

The Impact of Capital Structure on the Development of Unlisted Firms in China

Yongkang Deng^{1, †}, Muyun He^{2, *, †}, Hang Yi^{3, †}, Qige Zhang^{4, †}

¹Rutgers University New Brunswick, NJ 08901-8554, United States

²Beijing Normal University - Hong Kong Baptist University United International College, Division of Business and Management, Zhuhai, Guangdong, 519000, China

³Central University of Finance and Economics, International economy and trade, Beijing, 102200, China

⁴Marist College Poughkeepsie, NY 12601, United States

* Corresponding author. Email: q030018119@mail.uic.edu.cn

† These authors contributed equally.

ABSTRACT

One of the most difficult challenges that finance managers confront is determining the impact of capital structure on a company's profitability. Prior research has investigated the impact of capital structure on business profitability, however, most of them are from other areas of the world, with only a few studies conducted in China. The level of enterprise profitability is one of the significant factors to measure the health of enterprise development. A reasonable capital structure of the enterprise itself not only assists to improve the corporate governance mechanism and the optimal allocation of various economic resources, but also allows the enterprise to improve the economic efficiency of the enterprise itself. Therefore, the issue of the relationship between enterprise capital structure and profitability is an important part of corporate governance research. Consequently, this study has the objective to assess the influence of shareholding structure on the profitability of listed enterprises between 2013 and 2019. Descriptive statistics, correlation and multiple panel data regression models were used to examine the data. The relationship between capital structure and profitability was investigated using two distinct regression models. Using the data of listed Chinese companies from 2013 to 2019, this paper documents that shareholding concentration is positively associated with corporate performance.

Keywords: Capital Structure, Profitability, Relevant Analysis

1. INTRODUCTION

In previous years, there has been growing literature examining the impact of corporate shareholding structure on firms. However, their findings are mixed. There is still no consensus theory that managers can rely on to find the capital structure that maximizes the profit. At the same time, the impact of equity structure on firms is closely related to the important macro policies such as the reform occupying and the improvement of financing pattern in China now. The shareholding reform is a major initiative to make up for the deficiencies of China's securities market system and to improve the shareholding structure. In general, it is very important to study the impact of equity structure on the future development of firms.

Grossman and Hart demonstrate that if a firm's equity is highly fragmented, minority shareholders will have insufficient incentives to monitor managers [1]. Therefore, equity concentration facilitates better

monitoring of managers to reduce agency costs. Stiglitz argues that equity concentration is one important way to ensure that firm value is maximized [2]. Dang Trung Kien also investigates the relationship between ownership structure and divided policy of Vietnamese listed companies [3]. Moreover, the research conducted by Putra finds structure, liquidity, and growth that all have a significant effect on capital structure [4].

McConnell and Servaes study the effect of majority shareholder ownership and institutional ownership on Tobin's Q using an unused period sample and find a positive correlation between the level of majority shareholder and institutional ownership and Tobin's Q [5]. However, a linear negative correlation has been proposed by Shleifer and Vishny [6]. Besides, domestic scholars' research on the issue of equity structure mainly focuses on the existing equity system of listed firms. Sun, Y., and Huang, Z. affirm the effectiveness of holding with a certain degree of concentration after examining

the relationship between the shareholding ratio of the first largest shareholder and Tobin's Q [7]. Zhang, Hongjun use Tobin's Q as an indicator of public profitability using 1998 data as a research platform [8]. The study indicates that the percentage of shareholding of corporate shareholders was positively related to Q and the percentage of shareholding of state shareholders was negatively related to Q. However, Driffield maintains that high control may lower firm value in the sample countries[9] and Sahwer thinks that there is no significant relationship between capital structure and profitability[10]. Given the above studies on the impact of equity structure on firms, this essay will focus on Chinese listed enterprises as a subject in the context of China.

2. EMPIRICAL STRATEGY

2.1. Data Selection

Listed companies in the A-share market in Shanghai and Shenzhen, China, excluding the financial industry and SOE, are selected as the study population, and the

sample period is 2013-2019. The financial data and corporate governance structure data of the companies are obtained from the Cathay Capital (CSMAR) database in this paper. To ensure the validity and reliability of the research findings, this paper excludes the data of (1) ST or *ST companies, (2) companies with missing data, (3) state-owned enterprises (SOE) (4) companies in the financial industry, and (5) companies whose equity nature changed during the study period. Finally, 1867 companies are screened, and 9547 sample observations are obtained. This paper does not include state-owned enterprises in the sample because it takes into account the fact that the controlling body of state-owned enterprises is the central government or local government, and the equity is concentrated, which is quite different from private enterprises. The financial enterprises are not included in the sample because of the special nature of the financial industry, which has significant differences from other industries in terms of corporate finance and corporate governance structure.

2.2. Variable Definitions

Table 1. Definition of variables

Variable type	Variable symbols	Specific definitions
Dependent variable	ROA	Return on Assets = Net Profit after Tax / Total Assets
	ROE	Return on Net Assets = Net Profit / Net Assets
Independent variable	Z	A system of checks and balances in shareholding, where the sum of the shareholdings of the 2nd-5th largest shareholder to the shareholding of the 1st largest shareholder.
Control variables	Size	Natural logarithm of the company's total assets at the end of the period
	Lev	Gearing ratio = total liabilities at end of period/total assets at end of a period
	Grow	Growth rate of total operating revenue

2.3. Model Design

The following econometric model on the impact of equity check and balances system on corporate profitability is set:

$$ROA = \alpha + \beta_1 Z + \beta_2 Size + \beta_3 Lev + \beta_4 Grow + YEAR\ dummies + IND\ dummies + \epsilon \text{ (Model 1)}$$

$$ROE = \alpha + \beta_1 Z + \beta_2 Size + \beta_3 Lev + \beta_4 Grow + YEAR\ dummies + IND\ dummies + \epsilon \text{ (Model 2)}$$

2.4. Descriptive Statistics

Table 2. Analysis of descriptive statistical results for each variable

Variables	Number of samples	Average value	Median	Standard deviation	Minimum value	Maximum value
ROA	9547	0.042	0.042	0.059	-0.243	0.189
ROE	9547	0.0640	0.0700	0.110	-0.573	0.299
Z	9547	0.850	0.700	0.623	0.0550	2.984
Size	9547	21.85	21.74	1.035	19.83	25.05
Grow	9547	0.186	0.133	0.342	-0.508	1.866
Lev	9547	0.375	0.362	0.187	0.0520	0.839

The profitability indicator return on assets (ROA) has a mean value of 0.0420 and a standard deviation of 0.059, with a minimum value of -0.243 and a maximum value of up to 0.5166. While return on equity (ROE) has a mean value of 0.0640 and a standard deviation of 0.110, fluctuating more than ROA, but has a minimum value of -0.573 and a maximum value of 0.299. However, as with the return on assets, the difference between the two is relatively large, probably because China's private listed companies cover a wide range of industries so that the differences in development between industries make the profitability of each company more varied. In terms of the degree of equity checks and balances, the mean value of equity checks and balances (Z index) in the overall sample is only 0.850, with a median value of 0.700, indicating that most of the private listed companies in China do not have a high degree of checks and balances on the first shareholder by other shareholders. While the maximum value is 2.984 and the minimum value is 0.0550, with a standard deviation of 0.623, representing that there is a large disparity in the degree of checks and

balances among different listed companies. Therefore, combined with the degree of equity checks and balances (Z index), although the overall shareholding structure of the sample is not highly concentrated, the overall degree of equity checks and balances is at a low level. But due to the low importance attached to equity checks and balances by private listed companies in China, the situation of one share being dominant is still relatively serious.

The standard deviation of the control variable Grow is much larger than its mean, which shows that the development capacity of different private listed companies varies greatly. As the overall sample contains data of private listed companies in 17 industries, and the development patterns and characteristics of each industry are very different, especially the standard deviation of Size is 1.035. Besides, the difference between the maximum and minimum values is very large.

2.5. Relevance Analysis

Table 3. Results of correlation analysis between variables

	ROA	ROE	Z	Size	Grow	Lev
ROA	1					
ROE	0.9233*** (0.000)	1				
Z	-0.0376***	-0.0537***	1			

	(0.000)	(0.000)				
Size	0.0114	0.125***	-0.0549***	1		
	(0.267)	(0.000)	(0.000)			
Grow	0.240***	0.266***	0.0382***	0.0720***	1	
	(0.000)	(0.000)	(0.000)	(0.000)		
Lev	-0.316***	-0.133***	-0.0682***	0.503***	0.0716***	1
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	

Note: ***, ** and * represent significance levels of 1%, 5% and 10% respectively.

This paper performs the correlation analysis of each variable. According to the process of analysis of the above variables, it can be found that because the calculation method of return on assets (ROA) and return on equity (ROE) has a high correlation, there is a high degree of covariance between these two dependent variables. Besides, the correlation coefficients between the remaining two dissimilar variables are all less than 0.5, indicating that there is no co-linearity between the variables. In the meanwhile, the correlation between the variables is highly significant. The correlation coefficients between balances (Z index) and return on

assets (ROA) are significantly negative, as well as the correlation between balances (Z index) and return on equity (ROE), indicating a potential positive association between the shareholder concentration and corporate performance.

3. REGRESSION RESULTS AND ANALYSIS

3.1. Baseline Results

Table 4. Key Regression Results

Variables	(1) ROA	(2) ROE
Z	-0.006*** (-6.473)	-0.011*** (-6.472)
Size	0.012*** (20.23)	0.026*** (21.73)
Grow	0.045*** (28.42)	0.088*** (28.62)
Lev	-0.146*** (-42.39)	-0.179*** (-26.93)
Constant	-0.194*** (-11.63)	-0.473*** (-14.64)
Year fixed effect	Yes	Yes

Industry fixed effects	Yes	Yes
Observations	9547	9547
R-squared	0.212	0.159

Note: ***, ** and * represent significance levels of 1%, 5% and 10% respectively.

The result of baseline regression is presented in Table 4. As shown in column (1), the coefficient of the equity checks and balances variable (*Z* index) is significantly negative at the 1% level, indicating that equity checks and balances (*Z* index) has a negative effect on the profitability (ROA) of the firm. Similarly, by changing the dependent variable return on equity (ROE), the result is still a significantly negative coefficient of the equity checks and balances variable *Z*. This confirms the previous result that firms with more concentrated shareholdings tend to have better performance in terms of profitability. The potential reason is that in listed non-SOE companies with high equity concentration, the interests of the majority shareholder and the company being controlled are highly aligned in the long run. In other words, the major shareholder will not do anything to seriously infringe on the value of the company in the long run or short run by the "tunnel effect". If the shareholding of other major shareholders is also relatively high, there may be many problems of connected transactions, and the friction between shareholders' transactions is very unfavorable to the development of the company, which will bring adverse consequences to the management and investment

decisions of the enterprise. As a result, these unfavorable factors will have a negative impact on the profitability of the enterprise. Our regression results confirms that the negative consequences of such diffused shareholdings outweigh its potential benefits of stricter scrutiny placed on the controlling shareholders, the board of directors and the management. In addition, the higher the degree of checks and balances, the stronger the negative effect is.

As for the control variables, in line with previous studies, firm profitability is positively correlated with firm size (*Size*) and firm growth (*Grow*) at the 1% significance level, suggesting that the larger the firm's size and also the stronger the firm's future growth, the more profitable the firm is likely to be. The profitability of a company is also negatively correlated with its gearing (*Lev*) at the 1% level of significance, indicating that the higher the financial leverage of a company and the higher the level of debt, the more detrimental it may be to the business development of the company and the improvement of its profitability.

3.2. Cross-Sectional Analysis

Table 5. Group Regression

	Industry	Z	Size	Grow	Lev	Constant	Observations	R-squared		
ROA	Agriculture	0.010	0.027***	0.081***	-	0.205***	0.494***	139	0.386	
	Mining	-0.003	-0.003	0.019*	-	0.109***	0.177	120	0.181	
	Manufacture	-	0.006***	0.014***	0.052***	-	0.154***	0.202***	7,078	0.238
	Power, heat, gas and water production	-	0.024***	-0.003	0.040***	0.003	0.133	0.133	54	0.313
	Construction	-0.006**	0.002	0.039***	-	0.073***	0.048	0.048	212	0.314
	Wholesale and retail	-0.007	0.009***	0.025***	-	0.111***	-0.106**	-0.106**	364	0.207
	Transportation	-	0.020***	0.002	-0.001	-0.047	0.031	0.031	77	0.190

	Information, software and technology	0.001	0.010***	0.040***	-	0.129***	-0.131**	803	0.165	
	Finance	-0.009**	0.013***	0.015***	-	0.146***	0.172***	260	0.294	
	Real estate	-0.009	0.018***	0.056***	-	0.215***	-0.246*	87	0.458	
	Leasing	0.007	0.018**	0.043***	-	0.261***	-0.249*	124	0.414	
	Scientific research	-	0.014***	0.013***	0.025***	-	0.156***	-0.168**	96	0.467
	Culture, sports and entertainment	-	0.057***	-0.021**	0.076**	-0.004	0.564**	78	0.400	
ROE	Agriculture	0.014	0.053***	0.139***	-	0.429***	0.983***	139	0.373	
	Mining	-0.005	-0.006	0.036*	-0.081	0.259		120	0.138	
	Manufacture	-	0.011***	0.026***	0.098***	-	0.188***	0.445***	7,078	0.171
	Power, heat, gas and water production	-	0.039***	-0.006	0.082***	0.134***	0.213		54	0.480
	Construction	-0.016**	0.009	0.087***	-0.038	-0.077			212	0.219
	Wholesale and retail	-0.021**	0.026***	0.062***	-	0.132***	0.430***		364	0.119
	Transportation	-	0.039***	0.013	0.014	0.002	-0.164		77	0.213
	Information, software and technology	-0.002	0.019***	0.070***	-	0.149***	0.301***		803	0.109
	Finance	-0.023**	0.045***	0.050***	-	0.200***	0.781***		260	0.293
	Real estate	-0.022	0.050***	0.130***	-	0.392***	-0.824**		87	0.341
	Leasing	0.014	0.046***	0.097***	-	0.444***	-0.767**		124	0.326
	Scientific research	-0.031**	0.027***	0.080***	-	0.193***	-0.435**		96	0.305
	Culture, sports and entertainment	-0.086**	-0.029	0.195***	-0.030	0.766*			78	0.379

Note: *p* value in parentheses, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

We divide these companies into thirteen groups according to their industry, and the observations under 30 are ignored. From the grouping regression of return on asset (ROA) shown in Table 5, the significance of the equity checks and balances variable (*Z* index) varies from industry to industry. The negative effect of the equity checks and balances (*Z* index) of companies is observed in most industries, including manufacture, power heat, gas, and water production, transportation, warehousing and postal services, construction, financial, scientific research and culture, sports and entertainment industry are the most significant. From the regression coefficient results, the equity checks and balances of companies in only agriculture, information, software, and technology and leasing industries have a positive

effect on these companies' return on asset, but not significant.

From the grouping regression of return on net asset (ROE), the results are relatively similar. The negative effect of the equity checks and balances (*Z* index) of companies in manufacture, power heat, gas and water production, transportation, construction, wholesale and retail, financial, scientific research and culture, sports and entertainment industry is the most significant. From regression coefficient results, the equity checks and balances of companies in only agriculture and leasing have a positive effect on these companies' return on net asset, but still not significant.

3.3. Robustness Check

Table 6. Petersen Robust Regression Test

Variables	(1)	(2)
	ROA	ROE
<i>Z</i>	-0.006*** (-3.816)	-0.011*** (-3.997)
Size	0.012*** (10.92)	0.026*** (11.75)
Grow	0.045*** (4.945)	0.088*** (4.465)
Lev	-0.146*** (-11.57)	-0.179*** (-5.904)
Constant	-0.194*** (-11.18)	-0.473*** (-15.97)
Observations	9547	9547
Year fixed effect	Yes	Yes
Industry fixed effect	Yes	Yes
R-squared	0.220	0.159

Note: ***, ** and * represent significance levels of 1%, 5% and 10% respectively.

In order to effectively control the possible cross-sectional heteroscedasticity and time series autocorrelation of panel data, this paper uses the Petersen robust regression test with double cluster adjustment from the annual and company levels to test the robustness. The robustness test results are shown in Table 6. It can be seen that when the dependent variable is return on assets (ROA), the coefficient of equity check and balance (*Z* index) is significantly negative at the level of 1%. The results of the robustness test are consistent with the main regression results above and it still shows that the degree

of equity check and balance (*Z* index) has a significant negative effect on the profitability of enterprises, which can prove that the empirical results of this study are robust. In terms of control variables, the company size and growth are significantly positively correlated with the company's profitability, and the company's asset liability ratio (Lev) is significantly negatively correlated with the company's profitability.

3.4. Endogenous Test

Table 7. Endogenous test

	(1)	(2)
Variables	ROA	ROE
Z_1	-0.0051*** (-5.570)	-0.0096*** (-5.605)
Size_1	0.0120*** (18.220)	0.0247*** (19.999)
Grow_1	0.0374*** (22.663)	0.0705*** (22.698)
Lev_1	-0.1329*** (-36.071)	-0.1452*** (-20.970)
Constant	-0.1924*** (-10.849)	-0.4594*** (-13.783)
Year fixed effect	Yes	Yes
Industry fixed effect	Yes	Yes
Observations	7,675	7,675
R-squared	0.194	0.133

Note: ***, ** and * represent significance levels of 1%, 5% and 10% respectively.

In order to solve the estimation error caused by endogeneity, this paper carries out the first-order lag processing for all variables, and then carries out the regression again. The regression results are consistent with the previous text. Therefore, after the endogenous test, it shows that the results are robust.

4. DISCUSSION

In this research, it can be concluded that checks and balances have an important influence on the profitability of an enterprise. It indicates that if an enterprise has a more fragmented equity structure, its profitability will be lower. The data analysis strongly indicates that company size and growth have a positive correlation with profitability. And debt ratio has a negative effect on profitability. It is because fragmented equity will result in weak management which will directly cause the decline of profitability. This result can be widely used in making strategies and improving the equity structure. It can also serve as a guideline for enterprises that wish to improve their profitability by adjusting the equity ownership. Especially in the start-up and growth stage of a listed non-SOE company, a concentrated equity structure will improve the efficiency of decision making.

This will be helpful in the growth of an enterprise. An Efficient decision-making process is essential in a company which prevents them from losing opportunities.

However, there are some limitations of this study. This study only focuses on the listed companies excluding the financial industry and state-owned companies. These two kinds of companies are special in their equity structure for different purposes. Thus the result of this study cannot be generalized to all kinds of companies. Also, this study does not specify the best equity structure as it can be affected by various issues and tends to differ across companies. It only shows that empirical evidence indicates concentrated equity holdings are usually associated with higher profitability. In the future study, how to construct a good equity structure will be an important area to keep working on. Given the heterogeneity of companies, future study needs to specialize in different industries which can provide a better model.

5. CONCLUSION

This paper empirically analyzes the correlation between equity structure and firm profitability using data from Chinese listed firms from 2013 to 2019 as the

sample. We find that for Chinese listed firms, the concentration of equity has a positive effect on firm profitability. The largest shareholder holds a relatively large share of the company and masters the decision-making of the company. The major shareholder has an incentive to devote governance resources to monitor the management, while the potential threat of takeover by the major shareholder will force the management to improve its operational efforts. Consequently, this can greatly improve the efficiency of decision-making and greatly enhance the discipline of the company's shareholders on management. Moreover, the Chinese capital market is less liquid compared to foreign capital markets, and the fragmentation of shareholding within a company can be detrimental to corporate performance, with the negative effects of checks and balances by other shareholders far outweighing the positive effects of their monitoring of the majority shareholder. The meaning of this essay is that it can help companies make decisions of the equity structure to gain better performance. However, because of the changing economic environment and international regime, this essay does not provide a complete picture of some of the issues. This may also be the reason why our results differ from some previous studies.

REFERENCES

- [1] Grossman, S. and Hart, O., 1980. Disclosure Laws and Takeover Bids. *The Journal of Finance*, 35(2), pp.320-335. DOI: <https://doi.org/10.1111/j.1540-6261.1980.tb02161x>
- [2] Stiglitz, J., 1985. Credit Markets and the Control of Capital. *Journal of Money, Credit and Banking*, 17(2), p.133. DOI: <https://doi.org/10.2307/1992329>
- [3] Le, T. and Tannous, K., 2016. Ownership Structure and Capital Structure: A Study of Vietnamese Listed Firms. *Australian Economic Papers*, 55(4), pp.319-344.
- [4] Putra, N. and Sedana, I., 2018. The effect of asset structure, liquidity, sales growth and capital structure on profitability. *Russian Journal of Agricultural and Socio-Economic Sciences*, 85(1), pp.99-106.
- [5] McConnell, J. and Servaes, H., 1990. Additional evidence on equity ownership and corporate value. *Journal of Financial Economics*, 27(2), pp.595-612. DOI: [https://doi.org/10.1016/0304-405x\(90\)90069-c](https://doi.org/10.1016/0304-405x(90)90069-c)
- [6] Shleifer, A. and Vishny, R., 1997. A Survey of Corporate Governance. *The Journal of Finance*, 52(2), pp.737-783. DOI: <https://doi.org/10.1111/j.1540-6261.1997.tb04820.x>
- [7] Sun, Y. and Huang, Z., 1999. Equity Structure and Performance of Listed Companies. *The Journal of Economic Research*, 12(2), pp.24-33.
- [8] Wu Shoukang. 2000. Analysis of the Impact of Equity Structure of Listed Companies on Corporate Value. *The Journal of Securities Market*, pp.56-61.
- [9] Driffield, N., Mahambare, V. and Pal, S., 2007. How does ownership structure affect capital structure and firm value? Recent evidence from East Asia. *The Economics of Transition*, 15(3), pp.535-573. DOI: <https://doi.org/10.1111/j.1468-0351.2007.00291.x>
- [10] Al Ajlouni, D. and Shawar, M., 2013. The Effect of Capital Structure on Profitability: Evidence from the Petrochemical Companies in the Kingdom of Saudi Arabia. *SSRN Electronic Journal*. DOI: <http://doi.org/10.2139/ssrn.2383101>