

# The Analysis of Supply and Demand Condition of Credit Funds for Agricultural Production in Heilongjiang Province

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**Abstract**—Based on the investigation for agricultural production devoting circumstance, this paper establishes the theoretical calculation model of agricultural credit demand by using Financial Interrelations Ratio (FIR) theory. In addition, this paper analyzes quantitatively the supply and demand condition for agricultural production crediting funds in order to provide the reference for decision.

**Keywords**-Financial Interrelations Ratio, Financial Structure, Credit Funds, Rural Finance

## 1. Introduction

The development of agriculture and the improvement of farmers' living standards are depending on the rural financial support. As the most important capital allocation system in the economic development of rural financial, its function becomes more and more obviously. Throughout the world, the more the state gives rural financial support, the more development of agricultural production has achieved. Heilongjiang province attaches great importance to the agricultural investment, but accompany with the Heilongjiang province to develop agricultural industrialization and large scale globalization, to demand external capital, so the funding gap remains strong. This paper, by using the financial related theory, calculated theoretical values for the credit funds demand of Heilongjiang province grain production, gives intuitively supply and demand condition.

## 2. The Estimates of Agricultural Credit Demand Theory – the Model of Financial Interrelations Ratio (FIR)

### 2.1 The model of theoretical Financial Interrelations Ratio (FIR)

Since the 1970s, as the economic independence enhancing and the status improving of the developing countries in the world, the western economists turn to study the financial issues of the developing countries. The American named Goldsmith study the comparison of financial structure with the financial developing issues of the developing countries. He gives a Financial Interrelations Ratio (FIR), by use it measure the quantitative index for a national financial development level. Namely the total financial assets divided by the national wealth, the total financial assets including monetary financial assets, bonds of financial assets and other kinds of special funds, etc.

The value of FIR is determined by the following equation:

$$FIR = F/W \quad (1)$$

F: the total financial assets; W: the total national wealth.

The mathematical model of FIR is the foundation of the financial structure theory. It might be regarded as one of the basic characteristics of financial development. Goldsmith thought, FIR is increased gradually as one country economic development. That is, the more financial system developed, the Financial Interrelations coefficient is higher also, if on the basis of a certain national wealth or national output value.

## 2.2 The determination of financial demanding model for Heilongjiang agricultural production.

According to the Goldsmith's theory, it can established the following relationships between the financial developing scale and economic volume:

$$D = \text{FIR} \cdot \text{GDP} \quad (2)$$

D: financial demand; FIR: Financial Interrelations Ratio; GDP: the total economic volume.

And under the condition of open economy, rural economy includes not only the two departments, such as entity economy and financial, should also include government departments, family and net inflows of foreign capital. So, the theoretical amount of agricultural credit demand should be equals to the equation(2) minus the government funding support, the net investment of the family private capital and the net inflow of foreign capital, But because foreign capital flow to China's rural especially support grain production of rare, so can be ignored in calculation. So equation (2) should continue to correct for:

$$D = \text{FIR} \cdot \text{GDP} - \text{G} - \text{S} \quad (3)$$

G: the total funds of government's fiscal support; S: the net investments of the private capital of the farmers; D: the theoretical demand of the agricultural credit.

$$S = (\text{B} + \text{F}) \times \text{P} \quad (4)$$

B: the business expenses of the per person; F: the expenditures of the productive fixed asset of the per person; P: rural population, S: the same as above equation.

## 3. The Estimate and the Result Analysis of the Related Index

### 3.1 The measurements of the related demand indexes of the Heilongjiang agricultural credit funds.

First, we may calculate the 2000 ~ 2009 FIR of the whole China is as follows (Table I).

TABLE I. THE 2000~2009 FIR OF WHOLE CHINA

Year	The Total Financial Assets of the Whole China (100 millions yuan)	The GDP of the Whole China (100 millions yuan)	FIR
2000	135483.7	99214.6	1.36556
2001	154876.1	109655.2	1.41239
2002	184024.5	120332.7	1.52930
2003	225313.3	135822.8	1.65888
2004	262740.0	159878.3	1.64337
2005	302042.8	183217.4	1.64855
2006	365230.1	211923.5	1.72341
2007	454267.8	249529.9	1.82049
2008	542844.0	314045.4	1.72855
2009	681875.0	340506.9	2.00253

Source: calculated from the 2000 ~ 2009 "China Statistical Yearbook".

Second, according to the per farmer's expenditures, estimate the fund-owned by farmers (Table II).

TABLE II. THE TOTAL INPUT OF FUND-OWNED BY FARMERS IN HEILONGJIANG PROVINCE

Year	The Operational Expenses of Per Person (yuan)	The Expenditures of Purchasing Productive Fixed Asset of Per Person (yuan)	Rural Population (million persons)	The Investment of the Self-Owned Funds by Farmers (million yuan)
2000	1077.8	103.5	1829.6	2161306
2001	1259.2	198.7	1815.0	2646089
2002	1373.4	239.5	1809.0	2917736

2003	1375.7	220.5	1809.0	2887526
2004	1809.7	223.9	2014.5	4095479
2005	2591.2	410.2	2028.4	6088040
2006	2430.3	325.2	2045.0	5634988
2007	3067.5	413.7	1762.9	6137007
2008	4033.9	438.3	1706.0	7629573
2009	3558.0	613.6	1702.6	7102566

Source: calculated from the 2000 ~ 2009 "Heilongjiang Statistical Yearbook".

According to the equation (3) can work out the theoretical amount of the demand for the agricultural credit in Heilongjiang province, the values are as follows (Table III).

#### 4. The Theoretical Value of the Demand for Agricultural Credit in Heilongjiang Province

Year	FIR	GDP of Agriculture in Heilongjiang Province (million yuan)	The Investment of the Self-Owned Funds by Farmers (million yuan)	The Investment by the State (million yuan)	The Theoretical Demand Value (million yuan)
2000	1.36556	4144000	2161306	107519	3390055
2001	1.41239	4506000	2646089	120205	3597936
2002	1.52930	4875000	2917736	112015	4425586
2003	1.65888	5029000	2887526	206589	5248393
2004	1.64337	6202000	4095479	266089	5830613
2005	1.64855	7186000	6088040	295465	5462976
2006	1.72341	7874000	5634998	366294	7568839
2007	1.82049	9719000	6137007	1060181	10496154
2008	1.72866	11433000	7629573	1461989	10670950
2009	2.00253	12068000	7102566	1758020	15305946

Source: calculated from the 2000 ~ 2009 "Heilongjiang Statistical Yearbook".

#### 4.1 The analysis for the results

According to the theory of Goldsmith, calculate the theoretical demand value of the agricultural credit in Heilongjiang province. Now to calculate the gap in agricultural loan in Heilongjiang province combined with the actual situation in Heilongjiang province. The results are as follows (Table IV):

TABLE III. THE GAP IN AGRICULTURAL LOAN IN HEILONGJIANG PROVINCE (UNIT: MILLION YUAN)

Year	The Theoretical Demand value D	The Agricultural Loans L	The Gap in Agricultural Loan
2000	3390055	899000	2491055
2001	3597936	1000000	2597936
2002	4425586	1124000	3301586
2003	5248393	1280000	3968393
2004	5830613	1629000	4201613
2005	5462976	2217000	3245976
2006	7568839	2596000	4972839
2007	10496154	3199000	7297154
2008	10670950	3549000	7121950
2009	15305946	5030000	10275946

Source: calculated from the 2000 ~ 2009 "Heilongjiang Statistical Yearbook".

We can see, the gap in agricultural loan in Heilongjiang province is bigger, the gap of 2000 is RMB 2,491,055 million yuan, the gap of 2009 has reached RMB 10,275,946 million yuan. And tendency is presents the fast growth, the average of the annual growth is 41.2%.

#### 5. Conclusions and Recommendations

Through the above constructing model which compared the theoretical values of the demand for agricultural credit with the practical values, we can think the model reflects basically the current rural financial situation in Heilongjiang province. The rural financial development in Heilongjiang province has made great progress, but the whole situation is not optimistic. The funding gap remains strong, so limit the

rural economic development in Heilongjiang province, especially limits the industrial development of the grain and endanger national grain safety strategy.

In view of the above analysis, to accelerate the industrialization of agriculture and scale of development in Heilongjiang, must improve constantly rural financial effective supply mechanism in Heilongjiang province. Further deepening the reform of rural crediting cooperatives, rural crediting cooperatives become truly the own bank of farmers. For rural cooperative banks and rural commercial bank's functions and business scope to make scientific definition, make support agricultural development and support for rural economic functions into full play out, to meet the development of rural economy, farmers' production of financing needs. Relax market access system, the development of private financial institutions, and speed up the pace of small and medium rural financial institutions. To improve and perfect rural financial institutions mechanism of competition and trading system that will be able to establish long-term cooperation with local farmers relationship, achieve the purpose of mutual benefit.

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