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Influencing Factors and Optimization of Agricultural Listed Companies in China

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Abstract This paper reviews the connotation of agricultural listed company and the related researches on capital structure theory of enterprises in China. Based on this, research hypothesis is put forward. Capital structure has positive correlation with the scale, growth and debt paying ability of agricultural listed company, and has negative correlation with the profitability, operating capability and cash capacity. Taking 37 agricultural listed companies as the research samples, a total of 15 financial indices reflecting the growth, profitability, enterprise scale, operating capacity, cash capability and debt paying ability are selected to conduct factor analysis. Based on the principle of eigenvalue greater than 1, five factors are ascertained, which can explain 84.04% variance of original independent variables. Factor loading matrix indicates that these five factors can be named as debt paying factor, profitability factor, scale and growth factor, operating capacity factor and cash capability factor. Multiple linear regression is carried out by taking factor score coefficient matrix as the independent variable, and asset-liability ratio of agricultural listed company as the dependent variable. Remove method is applied under 5% significant level. And only profitability factor can pass the test. Result shows that there is significant negative correlation between profitability and asset-liability ratio, which is inconsistent with the assumption and has supported the Pecking Order Theory. The other four factors have not passed the significant test, and have certain negative correlation with the capital structure of enterprises. Among them, correlation between the capital structure and the debt paying factor and scale and growth factor is inconsistent with the assumption. Combining with the analysis result, corresponding countermeasures for optimizing the capital structure of agricultural listed company are put forward.

Key words Agricultural listed company; Capital structure; Influencing factor; Optimization; China

1 Problems put forward

Agricultural listed companies are a special group of listed companies in China. In the stock market, shares of company number, total assets and stock scale of agricultural listed companies are very small. However, impact and function of agricultural listed companies can never be ignored. Behaviors of agricultural listed company, a business unit, can be reflected in the capital structure. What's more, capital structure affects the capital cost, enterprise value and business performance. As the leader of agricultural industrialization, business performance of agricultural listed companies directly relates to the realization of agricultural industrialization in China. Therefore, research on influencing factors of the capital structure of agricultural listed companies has important practical significance.

Study on corporate capital structure theory started in the early 1990s in China. At that time, China was at the transition period from planned economy to socialist market economy. And capital market system had not yet formed, and financing channel for enterprises was relatively simple, mainly relying on debt financing of bank with relatively small proportion of equity financing. Therefore, companies did not care about the problem of capital structure. And research on capital structure of enterprises focused primarily on the introduction of the formation and development of capital structure theory system in foreign enterprises. With the establishment of socialist market economic system and the reform of national investment and financing system, many scholars have begun the study on capital structure

theory. Some scholars have tried to use the data of listed companies to conduct empirical study on the formation and influencing factors of capital structure in listed companies in China. Lu Zhengfei and Xin Yu are the pioneers of empirical research on influencing factors of capital structure in China. They finally conclude that capital structure in different industries has significant differences, and there is significant negative correlation between the profitability and capital structure. Company scale, assets security, growth and other factors have no significant impact on capital structure^[1]. Shen Genxiang and Zhu Pingfang find out that debt ratio of enterprises has positive correlation with the profitability, enterprise scale and assets mortgage rate, and has negative correlation with business growth and non-debt tax shield^[2]. An Hongfang and Lu Hua argue that capital structure has positive correlation with the collateral value of enterprise assets and the growth of enterprise, and has negative correlation with the profitability, realization capability and asset management capability of enterprise^[3]. Chen Chao and Rao Yulei point out that financial leverage reduces with the profitability, growth and non-debt tax shield, but increases with the company scale, tax rates and moral hazard. Moreover, different from the non-public utilities, selection behavior of capital structure in public utility corporation tends to use less debt^[4].

Influencing factors on capital structure of agricultural listed companies are studied based on the micro features of enterprises, that is, the financial data of agriculture listed companies. According to the existing research results and the basic theory of financial management, we assume that capital structure has positive correlation with the scale, growth and debt paying ability of agricultural listed company, and has negative correlation

with the profitability, operating capability and cash capacity. Agricultural listed company has both the characteristics of listed companies in general and its own characteristics. For instance, products are greatly affected by the weak quality of agriculture and the management has a strong nature of public welfare. This paper tries to study on the problems such as what kinds of micro-factors may affect the capital structure, whether it accords with the classical theory of capital structure or not, and how to optimize it.

2 Sample selection and variable description

At present, observable micro-characteristics affecting capital structure of enterprises are mainly scale, profitability, flow-ability, growth opportunity and tax, which is generally accepted in the academic circle. We believe that tax burden belongs to external environmental factor, having certain system characteristics. Thus, as a macro-factor affecting capital structure, tax burden should not be taken into account. According to the annual reports of a total of 45 listed companies in the year 2008, we cull out 8 ST companies in order to eliminate the effect of abnormal samples on research result. And the rest 37 agricultural listed companies are taken as the research samples. During the selection of research variables, we use the 15 financial indices reflecting the growth, profitability, enterprise scale, operating capacity, cash capability and debt paying ability. In order to achieve the dimension reduction and problem simplification under the premise of maintaining the main information of original variables, factor analysis on 15 financial indices is conducted. After that, multiple regression analysis is carried out

taking the factor score coefficient matrix after simplification as the independent variable, and the asset-liability ratio as dependent variable. Table 1 reports the specification of variables.

Table 1 Specification of variables

Reflected financial content	Index name
Capital structure	Asset-liability ratio (y)
Enterprise scale	Logarithm of total assets (x_1)
	Logarithm of <i>LN</i> major business income (x_2)
Growth	Growth rate of major business income (x_3)
	Growth rate of total assets (x_4)
Profitability	Return on net assets (x_5)
	Earnings per share (x_6)
	Net assets per share (x_7)
Operating capacity	Total asset turnover (x_8)
	Inventory turnover (x_9)
Debt paying ability	Current ratio (x_{10})
	Quick ratio (x_{11})
Cash capability	Cash flow per share (x_{12})
	Net cash flow (x_{13})

3 Factor analysis

Total variance interpretation of variable is conducted, including the variance interpretation of initial factor, extraction factor and twiddle factor. Number of principal components is determined by the method of eigenvalue greater than 1. Table 2 indicates that there are 5 factors with eigenvalue greater than 1, which can explain 84.04% variance of all the original independent variables. Table 3 identify and rename the factors according to the factor loading matrix after rotation.

Table 2 Eigenvalue and percentage of interpretation

Factor	Factor before extraction			Factor after extraction			After rotation		
	Eigenvalue	Variance proportion %	Proportion of cumulative variance %	Eigenvalue	Variance proportion %	Proportion of cumulative variance %	Eigenvalue	Variance proportion %	Proportion of cumulative variance %
1	3.38	25.98	25.98	3.38	25.98	25.98	2.68	20.60	20.60
2	2.90	22.28	48.27	2.90	22.28	48.27	2.67	20.57	41.18
3	1.94	14.92	63.19	1.94	14.92	63.19	1.96	15.08	56.25
4	1.68	12.94	76.13	1.68	12.94	76.13	1.83	14.06	70.31
5	1.03	7.91	84.04	1.03	7.91	84.04	1.78	13.73	84.04
6	0.80	6.19	90.23						
7	0.45	3.49	93.73						
8	0.38	2.95	96.67						
9	0.21	1.61	98.29						
10	0.13	0.99	99.27						
11	0.07	0.53	99.81						
12	0.02	0.19	100.00						
13	4.73E-0.16	3.64E-0.15	100.00						

Table 3 reports that factor 1 has the maximum loads in current ratio, quick ratio and net assets per share. According to the meanings of variables, these variables have certain correlation with the debt paying ability of company. Therefore, they are named as debt paying factor. Factor 2 has the maximum loads in major business income, growth rate of total assets and total asset turnover, which have certain correlation with growth

and enterprise scale. Thus, we name these variables as scale and growth factor. Factor 3 has the maximum loads in cash flow per share and net cash flow, which have correlation with cash capability of enterprises. Thus, we call them cash capability factor. Factor 4 has the maximum loads in growth rate of major business income and inventory turnover, which have correlation with operating capacity of enterprises. Thus, we call

them operating capacity factor. Factor 5 has the maximum loads in earnings per share, return on net assets and total as-

sets. These variables have correlation with the profitability of enterprises, and are called the profitability factor.

Table 3 Factor loading matrix after rotation

Index	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Logarithm of total assets(x_1)	-0.29	0.24	0.04	0.23	0.57
Logarithm of major business income(x_2)	-0.15	0.77	0.09	0.20	0.12
Growth rate of major business income(x_3)	0.10	-0.06	0.06	0.92	-0.03
Growth rate of total assets(x_4)	-0.03	0.96	0.03	0.01	0.12
Return on net assets(x_5)	0.16	0.16	0.04	-0.12	0.87
Earnings per share(x_6)	0.51	0.03	0.24	-0.09	0.78
Net assets per share(x_7)	0.72	-0.06	0.43	-0.16	0.18
Total asset turnover(x_8)	-0.03	0.96	0.03	0.01	0.12
Inventory turnover(x_9)	-0.10	0.28	0.02	0.90	0.00
Current ratio(x_{10})	0.93	-0.07	-0.23	-0.01	0.05
Quick ratio(x_{11})	0.91	-0.12	-0.20	0.13	0.03
Cash flow per share(x_{12})	-0.19	-0.06	0.90	0.01	0.16
Net cash flow(x_{13})	0.00	0.20	0.89	0.10	0.01

4 Analysis of regression result

4.1 Regression result Multiple linear regression is carried out by taking factor score coefficient matrix obtained by SPSS as the independent variable, and asset-liability ratio of agricultural listed company as the dependent variable. Remove method is applied under 5% significant level. The p values of debt paying factor, scale and growth factor, operating capacity factor and cash capability factor are all more than 0.05. Therefore, we eliminate the four factors and only profitability factor can pass the test. Final result of model estimation is:

$$\text{Asset-liability ratio} = 0.758 - 0.430 \times \text{profitability factor} \\ (3.767) (-2.107)$$

$$R^2 = 0.35; DW = 0.214.$$

Table 4 Variable besides the model

Factor	Coefficient	t	Significance p
Debt paying factor	-0.113	-0.702	0.487
Scale and growth factor	-0.092	-0.570	0.573
Cash capability factor	-0.089	-0.553	0.584
Operating capacity factor	-0.162	-1.017	0.316

4.2 Result analysis

(1) We believe that there are various reasons for variables failing to pass the test, including its own reasons and objective reasons. As is well known, there are few agricultural listed companies, which may affect the results of the analysis. Besides, "policy market" and "information market" in China's capital market, especially the stock market, lead to the inefficiencies of capital market. And a lot of information can not effectively be reflected in the change in stock market due to its low efficiency, so that the choice of capital structure is hard to follow the principles and modes of capital structure theory.

(2) According to the result, profitability and asset-liability ratio have significant negative correlation, which is inconsistent with the assumption and has supported the Pecking Order Theory. And it also accords with the study by Lu Zhengfei and Xin Yu. This paper argues that the agricultural profitability of listed companies is strong, and the cash flow produced is relatively

high. Enterprises can meet the financial needs through endogenous financing. Therefore, on the one hand, debt ratio of enterprises is relatively low; and the profitability of enterprises has negative correlation with its debt level. On the other hand, companies with good profitability are easier to obtain equity financing, and the asset-liability ratio can be reduced.

(3) Although some variables did not pass the significance test, they still have certain degree of correlation with the capital structure of enterprise. According to the financial management theory, strong operational capacity of enterprise leads to the fast inventory turnover and cash retrieve, which meet the needs of manufacturing operations for capital and may reduce the debt. Debt paying factor has certain negative correlation with asset-liability ratio. Strong debt paying capability of agricultural listed company leads to the small bankruptcy risk under the same asset-liability ratio. Thus, the company can borrow more money. From the perspective of creditors, they are more willing to lend funds to company with smaller risk of bankruptcy. Thus, debt paying factor has negative correlation with asset-liability ratio. Cash capability factor and asset-liability ratio have certain negative correlation with asset-liability ratio, which is inconsistent with the free cash flow theory, but is consistent with the Pecking Order Theory. We believe that if agricultural listed companies have more cash, capital problems can be solved through internal financing. Therefore, the negative correlation is reasonable. There is negative correlation between scale and growth factor and asset-liability ratio, which does not support the Trade-off Theory but supports the Agency Cost Theory. Therefore, impact of the scale of agricultural listed company on capital structure is uncertain. On the one hand, large-scale companies generally have a good reputation, and can get more attention from creditors. On the other hand, large-scale companies usually have less liability when considering their own images. In addition, for a company with better growth, there would be greater flexibility in selecting investments for the future and its debt agency cost would be higher. In order to reduce the agency costs, creditors would be more cautious when lending money to enterprise with good growth. Therefore, there are negative correlation between growth and debt level.

5 Optimization analysis of capital structure

Structure determines function, and function reacts on structure in turn. In a word, there is a negative correlation between the asset-liability ratio of agricultural listed companies and the independent variables, due to the low and declining asset-liability ratio of agricultural listed companies. Comparing the asset-liability ratio of agricultural listed companies to that of other listed companies over the same period, it can be found that asset-liability ratio of agricultural listed companies is relatively low. According to the theory of modern capital structure, when debt is within a certain limit, the company has a higher market value than companies without debt or bonded companies, due to the advantages in income tax credits and leveraged benefits. Thus, it can be seen that agricultural listed company does not give full play to the role of financial leverage; and the asset-liability ratio of agricultural listed company should be improved reasonably. However, every coin has two sides. More debt might make higher profits for shareholders; but due to the existence of operational risk and the threat of bankruptcy, more debt might also reduce the benefits of shareholders, and even lead to bankruptcy. This is a problem must be considered when improving the asset-liability ratio.

The ultimate goal of optimizing the capital structure is to improve a company's performance. Scale of agricultural listed companies in China is generally small, with weak resistance to operational risks and poor operating performance. This leads to the insufficient funds within the enterprise, restricts the internal financing, reduces the credibility and competitiveness of company, and affects the debt financing. Therefore, increasing the profitability of agricultural listed company is very important. In recent years, phenomenon of "non-agricultural management" becomes very serious among agricultural listed company in China. Capital is invested into other fields, which leads to the inadequate development of major industries, and affects the profitability of agricultural listed company and the credibility of investors. Inefficient use of funds, as well as non-agricultural expansion, has direct impact on the financing behavior and capital structure of agricultural listed company. An unreasonable cap-

ital structure will result in the decline of profits and operating performance, difficult improvement of corporate value, and the irrational structure of capital. In order to solve this problem and to fundamentally optimize the capital structure of agricultural listed company, we must take the financial management theory as the guidance and the growth of agricultural listed companies as the core, actively learn from the advanced experience of foreign countries based on the actual situation of China, advance the adjustment and optimization of capital structure step by step, and promote the rationalization of capital structure.

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中国农业上市公司资本结构的影响因素及其优化研究

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摘要 理清了中国农业上市公司的内涵, 综述了中国企业资本结构理论的相关研究, 在此基础上, 提出了研究假设: 农业上市公司的规模、偿债能力、成长性与其资本结构正相关, 赢利能力、营运能力、现金能力和其资本结构负相关。以 37 家中国农业上市公司为研究样本, 选取反映企业规模、成长性、盈利能力、营运能力、偿债能力、现金能力的 15 个财务指标进行了因子分析。根据特征值大于 1 的原则确定了 5 个主因子, 这 5 个因子解释了原始自变量 84.04% 的方差; 因子载荷矩阵显示, 5 个因子可分别被命名为偿债能力因子、规模和成长性因子、现金能力因子、营运能力因子和盈利能力因子。以因子得分系数矩阵为自变量, 以农业上市公司的资产负债率为因变量作多元线性回归, 在 5% 的显著性水平下使用强迫剔除法, 最后只有盈利能力因子通过了检验。结果表明: 盈利能力与资产负债率呈显著负相关关系, 与假设相符, 支持了优序融资理论; 其余 4 个因子虽然没有通过显著性检验, 但其与公司的资本结构仍存在一定的负相关关系, 其中, 偿债能力因子、规模和成长性因子与资本结构的关系和假设不符。结合分析结果, 探讨了优化农业上市公司资本结构的相关对策建议。

关键词 农业上市公司; 资本结构; 影响因素; 优化