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Empirical study of effect of financial capital on sustainable economic development in western rural China

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It will be conducive to promote sustainable development of the western rural economy by breaking financial restraints on rural economic development and fully playing the catalyst role of financial capital in improving rural production efficiency. Based on the endogenous economic growth theory, this paper analyzed the decisive relationships between variables such as economic growth in western rural China and capital marginal output rate, transformation rate of rural saving to investment and rural savings rate, analyzed the factors affecting changing of these variables, tested the factors by Johansen co-integration test method in the vector auto-regressive model by taking the relevant data of western rural economic development and rural finance from 1985-2012 in China as sample.

Keywords: Western Rural Areas,Sustainable Economic Development,Financial Capital

INTRODUCTION

After years of rapid growth, the economy in western rural China has made considerable development, while integrally still in a state of small-scale peasant economy or of natural economy production with low efficiency of agricultural production. The growth of western rural economy and increasing of farmers' income mainly rely on the inputs of land and labor force instead of total factor productivity. The development pattern of western rural economy is still characterized in extensive growth. Under the constraints of domestic and international market competition intensifying, production factors outflow increasing and ecological environment deteriorating, the western rural economic development is unsustainable. In order to solve the above problems, a fundamental transformation of western rural economy development pattern is required which means transformation from extensive pattern to intensive pattern. And the intensification of production factor inputs is the premise and foundation of realizing transformation from extensive growth to intensive economic growth in western rural economy. The important features of western rural economy, intensification and sustainable development, is extensive inputs of resources and labor replacing by the intensive input of capital and technology especially. The current status of development in western rural China is that supply of labor and land are sufficient and of capital and technology are scare. Under the condition of fixed rural production technical level, the capital element, especially the rural financial capital, has significant restraint effects on intensification and sustainable development of western rural economy. Consequently, it will be conducive to promote sustainable development of the western rural economy by breaking financial restraints on rural economic development and fully playing the catalyst role of financial capital in improving rural production efficiency. For this reason, it is necessary to study the relationship between rural economy sustainable development in western China and the financial capital so as to explore deeply how to promote transformation of western rural economy development pattern.

Literature reviews

Regarding the effect of financial capital on rural economy development, the effect of finance on economy growth has been emphasized in foreign early classical literatures made by Bagehot, Schumpeter, Gurley, Shaw, Goldsmith and McKinnon etc [1]. While according to Robinson[2] and Lucas[3], finance has no substantial contribution to economy growth. Till now, foreign academic circles still pay close attention to the study of the effect of finance on economy growth. It has been found by Alessandra[4], August etc[5], Ferda[6], Hsu etc[7], Kar etc[8], Ikonen[9],James[10] and so on that finance, in the way of private savings and investment, can promote economy growth, through theoretical research and empirical analysis both. Levine[11], who has further broken up the functions of financial system into five areas, i.e. mobilizing savings, resource configuration, convenient for risk management,

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supervising administrators as well as convenient for goods and service exchanging, also thought that finance, through capital accumulation and technical progress, can promote economy growth. Finance, which leads capital from low-efficiency department to high-efficiency department, finally realizes improving of the integral economy efficiency through optimizing capital allocation. In recent years, the effect of technological innovation on economy development is getting greater; the endogenous financial development theory is getting deeper; the finance innovation efficiency is paid close attention[12].

Generally speaking, there are very less literatures about the effects of financial capital on sustainable development of western rural economy. Most of the literatures are concerned on the relationship between finance development and rural economy growth, while no consistent conclusion has been made. And the study of the effects of financial capital on sustainable development of western rural economy, in particular, is scarce. Based on the endogenous economic growth theory frame and taking the relevant data of western rural economic development and rural finance from 1985-2012 as sample, this paper analyzed the restrictive factors of financial capital on western rural economy, and gave answer for whether financial capital can effectively promote transformation of economy development pattern in western rural China.

SPECIFICATION AND PARAMEER SETTING OF THE MODEL

Capital moderate over expansion or through promotion of government direct investment or financial capital, increasing capital investment to western rural economy is proper. While for western rural sustainable economy development, the crucial point is to stimulate economic endogenous growth by financial capital. In order to analyze the effects of financial capital on sustainable economic development in western rural area, we suppose that the western rural economy is a closed economy without government, only produce one kind of product, which can be used for consumption or investment, and suppose that the labor force input scale remains constant, thereby the gross output function can be simplified as:

$$Y_t = AK_t \quad (1)$$

In which A is the capital marginal output rate, K is the total capital stock. In case the product is used for investment and be depreciated at a certain rate terminally, given the capital depreciation rate δ as a constant, it can be conclude

$$I_t = K_{t+1} - (1-\delta)K_t \quad (2)$$

Make g_t as the western rural economy growth rate of term t, from （1）knows that $g_{t+1}=\Delta Y_{t+1}/Y_t=$（$AK_{t+1}$-$AK_t$）/$Y_t$. It is obtained by substitution of (2):

$$g_{t+1} = A\frac{I_t}{Y_t} - \delta \quad (3)$$

In a western rural economy system with government involvement, the effects of financial capital mainly reflect in accumulating fund and transforming into capital more efficiently. The capital market reaches equilibrium when the gross saving St equals to gross investment It. With profit-seeking nature and high transaction cost, the financial capital will have leakage in the process of rural saving transforming into rural investment. Suppose the leakage rate is (1-θ), then equilibrium is achieved if $I_t=\theta S_t$, in which θ is saving to investment transformation rate. In this way the economy growth rate under equilibrium is:

$$g = A\theta s - \delta \quad (4)$$

In which s=S/Y is saving rate. It is observed from (4) that capital marginal output rate A，saving to investment transformation rate θ and saving rate s are decisive variables for western rural economy growth. Any factors which affecting these three variables will affect the endogenous growth of western rural economy. The expansion of financial capital scale and efficiency improving will increase saving and improve transformation rate of saving to investment which will transform more savings into investment and further increase capital accumulating; ultimately, the output is increased by increasing the scale effect of capital accumulating and technological progress.

RESULTS AND DISCUSSION

Variable selection and data source

It is known from the above that the decisive variables for economy growth in western rural area g are capital marginal output rate A，saving to investment transformation rate θ and saving rate s, and any factors which affecting A, θ and s three variables will affect western rural economy growth. Normally, western rural economy growth g is measured by rural income. Due to lacking of complete statistics data, this paper indicated western rural economy growth index by variation of the sum of primary industry added value (GDP) and township enterprise added value. Capital expansion supports innovation activities of research

department, promotes technological progress which brings output scale increasing return that makes up the defect of capital marginal return diminishing and realizes western rural economy sustainable growth. Therefore, capital marginal output rate is affected by investment ratio. Under the assumption of a clearing western rural market and no stock for producer, the gross investment equals to the fixed capital investment; and capital marginal output rate can be indicated by the ratio of western rural economy growth to fixed capital investment TZ. Saving to investment transformation rate θ is subject to the level and efficiency of western rural financial development. According to financial development theory, western rural financial development level FIR is indicated by the ratio of western rural financial assets to western rural economy growth, in which western rural financial total asset is indicated by the sum of western rural deposits and loans. Western rural financial development efficiency XL, which is the efficiency of deposits transforming into loans by western rural financial system, reflects allocation capability of western rural financial system on rural financial resource and is indicated by the ratio of loans to deposits in this paper. The saving ratio s reflects integral rural saving condition. The western rural savings are affected more by the actual rural disposable assets balance, which is taken up mostly by rural savings. For this reason, the western rural saving ratio is indicated by western rural deposits ratio CB in this paper.

Considering the effects of factors such as data availability and statistical caliber etc, the statistical data of relevant provinces and cities in west part from 1985-2012 were adopted in the paper. Primary industry Gross Domestic Product (gross output of agriculture, forestry, animal husbandry and fishery), township enterprise added value as well as fixed assets investment data were from statistical yearbook of relevant provinces and cities. The rural deposits were the sum of farmers' savings and deposits and agricultural deposits; the rural loans were the sum of loans of agriculture, forestry, animal husbandry and fishery as well as of township enterprise, of which data were from each issue of Almanac of China's Finance.

Model specification

Based on the above mentioned theoretical analysis, the measurement model of this article was established with consideration of variable selection and data source:

$$g = \beta_0 + \beta_1 TZ + \beta_2 FIR + \beta_3 XL + \beta_4 CB + \mu \quad (5)$$

In the above equation, β_0 is a constant term, and β_1、β_2、β_3、β_4 are western rural investment ratio TZ, western rural financial development level FIR, western rural financial development efficiency XL, coefficient of western rural deposits ratio CB respectively. μ is a random error term.

Empirical analysis

In order to judge the stationeriness of the above variables, Eviews8.0 was adopted to ADF test all variables. The result (see table 1) showed that g, TZ, XL, FIR, CB were all non-stationary variables and all data sequences which have been first difference treated were all stationary and integrated of order one under 1% significance level. In which △g、△TZ、△XL、△FIR、△CB indicated integrated of order one of corresponding variables.

It was known from the ADF test that g, TZ, XL, FIR, CB were all I (1) process. According to the cointegration theory, there may exist co-integration relationship, namely long-term stable relationship in case the variables were the same order single whole(Table1).

According to the AIC and SC criterion, it was determined that the optimum lag phase of VAR model of g, TZ, XL, FIR, CB was phase II. The whole test process was realized by Eviews8.0 of which cointegration result was shown in Table 2.

From Table 2, it could be seen that co-integration relationship,namely long-term stable relationship existed between the five variables g, TZ, XL, FIR, CB under 1% significance level within sample range of 1985-2012. The equilibrium vector was as follows:

$$\beta' = (1.00, 0.405870, -0.012720, -0.887561, 0.137883, 0.140613) \quad (6)$$

The cointegration equation of the five variables was as follows:

$$\begin{array}{ccccccc} \ln g = & -0.405870 & + 0.012720 \times \ln TZ & + 0.887561 \times \ln XL & - 0.137883 \times \ln FIR & - 0.140613 \times \ln CB \\ & (0.04681) & (0.00093) & (0.08333) & (0.02132) & (0.04086) \\ & [-8.67086] & [13.7476] & [10.6518] & [-6.46768] & [-3.44114] \end{array}$$

Table 1. The original sequence of unit root test results

Data Name	Type	ADF Value	ADF critical value	conclusion
g	（C，T，3）	-2.453265	10%（-3.238）	No Stationary
Δg	（0，0，1）	-12.6655	1%（-2.660720）	Stationary
TZ	（0，0，2）	-2.168632	10%（-3.243079）	No Stationary
ΔTZ	（0，0，1）	-5.691089	1%（-4.374307）	Stationary
XL	（C，T，3）	-0.400193	10%（-3.233456）	No Stationary
ΔXL	（0，0，0）	-3.805632	1%（-2.660720）	Stationary
FIR	（C，T，1）	-2.794157	10%（-3.233456）	No Stationary
ΔFIR	（0，0，1）	-6.043114	1%（-2.660720）	Stationary
CB	（C，T，1）	-2.42833	10%（-4.356068）	No Stationary
ΔCB	（0，0，1）	-3.030852	1%（-2.660720）	Stationary

Table 2. Cointegration Test

The null hypothesis	Characteristic value	Trace statistics	The critical value of 1% significant level	P value
0**	0.950294	140.0853	76.97277	0
Up to 1**	0.792754	68.04609	54.07904	0.0018
Up to 2	0.499426	30.27367	35.19275	0.1541
Up to 3	0.395401	13.66565	20.26184	0.3131
Up to 4	0.064067	1.589083	9.164546	0.8572

Note: * * said to reject the null hypothesis at the 1% level of significance.

The cointegration equation shows that long-term equilibrium relationship existed between the five variables during 1985-2012 and positive relationship exists between western rural investment ratios (TZ), western rural financial development efficiency (XL) and rural economy growth (g). The contribution degree of western rural investment ratios to economic growth was only 0.013%, and of western rural financial development efficiency was 0.888%. The relationship between western rural financial development level (FIR), western rural deposits ratio (CB) and rural economy growth (g) was negative. The contribution degree of western rural financial development level was -0.138%, of western rural deposits ratio was -0.141%. In general, western rural investment ratios and western rural financial efficiency were favorable factors for western rural economy growth; while western rural financial development level and western rural deposits ratio were unfavorable factors for western rural economy growth during 1985-2012.

CONCLUSION AND POLICY

According to the endogenous growth theory, we know that the output scale return of technological innovation is incremental, which is an important theoretical basis for realizing sustainable economy growth which is driven by technology progress. Capital, one of the important factors for technological progress, being able to expand at a speed faster than that of economy growth is an necessary condition for western rural sustainable economic development. Capital moderate over expansion or through promotion of government direct investment or financial capital, increasing capital investment to western rural economy is proper. While for western rural sustainable economy development, the crucial point is to stimulate economic endogenous growth by financial capital. Capital marginal output rate，saving to investment transformation rate and saving rate are decisive variables for western rural economy growth. Any factors which affecting these three variables will affect the endogenous growth of western rural economy. The increasing of transformation rate will transform more savings into investment and further increase capital accumulating; ultimately the output is increased by increasing scale effect of capital accumulating and technological progress.

The western rural economy is still small-scale peasant economy or in natural economy production state integrally. Due to small capital scale and outdated production technology, the contribution degree of western rural investment ratios to economic growth was low. The economy growth in western rural area are greatly restricted by the low western rural marginal production rate which is unable to motivate investment will in western rural area as well as excessive saving rate leading to continuous reducing of investment requirements. After financial reform in rural China, the

phenomenon of western rural capital flowing to city was not relieved, but severer. The western rural financial capital neither be gathered for capital expansion, nor be transformed into investment as there are no motivations. Meanwhile, government invested capital is less and scattered. Consequently, the capital supply in western rural China is in serious shortage and capital accumulation is slow, which restraints science and technology innovation and spreading which further delays western rural economy growth. Moreover, the slow-growth western rural economy restricts increasing of saving ratio, which again affects economy growth in western rural area. In this case, the western rural economy will fall into a recurring simple reproduction state. It is thus clear that weakening of western rural financial capital function has severely affected endogenous growth motivation of western rural economy and sustainable economic development is restrained by outdated rural finance.

Changing rural financial system is vital for breaking financial restraints on western rural sustainable economy development. The reason is western rural sustainable economy development is distinguishingly characterized in production factors and technology intensification. Strong and high-efficient rural financial capital is required for supporting and promotion of fixed assets inputting as well as science and technology innovation and spreading both, which is unable to be achieved by existing western rural financial system. For this purpose, it is supposed to overall promote western rural financial system innovation, organizational mechanism innovation, product innovation, credit guarantee mechanism innovation, increase western rural financial capital efficiency, strengthen western rural financial market construction so as to reproduce financial capital function, improve its catalyst effect on improving rural production efficiency and strive for western rural sustainable economic development.

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