

Research on the Impact of Equity Structure of A-share Listed Companies on Corporate Financing Constraints, 2010-2023

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Abstract: "Difficult and expensive financing" has been one of the problems plaguing the development of enterprises at home and abroad, this paper is based on the data of A-share listed companies in 2010-2023 will be the equity structure as a corporate perspective factors on the impact of financing constraints, according to the existing literature using the regression model to reach the conclusion of empirical analyses, Through empirical analysis, the study concludes that an increase in equity concentration and management shareholding ratio mitigates the impact of equity structure on financing constraints. Specifically, it is found that non-state-owned enterprises exhibit a higher degree of equity concentration and management shareholding ratio compared to state-owned enterprises. However, state-owned enterprises experience a more significant reduction in financing constraints. Therefore, this paper based on the conclusion of the analysis puts forward suggestions, enterprises in the financing process, not only need to pay attention to the external environment of the enterprise, but also need to make appropriate adjustments to the content of the enterprise shareholding structure, improve the management's shareholding of the management of the equity incentives to stimulate the management to try to work to alleviate the financing constraints. At the same time, when the equity system is higher, it is conducive to the stability of the enterprise, and can better cope with the financing constraints and other problems.

Keywords: equity structure, financing constraints, equity concentration, management shareholding ratio.

1. Introduction

"Difficult and expensive financing" has always been one of the problems plaguing the development of enterprises at home and abroad, because in the financial market, the internal and external information asymmetry is high, it is difficult for enterprises to obtain adequate information on the supply of bank financing, and the traditional financial institutions are more prudent in the credit business of the enterprise, so that many enterprises are unable to obtain sufficient funds from financial institutions, and are facing the problem of financing constraints [1]. The current study finds from the impact of the macro environment that, among political factors, there is often a structural imbalance in government support in China, which may lead to an imbalance in which one part of the enterprises have abundant resources while another part of the enterprises face serious financing constraints [2]. Among economic factors, Chinese enterprises have limited access to financing channels, coupled

with frequent changes in the external economic environment and the policy environment, and the financing decisions of the enterprises are In the economic factors, Chinese enterprises have limited financing channels, coupled with frequent changes in the external economic environment and policy environment, enterprises' financing decisions are more susceptible to the impact of macro-supply-side factors, and thus financing constraints fluctuate particularly sharply with the economic cycle [3]. Regarding the legal factors, China is currently in a special period of the transition economy, and the relevant legal system is still unsound, which restricts the development of enterprises' external financing channels [4]. However, from a dynamic perspective, Chinese laws and regulations are also being established and improved. For example, *the Property Law of the People's Republic of China* has significantly improved the level of property rights protection in China, reduced the cost of corporate debt financing, and eased corporate financing constraints [5]. The current research has studied more from the macro perspective and formed a certain system, but the analyses are more scattered in the micro perspective of the enterprise, and most of the research will study the financing constraints as a mechanism variable, so this paper chooses the enterprise's point of view of the direct impact of the enterprise's financing constraints.

Fazzaris et al. conceptualize financing constraints as a phenomenon arising from capital market imperfections, which give rise to a financing premium for firms seeking external financing [6]. As a result, internal financing ceases to be a perfect substitute for external funds, prompting firms to exhibit a greater reliance on internal financing. This dependence on internal funds, stemming from the presence of an external financing premium, manifests as a measure of a firm's overall financing constraints. This theoretical framework highlights the significance of both internal and external financing dynamics in shaping a firm's financial landscape and underscores the need for strategic financial management in the face of market imperfections. Stiglitz and Weiss creatively put forward the concept of "financing constraints" on the basis of previous theories, and they called the phenomenon of enterprise financing behaviour being hindered due to information asymmetry in the capital market "financing constraints" [7].

International theoretical research on the financing constraint problem is mainly based on the principal-agent cost theory from the perspective that higher external financing costs lead to corporate financing constraints [8]. The theories affecting the cost of external financing of enterprises mainly consist of the information asymmetry theory and the free cash flow hypothesis. The information asymmetry theory holds that when there is information asymmetry between external investors and insiders, the enterprise will be required to pay a premium for the use of external funds, which leads to an increase in the cost of external financing, and the enterprise will face the problem of financing constraints. For example, the majority shareholder agency problem in the capital market with high equity concentration will lead to enterprise investment affected by the asset substitution problem, moral dilemma problem, adverse selection problem, and the information asymmetry of enterprise's internal information to the external investor, which will lead to the increase of the cost of enterprise's external financing, and then face the financing constraint problem. The free cash flow hypothesis examines that in a capital market with more dispersed shareholdings, the managerial agency problem caused by the separation of ownership and management will harm the interests of the enterprise, increase the cost of external financing, and lead to the problem of financing constraints of the enterprise.

Chinese research on corporate financing constraints has different perspectives. Feng verified the financing constraints of firms under information asymmetry from the perspective of the level of corporate dividends [9]. Jiangs et al. verified the financing constraints of firms under information asymmetry from the perspective of the size of the firms, respectively [10]. Zhengs et al. studied corporate financing constraints from the perspective of external capital market conditions Corporate ownership structure is an important corporate governance factor that affects corporate agency

problems [11]. Western listed companies have more dispersed shareholdings, a large degree of separation of ownership and operation rights, and enterprises are mostly controlled by managers, while the shareholding structure of Chinese listed companies presents a high degree of shareholding concentration and insider control, so Chinese listed companies are often controlled by majority shareholders, and the degree of infringement of minority shareholders by majority shareholders is much higher than that in developed countries such as the United Kingdom and the United States [12]. As a result, theoretical analyses of the financing constraints of Chinese listed companies should be conducted more from the perspective of the majority shareholder agency problem. At the same time, due to the external capital market conditions, privately held listed companies may face more policy and regulatory restrictions and market evaluation differences than state-owned listed companies, which leads to the differences in the degree of financing constraints faced by listed companies with different nature of shareholders.

Shareholding structure is a joint-stock company Of the total share capital, the different nature of the shares of the total share capital of a joint stock company and their relationship with each other. The proportion of shares held by equity holders enjoys corresponding rights and interests and bears corresponding obligations. Shareholding structure is the foundation of corporate governance and determines different corporate organisational structures. The distribution of shareholding structure determines the ownership of the enterprise and the judgement of decision-making power, and plays an important role in the daily business activities of the enterprise. There are two main aspects in the classification of equity: first, the distribution of equity. The distribution of equity refers to the concentration and distribution of enterprise equity in the hands of shareholders. There are two main measurements: equity concentration and equity checks and balances. The second is the nature of equity. It mainly refers to the type of equity owners of the company, mainly national governments, corporate entities, institutional investors and individual investors [13].

Equity structure embodies the characteristics of shareholders' rights and income distribution of a company, plays a decisive role in the business decisions of an enterprise, and is an important part of the corporate governance system [14]. Existing studies have mainly discussed the impact of equity nature and structure on R&D investment and innovation output of enterprises based on principal-agent theory [15][16]. Few of the current studies on equity structure directly study the impact of equity structure on financing constraints, so this paper studies the impact of equity outcomes on financing constraints as a factor from the firm's perspective.

2. Research design

2.1. Sample data sources

In this paper, some Chinese A-share listed companies from 2010 to 2023 are taken as the research samples, and the sample data are reasonably processed and screened according to the following steps: (1) the data of financial companies are excluded. (2) the samples of ST and *ST categories are excluded. (3) the samples with missing data are excluded. and (4) the continuous variables have been subjected to the 1 per cent and 99 per cent shrinkage process. The final panel data containing 40,420 sample observations is obtained. The data of explanatory variables, interpreted variables, and control variables in this paper are from CSMAR database.

2.2. Selection of variables

Through the existing literature, it is found that there are four measures of financing constraint index, SA, KZ, WW and FC, but most of the current research adopts SA index as the financing constraint index, in order to study the universality of the results, so the explanatory variable financing constraint is measured by KZ index. In the equity structure, this paper adopts equity concentration and

management shareholding ratio, in which equity concentration is measured by the shareholding ratio of the top ten shareholders. The control variables are mainly selected with reference to the existing literature as gearing ratio, firm size, percentage of independent directors, board size, firm age and Tobin's Q value. Table 1 shows the types of variables, variable names and specific symbols of representation.

Table 1: List of variables.

Variable type	variable name	variable symbol
explanatory variable	Financing constraints index	KZ
explanatory variable	shareholding concentration	TOP10
	Management shareholding	Mshare
	gearing	Lev
	Enterprise size	Size
control variable	Percentage of independent directors	Indep
	Board size	Board
	Age of business	FirmAge
	Tobin's Q	TobinQ

2.3. Modelling

In this paper, a regression model is used to verify the relationship between the impact of equity and structural financing constraints based on the existing literature as follows.

$$kz_{it} = \alpha_0 + \alpha_1 TOP10_{it} + \alpha_2 Lev_{it} + \alpha_3 Size_{it} + \alpha_4 Indep_{it} + \alpha_5 Board_{it} + \alpha_6 FirmAge_{it} + \alpha_7 TobinQ_{it} + \varepsilon_{it} \quad (1)$$

$$KZ_{it} = \alpha_0 + \alpha_1 Mshare_{it} + \alpha_2 Lev_{it} + \alpha_3 Size_{it} + \alpha_4 Indep_{it} + \alpha_5 Board_{it} + \alpha_6 FirmAge_{it} + \alpha_7 TobinQ_{it} + \varepsilon_{it} \quad (2)$$

Where model (1) is a study of the impact of equity concentration in equity structure on financing constraints. model (2) is a study of the impact of management shareholding in equity structure on financing constraints.

3. Empirical studies

3.1. Descriptive analysis

Table 2 shows the results of the descriptive analysis of the fake data, through the presentation of the results, it can be seen that the mean value of KZ is 1.279, the standard deviation is 2.509, the minimum value is -8.956, and the maximum value is 7.636, and the overall level of financing constraints in the sample data is in the middle-upper level and relatively smooth.

Top10 mean is 0.589, standard deviation is 0.154, minimum value is 0.210, maximum value is 0.909, the overall equity concentration in the sample data is in the upper middle level and relatively smooth. Mshare mean is 15.04, standard deviation is 20.31, minimum value is 0, maximum value is 70.60, the overall management shareholding in the sample data is in the lower level and less smooth. low level and less stable. Other variables are analysed in Table 2.

Table 2: Descriptive analysis.

Variable	Obs	Mean	Std.	Min	Max
KZ	40,420	1.279	2.509	-8.956	7.636
Top10	40,420	0.589	0.154	0.210	0.909
Mshare	40,420	15.04	20.31	0	70.60

Table 2: (continued).

INST	40,420	0.429	0.250	0.000995	0.924
Lev	40,420	0.406	0.205	0.0278	0.924
Size	40,420	22.16	1.285	19.69	26.41
Indep	40,420	37.62	5.336	28.57	60
Board	40,420	2.114	0.197	1.609	2.708
FirmAge	40,420	2.921	0.349	1.099	3.638
TobinQ	40,420	2.004	1.278	0.797	13.80

3.2. Correlation analysis

Table 3 shows the correlation analysis between each variable, from the statistical results in the table, it can be seen that the correlation coefficients of equity concentration and management shareholding ratio in equity structure on financing constraints are -0.307 and -0.312 respectively, and they are significant at the level of 1%, thus initially verifying that a reasonable equity structure can alleviate financing constraints. In addition, the control variables selected in this paper, such as gearing ratio, enterprise size, board size, enterprise age and Tobin's Q value, also have significant correlation with the explanatory variables, indicating that the selection of control variables in this paper is necessary and appropriate.

Table 3: Correlation analysis.

	KZ	Top10	Mshare	INST	Lev	Size	Indep	Board	FirmAge	TobinQ
KZ	1									
Top10	-0.307***	1								
Mshare	-0.312***	0.239***	1							
INST	0.044***	0.440***	-0.648***	1						
Lev	0.663***	-0.143***	-0.334***	0.194***	1					
Size	0.193***	0.058***	-0.368***	0.422***	0.509***	1				
Indep	-0.007	0.026***	0.065***	-0.063***	-0.016***	0.004	1			
Board	0.077***	-0.001	-0.212***	0.230***	0.153***	0.255***	-0.553***	1		
FirmAge	0.140***	-0.219***	-0.219***	0.017***	0.187***	0.208***	0.011**	0.016***	1	
TobinQ	0.027***	-0.103***	0.007	-0.036***	-0.222***	-0.341***	0.042***	-0.107***	-0.026***	1

3.3. Regression analysis

On the basis of correlation analysis, regression analysis was performed. Table 4 shows the results of the regression analysis of the data of the study sample, column (1) shows the results of the regression of Top10 on KZ, the regression coefficient is -3.0179, and is significant at the 1% level. Column (2) shows the results of regression of Mshare on KZ, the regression coefficient is -0.0164, and is significant at a 1% level. In order to ensure the reliability of the results, a fixed effects model is applied to the sample data, with year and industry fixed. Column (3) shows the results of the fixed effects of Top10 on KZ, with a regression coefficient of -2.8903, and significant at the 1% level. Column (2) shows the results of the fixed effect of Mshare on KZ, with a regression coefficient of -0.0144, and significant at the 1% level. The results of regression analysis in Table 4 verify that the increase in equity concentration and management shareholding can alleviate corporate financing constraints.

Table 4: Regression analysis.

	(1) KZ	(2) KZ	(3) KZ	(4) KZ
Top10	-3.0179*** (-50.8016)		-2.8903*** (-50.8739)	
Mshare		-0.0164*** (-33.6053)		-0.0144*** (-30.5627)
Lev	8.9033*** (176.8831)	9.0781*** (177.6098)	8.6871*** (173.3032)	8.9414*** (176.1634)
Size	-0.2473*** (-28.7219)	-0.3800*** (-42.7567)	-0.1991*** (-23.2244)	-0.3046*** (-34.2252)
Indep	0.0078*** (3.9438)	0.0057*** (2.8138)	0.0049*** (2.6448)	0.0032* (1.7021)
Board	0.2679*** (4.8167)	0.0655 (1.1502)	0.0364 (0.6808)	-0.0678 (-1.2397)
FirmAge	-0.0546** (-2.0865)	0.1112*** (4.2371)	0.2180*** (7.7045)	0.3983*** (13.9686)
TobinQ	0.2501*** (34.3955)	0.2484*** (33.3546)	0.3774*** (51.7593)	0.3679*** (49.0425)
_cons	3.7171*** (16.5611)	5.0849*** (21.0783)	2.8643*** (11.2017)	3.4551*** (12.8770)
N	40420	40420	40420	40420
adj. R ²	0.518	0.502	0.587	0.571

t statistics in parentheses* p < 0.1, ** p < 0.05, *** p < 0.01

3.4. Robustness analysis

In order to ensure the robustness of the results of the research sample, this paper uses the lagged one period explanatory variables, control variable increase/decrease method, and sample mediation method to conduct the robustness test. Table 5 shows the results of the robustness test. Columns (1) and (2) show the results of lagged one-period explanatory variables, and through the results, both Top10 and Mshare are found to be negatively correlated with KZ and significant at the 1% level. Columns (3) and (4) are the results of control variable addition and subtraction method, by adding control variables Management Expense Ratio (Mfee) and Large Shareholders' Capital Expenditure (Occupy), both Top10 and Mshare are found to be negatively correlated with KZ and significant at 1% level. Columns (5) and (6) show the results of the sample adjustment method, which removes special years with large impacts, such as the epidemic period, and finds that both Top10 and Mshare are negatively correlated with KZ and are significant at the 1% level. The robustness of the sample data was tested by the above three robustness analyses, and the results were the same as the regression results, so it was concluded that the sample data had strong robustness.

Table 5: Robustness analysis.

	(1) F.KZ	(2) F.KZ	(3) KZ	(4) KZ	(5) KZ	(6) KZ
Top10	-1.9186*** (-22.3026)			-2.8844*** (-39.9648)		-2.9355*** (-40.6946)
Mshare		-0.0127*** (-18.4049)	-0.0172*** (-29.2586)		-0.0175*** (-29.6429)	
Lev	7.1387*** (96.4135)	7.1971*** (96.8509)	8.6526*** (139.3687)	8.5370*** (139.2292)	8.7624*** (143.2447)	8.6249*** (142.6869)
Size	-0.2923*** (-22.4359)	-0.3927*** (-29.5938)	-0.4003*** (-36.4924)	-0.2609*** (-24.5079)	-0.4073*** (-37.1104)	-0.2649*** (-24.8684)
Indep	0.0041 (1.4539)	0.0030 (1.0737)	0.0059** (2.4465)	0.0081*** (3.4004)	0.0062** (2.5648)	0.0083*** (3.5119)
Board	0.0681 (0.8720)	-0.0479 (-0.6083)	0.0737 (1.0931)	0.2728*** (4.1228)	0.0629 (0.9314)	0.2659*** (4.0118)
FirmAge	-0.5297*** (-14.5088)	-0.4566*** (-12.6102)	-0.0624** (-2.0435)	-0.2098*** (-6.8474)	-0.0586* (-1.9130)	-0.2101*** (-6.8442)
TobinQ	0.0990*** (9.3126)	0.0901*** (8.3592)	0.2217*** (23.4691)	0.2338*** (25.3190)	0.2323*** (24.6448)	0.2431*** (26.4049)
Mfee			0.1870*** (5.6667)	0.1721*** (5.2790)		
Occupy			3.9221*** (10.1539)	3.2800*** (8.5853)		
_cons	7.1060*** (21.6400)	8.4393*** (24.2324)	6.1763*** (21.0048)	4.4963*** (16.3984)	6.3456*** (21.5558)	4.6310*** (16.8778)
N	19150	19150	28184	28184	28200	28200
adj. R ²	0.385	0.380	0.488	0.501	0.486	0.499

t statistics in parentheses* p < 0.1,** p < 0.05,*** p < 0.01

3.5. Heterogeneity analysis

In order to further investigate the impact of equity structure on corporate finance the situation was analysed for heterogeneity, the research sample was analysed for heterogeneity in terms of property rights and whether or not they were loss making, Table 6 shows the results of heterogeneity in terms of property rights and Table 7 shows the results of whether or not they were loss making.

Columns (1) and (2) in Table 6 show the results for state-owned enterprises and columns (3) and (4) show the results for non-state-owned enterprises. The findings reveal a statistically significant negative correlation between equity structure and financing constraints for both SOEs and non-state-owned enterprises (non-SOEs) at the 1% level. Notably, the regression coefficients of non-SOEs exhibit a smaller magnitude compared to those of SOEs, indicating a relatively larger alleviation of financing constraints for non-SOEs. These results highlight the differential impact of equity structure on financing constraints across ownership types, suggesting that non-SOEs may benefit more from optimizing their equity structure to mitigate financing constraints and access external capital.

Table 6: Property Rights Heterogeneity.

	(1) KZ	(2) KZ	(3) KZ	(4) KZ
Mshare	-0.0130*** (-9.6160)	-0.0148*** (-24.8913)		
Top10			-1.7122*** (-19.3310)	-3.7125*** (-47.8066)
Lev	8.2331*** (119.8491)	9.5256*** (135.8316)	8.0257*** (116.0948)	9.2534*** (135.6595)
Size	-0.3378*** (-29.7032)	-0.4239*** (-32.8029)	-0.2385*** (-20.0893)	-0.3526*** (-28.7322)
Indep	0.0046* (1.7925)	0.0042 (1.4663)	0.0046* (1.8099)	0.0042 (1.5094)
Board	-0.0495 (-0.6480)	-0.0022 (-0.0276)	0.0052 (0.0693)	0.0367 (0.4711)
FirmAge	-0.1804*** (-4.7635)	0.2396*** (6.9338)	-0.3124*** (-8.1573)	0.0296 (0.8709)
TobinQ	0.2260*** (18.8263)	0.2559*** (27.3801)	0.2302*** (19.4129)	0.2443*** (27.1204)
_cons	5.8085*** (18.4317)	5.6131*** (15.7015)	4.8789*** (16.2112)	6.5882*** (19.3081)
N	13865	26555	13865	26555
adj. R ²	0.520	0.466	0.530	0.497

t statistics in parentheses* p < 0.1,** p < 0.05,*** p < 0.01

Table 7 Columns (1) and (2) show the results for state-owned enterprises and columns (3) and (4) show the results for non-state-owned enterprises. The results find that both SOEs and non-SOEs equity structure and financing constraints are negatively correlated and significant at the 1 per cent level. However, the regression coefficients of loss-making firms are smaller than those of non-loss-making firms, and the absolute values are larger, so that loss-making firms get a greater degree of relief from financing constraints.

Table 7: Heterogeneity of whether or not a loss is incurred.

	(1) KZ	(2) KZ	(3) KZ	(4) KZ
Mshare	-0.0049*** (-4.4167)	-0.0157*** (-30.4378)		
Top10			-0.3979*** (-3.4515)	-2.9702*** (-46.3848)
Lev	5.7449*** (71.4330)	9.1944*** (158.0634)	5.7742*** (72.3534)	9.0450*** (157.9791)
Size	-0.2288*** (-12.8868)	-0.3518*** (-36.4431)	-0.2042*** (-11.4845)	-0.2277*** (-24.4705)
Indep	-0.0025 (-0.7025)	0.0057*** (2.6254)	-0.0019 (-0.5174)	0.0079*** (3.6875)
Board	-0.1056 (-1.0223)	0.1880*** (3.0736)	-0.0414 (-0.4035)	0.3654*** (6.1162)

Table 7: (continued).

FirmAge	0.1537*** (2.8534)	0.0154 (0.5531)	0.1545*** (2.8448)	-0.1427*** (-5.1380)
TobinQ	0.3294*** (24.7344)	0.2414*** (29.8482)	0.3395*** (25.9978)	0.2385*** (30.1064)
_cons	4.6429*** (9.6072)	4.3120*** (16.7107)	4.0559*** (8.8034)	3.1632*** (13.1622)
N	4709	35711	4709	35711
adj. R ²	0.588	0.478	0.588	0.495

t statistics in parentheses * p < 0.1, ** p < 0.05, *** p < 0.01

4. Conclusion

This paper examines the impact of equity structure on financing constraints through the data of A-share listed companies from 2010 to 2023, and concludes through empirical analyses that: the increase of equity concentration and the proportion of management shareholding can alleviate the financing constraints of the enterprises. the degree of alleviation of financing constraints is greater in the case of non-state-owned enterprises. Therefore, loss-making enterprises are able to alleviate financing constraints to a greater extent.

Based on the above analysis and conclusions mention the following suggestions: enterprises in the financing process, not only need to pay attention to the external environment of the enterprise, but also need to make appropriate adjustments to the content of the enterprise shareholding structure, the management's shareholding has been improved, the management of the equity incentives, stimulate the management to try to alleviate the financing constraints. At the same time, the equity system is higher, is conducive to the stability of the enterprise, and can better cope with financing constraints and other issues.

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