

An Empirical Study on Financial Support for Hunan's Agricultural Industrialization

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Abstract. This paper based on factor analysis, found that the total power of agricultural machinery is the main factor affecting the development of agricultural industrialization. Different stages of agricultural industrialization in Hunan are inconsistent. In order to promote the development of agricultural industrialization, the industrialization of agriculture in all regions of the financial support phase should be given.

Introduction

In 2017, the permanent population of Hunan Province exceeded 68 million, of which the rural population was 31 million, accounting for 45.38% of the population in the province. The important trend of modern agricultural development is the industrialization of agriculture. In the process of agricultural industrialization in Hunan Province, the development speed of rural finance could not keep pace with the development needs of agricultural industrialization. The imbalance between supply and demand has become an important factor restricting the development of agricultural industrialization in Hunan Province. Due to the serious imbalance in regional development, most of the region is still a decentralized production model. Leading companies themselves have inadequate training mechanisms, leading enterprises in agricultural industrialization have insufficient influence, leading industries do not have obvious advantages, and farmers have weak production organization capabilities and small industrial scale.

Selection and Description of Indicators

By using factor analysis, we try to find out the main factors that affect the level of agricultural industrialization. Domestic scholars have studied how to select the index of agricultural industrialization level.

Many achievements have been made. In conclusion, scholars pay more and more attention to the primary index system of agricultural industrialization and the secondary index under the first class index. According to the principle of setting the index, we rationalize it on the basis of the index selected by the scholars before. Therefore, the evaluation system of agricultural industrialization level index is composed of the first class index and the second grade index. The index of financial support for agriculture selects the balance of agricultural loans at the end of the year and the sum of government first-industry expenditure.

Table 2-1 Comprehensive Evaluation Index system of Agricultural industrialization Development level

Primary indicator	Secondary index	Indicator description	data code
Level of modernization	Ratio of machine-tillage area to crop area (%)	Total tillage area / total agricultural planting area	X2
	Fertilizer application amount per unit area (t / ha)	Fertilizer application / total agricultural sowing area	X3
Industrial management structure	Agricultural output value (100 million yuan)	Cereals and other crops, vegetables, horticultural crops, fruits, beverages and spices	X4
	Sowing rate of grain crops (%)	Grain crop sowing area / crop sowing area	X5
	Rural per capita investment in fixed assets(yuan/person)	Investment in fixed assets in rural areas / number of agricultural, forestry, pastoral and fishery practitioners	X6
	Fixed assets invested in agriculture (%)	Total investment of fixed assets in rural areas / total social fixed assets investment	X7
Production and management scale	Output value per unit area (yuan / ha)	total value of agriculture, forestry, animal husbandry and fishery / ha	X8
	Per capita large agricultural output value (yuan / person)	Total value of agriculture, forestry, animal husbandry and fishery / number of agricultural, forestry, pastoral and fishery practitioners	X9
		Per capita output of major agricultural products	X10
Agricultural Marketization	Value of agricultural commodities(100 million yuan)	Value of agricultural commodities	X11
Financial support	Financial support for agriculture(100 million yuan)	Agricultural loan balance+primary industry expenditure	FA

Empirical Process

The KMO value is 0.662, the Bartlett spherical test statistic is 556.877, and the corresponding probability Sig is 0.000, which can be used for factor analysis.

According to the correlation coefficient matrix, two principal components were determined, and the common factor variance showed that the common measure of most variables was above 96.8%. The two common factors extracted explained 96.74% of the variance of the original variable and had a strong explanatory power. The Varimax method is used to obtain the rotating factor load matrix. By using Eviews regression analysis of factor scores and financial support for agriculture in the past 17 years, we can see that R^2 is 0.743N / $F = 43.5$. Show that it passed the significance test; There is a positive linear correlation between agricultural industrialization and financial support in Hunan Province. The coefficient of independent variable is greater than 0, which indicates that the two variables are positively correlated with $R^2 = 0.743$, which indicates that financial support has a high explanatory power for the development of agricultural industrialization.

This part uses software SPSS22.0 to test the data by KMO and Bartlett sphere test. The output is shown in Table 3-1 above. From the output results, it can be seen that the KMO value is $0.740 > 0.5$

Bartlett spherical test statistics is 138.601, indicating that these variables have a strong correlation, so factor analysis can be carried out.

Table 3-1 KMO and Bartlett tests

Kaiser-Meyer-Olkin metric of sampling adequacy.		.740
Bartlett test of spericity	Approximate chi-square	138.601
	df	36
	Sig.	.000

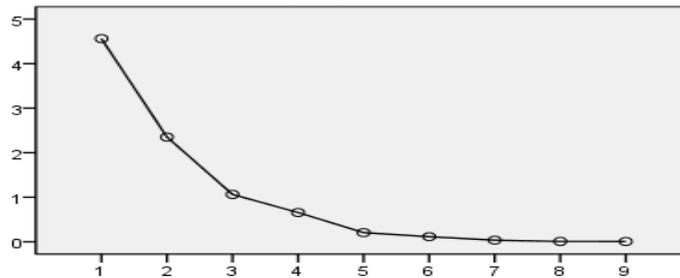


Fig. 3-1 Macadam diagram

From the lithotripsy diagram of figure 3-1, we can see that the eigenvalues of the first factor, the second factor and the third factor contribute more to the interpretation of the original variable, and the contribution from the fourth and fifth factors is becoming smaller and smaller, which shows that it is reasonable to extract the three main factors. The original scalar variance explained by the principal components in Table 3-2 shows that the characteristics of the first three factors are 4.562n2.350, 1.063, respectively. They explain the information of the variables 88.613% together, thus confirming the extraction of the first three factors as the main factors. The first principal factor reveals 50.690% of the original variable information, which is the most explanatory.

Table 3-2 Total variance explained

Com pone nt	Initial eigenvalue			Rotation Sums of Squared Loadings			Rotation square sum loading		
	Total	%of Variance	Cumulative %	Total	%of Variance	Cumulati ve %	Total	%of Variance	Cumulati ve %
1	4.562	50.690	50.690	4.562	50.690	50.690	3.149	34.993	34.993
2	2.350	26.113	76.803	2.350	26.113	76.803	3.057	33.967	68.961
3	1.063	11.810	88.613	1.063	11.810	88.613	1.769	19.653	88.613
4	.657	7.296	95.909						
5	.205	2.281	98.190						
6	.114	1.271	99.461						
7	.035	.391	99.852						
8	.007	.083	99.935						
9	.006	.065	100.000						

Extraction method: principal component analysis.

By using the variance maximization method, the rotation factor load matrix is obtained to enhance the interpretation ability of the common factor. The load values of F1 on X2X3X4 and X9 are very large, which indicates that the interpretation is the level of agricultural modernization. The main factor of agricultural industry management structure and agricultural marketization. F2 is the main factor explaining the level of agricultural modernization on X1 / X7, and the main factor of industrial management structure is the main factor. F3 on X1 / X8 is the main factor to explain the level of agricultural modernization and the main factor of production efficiency.

The factor score function can be obtained by using the factor score matrix of Table 3-3:

$$F1 = -0.39x_1 + 0.159x_2 + 0.3x_3 + 0.31x_4 + 0.187x_5 - 0.149x_6 + 0.28x_7 - 0.121x_8 + 0.313x_9$$

$$F2 = 0.193x_1 + 0.47x_2 - 0.218x_3 + 0.23x_4 - 0.306x_5 - 0.394x_6 + 0.186x_7 - 0.189x_8 - 0.06x_9$$

$$F3 = 0.211x_1 + 0.141x_2 - 0.035x_3 - 0.04x_4 - 0.17x_5 + 0.419x_6 + 0.140x_7 + 0.722x_8 - 0.55x_9$$

By calculating the ratio of information contribution rate to total contribution rate of each main factor, we can get 0.572F1 0.294F2 0.133F3, and substitute each factor score number into the formula to get the comprehensive score matrix of table 3-4. According to the ranking of agricultural industrialization in different regions, the degree of agricultural industrialization of 14 cities and states in Hunan Province is divided into four stages: the first is the stage of development in which the comprehensive score coefficient is greater than 1.0. The second is the developing level of the comprehensive score coefficient between 1.0 and 0, the third is the initial stage of the comprehensive score coefficient between -0.5 and 0, and the fourth is the comprehensive score coefficient between -1 and -0.5, the backward stage. On this basis, we compare the characteristics of the development stages of agricultural industrialization in different regions, and propose corresponding financial support, as shown in table 3-5.

Table 3-3 Factor score matrix

	Component				Component		
	1	2	3		1	2	3
x1	-.039	.193	.211	x6	-.149	-.394	.419
x2	.159	.047	.141	x7	.028	.186	.140
x3	.300	-.218	-.035	x8	-.121	-.189	.722
x4	.310	.023	-.094	x9	.313	-.006	-.055
x5	.187	-.306	-.017				

Extraction method: principal component analysis.
Rotation method: orthogonal rotation method with Kaiser standardization.

Table 3-4 combined scores and rankings of cantonal factors by city

City/state	Comprehensive score	Ranking
Changsha City	1.02106158	1
Changde City	0.92077499	2
Hengyang City	0.6307478	3
Yueyang City	0.54673877	4
Yongzhou City	0.22037647	5
Yiyang City	0.20902889	6
Shaoyang City	0.17454511	7
Xiangtan City	-0.14135499	8
Chenzhou City	-0.18701331	9
Zhuzhou city	-0.19828741	10
Huaihua city	-0.39029286	11
Loudi city	-0.80902091	12
Xiangxi Tujia and Miao Autonomous Prefecture	-0.9723146	13
Zhangjiajie City	-1.02499259	14

Table 3-5 Agricultural Industrialization Development Stage and Its Relative Financial Support

Stage of development	Comprehensive score interval	City/state	Characteristics of Agricultural industrialization and corresponding Financial support
Advanced level	>1.0	ChangSha	Give full play to Changsha's regional and economic advantages in Hunan Province, give full play to the role of local commercial rural finance, and form an effective financial service chain to meet the diversified needs of leading enterprises. Guide and support its development into a characteristic industry.
Developing level	0.1-1	Changde, Hengyang, Yueyang, Yongzhou, Yiyang, Shaoyang	Give full play to the financial support power of commercial rural areas, innovate the characteristic financial products, expand the brand effect of leading enterprises, and perfect the financial support industry chain.
Starting level	-0.1- -0.5	Xiangtan, Chenzhou, Zhuzhou, Huaihua	Give policy support, combine commercial finance with policy-oriented finance, focus on supporting leading enterprises, and continuously increase agricultural production bases with local characteristics.
Backward level	>-0.5	Loudi, Xiangxi, Zhangjiajie	Speed up the construction of agricultural product bases, introduce leading enterprises of processing type, standardize all kinds of specialized cooperatives, and focus on supporting the development of agriculture and animal husbandry.

Conclusions

First, the overall level of agricultural industrialization in Hunan Province still needs the support of financial funds, the government should increase the support efforts, increase the investment in agricultural fixed assets in it. Basic changes in infrastructure are achieved. The government of Hunan should provide tax relief and interest subsidy to agricultural policy-oriented financial institutions to improve their ability to bear risks. Helping agribusiness to establish a perfect credit evaluation system and credit guarantee system is helpful to meet the fund demand of small and medium-sized enterprises involved in agriculture.

Second, the industrial chain of agricultural products must have enough capital input to make it form a large scale. The national development bank should be regarded as the main body of Hunan agricultural investment projects, and should increase the support of financial institutions to Hunan's agricultural industrialization. Inject funds into companies with financing needs and quality projects. The Agricultural Development Bank, as an assistant, actively serves agriculture and increases the investment of policy funds for ecological agriculture with Hunan characteristics. Commercial banks should curb the declining trend of rural networks and actively develop innovations in financial products and financial services among farmers.

Third, the financial support of financial institutions at all levels is not only to invest funds, but also to give a large amount of valuable information, guide farmers to organize production rationally, reduce market risks, and promote the healthy development of agricultural industrialization.

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