

Study on Performance Evaluation of Agricultural Listed Companies Based on Factor Analysis

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Abstract: In this paper, the factor analysis model method is used to select the performance evaluation, research and empirical analysis of 37 agricultural listed companies in China as of 2017, and finally draw the following conclusions: first, agricultural listed companies are small in scale and relatively poor overall operating performance, and second, agricultural listed companies have a serious differentiation of two levels, The gap between scale and income is obvious; third, China's agricultural listed companies in the profitability, operating capacity, development capacity and debt repayment capacity of four aspects of uneven development. This paper makes a further analysis of the results of this study, and puts forward some countermeasures and suggestions to improve and improve the operating performance of agricultural listed companies.

1. Research Background

Agriculture, as the basic industry of the national economy, is experiencing the transformation from traditional mode to modern agricultural development. However, since the history of agriculture, the market development is low and the development of agriculture is slow. Therefore, it is necessary to improve its operating performance to promote and develop the agricultural economy. Operational performance indicators for evaluating the development of agricultural listed companies play an important role. Therefore, it is of great reference value to study which natural and non-natural factors affect business performance in order to improve and improve the economic development of agricultural enterprises. Furthermore, it can improve the sustainable development and comprehensive competitiveness of agricultural listed companies.

In this paper, factor analysis method is used to study and evaluate the current situation of business performance from the indicators affecting business performance, and then put forward countermeasures and suggestions to improve the current development situation of agricultural enterprises in China. We should further improve the performance evaluation system in theory and further develop our agricultural economy in practice. How to scientifically and accurately evaluate the performance of listed agricultural companies in China and improve their performance, so as to promote the sound and rapid development of listed agricultural companies and realize the great goal of rapid development of modern agriculture in China. In this paper, relevant research has been carried out.

2. Literature Review

Wang Lei and Liu Huiping (2016) show that the overall level of performance of agricultural listed companies in China is low, the development of the main factors such as profitability and solvency is poor, and the development of various sub-industries is also unbalanced.

Zhang Yanyan and Li Yueqiu (2018) studied the raw data of 45 agricultural listed companies in

China from 2016 to 2017. This paper constructs a multiple regression model to study the effects of diversification and ownership structure on the performance of agricultural listed companies. Empirical results show that ownership concentration, the proportion of circulating shares and the composition of main business sectors are important factors affecting the performance of agricultural listed companies.

Zhang Honghe and Dong Wei (2018) selected 51 agricultural listed companies by the end of 2016 through sorting out financial statements, and used factor analysis method to get the comprehensive scores of the performance of each agricultural enterprise and rank them. Empirical results show that there are different aspects of enterprise management, government policy and development direction.

Zeng Yu and Zhao Shang (2018) used the data of 49 agricultural listed companies in A-share market from 2012 to 2016 as research, and adopted the multiple linear regression analysis method. To study the relationship between science and technology and business performance. The results show that the more investment in technological innovation, the better the performance of enterprises. Then according to the research results, some feasible suggestions are put forward, such as increasing R&D investment and human resources development, and improving the level of patent output.

Li Xiaoyang et al. (2018) through the establishment of panel data, selected 34 agricultural listed companies in China in 2010 - 2016 data, the first time using threshold regression model for research and analysis. The research shows that due to the change of company form, there is a significant threshold effect on the performance of Chinese agricultural listed companies, which proves that there is a significant non-linear relationship between the two.

Wang Min et al. (2018) studied the impact of ownership structure on the performance of agricultural enterprises, and added the degree of vertical integration. The results showed that there was a mediating role between them.

3. Empirical Analysis on the Performance Evaluation of Agricultural Listed Companies

3.1 Construction of Index System.

The operating performance of agricultural listed companies will be affected by many factors. This paper chooses four aspects: profitability, operating capacity, solvency and development capacity, chooses 12 relevant indicators, constructs a system for evaluating the operating performance of agricultural listed companies, and uses the constructed system, then for the farmers in 2017. The operating performance of Listed Companies in industry is analyzed.

Table 1 Evaluation Indicators and Indicators of Operational Performance of Agricultural Listed Companies

Category	Index	Indicator description
Profitability	Net profit margin (X1)	Refers to the percentage of net profit from business operations to net sales. The formula is: net profit/main business income.
	Return on net assets (X2)	It is the percentage of a company's after-tax profit divided by its net assets,The formula is: net profit/average net assets
	Earnings per share (X3)	Refers to the ratio of after-tax profits to total equity. The formula is: net profit/total equity.
Operational capacity	Inventory turnover (X4)	It is a supplementary explanation to the turnover rate of current assets and a comprehensive index to measure the sales ability and inventory management level of enterprises. The formula is: cost of

	Receivable turnover rate (X5)	sales/average balance of inventory. It is the ratio of net income from credit sales to the average balance of accounts receivable in a certain period of time. It is an index to measure the turnover speed and management efficiency of enterprise accounts receivable. The formula is: current net sales income /(balance of accounts receivable at the beginning of period + balance of accounts receivable at the end of period)/ 2
Operational capacity	Total asset turnover rate (X6)	It is the ratio of net sales revenue to total average assets of an enterprise in a certain period. It is an index to measure the ratio between the scale of assets investment and the level of sales. The formula is: net operating income/total average assets.
Solvency	Liquidity ratio (X7)	It is the ratio of current assets to current liabilities. It is used to measure the ability of enterprises'current assets to be converted into cash for repayment of liabilities before the maturity of short-term liabilities. The formula is: current assets/current liabilities.
	Quick-moving ratio (X8)	Quick assets refer to the ratio of quick assets to current liabilities. Quick assets are the balance of current assets minus inventory and prepaid expenses. The formula is: quick assets/current liabilities.
Development capacity	Asset-liability ratio (X9)	It is used to measure the ability of enterprises to use creditors'funds to carry out business activities and to reflect the degree of security of creditors' loans. The formula is: total liabilities/total assets.
	Increase rate of business income (X10)	It refers to the ratio of the increase of business income in the current year to the total business income in the previous year. The formula is: the increase of business income/the total business income in the previous year.
	Net profit growth rate (X11)	The larger the index value, the stronger the profitability of the enterprise. The formula is as follows: (current net profit-last net profit)/last net profit.
	Gross Asset Growth Rate (X12)	The ratio of the total assets growth at the end of the year to the total assets at the beginning of the year is as follows: the total assets growth at the end of the year/the total assets at the beginning of the year

3.2 Empirical Process.

KMO test and Bartlett test

Table 2 Descriptive Statistical Analysis Results of Indicator Data

	Number of cases	Minimum value	Maximum value	Average value	Standard deviation
Net profit marginX1	37	-52.995	31.727	3.80441	17.556660
Return on net assets X2	37	-206.952	27.753	-3.1803	37.938382
Earnings per shareX3	37	-1.73670	2.1801	0.17893	0.6985488
Inventory turn overX4	37	0.047	10.110	3.03457	2.385226
Receivable turnover rateX5	37	1.506	351.79	32.5285	60.522558
Total asset turnover rateX6	37	0.104	1.569	0.56949	0.358191
Liquidity ratioX7	37	0.373	19.084	2.55146	3.144678
Quick-moving ratioX8	37	0.177	15.412	1.73722	2.612262
Asset-liability ratioX9	37	6.023	89.777	39.9915	18.620755
Increase rate of business incomeX10	37	-61.063	79.140	8.35443	31.419130
Net profit growth rateX11	37	-98.818	145.75	2.54762	36.038012
Gross Asset Growth RateX12	37	-23.047	87.059	10.8418	25.536402
Number of valid cases(Column)	37				

As shown in Table2, the original data are preliminarily processed to obtain descriptive statistics of the maximum, minimum, average and standard deviation of each index. Standardized processing of these data, then KMO test and Bartlett test, the results, such as table 3. From Table3, it can be seen that the KMO value is $0.770 > 0.7$, which meets the requirements of KMO value greater than 0.7. The statistical value of Bartlett sphericity test is 221.250, and the significance probability sig is 0.000, which passes the significance test. It shows that there is a certain degree of correlation between different variables, which is suitable for factor analysis.

Table 3 KMO and Bartlett sphericity test results

KMO and Bartlett sphericity test				
KMO Sampling	Appropriateness	Quantity		
Bartlett sphericity test			Chi	0.770
	Approximate			221.250
	Square			
		Freedom		66
		Significance		0.000

4. Common Factor Extraction

Through the component score coefficient matrix, that is, the component score coefficient matrix, the score of each factor is constructed by using the score value of each factor on each observable variable as the coefficient.

The factor score function is: $F_j = \beta_{j1}X_1 + \beta_{j2}X_2 + \dots + \beta_{jp}X_p$

From the above formulas, the scoring formulas of each factor can be obtained:

$$F_1=0.267X_1+0.333X_2+0.226X_3-0.179X_4+0.177X_5-0.035X_6-0.073X_7-0.097X_8-0.220X_9-0.066X_{10}+0.222X_{11}-0.048X_{12}$$

$$F_2=-0.019X_1-0.074X_2-0.027X_3+0.157X_4-0.127X_5+0.009X_6+0.454X_7+0.470X_8-0.162X_9+0.048X_{10}-0.035X_{11}+0.053X_{12}$$

$$F_3=-0.091X_1-0.004X_2+0.132X_3+0.476X_4+0.297X_5+0.427X_6-0.002X_7+0.030X_8-0.101X_9-0.072X_{10}-0.148X_{11}+0.032X_{12}$$

$$F_4=-0.051X_1-0.122X_2+0.084X_3+0.086X_4-0.270X_5+0.041X_6+0.090X_7+0.095X_8+0.240X_9+0.53X_{10}+0.048X_{11}+0.466X_{12}$$

Finally, according to the above model, the scoring situation of each factor is obtained. In order to get the comprehensive evaluation score F of 37 listed agricultural companies, the weighted sum of the variance contribution rate corresponding to each factor is carried out.

$$F=0.2909F1+0.2234F2+0.1337F3+0.0939 F4$$

According to the scores of each factor and the above formula, the comprehensive scores and rankings are obtained by using the standardized data of the samples, as shown in the table.

Table 4 Sample data factors and comprehensive scores and rankings

	Comprehensive score	Ranking		Comprehensive score	Ranking
Longping Gaoke	0.8278	13	Saint-Farmer Development	-0.0800	24
Denghai seed industry	0.1670	10	Huaying Agriculture	-0.0809	25
Zhongxing Bacteriology Industry	0.4774	5	Probiotic Shares	-0.5447	34
Tsuen Yin Polytechnic	0.0068	20	Lihua Shares	0.5819	2
Shennong gene	-0.0932	27	Muyuan Shares	0.4161	6
Ficus chinensis	0.0334	15	Xiantan Share	0.3764	7
Yasheng Group	-0.1467	30	Western Animal Husbandry	-0.9484	36
Agricultural Development Seed Industry	-0.0868	26	Wen's shares	0.5123	4
Dunhuang Seed Industry	-0.3220	32	Fucheng Stock	0.0270	17
New Agricultural Development	-0.3441	33	New Wufeng	0.0949	12
Wanxiang Denong	0.0020	21	Water fisheries	0.0186	18
Fragrant Pear Stock	0.9882	1	Swertia Island	-1.1190	37
Beidahuang	0.0967	11	Baiyang Stock	0.2979	8
Hainan rubber	-0.1093	29	Consultation in Hubei Province	0.2210	9
Pingtan Developmen	-0.0028	22	Guolian Aquatic Products	0.0588	14
Jinsen, Fujian	0.0179	19	Opening up the World	0.5447	3
Luoniu Mountain	-0.0646	23	Great Lakes Stock	0.0277	16
Saint-Farmer Development	-0.0800	24	homey	-0.2347	31
Minhe Stock	-0.7478	35	Fengle Seed Industry	-0.0974	28

5. Analysis of Empirical Results

According to the calculation results, this paper makes a comprehensive evaluation of the operating performance of agricultural listed companies in 2017, we can see that the comprehensive evaluation scores of the operating performance of agricultural listed companies in 2017. Xiangli Stock, Lihua Stock, Founding International, Wen's Stock, Zhongxing Bacteria Industry ranked the top five in the comprehensive score ranking.

The scores of comprehensive factors are relatively large, of which more than sixteen agricultural listed companies have negative scores. It can also be concluded that the overall development of agricultural listed companies is not comprehensive enough, the polarization is relatively large, and the development level gap among sub-industries is large.

Wen's shares, pioneering the international market, and the high value of Beidahuang in the public factor F1 reflect that the three enterprises have better profitability indicators, but also show that other indicators should be improved face to face.

Fragrant pear stock, Zhongxing bacterium industry and Denghai seed industry have higher scores on the public factor F2, which indicates that these three enterprises have developed better in terms of operational capacity. At the same time, Fragrant pear stock and Zhongxing bacterium industry rank better in other aspects, indicating that the enterprise performance development is better.

6. Conclusion

A series of studies show that the bigger the total assets of agricultural listed companies, the worse their operating performance. They show a certain degree of negative correlation. According to the data statistics and empirical research in this paper, the asset-liability ratio of agricultural listed companies in China is about 40%. To a certain extent, this is a relatively poor standard. Enterprises need to strengthen their production and operation performance to improve this situation. To improve the low utilization rate of enterprise funds, on the one hand, enterprises need to strengthen the use of funds to improve the efficiency of their use of funds, should give full play to the role of financial leverage, use financial leverage to improve its utilization rate of funds. On the other hand, enterprises should allocate funds rationally, and constantly improve the utilization rate of funds in the process of adjusting the allocation of funds. Enterprise's capital is one of the most important resources of an enterprise. Ensuring the safety of capital and giving full play to the efficiency of capital utilization will help to further improve the business performance of the enterprise.

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