

# The Impact of Institutional Cross-shareholdings on Financial Distress

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**Abstract:** Using the data of 4,057 listed companies in Shanghai and Shenzhen A-shares from 2012 to 2021, we explore the impact of institutional cross-shareholdings on financial distress and its mechanism of action. The research results show that institutional cross-shareholding is positively related to financial distress. Further research finds that: management shareholding ratio is an important channel for institutional cross-shareholding to influence financial distress; the impact of institutional cross-shareholding on financial distress is more significant in standard unqualified audit opinion and non-state-owned enterprises. The findings of this paper provide theoretical and empirical evidence for the effect of institutional cross-shareholding on corporate financial distress and its impact mechanism.

**Keywords:** Institutional cross-shareholding, Financial distress, Management's shareholding, Governance effects.

## 1. Introduction

Since 2000, the Securities and Futures Commission (SFC) first proposed the strategy of "extraordinary development of institutional investors", as of December 2021, the market value of institutional holdings accounted for 44% of the market value of institutional investors have become the backbone of China's capital market, and at the same time, the phenomenon of their cross-holdings is also becoming more and more common. Institutional cross-shareholding refers to the same institution simultaneously holding two or more listed companies in the same industry with large shareholdings (shareholding ratio greater than 5%) [1]. On the one hand, as a specialised external investor, cross-shareholding institutions can promote the sharing of information resources among enterprises due to their holding of multiple enterprises in the same industry; and due to the lower marginal cost of supervision and higher marginal returns, cross-shareholding institutions will be more actively involved in corporate governance compared to other investors, which has a positive impact on corporate governance as well as the enhancement of the integration of idiosyncratic information into the stock price. On the other hand, when institutional investors tend to pursue short-term interests, they often choose to conspire with management to carry out surplus management, thereby harming the interests of enterprises and enhancing financial distress. Financial distress enterprises are manifested in the inability to perform or repay debts on time, negative net assets, bankruptcy and liquidation, illiquidity and cash outflow, etc. [2]. Once the financial distress is not resolved in time, it may eventually lead to bankruptcy and liquidation of the enterprise [3], therefore, digging into the motivation of financial distress has become the key to resolve financial distress. Some studies have been conducted to analyse the impact of micro-factors of enterprises, such as return on total assets, interest coverage multiples, current ratio [4], cash flow ratio and cash to debt ratio [5], enterprise revenue from main business and cost, internal governance level, capital structure, etc. In addition, there are macro factors such as the degree of market competition [6], inflation [7], and monetary policy.

At present, the academic research on the role of institutional investors on financial distress has not formed a consistent conclusion. Some studies from the "resources" and "information" perspective analysis that institutional ownership has a mitigating effect. Institutional investors have a wide range of information channels [8] and strong information analysis ability [9], effectively alleviate information asymmetry [10], can broaden financing channels for enterprises, reduce financing costs [11], thus alleviating the financial difficulties caused by financing constraints. Some other studies analyse the effect of institutional shareholding from the governance perspective. For example, studies have shown that institutional investors will actively participate in the company's investment and financing decisions in order to reduce investment risks and obtain higher returns [9], which has an external governance role. While Gillan and Starks [12] believe that it is difficult for institutional investors to play a supervisory role on the management, due to the fact that it is difficult for institutional investors to fight against the controlling shareholders [13], and they tend to play the role of profit grabbers [14]. In summary, scholars have made a lot of research on the impact factors of financial distress. But whether institutional cross-shareholding promotes or inhibits financial distress, few literatures give an answer, which is an important question that this paper tries to address.

This paper selects listed companies from 2012 to 2021 as the research object to examine the relationship between institutional cross-shareholdings and financial distress. The core issues of concern in this paper are: what kind of impact will institutional cross-holdings have on financial distress? What is the transmission mechanism between the two? The possible contributions of this paper are: (1) in the current institutional investors in China's shareholding structure is concentrated, the proportion of shareholding increases, and gradually tends to the reality of long-term investment background, in-depth investigation of cross-shareholding of institutional investors how to influence the micro-enterprise financial decision-making, for the improvement of corporate governance has a certain practical significance. (2) Expanding the academic research on the economic consequences of

institutional cross-shareholding, the empirical research on cross-shareholding institutional investors is still in its infancy, and the findings have not yet reached a consensus. The research of this paper brings a new empirical basis for the promotion effect of cross-shareholding institutional investors on enterprise development.

## 2. Theoretical Analysis and Research Hypothesis

Institutional cross-shareholding and financial difficulties

On the one hand, the development of China's institutional investors late, the mechanism is not mature enough, and their own professional knowledge has to be strengthened and improved, when encountered with high-risk high-yield and other major decisions, often form a "herd effect" [15], the herd effect of cross-holding of institutional investors will ignore their own mastery of private information and trust the information of other investors. When the performance of the enterprise declines, the cross-holding institutional investors will choose to sell their shares to exit, thus exacerbating the financial difficulties of the enterprise. When the cost of cross-holding institutional investors is greater than the benefit, rational institutional investors will reduce the supervision of the management, or even conspire with the management to maximise their own interests, and the management will also increase the proportion of shares for their own benefit, reduce the disclosure of bad information, and aggravate the financial difficulties of the enterprise.

On the other hand, compared to the benefits of maintaining a business relationship with the investee unit, the benefits of capital appreciation may be more [16], therefore, cross-shareholding of institutional investors have enough incentives to supervise the management and participate in the management of the listed company, and when the proportion of shareholding is higher, it will send a signal to the market that the enterprise is of high quality, and play the role of the "investment vane", and improve the financial distress of the enterprise. When the shareholding ratio is high, it will send a signal to the market that the enterprise is of high quality, play the role of "investment wind vane", improve the investment confidence of other investors, enrich the external financing channels, reduce the financing constraints [17], and alleviate the financial difficulties.

So, is institutional cross-shareholding a facilitator or inhibitor of financial distress? Few literatures have studied this, so hypotheses 1 and 2 are proposed.

H1: Institutional cross-holdings can aggravate corporate financial distress.

H1: Institutional cross-shareholdings can alleviate corporate financial distress.

## 3. Variable Selection and Model Construction

### 3.1. Sample selection and data sources

After the implementation of the pilot RMB Qualified Foreign Institutional Investor system in 2011, institutional investors have gradually expanded and their structure has developed in the direction of diversification. Therefore, A-share listed companies in Shanghai and Shenzhen from 2012 to 2021 are selected for the study. And the following screenings were conducted: (1) deletion of financial and

insurance industry enterprises; (2) deletion of ST and \*ST enterprises; (3) deletion of samples with missing data, and a total of 25,889 samples from 4,057 listed companies were finally obtained. All the data in this paper are from the Cathay Pacific database, and the data processing uses Stata17, and all the variables are shrink-tailed at the 1% and 99% levels.

## 3.2. Definition of variables

### 3.2.1. Explained variables

The explanatory variable is financial distress (Z), which draws on the Z-Score model constructed by Altman (1968)[18] to measure firms' financial distress. A larger Z-Score value indicates a lower likelihood of financial distress.

### 3.2.2. Explanatory variables

Institutional cross-holding dummy variable (CrossDum), with reference to the practice of Zhou Taiyun et al. (2021) [19], if the ratio of the number of shares held by institutional investors in the enterprise and other enterprises in the same industry to the number of shares outstanding at the same time in the year are more than 5%, it is determined that there is an institutional investor cross-holding of shares in the enterprise, then CrossDum takes the value of 1, or else 0. (First, in China 5% represents the warning line for major equity changes; second, foreign scholars generally believe that shareholders holding more than 5% of the shares will have a significant impact on business decisions).

### 3.2.3. Control variables

Controls: In terms of corporate characteristics, enterprise size (Size), years of listing (Age), gearing ratio (Lev), return on assets (ROA), enterprise value (TQ), and proportion of fixed assets (FA) are selected; in terms of corporate governance, the proportion of shareholding of the first largest shareholder (Top1), the size of the board of directors (Board), the proportion of independent directors (Indep), the proportion of shareholding of the first largest shareholder (Top1), the proportion of independent directors (Indep), the proportion of independent directors (Indep), the proportion of independent directors (Indep), and the proportion of independent directors (Indep). directors (Indep), institutional investors' shareholding (Ins), and two positions (Dual).

The symbols and definitions of the main variables are shown in Table 1.

## 3.3. Model setting

In this paper, model (1) is constructed to test the effect of the main hypothesis institutional cross-holding dummy variable (CrossDum) on financial distress (Z).

$$Z_{i,t} = \beta_0 + \beta_1 CrossDum_{i,t} + \beta_2 Controls_{i,t} + u_i + v_t + \varepsilon_{i,t} \quad (1)$$

where  $u_i$  is the individual effect,  $v_t$  is the time effect, and  $\varepsilon_{i,t}$  is the random perturbation term. If the coefficient  $\beta_1$  is significantly positive, it means that hypothesis 1 is valid; if the coefficient  $\beta_1$  is significantly negative, hypothesis 2 is valid.

## 4. Empirical Results and Analysis

### 4.1. Descriptive statistics

Table 2 reports the descriptive statistics results of the main variables, with Z standard deviation of 5.893, minimum value of -37.694 and maximum value of 0.004, indicating that the financial distress of listed companies in China is at a high

level and dispersion. The mean of CrossDum is larger than the median, which indicates that the sample is slightly right skewed. The results of descriptive statistics of other control

variables (Controls) are basically consistent with existing studies.

**Table 1.** Definitions of major variables

The variable type	The variable name	Variable symbol	Variable definitions
The variable being explained	Financial distress	Z	For ease of understanding, take the opposite of Z—Score
Explanatory variables	Institutional cross-shareholding dummy variable	CrossDum	If the enterprise has cross-shareholding, institutional investors will take 1, otherwise 0.
	Enterprise size	Size	The natural logarithm of the total asset book value
Control variables	Years on the market	Age	The natural logarithm of the company's listing years plus 1
	Gearing ratio	Lev	Total liabilities/total assets
	Return on assets	ROA	Net profit/total assets
	Enterprise value	TQ	Market capitalization/total assets
	Proportion of fixed assets	FA	Fixed assets/total assets
	The largest shareholder's shareholding	Top1	Number of shares held by the largest shareholder/total number of shares
	Board size	Board	Number of board members
	Proportion of independent directors	Indep	(Number of independent directors / number of board members)× 100%.
	Percentage of shareholding by institutional investors	Ins	Number of shares held by institutional investors/total number of shares
	Two jobs in one	Dual	1 when the chairman and general manager are concurrently held by one person, otherwise 0

**Table 2.** Descriptive statistical results of major variables

Variables	N	Mean	Median	S.D	Min	Max
Z	25889	-5.073	-3.203	5.893	-37.694	0.004
CrossDum	25889	0.192	0.000	0.394	0.000	1.000
Size	25889	22.206	22.037	1.248	19.952	26.080
Age	25889	2.142	2.303	0.808	0.000	3.332
Lev	25889	0.417	0.409	0.200	0.057	0.883
ROA	25889	0.036	0.036	0.065	-0.282	0.196
TQ	25889	2.092	1.651	1.367	0.855	8.888
FA	25889	0.216	0.183	0.157	0.003	0.695
Top1	25889	0.341	0.319	0.145	0.092	0.737
Board	25889	8.505	9.000	1.667	5.000	15.000
Indep	25889	37.601	36.36	5.318	33.330	57.140
Ins	25889	0.426	0.442	0.247	0.003	0.906
Dual	25889	0.289	0.000	0.453	0.000	1.000

## 4.2. Correlation analysis

The Spearman correlation test for the main variables is presented in Table 3. The correlation coefficients are much less than 0.5, except for the correlation coefficients of Ins and

Top1, and the correlation coefficients of Board and Indep, which are slightly larger. In addition to this, the mean value of the variance inflation factor (VIF) of the variables is 1.4, which is less than 10. Therefore, it can be judged that there is no serious multiple covariance.

**Table 3.** Correlation coefficients for major variables

Variables	Z	CrossDum	Size	Age	Lev	ROA	TQ	FA	Top1	Board	Indep	Ins	Dual
Z	1												
CrossDum	0.049***	1											
Size	0.356***	0.296***	1										
Age	0.129***	0.219***	0.423***	1									
Lev	0.593***	0.120***	0.484***	0.336***	1								
ROA	-0.292***	0.022***	0.020***	-0.188***	-0.357***	1							
TQ	-0.704***	-0.032***	-0.371***	-0.044***	-0.259***	0.148***	1						
FA	0.153***	0.144***	0.152***	-0.154***	0.122***	-0.059***	-0.134***	1					
Top1	0.047***	0.052***	0.198***	-0.071***	0.032***	0.146***	-0.104***	0.113***	1				
Board	0.132***	0.158***	0.289***	0.181***	0.157***	0.011*	-0.138***	0.166***	0.037***	1			
Indep	-0.036***	-0.039***	-0.012**	-0.044***	-0.013**	-0.017***	0.051***	-0.049***	0.036***	-0.515***	1		
Ins	0.069***	0.278***	0.444***	0.237***	0.184***	0.101***	-0.050***	0.173***	0.504***	0.239***	-0.071***	1	
Dual	-0.083***	-0.116***	-0.186***	-0.247***	-0.127***	0.028***	0.079***	-0.107***	-0.047***	-0.193***	0.124***	-0.204***	1

Concentrate: \*, \*\*, \*\*\*Significance levels of 10%, 5% and 1% are indicated, respectively. The table below is the same.

## 4.3. Benchmark regression

Table 4 shows the results of regression of institutional cross-holding dummy variable (CrossDum) on financial

distress (Z), and with the addition of control variables, the effect of institutional cross-holding dummy variable (CrossDum) on financial distress (Z) is 1.396 and is significant at 1 per cent, which suggests that the two are

positively correlated, and hypothesis H1 is confirmed.

**Table 4.** Results of main regression test

Variables	<i>Z</i>
<i>CrossDum</i>	1.396*** (6.56)
<i>Size</i>	-2.887*** (-19.79)
<i>Age</i>	1.952*** (7.82)
<i>Lev</i>	19.179*** (34.72)
<i>ROA</i>	1.336** (2.00)
<i>TQ</i>	-5.591 (-230.04)
<i>FA</i>	-4.825*** (-5.04)
<i>Top1</i>	0.033 (0.48)
<i>Board</i>	0.026 (1.59)
<i>Indep</i>	7.440*** (11.81)
<i>Ins</i>	0.182 (1.06)
<i>Dual</i>	1.396*** (6.56)
Constant	53.823*** (17.20)
Time/individual	Yes
Observations	25889
<i>Adj R^2</i>	0.721

**Table 5.** Robustness test results

	(1) <i>O-Score</i>	(2) <i>Z</i>
<i>CrossDum</i>	0.333*** (8.05)	
<i>L.CrossDum</i>		0.369** (2.01)
<i>Size</i>	-0.585*** (-31.31)	-1.211*** (-9.04)
<i>Age</i>	-1.917 (-84.92)	0.219 (0.74)
<i>Lev</i>	7.960 (82.72)	18.248*** (37.20)
<i>ROA</i>	-11.830 (-45.83)	-1.884*** (-3.42)
<i>TQ</i>	-0.225*** (-17.25)	-2.800 (-80.31)
<i>FA</i>	-0.194* (-1.90)	2.840*** (4.47)
<i>Top1</i>	-1.021*** (-8.03)	-0.648 (-0.77)
<i>Board</i>	0.041*** (3.58)	0.111* (1.93)
<i>InDep</i>	0.008** (2.34)	0.011 (0.80)
<i>Ins</i>	1.573*** (19.00)	1.795*** (3.21)
<i>Dual</i>	0.021 (0.60)	0.331** (2.29)
Constant	5.497*** (13.94)	15.907*** (5.46)
Time/individual	Yes	Yes
Observations	25889	20681
<i>Adj R^2</i>	0.454	0.360

## 4.4. Robustness test

### 4.4.1. Variable substitution

Firstly, in order to exclude the interference of variable setting errors on the results, O-Score is selected as a proxy variable for the dependent variable, and a larger value of O-Score indicates a higher risk of financial distress of the firm. The results are shown in column (1) of Table 5. The results show that the signs of all core variables remain unchanged and the conclusion still holds.

### 4.4.2. one-period lagged independent variables

Secondly, considering the possible time lag of institutional cross-holding dummy variable on financial distress, the lagged one period explanatory variables are selected for regression and the results in column (2) show that the conclusion remains unchanged.

## 5. Further Research

### 5.1. Testing of intermediary mechanisms

Based on the previous analyses, management shareholding ratio (MSR) may be the transmission mechanism between institutional cross-shareholding dummy variables and financial distress. In this paper, we refer to the methodology of the papers by Wen Zhonglin et al. (2005) [20] and Wen Zhonglin and Ye Baojuan (2014) [21], and use the stepwise

method to test the model and analyse the mediating mechanism of management shareholding ratio in the relationship between the two.

$$MSR_{i,t} = \alpha_0 + \alpha_1 CrossDum_{i,t} + Controls_{i,t} + U_i + v_t + \varepsilon_{i,t} \quad (2)$$

$$Z_{i,t} = \beta_0 + \beta_1 CrossDum_{i,t} + \beta_2 MSR_{i,t} + Controls_{i,t} + U_i + v_t + \varepsilon_{i,t} \quad (3)$$

In this case, the management shareholding ratio (MSR) selects the total number of shares held by the board of directors, supervisory board and executives as a proportion of the total number of shares in the company, and the results of the mechanism test are shown in Table 6. Column (1) shows that the institutional cross-shareholding dummy variable (CrossDum) exhibits a positive relationship with management shareholding ratio (MSR). Column (2) also shows a positive relationship between management shareholding ratio and financial distress after adding the mediating variable to the baseline regression. This indicates that institutional cross-holdings increase firms' financial distress by contributing to management shareholding ratio. The mechanism effect of management shareholding ratio (MSR) holds.

Table 6. Results of intermediary mechanism test

Variables	(1)	(2)
	MSR	Z
<i>CrossDum</i>	0.677*** (3.67)	0.157** (2.23)
<i>MSR</i>		0.009*** (3.34)
<i>Size</i>	1.830*** (13.79)	-0.649*** (-12.75)
<i>Age</i>	-11.369 (-51.48)	-0.099 (-1.11)
<i>Lev</i>	-3.726*** (-7.65)	14.799 (79.47)
<i>ROA</i>	9.381*** (10.76)	-1.417*** (-4.24)
<i>TQ</i>	0.190*** (3.64)	-2.551 (-128.02)
<i>FA</i>	0.116 (0.18)	1.728*** (7.17)
<i>Top1</i>	24.861*** (29.55)	-1.547*** (-4.72)
<i>Board</i>	0.398*** (6.69)	0.011 (0.49)
<i>InDep</i>	-0.006 (-0.43)	0.000 (0.07)
<i>Ins</i>	-31.593 (-57.17)	1.686*** (7.45)
<i>Dual</i>	-0.264* (-1.77)	0.152*** (2.68)
<b>Constant</b>	-1.695 (-0.59)	7.406*** (6.76)
<b>Time/individual</b>	Yes	Yes
<b>Observations</b>	25889	25889
<b>Adj R<sup>2</sup></b>	0.336	0.584

## 5.2. Heterogeneity analysis

### 5.2.1. Whether it is a standard audit opinion

Considering that different audit opinions may have an

impact on the operation of enterprises, which in turn affects financial distress, regressions are conducted by distinguishing between audit opinions, as can be seen from the regression

results in columns (1) and (2) of Table 7, the coefficient of the institutional cross-holding dummy variable (CrossDum) is insignificant in non-standard unqualified audit opinions, and the coefficient of the independent variable is positive and significant at the 1 per cent level in standard unqualified audit opinions. Significant at the 1% level, which implies that the positive relationship between the institutional cross-holding dummy variable and financial distress only occurs in firms with standard unqualified audit opinions. Compared with non-standard unqualified audit opinion, standard unqualified audit opinion financial statement information quality is higher, which improves the transparency of information between the enterprise and external investors, so the response of financial distress to the effect of institutional cross-holdings is more sensitive in enterprises with unqualified audit opinion.

### 5.2.2. Whether it is a state-owned enterprise

On the one hand, state-owned enterprises bear the responsibility of realizing social and economic benefits [22]; on the other hand, compared with non-state-owned enterprises, SOEs have a huge advantage in accessing resources [23], are weakly sensitive to market changes, and lack a strong willingness to alleviate the financial difficulties of enterprises. Therefore, this paper conducts group regressions based on the nature of property rights. The results, as shown in columns (3) and (4) of Table 7, indicate that there is a positive relationship between financial distress (Z) and the institutional cross-shareholding dummy variable (CrossDum) in non-state-owned enterprises, and there is no such relationship in state-owned enterprises.

Table 7. Heterogeneity analysis results

Variables	(1)		(2)		(3)		(4)	
	Whether it is a standard audit opinion				Whether it is a state-owned enterprise			
	Yes	No	Yes	No	Yes	No	Yes	No
<i>CrossDum</i>	0.726*** (4.40)	-4.013 (-0.57)	-0.054 (-0.73)	0.304*** (2.86)				
<i>Size</i>	-1.029*** (-8.65)	-3.145 (-1.03)	-0.758*** (-11.75)	-0.587*** (-8.32)				
<i>Age</i>	-0.406** (-2.07)	1.253 (0.10)	-0.157 (-1.10)	-0.350*** (-2.98)				
<i>Lev</i>	18.135 (40.44)	10.196 (0.92)	11.163 (45.53)	16.428 (65.60)				
<i>ROA</i>	-0.829 (-1.20)	-6.522 (-1.38)	-2.389*** (-4.85)	-0.896** (-2.09)				
<i>TQ</i>	-3.010 (-85.55)	-6.781*** (-58.54)	-2.372 (-85.97)	-2.609 (-99.75)				
<i>FA</i>	2.541*** (4.47)	6.716 (0.38)	2.898*** (11.10)	1.011*** (2.84)				
<i>Top1</i>	-0.489 (-0.65)	-39.166 (-1.31)	-0.954** (-2.57)	-1.377*** (-2.90)				
<i>Board</i>	0.065 (1.24)	-2.915 (-1.58)	-0.007 (-0.29)	0.042 (1.20)				
<i>Indep</i>	0.009 (0.73)	-0.178 (-0.43)	-0.001 (-0.14)	0.003 (0.29)				
<i>Ins</i>	2.128*** (4.28)	30.227* (1.66)	2.793*** (9.24)	1.172*** (4.21)				
<i>Dual</i>	0.192 (1.42)	10.263*** (2.74)	0.085 (1.09)	0.121 (1.60)				
<b>Constant</b>	13.906*** (5.43)	98.903 (1.34)	10.326*** (7.34)	6.257*** (4.08)				
<b>Time/individual</b>	Yes	Yes	Yes	Yes				
<b>Observations</b>	25059	830	8791	17098				
<b>Adj_R<sup>2</sup></b>	0.340	0.951	0.616	0.587				

## 6. Conclusions and Recommendations

### 6.1. Research conclusions

This paper explores the relationship between institutional cross-shareholdings and financial distress and its path of action using data from A-share listed companies in Shanghai and Shenzhen from 2012 to 2021. It is found that: first, institutional cross-shareholdings are positively related to financial distress; second, the mediation test finds that institutional cross-shareholdings play a role in financial distress by affecting the proportion of management's shareholdings; and third, the heterogeneity analysis shows that institutional cross-shareholdings are positively related to financial distress only in the standard unqualified auditing opinion and in the non-state-owned enterprises compared to the non-standard auditing opinion enterprises and state-

owned enterprises. Third, the heterogeneity analysis shows that institutional cross-holdings are positively associated with financial distress only in firms with standard unqualified audit opinions and in non-state-owned enterprises.

### 6.2. Policy recommendations

First, establish a good investment ecosystem in the market. Institutional investment has gradually become an important source of medium- and long-term capital in the capital market, but according to the conclusions of this paper, institutional cross-shareholding exacerbates the financial difficulties of enterprises, which means that institutional investment in China's capital market is likely to produce the phenomenon of "conspiracy" and other phenomena, and is unable to alleviate the difficulties of enterprises. Therefore, it is necessary to strengthen the long-term assessment mechanism of

investment institutions from the institutional system, to incentivise medium- and long-term investment and equity investment, and to establish a good market investment ecosystem.

Secondly, the professionalism of institutional cross-shareholding should be continuously improved. As intermediaries, they play an important role in the connection between micro enterprises and macro markets, therefore, the information mining, processing and analysing capabilities of cross-shareholding institutions should be continuously strengthened to improve the level of supervision of enterprise management.

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