

An Empirical Study on Profitability and Capital Structure of the Agricultural Listed Companies

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Abstract

Based on the operating status and growth level of the agriculture listed companies in China, this paper makes a study on the growth of the agricultural listed companies from their panel data of 2013 Annual Report. And the enterprises profitability is one of core elements to make the corporate financial analysis; corporate capital structure directly has an effect on the business performance and long-term development. This paper conducts 4 indicators which mainly affect the profitability of enterprise, uses the method of factor analysis to make the comprehensive evaluation score on the 18 representative agricultural listed companies in China. As the asset-liability ratio is a main indicator to reflect the capital the structure, the correlation analysis and regression analysis are carried on between the profitability and the asset-liability ratio of the enterprise. Finally the study analyzes the relationship between profitability and capital structure of the agriculture listed companies, and it shows that there is a slight negative correlation on them.

Keywords: *Capital structure; Profitability; Factor analysis; Correlation analysis; Regression analysis*

1. Introduction

As the first industry of China, Agriculture is always unshakable foundation of the national economy. Agriculture is not only a market to create huge demand and production factor, but also provides an important product for the market. Whether the agricultural listed companies have a strong profitability or not is a key performance element of the first industry development. From the point of view of the agriculture development and rural economy, the listed companies have an important role in promoting the structural upgrading of the agricultural market and agricultural industries. However, at present, the agricultural listed companies in China have not played a leading role in the agriculture, agricultural product market and the industrialization of agriculture, the overall profitability has been in the general level. Therefore, the paper launches its development research from the perspective of agricultural listed companies' profit.

A large number of scholars and experts have studied the China's agricultural profitability of listed companies [1-6]. More research has drawn a conclusion that the company size, capital structure, ownership structure and corporate risk have a significant impact on the company's profitability through experience empirical test data. In terms of profitability, many scholars believe that the performance of the agricultural listed companies in China rely on the support policies, which are subject to the very large impact. Then the policy support of the government has become an important indispensable factor support in order to achieve good performance. As the profitability is an important content of enterprises financial analysis, this study thinks it is vital to study the relationship between profitability and capital structure of the agriculture listed companies, in order to increase their profitability. This study uses the asset-liability ratio

to reflect the company's capital structure, which reflects the proportion of funds from creditors, as well as the extent of corporate assets to protect the interests of creditors in the enterprise total assets.

2. The Principal Theory of Corporate Profitability and Capital Structure

Corporate profitability refers to the ability of companies to earn profits, which is a reflection of a comprehensive ability, including the corporate marketing capabilities, the ability of obtaining cash, the ability of reducing costs and the ability of avoiding the risk. Investors, creditors and business managers are concerned about the growing importance and profitability of enterprises. Based on the most important statement in the financial analysis, including the balance sheet, income statement and profit distribution table, the financial profitability analysis mainly constructs a set of indicators system through logical relationship among each item in the tables, and then calculates the value of the indicator. Production operations to achieve profitability reflects the profit responding to making a hundred sales, which is mainly stood for by a net profit margin on sales and gross profit margin on all sales. Asset profitability is used to measure the profitability of corporate assets, reflecting the overall investment effect. Only when asset profitability is higher than the social average profit margin, the company's development will be in a favorable position. And this capability uses rate of return on common stockholders' equity (ROE) and return on assets (ROA) to represent [2].

3. Select the Evaluation Indicators and Sample Data

In this paper, Agricultural listed companies referred to the listed companies which are only engaged in agriculture, excluding forestry, animal husbandry, and fisheries listed companies. As of the end of 2013, a total number of the agricultural listed companies in China is 22, and the ST and * ST listed companies are kicked off, finally 18 effective sample of agricultural listed companies are obtained and studied. By means of SPSS software, the paper uses factor analysis to study the relationship among the four corporate profitability indicators: Net Profit Margin on Sales (X_1), ROA (X_2), ROE (X_3), gross profit margin on all sales (X_4), and then a comprehensive evaluation indicator of corporate earnings (Z) could be conducted, and finally the correlation and regression analysis are used to study the relation between the comprehensive evaluation indicator (Z) and the asset-liability ratio (X) which reflects the debt ratio and capital structure. The ticker symbol and company name of the 18 agricultural listed companies selected are shown in Table 1 below. Their panel data of 2013 Annual Report are used to analyze, and specific indicators data are shown in Table 2:

Table1. The Basic Information of 18 Agricultural Listed Companies

ID	Stock Code	Name of the listed companies
C ₁	600354.sh	Gansu Dunhuang Seed Company
C ₂	600359.sh	Xinjiang Talimu Agriculture Development Company
C ₃	600108.sh	Gansu Yasheng Group Company
C ₄	600251.sh	Xinjiang Guannong Group Company
C ₅	600313.sh	Zhongnongfa Seed Industry Group Company
C ₆	600371.sh	Wanxiang Doneed Company

C ₇	600506.sh	Xinjiang Korla Pear Company
C ₈	600540.sh	Xinjiang Sayram Modern Agriculture Company
C ₉	000061.sz	Shenzhen Agricultural Products Company
C ₁₀	000702.sz	Hunan Zhenghong Science and Technology Develop Company
C ₁₁	000713.sz	Hefei Fengle Seed Company
C ₁₂	000860.sz	Beijing Shunxin Agriculture Company
C ₁₃	000998.sz	Yuan Longping High-tech Agriculture Company
C ₁₄	002041.sz	Shandong Denghai Seeds Company
C ₁₅	002321.sz	Henan Huaying Agricultural Development Company
C ₁₆	002385.sz	Beijing Dabeinong Technology Group Company
C ₁₇	300189.sz	Grand Agriseeds Technology Company
C ₁₈	300268.sz	Wanfu Biotechnology (Hunan) Agricultural Development Company

Table 2. The Indicator Data of Earnings and Capital Structure on 2013 Annual Report of 18 Agricultural Listed Company

ID	X ₁ (%)	X ₂ (%)	X ₃ (%)	X ₄ (%)	X (%)
C ₁	6.11	2.65	1.75	34.09	60.06
C ₂	-1.81	-0.82	3.78	17.22	84.25
C ₃	16.25	6.02	8.41	24.15	27.52
C ₄	22.91	10.56	23.21	7.59	48.69
C ₅	3.36	4.86	4.03	7.23	25.46
C ₆	-9.31	-3.76	-9.09	21.67	61.78
C ₇	3.55	1.29	1.68	10.25	4.96
C ₈	-3.26	-1.75	-5.53	7.37	67.52
C ₉	9.89	1.89	2.35	38.52	50.15
C ₁₀	-1.24	-3.07	-5.89	7.07	39.42
C ₁₁	3.33	2.94	4.54	16.38	34.99
C ₁₂	2.26	1.56	6.64	31.20	76.97
C ₁₃	16.09	8.17	14.62	34.01	54.65
C ₁₄	37.53	17.55	22.6	59.13	25.81
C ₁₅	-7.39	-4.07	-10.43	1.82	57.56
C ₁₆	4.70	11.25	17.41	20.74	35.51
C ₁₇	7.72	2.14	2.88	28.92	12.98
C ₁₈	-85.34	-26.99	-47.75	-0.50	36.49

4. Data Processing of Selected Sample

This study is mainly using factor analysis method for analysis of sample data, in which the software of SPSS 17.0 is used.

4.1. Conduct Sample Validity

As can be shown on Table 3, the result of KMO test is 0.787, which is far greater than 0.5 and shows that this case is suitable for factor analysis. And the Bartlett test of sphericity of Sig. is 0.000, which is far smaller than 0.05. So the hypothesis is established that independent of the variables are rejected.

Table 3. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		0.787
Bartlett's Test of Sphericity	Approx. Chi-Square	89.843
	df	6
	Sig.	0.000

4.2. Extract the Main Factor

SPSS software is used to made factor analysis is conducted [7-9]. Firstly, the elementary factor loading matrix can be obtained via the extraction method of principal component analysis. Secondly, the total explained variance in Table 4 below is obtained via the rotation method of varimax with Kaiser Normalization. As can be shown at the Table 4, the contribution of the first main factor is 68.408%, and the contribution of the second main factor is 29.495%. According to the principle that cumulative contribution rate is greater than or equal to 85%, so this paper selects first main factor and second main factor to stand for all the information of the original variables.

Table 4. Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.329	83.214	83.214	3.329	83.214	83.214	2.736	68.408	68.408
2	0.588	14.689	97.903	0.588	14.689	97.903	1.180	29.495	97.903
3	0.066	1.641	99.544						
4	0.018	0.456	100.000						

4.3. Calculate the Overall Score of the Profitability

Based on the component score coefficient matrix and standardized value of the original variable, the overall score of the first main factor and the second main factor are obtained, which are represented by the variable Z1 and Z2 that are calculated via the equation (1) and (2) below:

$$Z1=0.376*ZX1+0.382*ZX2+0.425*ZX3-0.369*ZX4 \quad (1)$$

$$Z2=-0.091*ZX1-0.094ZX2-0.185*ZX3+1.161*ZX4 \quad (2)$$

$$Z = (68.408 * Z_1 + 29.495 * Z_2) / 97.903 \quad (3)$$

As is shown on the Table 5, the component score coefficient matrix is obtained. ZX_i ($i=1,2,3,4$) stands for standardized value of the original variable X_i ($i=1,2,3,4$), Z stands for the overall score of profitability, which is calculated via the equation (3). So the overall score of profitability of 18 agricultural listed companies is calculated, whose calculation results are shown at the Table 6.

Table 5. Component Score Coefficient Matrix

Variable	Component	
	1	2
X1	0.376	-0.091
X2	0.382	-0.094
X3	0.425	-0.185
X4	-0.369	1.161

Table 6. The Overall Score of Profitability of 18 Agricultural Listed Companies

ID	Z_1	Z_2	Z
C ₁	-0.22255	1.01218	0.14944
C ₂	-0.02916	-0.22279	-0.08749
C ₃	0.49273	0.10937	0.37724
C ₄	1.58183	-1.38883	0.68686
C ₅	0.53432	-1.05919	0.05425
C ₆	-0.72134	0.32324	-0.40664
C ₇	0.25233	-0.76721	-0.05482
C ₈	-0.10461	-0.84378	-0.32730
C ₉	-0.28633	1.33394	0.20181
C ₁₀	-0.13108	-0.85629	-0.34956
C ₁₁	0.24759	-0.35308	0.06663
C ₁₂	-0.12602	0.76172	0.14143
C ₁₃	0.51047	0.76104	0.58596
C ₁₄	0.84358	2.39144	1.30990
C ₁₅	-0.26378	-1.16691	-0.53586
C ₁₆	0.85770	-0.26462	0.51958
C ₁₇	-0.06431	0.60695	0.13792
C ₁₈	-3.37139	-0.37719	-2.46934

4.4. Perform Correlation Analysis

By means of the SPSS software, the closeness of the relationship between the profitability (Z) and the asset-liability ratio (X) of agricultural listed companies will be studied. It is clear that Pearson correlation between Z and X is -0.094 and Sig. (2-tailed) is 0.712, which is bigger than 0.05. The above data demonstrate the correlation between profitability (Z) and asset-liability ratio (X) is not very obvious.

4.5. Conduct the Regression Analysis

Regression analysis is used to investigate the number's business impact on the profitability (Z) from the asset-liability ratio (X). Let profitability (Z) as the dependent variable, and let the asset-liability ratio (X) as independent variables perform the regression. And the results are shown in Table 7. So the regression equation of factor analysis is seen on the equation (4) below, the constant term 0.148 passes the test at the significance level of 0.435, and the coefficient term -0.003 passes the test at a significance level of 0.009. The above analysis is content with actual fact.

$$Z=0.148-0.003*x \quad (4)$$

Table 7. The Outcome of Regression Analysis

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.148	0.435		0.341	0.738
	X	-0.003	0.009	-0.094	-0.376	0.712

9. Conclusion

Based on the correlation analysis and regression analysis between asset-liability ratio and corporate profitability of the selected sample, it shows that there is a slight negative correlation on them; that is to say, the capital structure of the agricultural listed companies' profitability will produce a slight effect to the overall profitability. Generally, the lower the asset-liability ratio of the enterprise, the higher the profitability of the enterprise is. In order to achieve the goal of maximizing the wealth of shareholders, decision of listed companies on the financing strategy must be on the premise of the pursuit of the optimal capital structure.

Due to debt of the saving tax effect, a certain proportion of debt can reduce the comprehensive cost of the enterprise. However, if the proportion of debt financing is too big, the financial risk of the enterprise will increase and its own capital costs will increase, which leads to bringing a lot of pressure, even leading to the enterprise bankruptcy.

For the same reason, corporate profitability has a great influence on the corporate capital structure. This study takes the 18 representative agricultural listed companies in China as an example, analyze the relation between the profitability and capital structure, and provide a decision-making reference for the sustainable development of agricultural listed companies.

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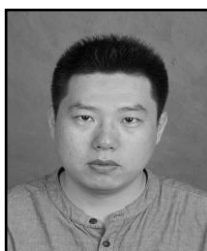
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References

- [1] C. Y. Huang, "Demonstration Analysis on the Profit Status of Agricultural Listed Companies and Its Influencing Factors in China", *Journal of Anhui Agricultural Science*, vol. 36, (2008), pp. 1226-1228.
- [2] B. R. Li and Z. R Wang, "Empirical analysis of profitability and capital structure of our country' listed company", *The Journal of Quantitative & Technical Economics*, vol. 4, (2003), pp. 150-153.
- [3] H. M. Lin, M. Z. Lin and J. H. Ding, "Empirical analysis of profitability and capital structure of our country' listed company", *The Journal of Quantitative & Technical Economics*, vol. 9, (2004), pp. 1-5.
- [4] Y. A. Liu, "The empirical study on profitability of China's Agricultural listed companies and its influence factors", *Shandong University*, (2012), pp. 36-46.
- [5] S. S. Lv and J. B Yi, "The profitability research of the agricultural listed companies in China", *Friends of Accounting*, vol. 5, (2012), pp. 82-86.
- [6] H. H. Xin and W. J. Yang, "Profitability Analysis of Agricultural Listed Companies", *Communication of Finance and Accounting*, vol. 5, (2011), pp. 110-111.
- [7] Y. Z. Xiong, S. J. Yun, J. Y. Xing, X. R. Huang and W. Shu, "An Empirical Study on Evaluation of Marketing Channel Risk in Agricultural Products via PCA and Cluster Analysis", *Advance Journal of Food Science and Technology*, vol. 6, no. 4, (2014), pp. 552-557.
- [8] H. Zhang and L. Feng, "Application of the principal component analytical method to Science and Technology innovation capability evaluation of universities", *J. Wuhan Univ. Technol. Inform. Manage*, vol. 26, no. 6, (2004), pp. 157-161.
- [9] Y. Z. Xiong, J. Ke, J. Y. Xing and J. F. Chen, "Study on the Urban Development Level in Hubei Province Based on PCA and AHP", *Research Journal of Applied Sciences, Engineering and Technology*, vol. 5, no. 8, (2013), pp. 2604-2611.

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