

# An Empirical Study of Rural Financial Development on Poverty Alleviation Based on Interprovincial Panel Data

Yu Zhou

Hunan Vocational College of Modern Logistics, Changsha, 410131, China

8857025@qq.com

**Keywords:** Interprovincial Panel Date; Rural Financial Development; Poverty Alleviation; Empirical Study

**Abstract:** This paper studies the relationship between rural financial development and poverty alleviation under government intervention by adopting interprovincial panel date from 2008 to 2018. A cross term between government intervention and rural financial development is added to the empirical model to examine the relationship between rural financial development and poverty reduction under the influence of government intervention. The result demonstrates that rural financial development has always promoted poverty alleviation; rural financial development efficiency plays an adverse effect on poverty reduction while rural financial development under government interference benefits poverty relief. At last, some policy suggestions are put forward for the rural financial development in China to better promote poverty alleviation on the basis of the research conclusion of the empirical analysis.

## 1. Introduction

With the rapid economic growth, our financial industry is also thriving but the poverty issue has always been the focus of world attention. Therefore, we should combine financial development with poverty to study the impact of the former on the latter, providing a new prospective for addressing poverty. [1] Formulating policies from a financial perspective, policymakers can consider integrate financial policies with other policies to reduce poverty, so as to better solve the poverty problem in China. The research of this paper is expected to provide some policy basis for it. In addition, as a Chinese proverb says: Give a man a fish; he can eat for a day. Thus, if we study the impact on poverty alleviation from a financial perspective and start with the money problem the poor lack most, we could assist impoverished people to invest in human capital and improve their ability to increases income.[2] When we pay attention to “blood transfusion” in the work of poverty relief, we still have to emphasize the impact of “hematopoiesis”, which is conducive to improving the efficiency of poverty alleviation.[3] This paper studies the impact of financial development on poverty reduction under government intervention, compares it with free development finance, and better examines the role of the government in financial poverty alleviation, hoping to provide policy makers with a certain policy basis.

## 2. The empirical study of rural financial development on poverty alleviation

### 2.1 Model setting

This paper adopts panel data from 30 provinces (cities) to conduct regression analysis. Therefore, the basic model of this paper is set as follows:

$$PKJH_{it} = C + \alpha_1 FD_{it} + \alpha_2 RGDP_{it} + \alpha_3 ZGFD_{it} + \alpha_4 Control_{it} + \mu_i + \varepsilon_{it} \quad (1)$$

$$PKJH_{it} = C + \beta_1 FE_{it} + \beta_2 RGDP_{it} + \beta_3 ZGFE_{it} + \beta_4 Control_{it} + \mu_i + \varepsilon_{it} \quad (2)$$

In this model, PKJH is explained variable indicating rural poverty reduction. Explanatory variable PD stands for rural finance development scale, FE represents rural financial development efficiency. ZGFD is the cross product of ZF standing for government intervention index and FD

representing rural financial development scale merit. XGFE is the cross conduct of ZF and FE, reflecting the influence of rural financial development on poverty relief under government intervention. Control covers some other control variable including rural economic development index (RGDP), income distribution index (CR) and rural educational level index (RJY). All of the above variables should be taken logarithm.  $\mu_i$  is an unobservable regional effect controlling some unobservable factors that differ from province to province but do not change over time;  $\varepsilon_{it}$  is a random disturbance term.

## 2.2 Index selecting and data sources

Domestic and foreign scholars mainly use two indexes to measure the poverty level---poverty incidence and poverty gap. The poverty incidence, the most widely used poverty indicator at present, refers to the proportion of population whose income is below the poverty line to the total population; Poverty gap, also known as poverty gap index, refers to the average distance between the income level of the poor and the poverty line. Considering that this paper adopts data from provinces to conduct empirical study as well as considering the availability of provincial data, this paper refers to Quartey (2005) and Odhiambo (2009) to express poverty alleviation (PKJH) through per capita consumption level.

## 2.3 Research method

Two methods are used in this paper to estimate the form panel data model. The first is F statistics which are used to test the fixed effect model. If the P value from F test is less than the significance level, the null hypothesis will be rejected and the fixed effect model will be selected. Otherwise, the mixed estimation model will be selected. The second is Hausman test. Hausman test is carried out on the premise that F test passes. [4]If the tested result P value is smaller than significance level, the fixed effect model will be chosen. Otherwise, the random effect model will be chosen. Finally, the robustness of the model will be tested and the stationarity of the residual of regression equation will be examined to determine the stability of the regression results.

## 2.4 Empirical analysis and result

### 2.4.1 Unit root test

Before the regression analysis, the unit root test will be conducted on the panel data to judge the stationarity of variables and avoid the occurrence of pseudo-regression. The test methods of LLC, IPS, Fisher-ADF and Fisher-PP are used in this paper to conduct unit root test. The test results are shown in table 1:

Table 1 Panel Unit Root Test Results

	LLC	IPS	Fisher-ADF	Fisher-PP
PKJH	-7.47* (0.0000)	-1.65** (0.0489)	74.55 (0.0979)	198.67* (0.0001)
FD	-7.54* (0.0000)	-1.92** (0.0272)	87.19** (0.0125)	97.66* (0.0015)
FE	-6.16* (0.0000)	-2.22* (0.0131)	90.94* (0.0061)	100.62* (0.0008)
CR	-5.40* (0.0000)	-7.36* (0.0000)	170.72* (0.0000)	109.82* (0.0000)
RGDP	-7.60* (0.0000)	-4.84* (0.0000)	133.51* (0.0000)	211.94* (0.0000)
RJY	-6.38* (0.0000)	-2.57* (0.0051)	75.26 (0.0886)	87.44** (0.0119)
ZGFD	-3.61* (0.0002)	-0.83 (0.2023)	113.46* (0.0000)	110.05* (0.0001)
ZGFE	-4.84* (0.0000)	-2.33** (0.0100)	82.45** (0.0289)	76.21 (0.0772)

Table 1 shows that except Fisher-ADF test of PKJH index and RJY index, IPS test of ZGFD index and Fisher-PP test of ZGFE index, the test results of the other three test methods are the same, indicating that the above variables are stable. To avoid pseudo-regression, the co-integration test will be carried out on panel data in the next part of this paper to further determine the relationship between variables

#### 2.4.2 Panel co-integration test

In this paper, Pedromi method is used to test the co-integration of panel data. This method constructs seven statistics based on regression residuals for panel co-integration test, four of which are described by joint intra-group scale, and the other three are described by inter-group scale. The specific test results are shown in the table below.

Table 2 Panel co-integration test for all variables

Model	panel co-integration test results				
Model(1)	intra-group statistics	Panel v-stat 11.3264*	Panel $\rho$ -stat 5.5355	Panel PP-stat -9.6536*	Panel ADF-stat -9.1374*
	inter-group statistics		Group $\rho$ -stat 7.7033*	Group PP-stat -16.4063*	Group ADF-stat -8.4438
Model(2)	intra-group statistics	Panel v-stat 17.6860*	Panel $\rho$ -stat 5.0424	Panel PP-stat -9.8818*	Panel ADF-stat -7.5129*
	inter-group statistics		Group $\rho$ -stat 7.1462	Group PP-stat -17.4215*	Group ADF-stat -7.3383*

The above test results demonstrate that, except for the Panel  $\rho$ -stat and Group  $\rho$ -stat tests, which accept the null hypothesis, the other tests reject the null hypothesis that there is no co-integration relationship. Considering comprehensively that co-integration relations exist between the variables of the two models, indicating that there is a long-term stable equilibrium relationship between the variables, and regression analysis can be performed.

#### 2.4.3 Empirical regression results

The form of panel model should be first selected before regression. In econometric model, both F test and Hausman test ( $P = 0$ ) on the econometric model both support the fixed effect model, indicating that the fixed effect model should be selected. The results of model regression are shown in the following table.

Table 3 Panel Regression Results

Explanatory variables	Poverty reduction(PKJH)	
	Model(1)	Explanatory variables
RGDP	0.7229*(0.0000)	RGDP
FD	0.0226**(0.0141)	FD
ZGFD	0.0147**(0.0404)	ZGFD
FE	—————	FE
ZGFE	—————	ZGFE
RJY	1.5106*(0.0000)	RJY
CR	0.0113(0.8729)	CR
C	-1.511*(0.0000)	C
Adjusted $R^2$	0.9609	Adjusted $R^2$
F statistics	311.58	F statistics
P value	0.0000	P value

Note:\* and \*\* represent the rejection of null hypothesis at the significance level of 1% and 5% respectively, and the P value of the corresponding coefficient is in brackets.

According to the results from table 3, it is clear that rural economic growth RGDP is positively

correlated with poverty alleviation, that is, rural economic growth is conducive to poverty reduction, which is consistent with the previous theoretical analysis. On one hand, economic growth can create more employment opportunity and help poor people to get employed, increasing their wage form income. On the other hand, government taxation and fiscal revenue will also increase with economic growth. Increase in fiscal revenue as a source of transfer payments and agricultural subsidies for the poor will increase their income level, which is beneficial to poverty relief in rural areas. In addition, the “trickle-down effect” of economic growth enables the poor to benefit spontaneously from economic growth, thus contributing to poverty alleviation. Both the scale of rural financial development FD and the scale of rural financial development ZGFD under government intervention are positively correlated, that is, the scale of rural financial development can promote the poverty relief of rural areas. Expanding financial scale can help low income families who need financial services and middle and small-sized enterprises get access to what they need.[5] Impoverished people also are able to increase income through financial services. The disadvantaged can also achieve the same economic opportunities as the rich. All these benefit poverty reduction. On the contrary, rural financial efficiency under government intervention is positively related to poverty alleviation. On one hand, the government's intervention in financial development inhibits the profit-seeking of capital and helps alleviate poverty while reducing the efficiency of financial development. On the other hand, the mandatory “pro-poor” effect of the government's financial policy for supporting agriculture has enabled financial institutions to put funds into rural areas, which is conducive to increasing farmers' income and also promote poverty alleviation.

### **3. Policy Suggestions on Promoting Poverty Alleviation through Rural Financial Development**

#### **3.1 Building a diversified rural financial service system**

At present, the simple organization form of rural financial institutions in China cannot fully satisfy the needs of all agrochemical enterprises for financial services, which is unconducive to poverty reduction in rural areas. Therefore, it is necessary to establish a diversified, multi-level and moderately competitive rural financial system in rural areas, covering traditional policy banks, commercial banks, new financial institutions and informal financial institutions that can benefit the rural financial service system of the poor.

#### **3.2 Improve rural insurance system to guarantee farmer's income**

There are several countermeasures for improving rural insurance system.

Agricultural insurance should reduce the losses faced by farmers when they suffer accidents, like establishing a policy agricultural insurance company. Commercial insurance companies can carry out comprehensive insurance business, like agricultural insurance business. Commercial insurance companies may be reluctant to get involved for agricultural insurance has higher risks and lower profit margins. Laws and regulations on agricultural insurance should be improved and the responsibilities and obligations of insurers and policyholders should be regulated, making their actions law-abiding.

#### **3.3 Guaranteeing the effective implementation of financial policies supporting agriculture through government's support**

Government should provide an enabling environment for financial poverty relief. An information sharing platform needs to be built to reduce transaction costs of both supply and demand sides of credit funds. Administrative measures need to be taken to limit capital outflow. Rural financial legal system needs to be improved. Legal system plays an indispensable role for the long-term and effective development of rural finance. It can not only protect the achievements of rural financial reform, but also regulate and guide its development at the legal level.

#### 4. Conclusion

This paper studies the impact of rural financial development under government intervention on poverty alleviation, and analyzes the scale and efficiency of rural financial development respectively. The results of the research shows that rural financial development scale has always beneficial to poverty relief and rural financial development efficiency plays an adverse effect on poverty reduction. But the rural financial development efficiency under government intervention is conducive to poverty alleviation. Overall, rural financial development is a feasible way to promote poverty alleviation. However, there are some problems existing in the course of rural financial development. Only by establishing a rural financial service system to meet the needs of the poor population can we better promote poverty alleviation.

#### References

- [1] To be or not to be: dilemma of Africa's economic engagement with China and other emerging economies [J]. Alemayehu Geda, Solomon Mosisa, Matias Assefa. *Africa Review*. 2013 (2)
- [2] Understanding Financial Inclusion in China [J]. Zuzana Fungáčová, Laurent Weill. *China Economic Review*. 2014
- [3] Credit constraints, entrepreneurial talent, and economic development [J]. Milo Bianchi. *Small Business Economics*. 2010 (1)
- [4] Relationship between Financial Development and Income Distribution and Kuznets Effect: the Case of Liaoning, China [J]. Yanjuan Cui, Liping Kong, Xiaofei Xu. *International Journal of Advances in Management Science*. 2012 (2)
- [5] Regional poverty targeting in China [J]. Albert Park, Sangui Wang, Guobao Wu. *Journal of Public Economics*. 2002 (1)