $p < 0.08$) and the adverse relationship between CSR and Tobin's q ($\beta = 0.007$;

$p < 0.01$), according to the results of Models 2 and 6. Model 10 shows that its impact is not of statistical significance ($p > 0.08$) on the relationship between CSR and idiosyncratic risk. In summary, financial flexibility increases the favourable impact of CSR on company profits and systematic risks, hence supporting H2 (a) and H2 (b). It also significantly reduces the adverse impact of CSR on corporation profits and systematic risks.

The role of spending on research and development as a moderator. The negative correlations between CSR and idiosyncratic risk ($\beta = 0.087$; $p < 0.08$) and Tobin's q ($\beta = 0.087$; $p < 0.08$) are significantly attenuated in Models 3 and 11 by R&D spending. It has no discernible effect ($p > 0.12$) on the positive relationship between CSR and systemic danger in Model 7 [53]. In conclusion, R&D strengthens the positive effect of CSR on corporate profitability, hence mitigating the negative impact of CSR on earnings, thereby supporting H3 (a). R&D, however, mitigates the negative impact of CSR on idiosyncratic risk, so the H3 (b) is denied.

Table 3 Regression Analysis Result.

	M1	M2	M3		M4	M5	M6	M7	M8	M9	M10	M11	M12
CSR* RD			0.895** (0.089)		0.079** (0.049)			-0.079 (0.079)	-0.079 (0.079)			0.000** (0.000)	0.000* (0.000)
ROA	0.079** (0.795)	0.549* (0.219)	0.777* (0.549)		0.078* (0.089)	0.369* (0.089)	0.149* (0.219)	0.796* (0.495)	0.087* (0.079)	-0.089 (0.964)	-0.079 (0.009)	-0.870** (0.079)	-0.897 (0.079)
FLEX	0.891* (0.269	0.896* (0.495)	0.590* (0.296)		0.498* (0.549)	0.479* (0.358)	0.976* (0.792)	0.496* (0.479)	0.149* (0.046)	0.741* (0.496)	0.749* (0.398)	0.089* (0.409)	0.008 (0.098)
RD	-0.895 (0.219)	-0.489* (0.219)	0.749* (0.419)		0.879* (0.214)	0.419 (0.879)	0.891* (0.795)	-0.087 (0.879)	-0.749* (0.749)	0.964* (0.749)	-0.879* (0.089)	0.879* (0.089)	-0.479 (0.495)
CSR	-0.098 (0.095)	-0.079** (0.079)	-0.719** (0.549)		-0.395** (0.319)	-0.290* (0.896)	-0.041** (0.089)	-0.329* (0.419)	-0.879** (0.809)	-0.259* (0.968)	-0.079** (0.879)	-0.840* (0.847)	-0.089** (0.090)
CSR* FLEX		0.089* (0.008)			0.079* (0.079)		-0.089** (0.087)		-0.075** (0.008)		-0.087 (0.089)		-0.000 (0.000)
SIZE	-0.489** (0.089)	-0.089** (0.089)	-0.049* (0.079)		-0.049 (0.089)	0.049** (0.075)	-0.079* (0.849)	-0.075** (0.978)	0.084* (0.097)	-0.007** (0.079)	-0.049* (0.849)	-0.089** (0.479)	0.087* (0.096)
STATE	-0.980* (0.770)	-0.890* (0.549)	-0.089* (0.198)		-0.089** (0.049)	0.087** (0.049)	-0.049* (0.089)	-0.029** (0.049)	-0.079** (0.008)	-0.049** (0.079)	-0.049** (0.059)	-0.087* (0.098)	-0.968* (0.079)

AGE	-0.089* (0.849)	-0.968** (0.419)	0.108** (0.089)		-0.049** (0.298)	-0.049** (0.042)	-0.398* (0.079)	-0.014* (0.089)	-0.095** (0.093)	-0.089* (0.296)	-0.089* (0.082)	-0.087* (0.049)	-0.079** (0.040)
COMP	-(0.089)* (0.049)	-0.079** (0.070)	-0.549* (0.047)		-0.089** (0.080)	-0.879** (0.079)	-0.079* (0.059)	-0.796** (0.049)	-0.079** (0.099)	-0.049* (0.079)	-0.089* (0.079)	-0.079** (0.079)	-0.079** (0.596)
BIG1	-0.089 (0.089)	-0.079** (0.079)	-0.879** (0.074)		-0.594* (0.041)	-0.965* (0.079)	-0.089** (0.089)	-0.079* (0.092)	-0.079** (0.089)	-0.879* (0.098)	-0.965** (0.079)	-0.794* (0.098)	-0.059** (0.089)
SH	-4.896** (0.089)	-0.087* (0.096)	-0.796** (0.890		-0.014* (0.089)	-0.089** (0.089)	-0.087* (0.049)	-0.968** (0.896)	-0.989** (0.879)	-0.089* (0.749)	-0.967** (0.089)	-0.098** (0.098)	-0.976** (0.965)
Constant	-0.029** (0.049)	-0.079** (0.008)	-0.049** (0.079)		-0.029** (0.049)	-(0.089)* (0.049)	-0.087* (0.098)	-0.098** (0.089)	-0.098 (0.095)	-0.079** (0.079)	-0.719** (0.549)	-0.395** (0.319)	-0.079* (0.092)
Industry FE	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	19,259	14,296	11,298		13,495	18,296	16,495	18,298	17,299	18,154	19,399	17,968	19,289
R^2	0.879	0.590	0.890		0.049	0.549	0.978	0.968	0.790	0.079	0.795	0.890	0.090
Adjusted	0.890	0.089	0.298		0.079	0.490	0.790	0.089	0.801	0.079	0.079	0.089	0.849
F	100.8	98.59	97.89		97.89	39.47	29.79	23.99	98.79	97.54	93.64	97.56	98.64

Tests of Robustness

Three techniques were used to further assess how reliable the empirical findings were. Initially, the same equation was used to include all of the moderating variables and interaction variables (see M4, M8, and M12). Second, the dependent variable was measured using a four-factor model. Lastly, seemingly independent regression analyses for joint estimate were used to take into account any contemporaneous correlations that might exist between the dependent variables. All of the robustness test results mostly agreed with the primary results.

DISCUSSION

The link between corporate value and CSR remains debatable despite growing acceptance of CSR and its needs. In addition to examining the moderating effects on financial flexibility & R&D expenditure, this paper looks into the relationship between CSR and the value of the company. Based on a sample of Chinese A-share listed companies from 2018 to 2024, [53, 54], the findings indicate that Corporate Social Responsibility (CSR) has a "double-edged sword" effect on firm value. Financial flexibility, on the one hand, increases the positive impact of Corporate Social Responsibility (CSR) on systematic risk and corporate earnings, but has no effect on idiosyncratic risk; on the opposing hand, [54], R&D investment both increases the positive effects of CSR with company earnings and decreases its negative impact on idiosyncratic risk. Furthermore, it makes little difference to how CSR and systemic risks are related. The results are detailed in some detail below [55].

First, in terms as economic development, China currently lags behind him other nations despite being an emerging country. China's Corporate Social Responsibility (CSR) development is still in its infancy compared to other developed market nations, despite the government's adoption of several measures to encourage CSR growth.

Second, Chinese investors have a weaker understanding of corporate social responsibility (CSR) than investors in industrialised nations. This makes it difficult to explicitly connect their investing strategy with corporation social responsibility [55, 56]. Rather, "self-interested" criteria like risk and return are of more importance to Chinese investors.

Furthermore, it's important to note that the stock exchange in Shanghai has a higher systemic risk than the Shenzhen Stock Exchange, according to the regression analysis results of the control variables. This could be because to the Shanghai Stock Exchange's poor information efficiency. The study's conclusions have significant ramifications for the pertinent literature. This work, first and foremost, advances the notion of market-based value [56, 57]. The study's findings demonstrate how intricate the relationship's outcomes are: Corporate social responsibility (CSR) affects a company's value in two ways: it increases the systematic risk and decreases the idiosyncratic risk, while financial flexibility & R&D investment can mitigate the negative consequences.

Secondly, this study addresses the research findings that suggest boundary factors impact the relationship between Corporate Social Responsibility (CSR) and business performance. The financial framework of a corporation has seldom ever been taken into account as a border issue in earlier study. Financial flexibility serves as a barrier against the detrimental effects of Corporate Social Responsibility (CSR) on the value of the company [57, 58]. Examples of these effects include a weakening of the decline in Tobin's q and an increase in systemic risk. In this way, one of the critical organisational abilities is financial flexibility.

Thirdly, this work contributes to a deeper understanding of how CSR and important strategic marketing tools combine to lower corporate risk among academics. The varying degrees of CSR's influence on business risk can be explained by varying degrees of strategic lever intensity, such as R&D, according to earlier studies [58]. Research and development is essential to the creation of business value and is one of the key tactics for fostering innovation in organisational capacity.

The findings of this research have significant ramifications for managerial strategies on corporate social responsibility. First, a theoretical foundation for the management team to make judgements on CSR initiatives has been established by the intricate relationship between CSR & business value. While it lowers company earnings and raises systemic risks, [59], corporate social responsibility also helps to mitigate idiosyncratic hazards. As such, scenario elements must be taken into account while making decisions [59, 60]. For example, a firm that prioritises market value may decide to increase its corporate social responsibility spending when debt is low or R&D investment is high.

CONCLUSION

The findings of this research have significant ramifications for managerial strategies on corporate social responsibility. First, a theoretical foundation for the management team to make judgements on CSR initiatives has been established by the intricate relationship between CSR & business value. While it lowers company earnings and raises systemic risks, corporate social responsibility also helps to mitigate idiosyncratic hazards. Consequently, scenario elements must be taken into account while making decisions. For example, a firm that prioritises market value may decide to increase its corporate social responsibility spending when debt is low or R&D investment is high. However, it is preferable to perform a company's CSR with a high degree of financial flexibility when it needs to minimise risks. A comprehensive evaluation of marketers' performance should take into account the impact of multi-sector decisions. The majority of performance reviews don't take other departments' policies into account. For instance, the marketing division anticipates a rise in the company's worth when it engages in CSR initiatives. But, the benefits of Corporate Social Responsibility (CSR) will diminish and may even worsen as a company's debt load increases. As a result, the influence of CSR on different divisions should be taken into account while evaluating its efficacy.

The limitations of this study provide room for more research in the future. First off, there has been debate on the connection between corporate social responsibility and business value. Only the moderating effects of two crucial organisation capabilities—financial flexibility and research and development—are taken into account in this study. Future studies can examine additional variables, such as social structures made up of laws, customs, values, and beliefs as well as cultures and faiths, each of which has a unique impact on the impact of CSR.

Furthermore, the study did not differentiate between different kinds of CSR activity. CSR is a multifaceted concept that encompasses institutional and technological components. Technological components include environmental protection and product innovation. It is therefore important to give greater thought to how different forms of CSR may affect business value in different ways. Lastly, even though China is an accurate representation of emerging markets, our findings might not be as broadly applicable given this context. More studies in different established and emerging economies are needed to compare and contrast how corporate social responsibility affects business value.

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