

The Impact of the financial crisis on the value of A-share enterprises in China

Hanjie Tang

Nanjing University of Science and Technology, Nanjing 210094, China

Abstract: Enterprise value creation is heavily influenced by the macroeconomic environment. As an extreme manifestation of environmental uncertainty, the financial crisis can be transmitted to the real economy through trade channels and financial channels, affecting firms production, operation and strategic decision-making. Taking the 2008 financial crisis as a quasi-natural experiment, this paper selects A-share main board listed companies from 2004 to 2023 as samples and uses the difference-in-differences (DID) model for empirical research. Robustness checks are conducted through counterfactual analysis and replacing firm value variables. This paper further investigates whether the impacts differ among firms with different ownership types. The results show that the outbreak of the financial crisis significantly inhibits enterprise value creation. Financial constraints serve as one channel through which the financial crisis affects firm value, exerting a partial mediating effect. The inhibitory effect of the financial crisis on value creation is stronger in non-state-owned enterprises, and the mediating effect of financial constraints is also more significant.

Keywords: Executive Compensation; Financial Crisis; Financial Constraints; Firm Value.

1. Introduction

Under the tide of economic globalization, enterprises production and operation are facing a more complex and volatile internal and external operating environment, with increasing environmental instability. In terms of the international environment, the global economic growth rate has slowed down, trade protectionism has become increasingly fierce, geopolitical conflicts have intensified and coupled with the occurrence of global black swan events such as the COVID-19 pandemic, enterprises are facing challenges brought by a more volatile international environment.

In terms of the domestic environment, with the continuous improvement of Chinas economic system and the adjustment of macro policies, the transparency of market information has been improved. The continuous development of emerging technologies has intensified competition among enterprises, widened the gap, and gradually increased the uncertainty faced by enterprises in their development. [1]

As an extreme uncertainty event in the development of the global economy, the financial crisis has a far-reaching impact on the global economy and enterprise operations. The global financial crisis that broke out in 2008 dragged the world economy into the abyss of recession and had a profound impact on the economic development of all countries. Against the background of the financial crisis, enterprises are facing many uncertainties such as changes in market demand and exchange rate risks. This uncertain external environment will bring great challenges to the production, operation and development of enterprises.

Since the 2008 global financial crisis, the academic community has conducted a lot of research on it, but most of them have focused on the macro level, such as the causes of the financial crisis, transmission mechanisms and its impact on the macroeconomy. However, there is relatively little discussion on the micro level, especially how the financial crisis specifically affects enterprise value. As a comprehensive indicator to measure enterprises operating performance, financial health and future profitability,

enterprise value fluctuations directly affect the survival and development of enterprises. The financial crisis impacts enterprises through various channels, such as trade and financial channels, and these impacts may affect enterprises financing environment, thereby affecting enterprise value.

Based on the above analysis, taking the 2008 financial crisis as the research background, this paper selects A-share main board listed companies from 2004 to 2023 as samples and adopts the difference-in-differences (DID) model for empirical analysis, aiming to reveal the direct impact of the financial crisis on enterprise value and the mediating effect of financial constraints in it.

2. Research Hypotheses

After the outbreak of the financial crisis, the global economic environment deteriorated rapidly, trade competition between countries intensified, and trade protectionism emerged. Various countries have protected their domestic enterprises by restricting imports, leaving enterprises facing trade protection barriers, a sharp decline in export orders, and many foreign trade enterprises reducing or even stopping exports. This crisis not only seriously affected the development of Chinas export trade and dealt a heavy blow to domestic foreign trade enterprises, but also severely impacted corporate value creation.

At the same time, the flow of capital factors in the international market was affected. The market liquidity of countries hit by the financial crisis decreased, and they tightened their investments in other markets, which in turn affected the value of enterprises in other countries through channels such as foreign direct investment and international bank credit. Therefore, this paper holds that the financial crisis has a negative impact on the value creation of Chinese enterprises through trade channels, financial channels and other aspects, and puts forward the following hypothesis:

H1: The outbreak of the financial crisis inhibits the value creation of Chinese enterprises.

The financial crisis affects the degree of corporate financial constraints through various channels. First, through trade

channels, the financial crisis reduces the national wealth and income of various countries, leading to economic downturn. At the same time, the government injects liquidity into the market by issuing currency and reducing interest rates, resulting in the depreciation of the local currency and an increase in the prices of imported goods and services; the rising prices of raw materials in the international market increase the production costs of export enterprises, reduce their competitiveness, leading to operational difficulties, capital shortages and insufficient internal capital supply for export enterprises.

Second, the outbreak of the financial crisis has lowered investors' expectations. Banks and other investors have reduced external lending out of prudence, increasing the difficulty of corporate financing. At the same time, due to the pessimistic overall economic situation, the market value of fixed assets used by enterprises as collateral has shrunk, further making it more difficult for enterprises to obtain financing and exacerbating the degree of corporate financial constraints.

Corporate value is largely restricted by financial constraints. When enterprises face financial constraints, they may abandon good investment projects, hinder their development, and thus affect their value creation. At the same time, enterprises with a high degree of financial constraints tend to hold more funds, which exacerbates the agency problem of enterprises and further enhances its impact on corporate value. Therefore, the financial crisis will affect the degree of corporate financial constraints, which in turn will further affect corporate value. Thus, the following hypothesis is proposed [2]:

H2: Financial constraints play a mediating role in the path through which the financial crisis affects corporate value.

3. Research Design

3.1. Data Source

The research focus of this paper is the changes in the value of Chinese listed companies after the outbreak of the 2008 financial crisis. The data sample used is the panel data of Chinese A-share listed companies from 2004 to 2023. Referring to Malmendier (2011), the change in a firm's stock price in 2008 is used as the basis for judging whether the firm experienced the financial crisis. Firms whose closing stock price at the end of 2008 was less than 50% of the opening price in the same year are set as the treatment group, and firms whose closing stock price at the end of 2008 was higher than 50% of the opening price in the same year are set as the control group. The difference-in-differences (DID) method is employed to test the impact of the financial crisis on corporate value.

The original data are processed as follows: (1) Excluding samples of financial enterprises. (2) Excluding samples of ST and *ST enterprises. (3) Excluding samples of enterprises with missing financial data. (4) Conducting 1% winsorization on all continuous variables. After processing, this paper finally obtains 2045 sample enterprises and 20450 observations.

3.2. Variable Selection and Data Description

(1) Dependent Variable. Corporate Value: Existing literature usually measures corporate value through the following approaches: Tobin's Q, Economic Value Added (EVA), discounted cash flow (DCF), market value, and book-

to-market ratio. As a market indicator, Tobin's Q can better reflect the long-term operating conditions of enterprises, so this paper uses Tobin's Q to represent corporate value. In addition, the market value indicator is adopted later for robustness tests.

(2) Core Explanatory Variable. Financial Crisis: Drawing on the idea of Malmendier (2011), this paper considers that a firm experienced the financial crisis if its closing stock price at the end of 2008 was less than 50% of the opening price in the same year. An interaction term Crisis between the financial crisis and time is set, where Crisis takes a value of 0 before the firm experienced the financial crisis and 1 after that.

Financial Constraints: At present, there are many indicators for measuring financial constraints at home and abroad, and no unified view has been formed. In general, financial constraint indicators can be divided into single-variable indicators and multi-variable indicators. Single-variable indicators mainly include dividend payout ratio, firm size, debt level, and interest coverage ratio, while multi-variable indicators mainly include KZ index, WW index, and SA index. Among them, single-variable indicators are usually used for grouping according to financial constraints due to their single evaluation standard; among multi-variable indicators, the KZ index involves indicators related to corporate value in the construction process, and the WW index has few domestic studies, which cannot guarantee its applicability for measuring the degree of financial constraints of domestic firms. However, the SA index can better overcome the endogeneity problem and is widely used to measure the degree of financial constraints of domestic firms. Therefore, this paper selects the SA index to measure the degree of financial constraints faced by firms. The formula of the SA index is as follows:

$$SA = 0.043 \times SIZE^2 - 0.04 \times AGE - 0.737 \times SIZE$$

Among them, SIZE is the natural logarithm of firm size (Unit: 1 million yuan), and AGE is the length of time since the firm was established (Unit: year).

Control Variables. Since the financial and operational conditions of enterprises themselves will directly or indirectly affect corporate value, referring to existing literature, the following control variables are constructed in turn: (1) Firm Size (SIZE), measured as the natural logarithm of the total assets of the enterprise; (2) Firm Age (Age), measured as the number of years since the establishment of the enterprise; (3) Financial Leverage (Lev), measured as the ratio of (financial expenses + net profit + income tax expenses) to (net profit + income tax expenses); (4) Current Asset Ratio (Cr), measured as the ratio of current assets to total assets of the enterprise; (5) Firm Growth (Growth), measured as the growth rate of total assets of the enterprise; (6) Operating Cash Flow (CFO), measured as the ratio of operating cash flow to total assets of the enterprise.

3.3. Model Specification

Based on the panel data of A-share listed companies from 2004 to 2023, to verify the impact of the financial crisis on corporate value, this paper regards the impact of the 2008 financial crisis as a quasi-natural experiment and constructs a difference-in-differences (DID) model to study the impact of the financial crisis on Chinese corporate value [3].

Among the enterprise samples, this paper regards enterprises that experienced the financial crisis as the treatment group and those that did not experience the financial crisis as the control group, and constructs the

following model:

$$TobinQ_{it} = \alpha_{10} + \alpha_{11}Crisis_{it} + \sum \alpha_{1j}Controls_{it} + \mu_{1i} + \gamma_{1t} + \varepsilon_{1it}$$

Where i represents the enterprise; t represents the year; TobinQ is the dependent variable, representing corporate value; Crisis is the independent variable, which is the interaction term between the financial crisis and time. Crisis takes a value of 0 before the enterprise experienced the financial crisis and 1 after that; Controls are control variables; μ_{1i} and γ_{1t} are individual and time fixed effects, respectively; ε_{1it} is the random error term [4].

In the estimation results of the above formula, if α_{11} is significantly negative, it indicates that the financial crisis has a significant negative effect on corporate value creation. On the contrary, if α_{11} is not significant or significantly positive, it indicates that the financial crisis has no significant impact or a significant positive impact on corporate value creation.

4. Empirical Analysis

4.1. Baseline Regression Analysis

This section conducts regression analysis on the impact of the financial crisis on corporate value and the mediating effect of financial constraints respectively [5]. The regression results are shown in the following table:

Column (1) presents the result of the difference-in-differences regression test for the benchmark model of the financial crisis and corporate value. It can be seen that the estimated coefficient of the independent variable Crisis corresponding to the dependent variable Tobin's Q is -0.266, which is significant at the 1% level. This indicates that the financial crisis has a negative impact on the value of Chinese listed companies and inhibits corporate value creation, thus Hypothesis H1 is supported.

Table 1. Regression Results of Financial Crisis, Financial Constraints and Corporate Value

Variable Name	(1) TobinQ	(2) SA	(3) TobinQ
Crisis	-0.266*** (-3.62)	0.016*** (2.92)	-0.253*** (-3.49)
SA			-0.623*** (-4.35)
SIZE	-0.628*** (-22.90)	1.193*** (198.83)	0.114 (0.70)
age	0.002 (0.69)	-0.015*** (-20.50)	-0.008** (-2.52)
Lev	-0.016*** (-10.10)	0.001*** (2.71)	-0.015*** (-9.90)
Cr	-0.189** (-2.19)	0.055*** (3.18)	-0.152* (-1.76)
Growth	-0.199*** (-13.30)	0.004 (1.39)	-0.197*** (-13.52)
CFO	0.047 (1.23)	0.021** (2.17)	0.061 (1.62)
R2	0.600	0.994	0.603

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively, with t-statistics in parentheses.

4.2. Robustness Tests

4.2.1. Placebo Test

The above regression results show that the financial crisis has a significant negative impact on the value of Chinese listed companies. However, in addition to the external shock of the financial crisis, there may also be other macroeconomic policies or events that affect corporate value. To further test the robustness of the difference-in-differences regression results of the benchmark model, a counterfactual test is conducted on the net negative effect of the financial crisis on corporate value, that is, to examine the impact of the independent variable Crisis on corporate value when the financial crisis did not occur[6].

If the independent variable Crisis has no significant impact on corporate value, it indicates that before the occurrence of the financial crisis, there was indeed no conclusion that the financial crisis affected corporate value, and the conclusion drawn from the regression results of the benchmark model is credible; if the independent variable Crisis has a significant impact on corporate value, it indicates that the changes in corporate value may come from other factors, and the conclusion drawn from the regression results of the benchmark model is unreliable.

The occurrence time of the financial crisis is advanced by 1 year (Crisis2007), 2 years (Crisis2006) and 3 years (Crisis2005) respectively for verification. The regression results are shown in the following table:

Table 2. Placebo Test

VARIABLES	(1) TobinQ	(2) TobinQ	(3) TobinQ
crisis2007	-0.225 (-0.027)		
crisis2006		-0.187 (-0.024)	
crisis2005			-0.207 (-0.027)
SIZE	-0.627*** (-22.86)	-0.627*** (-22.83)	-0.626*** (-22.79)
age	0.002 (0.59)	0.001 (0.50)	-0.000 (-0.02)
Lev	-0.016*** (-10.13)	-0.016*** (-10.19)	-0.016*** (-10.23)
Cr	-0.188** (-2.19)	-0.187** (-2.18)	-0.185** (-2.16)
Growth	-0.198*** (-13.22)	-0.197*** (-13.18)	-0.197*** (-13.17)
CFO	0.047 (1.22)	0.048 (1.24)	0.049 (1.26)
Constant	16.064*** (27.47)	16.037*** (27.44)	16.063*** (27.46)
R-squared	0.599	0.599	0.599

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively, with t-statistics in parentheses.

According to columns (1) to (3), after advancing the occurrence time of the financial crisis by 1 year, 2 years and 3 years respectively, the financial crisis has no significant impact on corporate value. This indicates that when the financial crisis did not occur, the explanatory variable Crisis exerted no effect on corporate value and no systematic error exists. Therefore, it can be concluded that the change in corporate value stems from the impact of the financial crisis, and the conclusion regarding the effect of the financial crisis

on corporate value obtained from the benchmark model is credible.

4.2.2. Replacing the indicator of the dependent variable

To prevent potential impacts on the results of this paper caused by different selections of corporate value indicators, this paper additionally adopts market capitalization (MC) as an alternative indicator to measure corporate value and conducts regression analysis using the same model as in the empirical section. The regression results are generally consistent with those above.

Table 3. Regression Results of Variable Replacement

	(1)	(2)	(3)
VARIABLES	MC	SA	MC
Crisis	-0.489*	0.016*	-0.004*
	(1.68)	(1.92)	(-1.91)
SA			-0.194*
			(1.93)
SIZE	1.378***	1.193***	-1.106***
	(7.96)	(19.83)	(-8.56)
age	0.772***	-0.015***	1.112***
	(35.96)	(-20.50)	(30.37)
Lev	-0.010**	0.001***	-0.022***
	(-2.18)	(2.71)	(-5.26)
Cr	0.854**	0.055***	-0.459
	(2.05)	(3.18)	(-1.15)
Growth	-0.032	0.004	-0.095
	(-0.53)	(1.39)	(-1.37)
CFO	0.395**	0.021**	-0.100
	(2.45)	(2.17)	(-0.59)
Constant	-42.500***	-22.048***	446.919***
	(-11.41)	(-173.85)	(8.25)
R-squared	0.788	0.994	0.878
	(1)	(2)	(3)
VARIABLES	MC	SA	MC
Crisis	-0.489*	0.016*	-0.004*
	(1.68)	(1.92)	(-1.91)
SA			-0.194*
			(1.93)
SIZE	1.378***	1.193***	-1.106***

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively, with t-statistics in parentheses.

5. Research Conclusions

The outbreak of the global financial crisis exerted a tremendous impact on the world economy and the international financial system, and also posed severe challenges to the stable and healthy development of China's economy [7]. The financial crisis has also brought a strong shock to corporate value creation. Based on the 2008 financial crisis, this paper investigates its impact on the value of China's A-share listed firms, further examines the mediating effect of financial constraints, and finally discusses the influence of heterogeneity in firm property rights on the empirical results. The main conclusions of this paper are as follows:

The outbreak of the financial crisis significantly suppressed corporate value creation. First, after the financial crisis,

China's export trade volume was hit, corporate profits declined, operating cash flows shrank, and capital turnover became more difficult, thereby affecting firms' daily operations [8]. The strengthened precautionary motive encouraged firms to hold more cash, reducing return on assets. Normal investment and innovation activities were restricted, hindering the improvement of core competitiveness and making it difficult to effectively expand market share. Second, the financial crisis led to a decline in actual foreign direct investment utilized by China and a rise in domestic capital demand, resulting in financing difficulties for firms. The sharp drop in China's stock market prices caused investors to sell shares massively at low prices, leading to a serious shrinkage of corporate market value, withdrawal of funds needed for daily investment and operation, and survival crises for firms. In summary, the financial crisis negatively affected firms through trade and financial channels, thereby reducing corporate value.

Financial constraints acted as one channel through which the financial crisis affected corporate value, exerting a partial mediating effect. First, after the financial crisis, banks and other financial institutions faced greater difficulties in capital turnover and increased credit risk. To maintain liquidity, financial institutions tightened credit policies comprehensively, making external debt refinancing more difficult and financing costs higher for firms. The shrinking stock market also hindered external equity financing. Upstream firms reduced the scale of commercial credit to maintain liquidity, making it harder for downstream firms to supplement liquidity through commercial credit and exacerbating their financial constraints. Second, when external financing costs rose and the gap between internal and external financing costs widened, firms preferred to use internal resources first. The financial crisis reduced profitability and made capital chain maintenance more difficult. Meanwhile, even with high-quality R&D or investment projects, firms tended to hold more cash for liquidity purposes, leading to inefficient internal resource allocation and difficulties in internal financing. Finally, under the dual constraints of internal and external financing, firms' investment profitability and sustainable growth capacity declined, internal agency costs increased, investor expectations deteriorated, and corporate value decreased [9].

The property rights nature of firms affected the empirical results. Compared with state-owned enterprises, the corporate value of non-state-owned enterprises suffered a greater negative impact from the financial crisis. Meanwhile, the mediating effect of financial constraints between the financial crisis and corporate value was stronger for non-state-owned enterprises than for state-owned enterprises. Since state-owned enterprises undertake more responsibilities in maintaining economic and social stability, the government tended to protect them during the crisis to ensure macroeconomic stability. With implicit government guarantees, state-owned enterprises received priority credit and financial support from the government and banks when facing liquidity problems, which ensured their daily operations and investment activities. Therefore, financial constraints had a weaker impact on the value of state-owned enterprises.

References

- [1] Driver C, Muñoz-Bugarin J. Financial constraints on investment: Effects of firm size and the financial crisis[J].

- Research in International Business and Finance, 2019, 47: 441-457.
- [2] Malmendier U, Tate G, Yan J. Overconfidence and early-life experiences: the effect of managerial traits on corporate financial policies[J]. The Journal of finance, 2011, 66(5): 1687-1733.
- [3] Bruhn M, Love I. The real impact of improved access to finance: Evidence from Mexico[J]. The Journal of Finance, 2014, 69(3): 1347-1376.
- [4] Corrado G, Corrado L. Inclusive finance for inclusive growth and development[J]. Current opinion in environmental sustainability, 2017, 24: 19-23.
- [5] Hajek P, Henriques R. Mining corporate annual reports for intelligent detection of financial statement fraud A comparative study of machine learning methods[J]. Knowledge-Based Systems, 2017, 128:139-152.
- [6] Frydman C, Papanikolaou D. In search of ideas: Technological innovation and executive pay inequality. Journal of Financial Economics. 2018, Vol. 130 (No. 1), p. 1-24.
- [7] Zhang Youtang, Chang Yuming. An Empirical Test of the Impact of Digital Finance on the Investment Efficiency of Technology-based Enterprises. Statistics and Decision. 2020, Vol. 36 (No. 16), p. 179-183.
- [8] King R G, Levine R. Finance, entrepreneurship and growth[J]. Journal of Monetary economics, 1993, 32(3): 513-542.
- [9] Leyshon A, Thrift N. Financial exclusion and the shifting boundaries of the financial system[J]. Environment and Planning A, 1996, 28(7):1150-1156.