Research on the Relationship between Agricultural Mechanization and Agricultural Loan Support in China

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Abstract: Raising the level of agricultural mechanization requires the support of many factors, among which the support of agriculture-related loans from financial institutions is very important. Through the regression analysis of the level of agricultural mechanization and the loans of agriculture-related financial institutions to agriculture, farmers and small rural enterprises, it is explored which financial institutions play an important role in improving the level of agricultural mechanization. The study shows that rural cooperative banks, Postal Savings Bank of China and Rural Credit Cooperatives of China play an important role in improving the level of agricultural mechanization. Banks in agriculture-related loans may exist in the “agricultural machine neglect” tendencies.

Keywords: Agricultural Mechanization; Agricultural Loan; Multiple Regression Model.

I. INTRODUCTION

As a large agricultural country with relatively limited land resources, the development of modern agriculture and the industrialization of agriculture is the core of China's agricultural development strategy (Wen, 2012). The basis is to achieve a high level of agricultural mechanization. Agricultural mechanization is not only a way to improve the production technology, but also the effective way to improve agricultural productivity and raise the level of agricultural mechanization on agricultural industrialization development. Therefore, the improvement of the level of agricultural mechanization plays an important role in the development of agricultural industrialization and the establishment of modern agriculture and the improvement of the international competitiveness of agriculture (Yang and Bai, 2004).

There are many factors that affect the level of agricultural mechanization, among which the number of agricultural mechanization investment plays a key role. Before 1985, agricultural mechanization investment was mainly from the collective ownership and the ownership of the whole people. And after that, private investment gradually dominated (Lin and Sun, 2007). For the time being, the sources of private investment mainly include agricultural loans, their own accumulation (income) and financial subsidies. Modern agricultural machinery, especially large-scale agricultural machinery required a larger amount of funds, most farmers and agricultural cooperatives to buy agricultural machinery to rely mainly on agricultural loans. Therefore, it is very important to study the relationship between agricultural credit support and agricultural mechanization.

This paper attempts to analyze the relationship between the loan situation of farmers and small enterprises and the level of agricultural mechanization, and explore which financial institutions play a key role in improving the level of agricultural mechanization. The paper tries to make recommendations to effectively serve the farmers and small agricultural enterprise for improving the level of agricultural mechanization.

II. MODEL BUILDING AND DATA SOURCES

Model Building

Using the least squares method, the regression equation is:

\[
Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \epsilon
\]

Y: Per hectare of cultivated land power equipment annual growth rate

- \(X_1\): Annual growth ratio of agricultural loan balance from Agricultural Development Bank of China (ADBC)
- \(X_2\): Annual growth ratio of agricultural loan balance from rural cooperative banks
- \(X_3\): Annual growth ratio of agricultural loan balance from rural commercial banks
- \(X_4\): Annual growth ratio of agricultural loan balance from Postal Savings Bank of China (PSBC)
- \(X_5\): Annual growth ratio of agricultural loan balance from new rural financial institutions
- \(X_6\): Annual growth ratio of farmers’ agricultural loan balance from rural commercial banks
- \(X_7\): Annual growth ratio of farmers’ agricultural loan balance from rural cooperative banks
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The first-order RESET test is performed on the model, and the F-value display cannot reject the original hypothesis. That is the function selection is correct.
Heteroscedasticity test results show that the original hypothesis cannot be rejected. That is the model does not have heteroscedasticity.
The LM test results show that the original hypothesis cannot be rejected. That is there is no autocorrelation in the model.

B. Empirical Model and Results Analysis
The coefficient coefficients of the least squares estimation are brought into the theoretical model, and the empirical model is obtained:

\[ Y = 0.0673 - 0.0521X_1 - 0.0342X_2 - 0.0198X_3 - 0.0534X_4 - 0.0309X_5 - 0.0077X_6 
+ 0.0119X_7 + 0.0034X_8 - 0.0003X_9 + 0.0117X_{10} \]

\( X_1, X_2, X_5, X_8, X_{10} \) passed a 5% significance test. Among them, coefficient of \( X_1, X_2 \) is negative, indicating that the growth rate of loan balance from ADBC and the rural cooperative banks is inversely related to the growth rate of the power equipment of per hectare of arable land.

The coefficients of the variables \( X_7, X_8 \) are positive, indicating that the annual growth ratio of farmers’ agricultural loan balance from rural cooperative banks and PSBC, the growth ratio of small businesses’ agricultural loan balance from Rural Credit Cooperatives of China are positively related to the growth rate of the power equipment of per hectare of arable land.

IV. CONCLUSION
The research shows that the improvement of the level of agricultural mechanization has a close relationship with the agricultural loans.

Rural cooperative banks, Postal Savings Bank of China and Rural Credit Cooperatives of China play an important role in improving the level of agricultural mechanization.

There are significant positive correlations between the variables \( X_7, X_8, X_{10} \) and the level of agricultural mechanization, which means that rural cooperative banks play a key role in improving the level of agricultural mechanization for farmers, and for small businesses, Credit support comes from rural credit cooperatives.

Some banks have a significant "agricultural machine neglect" tendencies in agriculture-related loans.
From the results, all banks have a negative correlation. In particular, the variable \( X_1 \) plays a significant negative correlation, which is worth pondering. This is true with the fact that most of the loans issued by ADBC are used for some large projects. The variable \( X_2 \) also plays a significant negative correlation, which seems to contradict the conclusion of the previous variable \( X_7 \). There should be a possibility that farmers buy agricultural machinery is very dependent on rural cooperative banks, but the rural cooperative banks to increase the balance of agricultural loans, farmers buy agricultural loans accounted for the proportion of less.

Comprehensive analysis down, the bank in agriculture-related loans may exist in the "agricultural machine neglect" tendency. It may be the increase in the amount of loans to farmers, more investment in other means of production.

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V. REFERENCES