

# The Inhibitory Effect of Fiscal Decentralization on Rural Revitalization——Based on China's Provincial Panel Data from 2013 to 2019

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**Abstract:** Based on the rural revitalization policy, this paper uses the entropy method to calculate the weight of each index, selecting the panel data of 31 provinces from 2013 to 2019 to construct a measure of the development level of rural revitalization and using fixed effect model to explore the influence of fiscal distribution to rural revitalization. The empirical results show that agriculture-related financial expenditure is an important guarantee for rural revitalization and development, and the high financial burden of local governments will weaken the investment in public goods in rural areas. The degree of fiscal decentralization has a significant negative correlation with the level of rural revitalization and development, indicating that with high fiscal autonomy, local government financial resources will be tilted toward cities, crowding out construction spending in rural areas. It is necessary to improve the current fiscal decentralization system, reverse the local government incentive mechanism, ensure the investment of fiscal funds, and promote the sustainable development of the rural revitalization.

**Keywords:** rural revitalization, fiscal distribution, entropy method, fixed effect

## 1. Introduction

Since the "rural revitalization" strategy was first proposed at the 19th National Congress of the Communist Party of China in October 2017, rural revitalization has been a hot issue in national governance research and academic circles. In the survey results of the National Two Sessions in 2022, the attention of "rural revitalization" ranks eighth. In 2021, China had complete victory in the fight against poverty. In order to consolidate the achievements of poverty alleviation, promote the construction of "agriculture, rural areas and farmers", and achieve common prosperity for all people, vigorously developing the rural revitalization strategy has become top priority of the new development stage of the "14th Five-Year Plan".

This paper analyzes 15 secondary indicators, and conducts empirical research through provincial panel data and fixed-effect model to explore the impact of fiscal decentralization on the implementation of my country's rural revitalization strategy, and puts forward relevant suggestions for further optimizing rural revitalization fiscal policies.

## 2. Literature Review

### 2.1. Domestic and foreign experiences in the construction of Rural Revitalization indicators

Cloke (1997) first proposed the construction of rural index in the 1970s<sup>[1]</sup>. Vicki et al. (2003) Then tested cloke's rural index <sup>[2]</sup>. Woods (2003) put forward suggestions on improving cloke's rural index system <sup>[3]</sup>. Many scholars have used the method of social representation in their measurement methods, but the method has poor operability. Jin Liu et al. (2020) based on in-depth mining of the content of the current policy documents, creatively combined traditional and non-traditional data to build a Rural Revitalization evaluation system, and used the entropy weight method to determine the index weight to measure and compare the rural revitalization and development level of 30 provinces<sup>[4]</sup>.

## 2.2. The influence of fiscal decentralization on local fiscal expenditure

Tiebout (1956) proposed that the behavior of local governments is as benefit oriented as that of private manufacturers. When the population can flow freely, Regional public goods supply has become an important condition for individuals to choose their preferred place of residence. Han and Kung (2015) studied the incentive impact of changes in intergovernmental tax distribution caused by fiscal decentralization on local government behavior through county-level data, and found that local governments can obtain more extra budgetary income by selling more land. Ang (2009), Hatano (2010) and other researchers believe that government public financial expenditure is conducive to promoting private investment, with obvious "crowding in effect"; Kitaoka (2002)<sup>1</sup>, Nakazato (2004) and other researchers believe that government public financial expenditure has a negative impact on private investment, and its "crowding out effect" exists objectively. Of course, some scholars believe that under different circumstances, such as different inflation levels and different countries, the impact of government public financial expenditure on private investment is different.

## 3. Constructing rural revitalization index system

### 3.1. Data selection and entropy weight method

The data for the evaluation indicators of rural revitalization mainly come from yearbooks and materials such as "China Rural Statistical Yearbook", "China Social Statistical Yearbook", "China Leisure Agriculture Statistical Yearbook", "China Rural Poverty Monitoring Report", and provincial government work reports. According to the general requirements of rural revitalization, it takes five first-level indicators such as industry, ecology, civilized people, governance, and life prosperity. In addition, interpret and analyze the connotation of five first-level indicators, and set up 15 second-level indicators. The specific contents are shown in the following table 1.

Table 1: Rural Revitalization Evaluation Index System

first-level indicator	Relative weight of first-level indicators	Secondary indicators	Relative weight of secondary indicators	The direction of influence of the indicator
Industry prosperity	32.0%	Gross output value of agriculture, forestry, animal husbandry and fishery per capita (yuan)	25.9%	positive
		Total power of agricultural machinery per 10,000 square kilometers (kW)	59.8%	positive
		Per capita fixed investment of rural residents (yuan)	14.2%	positive
Ecological livability	16.7%	Village clinic staff per thousand people	28.2%	positive
		Number of elderly care institutions per 100 villages	42.9%	positive
		Annual average concentration of PM2.5 ( $\mu\text{g}/\text{m}^3$ )	28.8%	negative
Rural civilization	12.5%	Years of education per capita of rural residents	14.8%	positive
		Number of township cultural stations per 100 villages	62.5%	positive
		Educational and cultural expenditure per capita (yuan)	22.7%	positive
Governance effectiveness	24.7%	Rural residents with minimum living allowances as a percentage of rural population (%)	20.9%	negative
		Proportion of national democracy and rule of law demonstration villages in administrative villages (%)	54.1%	positive
		The penetration rate of sanitary toilets (%)	25.0%	positive
Affluence	14.1%	Rural Engel coefficient (%)	13.9%	negative
		Comparison of income levels of urban and rural residents (rural residents = 1)	36.3%	negative
		Disposable income per person (yuan)	49.8%	positive

The steps of entropy weight method mainly include the following three steps:

① Standardization processing: The entropy weight method weighting steps can be divided into standardization processing due to the different unit calibers of various data in the evaluation system.

There are k indicators: X1, X2, X3, …, Xk,

$$X_i = \{x_1, x_2, x_3, \dots, x_n\}$$

Assuming that the standardized value of the indicator is Y1, Y2, …, Yk, then

$$Y_{ij} = \frac{x_{ij} - \min(x_i)}{\max(x_i) - \min(x_i)}$$

② Find the information entropy of the index: set the information entropy of this group of data to be E<sub>j</sub>,

$$p_{ij} = \frac{Y_{ij}}{\sum_{i=1}^n Y_{ij}}$$

if:  $p_{ij} = 0$ , then:  $\lim_{p_{ij} \rightarrow 0} p_{ij} \ln(p_{ij}) = 0$

then:  $E_j = -\frac{1}{\ln(n)} \sum_{i=1}^n p_{ij} \ln(p_{ij})$

③ Determine the entropy weight of each index: According to the information entropy, after calculating E1, E2, …, Ek, calculate the weight of each index accordingly:

$$W_i = \frac{1 - E_i}{k - \sum E_i}$$

Using the above method, the weights of the second-level indicators in the rural revitalization index system can be obtained, and then calculated upwards to obtain the weights of the first-level indicator.

#### 4. An empirical test of the impact of fiscal decentralization on rural revitalization

##### 4.1. Variable selection and sources

###### Explanatory variables

**Fiscal Decentralization Indicators (FD):** This paper uses the average value of fiscal revenue decentralization and fiscal expenditure decentralization to measure the degree of fiscal decentralization in each province.

###### Control variables

**Financial burden (burden):** The data of per capita fiscal expenditure minus per capita fiscal revenue of each province is used to measure the fiscal burden. **The level of economic development (lngdp):** The per capita GDP of each province is used to reflect its economic development level, and logarithmic processing is adopted to reduce the heteroscedasticity of the data. **Degree of openness (open):** The ratio of the total import and export trade to GDP of each region reflects its degree of openness to the outside world. **Agricultural industry level (ra-agri):** Measure the importance of regional agricultural industry by the proportion of primary industry in GDP. **Proportion of agriculture-related expenditures (ra-pay):** Use the total fiscal expenditure of each province in the year to obtain the proportion of agriculture-related finance, and measure the strength of regional finance to support agriculture.

##### 4.2. Descriptive statistics

Table 2: Descriptive statistics

Variables	Variable explanation	Number of observations	Mean	Standard deviation	Minimum value	maximum value
score	Rural revitalization indicators	217	71.87	6.49	43.97	87.06
fd	fiscal decentralization	217	0.81	0.43	0.42	2.13
burden	financial burden	217	0.775	0.751	0.101	5.601
open	Degree of openness	217	0.039	0.043	0.002	0.217
lngdp	The level of economic development	217	10.87	0.41	10.05	12.01
ra-agri	Agricultural industry level	217	9.51	4.98	0.3	24
ra-pay	Proportion of agriculture-related expenditures	217	11.69	3.37	4.11	20.34

Descriptive statistics variable explanation, various indicators, etc. are shown in Table 2.

#### 4.3. Hausman test

Hausman test: This paper uses Stata software to perform Hausman test. The test results show that P is 0.0011, which strongly rejects the null hypothesis that the model is a random effect at the 1% significance level. Therefore, this paper chooses to use a fixed effect model for empirical analysis. The test results are shown in Table 3.

Table 3: Hausman Test Results

	Coef.
Chi-square test value	22.21
P-value	0.0011

#### 4.4. Model building and regression analysis

Based on the correlation test and Hausman test, the fixed effect model is constructed as follows:

$$\text{score} = \beta_0 + \beta_1 \text{FD} + \beta_2 \text{burden} + \beta_3 \text{open} + \beta_4 \text{lngdp} + \beta_5 \text{rapay} + \beta_6 \text{raagri} + \mu_t + \varepsilon_{it}$$

The empirical results of this paper are shown in the following table4:

Table 4: Empirical Results of Fixed Effects Model

Variables	Fixed Effects Model					
	1	2	3	4	5	6
Fd	-6.395*** (2.042)	-6.611*** (2.033)	-6.882*** (2.045)	-7.01*** (2.071)	-7.092*** (2.099)	-5.77*** (2.146)
burden		-1.329* (0.729)	-1.422* (0.733)	-1.368* (0.745)	-1.376* (0.747)	-1.632** (0.746)
open			-40.786 (36.013)	-35.236 (38.291)	-36.095 (38.524)	-37.331 (38.044)
lngdp				0.624 (1.438)	0.47 (1.552)	0.115 (1.54)
ra-agri					-0.05 (0.186)	-0.242 (0.201)
ra-pay						0.519** (0.219)
Observations	217	217	217	217	217	217
R-squared	0.05	0.067	0.074	0.075	0.075	0.103

## 5. Conclusions and Policy Recommendations

### 5.1. Conclusion

① There is a significant negative correlation between the level of regional fiscal decentralization and rural revitalization and development.

② There is a significant negative correlation between the level of regional financial burden and the level of rural development.

③ There is a significant positive correlation between the proportion of agriculture-related expenditures and the level of rural development.

### 5.2. Policy Recommendations

① Build a long-term guarantee mechanism for rural revitalization investment, and reverse the urban tilt of local governments in the field of expenditure and investment. In terms of financial funds, it is necessary to simultaneously increase the investment in rural revitalization construction in terms of absolute value and proportion, and improve supporting systems through legislation and financial policies to ensure the establishment of a long-term investment mechanism.

②Improve the current fiscal decentralization system and transfer payment system. Finance at all levels should reasonably divide the scope of revenue and expenditure, clarify the rights and responsibilities of governments at all levels, establish a financial management system with more unified administrative and financial powers, and change the current situation in which local governments have concentrated too much administrative power and are seriously asymmetrical with their financial powers.

③Strengthen the supervision of the use of local financial funds, and ensure reasonable investment in agricultural-related financial expenditures. In accordance with the principle of giving priority to fairness and taking into account the efficiency, the transfer payment between the central and local governments and between the local governments shall be increased.

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