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Financing Constraint, Ownership Concentration and Financial Performance——Empirical research based on Chinese listed manufacturing firms

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Abstract: *Taking A-share manufacturing listed companies from 2013 to 2019 as samples, this paper utilizes OLS regression model to test the relationship between financing constraint and financial performance under the adjustment of ownership concentration. The results show that there is a negative correlation between financing constraint and financial performance of manufacturing firms, and ownership concentration played in an inverted U shape to adjust them. The conclusion of this study is helpful for manufacturing companies to formulate reasonable equity allocation strategies, under the financing constraint to enhance financial performance.*

Keywords: *Manufacture, Financing constraint, Ownership Concentration, Financial Performance*

1. Introduction

Financing constraint refer to the problem that internal free cash flow of the firm can't meet all producing and R&D activities at the same time, while the cost of exogenous financing is higher. According to information asymmetry, firms can't timely disclose the operation process, resulting in low transparency of firms. Investors have limited access to corporate information. Considering the risks of the company, investors usually require an additional rate of return. So the internal and external financing difference is caused. When internal capital can't meet the investment demand at the same time, the development of the company faces different degrees of financing constraint.

Whether the financing constraint affect financial performance of the company? Positive or negative? Further information asymmetry is also suitable for shareholders and managers because of the separation of management and decision-making rights. Therefore, attention should be paid to the impact of ownership concentration on financial performance. At present few literatures that take ownership concentration as a regulating variable to study the relationship between financing constraint, ownership concentration and financial performance. This paper uses OLS model to discusses the regulating effect of ownership concentration on the relationship of the other two.

The relationship between financing constraint and financial performance are mainly based on the optimal capital structure theory and agency theory. Scholars who support the theory of optimal capital structure believe that companies can't choose financing methods based on optimal capital structure owing to financing constraint, and the income brought by financial leverage can't be fully obtained. Harrris and Trainor [1] (2005) studied British industrial firms under different financing constraint and found firms with low financing constraint had higher industrial production levels. Lei Ni [2](2014) studied Zhejiang private firms and found under other conditions, when the financing constraint increased by one unit, the performance decreased by 1.52 percentage points.

However, some scholars, considering agency cost, believe that financing constraint can effectively reduce irrational decision-making and moral hazard of management, improve the efficiency of capital use, and better the financial performance of the company. By constructing the KZ model, NKaplan and Zingales[3](1997) found that financing constraint would promote firms to improve their liquidity to enhance financial performance .Kaushik and Chauhan[4](2019) studied the regulating effect of five forms of financing constraint on the financial performance of firms, and found that the regression of five forms was all positive, and discovered that companies with a large degree of financing constraint tended not to delay the payment of interest and dividends. Badia and Slootmackers[5](2009) believed if the company had financing constraint, it would be more cautious to make investment decisions, reduce inefficient

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investment behaviors and improve the company's performance. Hovakimian[6](2011) 's research shows because financing will bring inconvenience and excess cost, management will give up low-return investment and choose more valuable project investment.

For the relationship between financing constraint and ownership concentration, Xi Pu[7] estimated impact of ownership concentration on corporate credit constraint by using structural equations, and found the increase of ownership concentration is conducive to improve principal-agent problem, reduce external financing costs and credit constraint, and alleviate the dilemma of corporate financing constraint. From the perspective of agency, huiyang Zhou [8](2018) proposed through the study on private firms that the increase of ownership concentration effectively improves the financing constraint of private firms.

For the relationship between ownership concentration and corporate performance. Some scholars believe according to the "interest convergence effect", increasing ownership concentration can help major shareholders improve the company's operating conditions, reduce the agency cost and improve the company's performance. Liping Xu[9] (2006) studied the influence of ownership concentration and ownership balances on corporate business performance, and concluded that there is a significant positive relationship between business performance and ownership concentration, that is, the influence of controlling shareholders on corporate business performance is more positive incentive effect. However, some scholars consider the stakeholder theory and believe that major shareholders abuse their power to protect their own interests and harm the interests of other stakeholders, which is the "benefit encroachment effect". Scholar Zengquan Li [10](2005) thinks the reason for interest encroachment is listed companies do not form a reasonable restraint mechanism for controlling shareholders, so the controlling shareholders can "hollow out" the company's assets at will. Therefore, ownership concentration is negatively correlated with corporate performance.

2. Research Design

2.1 Sample selection and data sources

This paper takes A-Share manufacturing listed companies from 2013 to 2019 as the initial samples.

Definition of variables. (1)Explained variables. This paper uses ROA as the indicator to measure financial performance. Return on equity (ROE) is used as the robustness test index. (2)Explanatory variable. This paper adopts SA index to estimate financing constraint, which is calculated as Equation (1):

$$SA = -0.737 \times SIZE + 0.043 \times SIZE^2 - 0.040 \times AGE \quad (1)$$

Where SIZE is the natural logarithm of the total assets, and AGE is the number of years from listed. If SA index increases, the financing constraint faced by companies will increase accordingly.

(3) Regulative variable. Ownership concentration: The equity ratio and of the top ten shareholders are used as the measurement standard. (4)Controllable variables. This paper, referring to the existing literature, adds the asset-liability ratio, the growth of the company, the growth of the profit, the cash percentage. Specific variables and their definitions are shown in Table 1

Table 1: Variable Definition

Variable Property	Variable Name	Variable Code	Variable Definition
Explained Variable	Financial Performance	ROA	Net profit/Total assets
Explanatory Variable	Financing constraint	SA	Equation (1)
Regulative Variable	Ownership Concentration	OC	The total equity ratio of the top ten shareholders
Controllable Variable	Asser-Liability Rate	ALR	Total Liabilities /Total Assets
	Growth of Company	AGR	(Total assets of current period - Total assets of previous period) /Total assets of previous period
	Growth of Profit	PGR	(Net profit of current period - Net profit of previous period)/ Net profit of previous period
	Cash	CAR	(Cash+ Cash Equivalent)/Total Assets

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2.2 Model construction

$$ROA_t = \alpha_0 + \alpha_1 SA_t + \alpha \sum control_t + \varepsilon_t$$

Model 1 is to used to test the linear relationship between financing constraint and financial performance.

$$ROA_t = \beta_0 + \beta_1 SA_t + \beta_2 SA_t \times OC_t + \beta \sum control_t + +\varepsilon_t$$

Model 2 is used to test the linear adjustment of ownership concentration in the impact of financing constraint on financial performance.

$$ROA_t = \alpha_0 + \alpha_1 SA_t + \beta_2 SA_t \times OC_t + \beta_2 SA_t \times OC_t^2 + \alpha \sum control_t + \varepsilon_t$$

Model 3 is to test the nonlinear adjustment of ownership concentration.

3. Empirical analysis

3.1 Descriptive statistical analysis

According to Table 2, the mean value of ROA is 5.3%, indicating that the investment return of sorting in the manufacturing industry is not high in the current environment, The standard deviation is 0.0716, the maximum value is 53.8%, and the minimum value is -69%, indicating that there are certain individual differences in manufacturing firms, the wealth is relatively concentrated, and the polarization is obvious. The mean value of financing constraint (SA) is 4.468, the minimum is 0.578, and the maximum is 11.32, indicating that the financing constraint faced by manufacturing firms is generally high and the difference is large. The mean of ownership concentration is 55.4%, indicating that the equity of top ten shareholders in manufacturing firms accounts for more than half.

3.2 Pearson correlation analysis

According to the results in Table 3, there is a significant nagative correlation between financing constraint and financial performance at the level of 1%, which preliminarily validates that there is a negative correlation between financing constraint and financial performance of manufacturing firms. In addition, the VIF test is carried out for each variable, and the results show that the expansion factor <2. It can conclude that there is no multicollinearity among variables.

Table 2: Descriptive Statistics

Variable	Obs	Mean	Std.Dev.	Min	Max
ROA	8,827	0.0530	0.0716	-0.696	0.538
OC	8,827	0.554	0.143	0.0897	0.960
SA	8,827	4.468	1.366	0.578	11.32
AGR	8,827	0.143	0.485	-0.929	15.89
ALR	8,827	0.409	0.193	0.00797	0.994
PGR	8,827	0.180	1.446	-2.306	82.70
CAR	8,827	0.356	1.860	-0.0169	70.08

Table 3: Pearson correlation analysis and VIF test

	ROA	OC	SA	AGR	ALR	PGR	CAR	VIF
ROA	1							
OC	0.174***	1						1.10
SA	-0.119***	0.218***	1					1.38
AGR	0.144***	0.084***	0.081***	1				1.07
ALR	-0.235***	-0.077***	0.454***	0.018*	1			1.31
PGR	0.039***	0.0100	0.00100	0.228***	0.0170	1		1.06
CAR	-0.027**	-0.034***	-0.074***	-0.020*	-0.029***	-0.00200	1	1.01

*** p<0.01, ** p<0.05, * p<0.1(same as below)

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3.3 Multiple regression analysis

Mixed OLS model is selected for multiple regression analysis. The regression results are shown in Table 4. According to Table 4, the financing constraint (SA) of manufacturing firms is significantly negatively correlated with its financial performance (ROA) at the level of 1%. Among the control variables, the asset-liability ratio (ALR) is negatively correlated with financial performance, indicating that higher proportion of debt financing means greater burden of interest costs, and has a negative impact on financial performance. The profit growth rate (PGR) is positively correlated with financial performance, indicating that the improvement of a firm's marketing ability and growth ability is beneficial to the improvement of financial performance. The asset growth rate (AGR), a measure of firm growth, is positively correlated with its financial performance, indicating that when the firm scale grows, the economies of scale brought by it will reduce the cost of the firm and promote the development of financial performance. In addition, the adjusted R^2 of sample data is relatively low. There may be many external factors, such as national economic policies. Although the fitting degree is not ideal, it does not affect the internal validity of the house of financing constraint and financial performance.

Further considering the moderating effect of ownership concentration (OC). Firstly, the ownership concentration (OC) is decentralized to eliminate the collinearity problem. Then, the first order cross multiplier (SA×OC) was introduced into regression model 1, and model 2 was obtained to verify the linear adjustment of ownership concentration. Furthermore, based on model 2, the second order cross multiplier (SA×OC^2) is introduced to obtain model 3, and then the nonlinear regulating effect of ownership concentration (OC) on the relationship between the two is verified. The observation results show that the adjusted R2 of model 2 and Model 1 does not change much, and the fitting degree is consistent. The negative correlation effect of financing constraint (SA) on financial performance (ROA) is still significant at the level of 1%, and the first-order cross multiplier of ownership concentration and financing constraint (SA x OC) is significantly positive at the level of 1%. It shows that the linear adjustment of ownership concentration plays a positive role. The second-order cross factor SA x OC2 of ownership concentration (OC) is significantly negative at the level of 5%, indicating that ownership concentration (OC) plays an inverted U-shaped moderating role on the positive correlation between financing constraint (SA) and financial performance (ROA).

3.4 Robustness test

ROE is used as an alternative indicator of ROA to test the robustness of the model. The test conclusions are basically consistent, indicating the robustness of the study.

Table 4: Regression results

VARIABLS	Model 1	Model 2	Model 3
AGR	0.0183***	0.0179***	0.0179***
	(0.00151)	(0.00151)	(0.00151)
ALR	-0.134***	-0.130***	-0.130***
	(0.00412)	(0.00419)	(0.00419)
PGR	0.000849*	0.000835*	0.000831*
	(0.000504)	(0.000503)	(0.000503)
CAR	-0.000577	-0.000573	-0.000569
	(0.000382)	(0.000382)	(0.000381)
SA	-0.0143***	-0.0132***	-0.0135***
	(0.000586)	(0.000617)	(0.000642)
SA x OC		0.000868***	0.000919***
		(0.000153)	(0.000155)
SA x OC^2			-0.000218**
			(0.000113)
Constant	0.0416***	0.0446***	0.0441***
	(0.00250)	(0.00255)	(0.00256)
Adj R-squared	0.136	0.140	0.140

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4. Conclusions and Suggestions

4.1 Research conclusion

(1) The financing constraint of manufacturing firms have significant negative influence on financial performance. This may be for listed manufacturing companies, the existence of financing constraints makes the company unable to choose financing freely Capital mode which is difficult to seek development through external financing of the company Furthermore, as a result, the company cannot achieve the optimal capital structure or make the optimal investment decisions, the company has to give up the investment opportunities with higher returns, thus distorting the direction of resource allocation and reducing the company's performance; (2) The moderating effect of ownership concentration on the two is inverted U-shaped. When financing constraint, higher ownership concentration can reduce the agency cost, make the decision of improving R&D expense quicker and management focused more beneficial projects to improve performance, also major shareholders can play a role of supervision and management. However, if ownership concentration excesses limit, major shareholders will take their own interests as the starting point. To preserve themselves, they may decide to reduce the expense of R&D and restrict firm to invest in high value but high-risk projects, result in bad financial performance.

4.2 Policy suggestions

China's manufacturing firms should maintain certain proportion of high ownership concentration, improve the "principal-agent" relationship, reduce agency costs, exert supervisory role, so the company's behavior can be consistent with major shareholders. Under the external financing constraint, moderately increasing ownership concentration is conducive, reducing the time cost of information decision-making, improving firm operation efficiency, effectively concentrating funds in R&D and projects with high rate of return, and reducing the risk of firm bankruptcy.

Manufacturing firms should also constantly improve the level of corporate governance, strengthen internal control; at the same time, broaden financing channels, diversify investment strategies, so as to alleviate the financing difficulties of firms; Establish a centralized and relatively balanced equity structure to avoid the "hollowing out" harm of major shareholders.

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