Empirical Study on State-Owned Institutional Investors and the Risk of Stock Price Collapse

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Abstract. Taking the listed companies in Shanghai and Shenzhen stock markets from 2015 to 2024 as the sample, this study investigated the relationship between state-owned institutional investors and the risk of stock price collapse. The research found that state-owned institutional investors significantly reduced the risk of stock price crashes of companies, and there was a negative correlation between them. After conducting robustness tests by replacing explanatory variables, the above conclusion remained valid. In the context of the comprehensive promotion of the registration-based reform of the capital market in China, state-owned institutional investors should adhere to their duties in entering the market, eliminate market speculation behaviors, adhere to the concept of value investment, maintain the long-term stability of the securities market, play the role of a "regulator" in the securities market, actively participate in corporate governance, strive to create a healthy and favorable investment and financing environment and capital market ecosystem, and promote the high-quality development of listed companies.

Keywords: State-owned institutional investors, Risk of collapse, Data analysis,

1 Introduction

Compared with the mature international markets, the current Chinese capital market is still in the development stage. There are certain flaws in market effectiveness, and abnormal phenomena occur frequently in the securities market. Stock prices show high volatility. The stock market crash in 2015 and the implementation of the circuit breaker mechanism in 2016 led to a 49% decline in the Shanghai Composite Index within eight months, causing a stock market crash. This not only disrupted the orderly operation of the capital market but also severely undermined investor confidence and triggered panic. In the face of such intense fluctuations, the government has taken various measures to rescue the market, such as lowering interest rates and reserve requirements, reducing transaction and settlement fees, etc. State-owned institutional investors such as China Securities Finance Corporation and Central Huijin Company have entered the market. They have stabilized the securities market and enhanced market liquidity through measures such as significant capital increase and shareholding. The govern-

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ment's intervention in the market through the injection of funds by state-owned institutional investors has achieved positive results in dealing with index declines to a certain extent. The long-term holding behavior of state-owned institutional investors, apart from continuing to play a role in maintaining the stability of the securities market, whether it can exert a restraining effect on listed companies and reduce the risk of stock price crashes, is a question worthy of study.

Previous scholars have mainly formed two viewpoints in their research on the relationship between institutional investors and the risk of stock market crashes. One viewpoint holds that institutional investors possess rich investment experience, extensive information channels, and professional investment skills, and can supervise and restrain companies, thereby effectively stabilizing the securities market[2] . The other viewpoint contends that institutional investors do not play a stabilizing role in the market. Instead, Institutional investors cause short-term passive investors to reduce their holdings. Institutional investors' actions due to negative news, such as selling off their positions, herd behavior, and threats of withdrawal, can lead to a risk of stock price collapse [1]. However, few scholars have delved deeply into the impact of state-owned institutional investors, this particular type of institutional investor, on the risk of stock market crashes.

The risk of stock price collapse mainly refers to the possibility of a sharp decline in the stock price of a listed company or the index of the securities market [3]. Existing literature mainly studies the causes of stock price collapse from the perspectives of information asymmetry and the theory of principal-agent. The company's management, considering factors such as reputation, promotion of position, and their own interests, deliberately hides or delays the release of negative information, which leads to an increase in the degree of information asymmetry of the company. When the accumulation of negative information reaches the threshold and is released collectively to the market, a stock price collapse phenomenon will occur. Currently, scholars have successively explored the impact of accounting conservatism, major shareholder holdings, equity pledge, and other factors on the risk of stock price collapse. Chune et al. conducted a study which found that the supervision by institutional major shareholders over the opaque behavior of management can reduce the risk of company collapse[4]. This effect is more pronounced in companies with a high degree of information asymmetry. Institutional investors play a supervisory role. Therefore, institutional investors' holdings can reduce the risk of stock price collapse. However, since the Chinese capital market is not yet fully mature, the structure of investment entities needs to be optimized.

Information asymmetry makes it difficult for external investors to understand the true internal operating situation of the company. They can only analyze based on the information disclosed by the company. However, the information disclosed by the company may not be completely true. Self-interested management may choose to delay disclosure or conceal negative information of the company for the purposes of improving their own performance and expanding the company's scale. This further aggravates the degree of information asymmetry, causing negative information to accumulate within the company and increasing the probability of a stock market crash. Fu Fanjie's research has demonstrated that long-term institutional investors can curb the short-sighted behavior of management, thereby reducing the risk of a market crash[7]. The main purpose of state-owned institutional investors' shareholding is to stabilize the trading order and

avoid sharp fluctuations in the securities market. The holding of shares by state-owned institutional investors is more conducive to curbing the opportunism of management, timely identifying the irrational behaviors of management, thereby enhancing the information transparency of listed companies, improving the information environment, enabling the characteristic information of listed companies to be more accurately reflected in the stock prices, and reducing the occurrence of stock market crashes. Therefore, based on the above analysis, this paper proposes the hypothesis that the higher the proportion of state-owned institutional investors' holdings, the lower the risk of stock price collapse for listed companies, and the two variables have a negative correlation.

2 Research Design

2.1 Sample Selection and Data Sources

This study takes the stocks of Chinese A-share listed companies in 2015 - 2024 as the research object, covering the large-scale anomaly-fighting funds in the stock market during the period of 2015 and subsequent years. It includes multiple cycle data and uses annual data as the observation frequency. The sample data undergoes the following steps of processing: (1) Exclude the listed companies in the financial industry as defined by the China Securities Regulatory Commission in 2012. (2) Excluding listed companies that were subject to special circumstances such as ST, *ST, PT, or delisting consolidation during the sample period. (3) To ensure the accuracy of the calculation of the stock price crash risk variables, the stock data with less than 30 weeks of weekly returns within the year are excluded from the sample. (4) Exclude the company samples with missing values in the relevant variable data. (5) To avoid the influence of extreme values in the data on the sample analysis, the continuous variables within the sample data undergo 1% and 99% truncation processing. The data sources for this study regarding state-owned institutional investors in the Chinese capital market are from the WIND database, while the financial data of other listed companies and capital market transaction data are all from the CSMAR database.

2.2 Model Design

Based on the research works of Kim and Boubakri [5][6], in order to test whether state-owned institutional investors can influence the risk of stock price crashes in listed companies, this chapter constructs a two-way fixed effect model for companies and time using unbalanced panel data.

$$Crash_{i,t} = \alpha_0 + \beta_1 natra_{i,t} + \sum \gamma\, ControlVariable_{i,t} + year + indcd + \varepsilon_{i,t}$$

The dependent variable Crash $_{i,t}$ represents the magnitude of the stock $_{i's}$ collapse risk at time t. The explanatory variable natra $_{i,t}$ indicates the proportion of time t that stock i is held by state-owned institutional investors. ControlVariable $_{i,t}$ represents a series of

control variables for stock i at time t. year denotes the time effect of the stock. indcd represents the industry effect of listed companies. $E_{i,t}$ is the random error term.

This study draws on the measurement methods of stock market crash risk proposed by scholars such as Huttond (2009), Kim (2011), in previous literature research[5][8]. It will adopt the following two indicators to measure the risk of stock market crash: NCSKEW and DUVOL.

$$NCSKEW_{i,t} = [n(n-1)^{3/2}\sum W_{i,t}^3] / [(n-1)(n-2)(\sum W_{i,t}^2)^{3/2}]$$

$$\mathrm{DUVOL}_{i,t} = \ln\left\{\left[(n_u - 1)\sum_{down} W_{i,t}^2\right] / \left[(n_d - 1)\sum_{up} W_{i,t}^2\right]\right\}$$

The state-owned institutional investors studied in this article are mainly composed of special institutions such as the China Securities Finance Corporation, Huijin Company, and customized funds. This article takes the annual shareholding ratio of state-owned institutional investors as the measurement indicator and labels it as "natra".

The control variables mainly include company size (Size), company profitability (ROA), financial leverage (Lev), book-to-market ratio (BM), mean of weekly return rate (Ret) and standard deviation (Sigma), monthly average excess trading rate (Dturno), proportion of institutional investors (Inst), and analyst attention (AnaAtt). At the same time, it also controlled for the industry effects and time effects.

3 Empirical Results

3.1 Descriptive Statistical Analysis

Table 1. Descriptive statistical analysis

	mean	sd	min	p50	max
DUVOL	-0.194	0.478	-1.571	-0.198	1.319
NCSKEW	-0.304	0.730	-2.697	-0.270	2.267
natra	0.006	0.016	0.000	0.000	0.137
Size	22.655	1.312	19.771	22.484	26.697
Lev	0.453	0.197	0.067	0.449	0.929
ROA	0.032	0.075	-1.324	0.032	1.285
BM	0.662	0.267	0.064	0.660	1.303
Sigma	0.049	0.020	0.014	0.045	0.139
Ret	-0.001	0.001	-0.010	-0.001	0.001
Inst	0.493	0.266	-0.051	0.493	1.000
Dturno	-4.418	40.538	-225.218	-1.069	147.060
AnaAtt	1.266	1.206	0.000	1.099	4.331

Table 1 presents the descriptive statistical analysis results of the main variables. The mean values of the risk measurement indicators NCSKEW and DUVOL for stock price

crash are -0.194 and -0.304 respectively, with standard deviations of 0.478 and 0.730 respectively. These values are similar to the data distribution characteristics in existing literature, providing sufficient variation for the subsequent regression analysis.

3.2 Basic Regression

Table 2. Basic regression results

	(1)	(2)
	NCSKEW	DUVOL
natra	-1.586***	-0.756***
	(0.328)	(0.218)
Size	-0.096***	-0.080***
	(0.007)	(0.005)
Lev	0.103***	0.070***
	(0.033)	(0.022)
ROA	-0.489***	-0.305***
	(0.097)	(0.062)
BM	0.116***	0.173***
	(0.030)	(0.020)
Sigma	-0.364	-0.120
	(1.041)	(0.685)
Ret	119.948***	68.967***
	(16.411)	(10.878)
Inst	0.020	0.011
	(0.021)	(0.014)
Dturno	-0.000**	-0.000***
	(0.000)	(0.000)
AnaAtt	0.075***	0.042***
	(0.006)	(0.004)
_cons	1.847***	1.530***
	(0.152)	(0.100)
N	22358	22358
R^2	0.080	0.088
adj. R^2	0.076	0.084

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

This study examines the impact of the holding behavior of state-owned institutional investors on the risk of stock market crashes by using a basic regression model. The risk indicators for stock market crashes are NCSKEW and DUVOL. The regression results are shown in Table 2. The regression coefficients of state-owned institutional investors on the risk of crashes are -1.586 and -0.756, which are significant at the 1% level. This indicates that the holding behavior of state-owned institutional investors can effectively reduce the level of stock market crash risks. Therefore, it can be concluded

that the stabilization fund's actions have the effect of stabilizing the market, thereby verifying the research hypotheses presented earlier.

3.3 Robustness Test

In the previous section on basic regression, the shareholding behavior of state-owned institutional investors was measured by the proportion of their holdings. To obtain a more direct and reliable measurement of the impact of state-owned institutional investors on the risk of market collapse, in the robustness test section, the variable of whether state-owned institutional investors hold stocks of listed companies was used instead of the continuous proportion variable as the measurement indicator. The replacement variable can eliminate the influence of extreme values and more intuitively reflect the effect of state-owned institutional investors' shareholding.

Table 3. Robustness test - Replacing explanatory variables

	(1)	(2)
	NCSKEW	DUVOL
nathold	-0.064***	-0.028***
	(0.013)	(0.009)
Size	-0.095***	-0.080***
	(0.007)	(0.005)
Lev	0.100***	0.069***
	(0.033)	(0.022)
ROA	-0.487***	-0.304***
	(0.097)	(0.062)
BM	0.112***	0.172***
	(0.030)	(0.020)
Sigma	-0.327	-0.090
	(1.040)	(0.684)
Ret	120.598***	69.370***
	(16.401)	(10.869)
Inst	0.022	0.012
	(0.021)	(0.014)
Dturno	-0.000**	-0.000***
	(0.000)	(0.000)
AnaAtt	0.074***	0.042***
	(0.006)	(0.004)
_cons	1.842***	1.535***
	(0.152)	(0.100)
N	22358	22358
R^2	0.080	0.088
adj. R^2	0.076	0.084

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The regression results are shown in Table 3. The regression coefficients of state-owned institutional investors for the risks of stock price crashes (NCSKEW and DUVOL) are -0.064 and -0.028, both of which are significant at the 1% level. Consistent with the research conclusions of this article, the results are quite robust.

Table 4. Robustness test - Incorporation of corporate governance variables

	(1)	(2)
	NCSKEW	DUVOL
natra	-1.610***	-0.778***
	(0.330)	(0.219)
Size	-0.096***	-0.080***
	(0.007)	(0.005)
Lev	0.104***	0.070***
	(0.033)	(0.022)
ROA	-0.484***	-0.302***
	(0.097)	(0.062)
BM	0.119***	0.176***
	(0.030)	(0.020)
Board	-0.029	-0.008
	(0.035)	(0.023)
Indep	0.205*	0.153**
	(0.107)	(0.070)
Sigma	-0.372	-0.117
	(1.041)	(0.685)
Ret	120.307***	69.269***
	(16.414)	(10.875)
Inst	0.023	0.013
	(0.021)	(0.014)
Dturno	-0.000**	-0.000***
	(0.000)	(0.000)
AnaAtt	0.075***	0.043***
	(0.006)	(0.004)
_cons	1.832***	1.495***
	(0.174)	(0.114)
N	22358	22358
R^2	0.080	0.088
adj. R^2	0.076	0.084

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

To address the endogeneity issue caused by omitted variables, this study will further control a series of factors related to the company structure. The level of corporate governance is directly related to the ability of the management to conceal bad news. This is directly linked to the classic theory of the management's hoarding of stocks in the context of the risk of stock price collapse. As a major component of the corporate governance

system, the management, the board of directors, major shareholders, and other entities play a decisive role in corporate governance. The regression results are shown in Table 4. The regression results show that the regression coefficients of state-owned institutional investors with the indicators of market crash risk (NCSKEW) and (DUVOL) remain significantly negative.

4 Research Conclusions and Implications

This study, using the data of A-share listed companies from 2015 to 2024 as samples, investigated the impact of state-owned institutional investors' shareholding on the risk of stock price crashes. The research finds that the holdings of state-owned institutional investors significantly reduce the risk of stock price crashes for listed companies. The above conclusion still holds after conducting robustness tests by replacing explanatory variables and adding corporate governance variables. Since the stock market crash in 2015, state-owned institutional investors have entered the market on a large scale, taking on the responsibility of maintaining market stability and restoring normal market order. After the crisis, state-owned institutional investors continued to participate in stock trading in the securities market. By holding shares in listed companies, they indirectly fulfilled their supervisory functions, effectively utilizing the market mechanism to improve the information environment of companies and enhance the quality of information disclosure, thereby reducing the risk of stock price collapse of listed companies. From the micro perspective, this once again affirmed the positive impact of such special institutional investors, the state-owned ones, on the capital market.

In terms of policy suggestions, this article believes that the existence of state-owned institutional investors in China's securities market in the long term is reasonable, and the scale of their participation in the market can be appropriately expanded to better play their roles. Therefore, in the context of the comprehensive promotion of the registration-based reform of the capital market in China, state-owned institutional investors should adhere to their duties of entering the market, eliminate market speculation behaviors, and uphold the concept of value investment. State-owned institutional investors should maintain the long-term stability of the securities market, play the role of a "regulator" in the securities market, actively participate in corporate governance, strive to create a healthy and favorable investment and financing environment and capital market ecosystem, promote the high-quality development of listed companies, and improve the institutional construction of the capital market.

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