RESEARCH-ARTICLE

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Published: 18 July 2025

GAITDI 2025: International Conference on Implementing Generative AI into Telecommunication and Digital Innovation
July 18 - 20, 2025
Beijing, China

GAITDI '25: Proceedings of the International Conference on Implementing Generative AI into Telecommunication and Digital Innovation 2025 (July 2025)
https://doi.org/10.1145/3771792.3773853
ISBN: 9798400714924

The influence of rural financial development on economic growth level

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Abstract

The rural industrial foundation in western China, such as Guizhou Province, is relatively weak, and the same to infrastructure and finance development. Based on the panel data of 2021 cities in Guizhou Province from 2001 to 2021, this paper quantitatively analyzes the impact of rural financial development on the level of rural economic growth by establishing a multi-linear regression model and use the scale of financial development and financial development efficiency of two dimensions of the relevant variables to characterize and measure the rural financial development. Through the empirical test, Guizhou province's financial development scale and financial development efficiency have a positive impact on rural economic growth. Expanding the scale of rural finance, improving the efficiency of rural finance and increasing the investment of rural capital are beneficial to increasing rural financial resources, improving the efficiency of management, increasing the income of farmers and promoting the growth of rural economy.

CCS Concepts

• **Applied computing**; • **Law, social and behavioral sciences**; • **Economics**;

Keywords

Financial development scale, Finance development efficiency, Rural economic growth

ACM Reference Format:
Kao Gao, Min Nian, and Jiahui Ren. 2025. The influence of rural financial development on economic growth level. In *International Conference on Implementing Generative AI into Telecommunication and Digital Innovation (GAITDI 2025), July 18–20, 2025, Beijing, China.* ACM, New York, NY, USA, 5 pages. https://doi.org/10.1145/3771792.3773853

1 Introduction

At present, China's economy has entered a new development period, and it is necessary to form a new development pattern of "promoting agriculture by industry, mutual benefit between industry and agriculture, and mutual promotion" in order to break the bottleneck of agriculture as a further economic development[1]. However, financial institutions are profit-oriented, and major banks have "abandoned their villages and returned to the city", reducing and merging their branches below the county level, directly weakening the power of rural economic development[2]. At the same time, in the country, due to the lack of peasant household credit, which leads to the lag of rural area economic development, agricultural production is facing great natural risk, which leads to agricultural financing difficulty in the country[3,4]. Therefore, this paper analyzes the correlation between rural financial development and rural economic growth and discusses the important role of rural financial development in rural economic growth. In the current situation, a large number of studies are relatively macro, and there are not many related research and analysis based on the micro perspective. On this basis, this paper attempts to reveal the internal relations many two and explore how rural financial development affects the level of rural economic development, so as to further enrich and improve the theoretical system of rural financial and economic development in our country. The article believes that optimizing the rural financial system and enhancing rural financial support are crucial to promoting rural economic growth, helping to implement the "rural revitalization" strategy, and narrowing the gap between urban and rural and regional economic development.

2 Analysis of the current situation of rural financial development and rural economic growth in Guizhou Province

2.1 Present situation of rural financial development in Guizhou Province

2.1.1 Current situation of rural financial development in Guizhou Province. In this paper, the ratio of the sum of rural deposits and loans of financial institutions to the gross rural product is chosen to represent the scale of rural finance[5]. Figure 1 shows the scale of rural finance development in Guizhou province, which can be seen to have a large change in recent years. Since 2001, the financial scale has been on the rise in general, and began to decline after 2019 due to the impact of the epidemic, and then there is a slight upward trend. It indicates that the scale of rural credit funds is constantly expanding, and the number of financial intermediaries is also increasing.

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GAITDI 2025, Beijing, China

ACM ISBN 979-8-4007-1492-4/2025/07
https://doi.org/10.1145/3771792.3773853

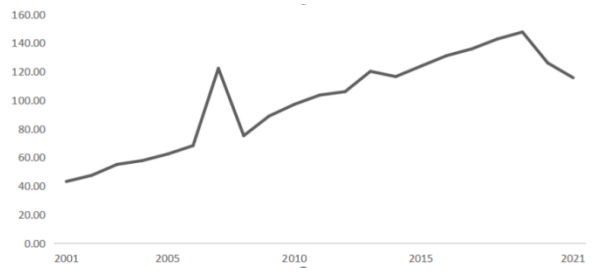

Figure 1: Scale of rural financial development in Guizhou Province

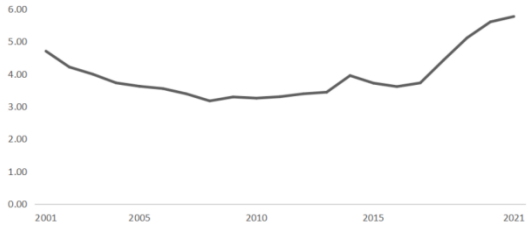

Figure 2: Efficiency of rural financial development in Guizhou Province

2.1.2 Current situation of rural financial development efficiency in Guizhou Province. Improving the efficiency of rural finance is one of the important ways to promote rural economic growth, which can accelerate the speed of capital turnover and broaden the development space of rural finance. This paper chooses the ratio of rural loans to rural deposits of financial institutions to represent rural financial efficiency[6]. As can be seen from Figure 2, since 2001, the overall financial efficiency has been above 3%, and in recent years, the financial efficiency has been greatly improved and is expected to exceed 6%. It reflects that the ratio of deposits and loans in rural areas of Guizhou Province has been greatly improved in recent years, and gradually improved policies and various support efforts have promoted the significant improvement of rural financial efficiency in Guizhou Province. It also shows that the rapid growth of rural economy is closely related to the growth of rural credit.

2.2 Present situation of rural financial development in Guizhou Province

2.2.1 General situation of rural economy. In order to reflect the rural economic growth in Guizhou Province over the years, this paper chooses the gross domestic product of rural areas that can reflect the overall development level of rural economy for analysis, and chooses the gross domestic product of agriculture, forestry, animal husbandry and fishery in rural areas for more accurate and effective analysis[7]. As can be seen from Figure 3, the total output value of agriculture, forestry, animal husbandry and fishery in the five prefecture-level cities in Guizhou Province has reached nearly 300 billion yuan in 2021, accounting for nearly 64% of the total output value of agriculture, forestry, animal husbandry and fishery in Guizhou Province. The total output value of agriculture, forestry, animal husbandry and fishery has gradually expanded, and the scale of development has gradually expanded.

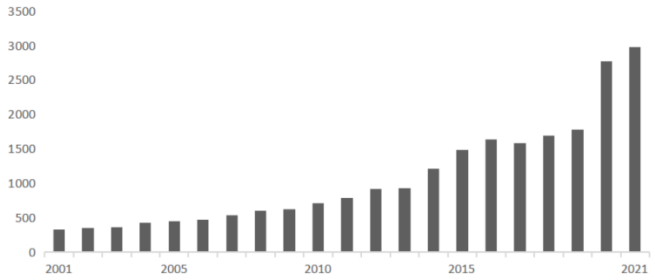

Figure 3: Total GDP of Rural areas of Guizhou Province (100 million yuan)

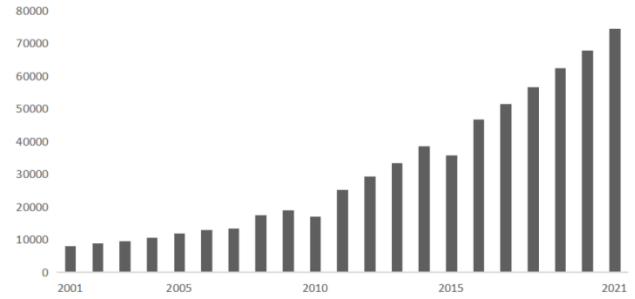

Figure 4: Per capita disposable income of rural Permanent residents in Guizhou Province (Yuan)

As shown in Figure 4, the per capita disposable income of rural residents in the five prefecture-level cities in Guizhou Province has shown a steady growth trend in recent years, which is a positive development trend and the growth rate is relatively large. This has much to do with the rapid development of the local economy, the continuous support of policies and the continuous improvement of people's living standards.

3 Empirical analysis of the impact of rural finance on the level of rural economic growth in Guizhou ProvincE

On the basis of the above analysis, to study the impact of rural finance on rural economic growth level in Guizhou province, a multiple regression econometric growth model is constructed. Five prefecture-level cities of Liupanshui, Guiyang, Zunyi, Tongren and Bijie in Guizhou Province are selected as the research objects. Descriptive statistics, correlation analysis, unit root test, cointegration test and multiple regression model analysis are adopted to conduct empirical research on panel data from 2001-2021. The influence of rural financial development on rural economic growth in Guizhou province was deeply studied.

3.1 Variable selection and model construction

3.1.1 Model construction. The data series formed through the combination of cross section data and time series, because of the increase of prefecture-level cities, the observed value will also increase correspondingly, and the panel data model can obtain more effective information at this time[8]. In the research process, we use the logarithmic processing statistical method of data variables to reduce the adverse effects caused by data heteroscedasticity. The measurement model is as follows:

$$LNADI_{it} = C + \beta_1 LNGM_{it} + \beta_2 LNXL_{it} + \beta_3 LNZB_{it} + T + U_{it} \quad (1)$$

In the above formula, the subscript i represents a certain prefecture-level city, t represents a certain year, C represents a constant term, from $\beta 1$ to $\beta 3$ represents the estimated coefficient corresponding to a variable, U represents a random disturbance term, and T represents a time variable, so as to indicate whether there is a time trend in the model. LNADI (Rural economic growth) is the explained variable, LNGM (financial development scale) and LNXL (financial development efficiency) are the explanatory variables, and LNZB (rural capital input) is the control variable. This paper mainly uses five indicators of per capita disposable income of rural permanent residents in five prefecture-level cities in Guizhou Province, rural deposits in financial institutions, rural loans in financial institutions, fixed asset investment, and rural gross domestic product (GDP). Considering the actual situation of rural finance and rural economic development and the difficulty of data acquisition, the gross rural product was replaced by the gross agricultural, forestry, animal husbandry and fishery production.

3.1.2 Explained variables. To empirically analyze the impact of rural financial development on the level of rural economic growth in Guizhou province, the rural economic growth index is selected as the explanatory variable, and the rural GDP is often used to express it in many literatures[9]. However, due to the lack of specific and accurate data on the GDP investigated in rural areas in China at present. Considering that Guizhou is a large agricultural province with a large rural population base and a low urbanization level, we selected the average disposable income of rural residents in the five prefecture-level cities of Guizhou as the main indicator to reflect the rural economic growth of Guizhou. First, the average disposable income of rural residents can comprehensively and intuitively reflect the level of economic growth. Secondly, because the average is done through the population base, the influence caused by the population base can be effectively eliminated. This indicator is denoted as ADI.

3.1.3 Explain variables. Considering the availability of data and the realistic factors of rural financial development in 5 prefecture-level cities in Guizhou Province, this study is based on operability and feasibility[10]. This paper selects two indicators: the scale and efficiency of rural financial development as important indicators to measure rural financial development. Therefore, this paper uses the ratio between rural deposits and rural loans as an indicator of the efficiency of rural financial development, called XL. In this paper, the scale of rural financial development will be measured by the ratio of the total amount of rural deposits and loans to the gross rural product, and it will be recorded as GM.

3.1.4 Control variables. Based on the above variable Settings, a multiple regression model based on the panel data of time series was established to verify the validity of the sample demonstration by taking five prefecture-level cities in Guizhou Province from 2001 to 2021 as the research object[11]. Data sources are mainly China Statistical Yearbook, Guizhou Statistical Yearbook, Guizhou Financial Yearbook, National Economic and Social Development Statistical Bulletin and Statistical Yearbook of five prefecture-level cities, and Eviews10.0 software is used for empirical analysis.

The specific explained variable and explained variable Settings are shown in the following table:

3.2 Descriptive statistics and correlation analysis of variables

From Table 2, we can see that the standard deviation of ADI is 4511.44, the maximum is 20526, and the minimum is 1289, which indicates that there are great differences in the average disposable income level of rural residents among prefectural cities, and there are also significant regional differences in the degree of rural economic growth and development. The difference between the maximum value and the minimum value of rural financial development scale (GM) in the five prefecture-level cities in Guizhou Province is also very large, which indicates that there is a large imbalance in the whole; The standard deviation of rural financial efficiency (XL) is 0.192861. The analysis results show that the financial institutions in different cities have the same ability to realize the transformation from deposit to investment. The maximum value of capital investment in rural areas is 15.72, and the minimum value is 0.07. The results show that the capital investment in different regions and different types of cities varies greatly. At present, there are some problems in the rural economic development of Guizhou province, such as insufficient fund supply, excessive demand, unreasonable investment structure and weak investment function. As can be seen from the correlation matrix of variables in Table 3 below, the correlation coefficient corresponding to each variable is relatively small, so the model passes the correlation test and the possibility of multicollinearity is relatively low. The model variable can be further tested and analyzed.

3.3 Regression analysis

3.3.1 Unit root test. Since most of the time series are unstable, to prevent the "false regression" problem of panel data in the time series regression equation in the research, we will first test its stationarity[12]. With the help of Eviews10.0, the unit root statistical analysis is carried out on the logarithm data of each prefecture-level city variable. The results are as follows:

3.3.2 Co-integration test. Table 5 shows the specific results of the cointegration test. We can see that the P-values of Panel PP and ADF statistics, Group PP and ADF statistics are 0.0071, 0.0001, 0.0363 and 0.0001, which are all less than 0.05, respectively. These four tests prove that there is a co-integration relationship between rural economy and rural financial development level. In addition, the ADF statistic in the co-integration (Kao) test is -2.648677, and the corresponding P value is 0.0040, less than 0.05, which confirms that there is a significant co-integration relationship between LNADI

Table 1: Selection of variables

index	variable	Markers	Calculation formula
Economic growth	Explanatory variable	ADI	The average disposable income of rural residents in 5 cities of Guizhou province
Scale of financial development	Explained variable	GM	Sum of rural deposits and loans in 5 cities of Guizhou Province/5 City rural GDP
Financial development efficiency	Explained variable	XL	Guizhou province 5 cities rural loans/5 City rural deposits
Rural capital input	Control variable	ZB	Rural fixed assets investment in 5 cities of Guizhou province/5 City rural GDP

Note: The above index variables are selected according to the two principles of economic meaning and data availability and are sorted out by the author on the basis of reference to previous studies.

Table 2: Describes the statistics

variable	Observed number	Mean value	Standard deviation	Maximum value	Minimum value
ADI	105	6281.296	4511.440	20565.00	1289.000
GM	105	19.86495	26.30548	98.48000	1.730000
XL	105	0.789048	0.192861	1.340000	0.510000
ZB	105	3.175048	3.289611	15.72000	0.070000

Table 3: variable correlation matrix table

	LNADI	LNGM	LNXL	LNZB
LNADI	1.000			
LNGM	0.329	1.000		
LNXL	0.289	0.256	1.000	
LNZB	0.126	-0.295	-0.279	1.000

Table 4: Test results of unit root stationarity

variable	LLCstatistic	p-value	ADF statistics	p-value	result
LNADI	-6.25403	0.0000	52.2811	0.0000	Smooth and steady
LNGM	-7.31072	0.0000	60.2910	0.0000	Smooth and steady
LNXL	-2.25320	0.0121	26.1307	0.0036	Smooth and steady
LNZB	-3.86915	0.0001	31.2017	0.0005	Smooth and steady

Table 5: Cointegration test results

Inspection mode	statistic	Statistical value	p-value
Pedroni Cointegration test	Panelv-Statistic	0.493103	0.3110
	Panelrho-Statistic	-0.539004	0.2949
	Panel PP-Statistic	-2.451935	0.0071
	PanelADF-Statistic	-3.822323	0.0001
	Grouprho-Statistic	0.870635	0.8080
	Group PP-Statistic	-1.795264	0.0363
	GroupADF-Statistic	-3.757669	0.0001
Kao test	ADF	-2.648677	0.0040

Table 6: Regression analysis results of fixed effect models in Guizhou province

variable	coefficient	Standard error	T-test quantity	p-value
C	5.919191	0.236015	25.07972	0.0000
LNGM	1.236906	0.103933	11.90102	0.0000
LNXL	1.184838	0.187568	6.316853	0.0004
LNZB	0.035044	0.063508	0.551803	0.0000
Degree of fitting	0.965650			
Correction coefficient of determination	0.964276			
P(F statistic)	0.000000	F statistic	50.81797	

and the panel data of LNGM, LNXL and LNZB in five prefecture-level cities in Guizhou Province.

4 Estimation of regression model

4.1 Regression model estimation

Eviews10.0 was used to construct a fixed-effect model on the panel data of five prefecture-level cities in Guizhou Province from 2001 to 2021, and a regression model was estimated considering the time factor, and the following conclusions were drawn.

As can be seen from Table 6, R2=0.964276, F statistic value is 50.81797, corresponding P value is 0, indicating that the model has a very high degree of fit. Therefore, according to the fixed effect model, the regression equation can be established as:

$$LNADI_{it} = 5.919191 + 1.236906LNGM_{it} + 1.184838LNXL_{it} + 0.035044LNZB_{it} \quad (2)$$

As can be seen from the above equation, the economic significance of the fixed effect model of this paper is as follows: when the efficiency of rural financial development and rural capital input changes by 1% each, there will be a positive change of 1.184838% and 0.035044% in rural economic growth. The rural economic growth will also change positively with the change of 1% in the scale of rural financial development and 1.236906%.

Through the analysis of the above fixed model, the rural financial development of Guizhou province has an obvious positive promoting effect on the rural economic growth of Guizhou province. Among them, the scale of rural financial development makes a significant contribution to rural economic growth. Specifically, when the scale of rural financial development increases by 1%, rural economic growth will increase by 1.236906%. The expansion of rural financial scale means the increase of rural credit funds, and rural financial resources will increase accordingly. Through the reasonable allocation of rural financial resources, it will be guided to the leading industries and characteristic industries in rural areas, improve the added value of the second and third industries, and then promote the economic development of rural areas. However, the rural financial development of Guizhou Province is relatively backward, and its financing capacity and financial products and services cannot meet the needs of rural economic development, which will reduce the development scale of rural finance, which is not conducive to the optimization of agricultural industrial structure and economic growth. Guizhou Province is a western region that pays relatively late attention to and attaches great importance to rural economic growth, and relevant financial institutions in rural areas have low efficiency in resource allocation, so their role in promoting rural economic growth is not obvious. Secondly, the continuous improvement of rural financial efficiency means that financial organizations can transform rural deposits into rural investment in a timely and efficient manner, so that more rural deposits from rural areas will flow to rural areas in the future. This is of great significance for promoting the optimal allocation of financial resources in rural areas of Guizhou Province, improving the efficiency of its operation and distribution, and for the economic development of rural areas. The further improvement of the efficiency of rural financial development means that the financial development operation is more effective and can meet the current rural needs for loan funds, thus driving rural economic growth.

Acknowledgments

We are grateful for the support of Wuhan Business University's Academic Team Building Project(Grant No. 2024TD010).

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