

# Investigation on the Path and Performance Evaluation of Internet Finance Supporting Rural Revitalization in Yunnan under the Background of “Digital Economy”

**Yanni Zhao**

*Yunnan University Dianchi College, Kunming, Yunnan, China  
324040828@qq.com*

**Abstract:** *With the development of the digital economy, research on RR (Rural Revitalization) and financial support in Yunnan Province is constantly improving. The path analysis of financial support for rural areas and the design of performance evaluation models based on DEA (Data Envelopment Analysis) are becoming increasingly important. In the entire research on the path and performance evaluation of RR, how to enhance the integrated development of rural industries in Yunnan Province is currently a key issue that needs to be urgently addressed. Through the research on the development process of rural industrial integration and RR and financial support in Yunnan Province, with the help of the Linear programming model of DEA evaluation decision-making unit, and combined with the questionnaire survey experiment, the following conclusions were drawn based on the data results: Based on the development of digital economy, the statistical yearbooks of six counties and districts in Yunnan Province were selected to calculate their pure TE (Technical Efficiency), scale efficiency and comprehensive TE. It was concluded that only the pure TE and scale efficiency of Fugong County and Weixin County reached 1 at the same time. That is to say, their performance evaluation was more effective. At the same time, in the questionnaire survey experiment, ten returning college students had a high satisfaction evaluation on strategies such as improving the ability of financial institutions to serve RR and continuously improving rural basic financial services for RR. This indicated that the financial support for RR path policy was effective and the performance evaluation model based on DEA had good practical application results.*

**Keywords:** *Digital Economy, Financial Support, Rural Revitalization, Performance Evaluation*

## 1. Introduction

The integration of internet finance and rural industries is accelerating, and people's research and discussion on it has entered a new stage. The main goal of this article is to leverage the development process of rural industry integration in Yunnan Province and the related research on RR and financial support. Therefore, it is very important to conduct research on the path and performance evaluation of internet finance support for RR in Yunnan based on the development of the digital economy.

There are many research theories on rural path revitalization. Jiang JZM, taking the rural plum industry in Luhe County, Guangdong Province, China as an example, precisely positioned the characteristics of rural tourism resources, took the status quo as the guide, and improved the tourism function as the carrier to innovate the rural tourism industry system, so as to improve the quality of rural tourism development and achieve the strategic goal of RR [1]. Based on the RR plan, which is an action guide for implementing the RR strategy, Zhou X H used land use planning as a guide to achieve RR. In order to strengthen the implementation and sustainability of the RR path, the implementation direction of the RR path was explored, and a performance evaluation plan based on the RR path was proposed [2]. Zhang L constructed a spatial governance based analysis framework for the transformation of rural industrial land, which played a crucial role in RR. Taking Shunde District, a typical semi urbanized area in China, as the research object, Zhang L explored the path of RR based on rural spatial governance. Finally, it showed that the experience of RR in semi urbanized areas was of great significance to other regions [3]. Shan L discussed many problems such as the imbalance of urban and rural development and the loss of rural vitality caused by the transfer of a large number of labor forces from rural areas to cities in the process of urbanization. Taking Jiuling Village, Jiaoling County,

Guangdong Province as the research object, he expounded the necessity of industrial integration development and explored the path of industrial integration in rural areas [4]. By cultivating and expanding the scale of new agricultural business entities, Ting aimed to better improve the modern agricultural system and implement the RR strategy. He fundamentally solved the Three Rural Issues, and explored the cultivation path of new professional farmers and conducted performance evaluation research. At the same time, he reviewed the current research status of professional farmers worldwide, elaborated on the necessity of cultivating new types of professional farmers, and proposed countermeasures and suggestions for cultivation from various aspects [5]. Wang Y analyzed the triple path obstacles of land transfer income supporting RR under the premise of existing policy support, attempted to qualitatively analyze the obstacle factors, and quantitatively calculate the degree of obstacles. He finally used entropy method and cluster analysis to construct a RR performance evaluation model that solves the differences [6].

The combination of internet finance and RR has prompted relevant departments to re study the path and performance evaluation of RR [7-8]. The above uses various research theories and methods to effectively discuss the path obstacles of RR, but lacks some performance evaluation examples to verify and analyze.

The research on RR and financial support, as well as the analysis of the path to RR in Yunnan, is a major focus of this paper. In this article, based on the discussion and research on the development process of rural industry integration in Yunnan Province, combined with questionnaire survey and experimental analysis, a performance evaluation model for financial support for RR in the context of digital economy based on DEA is constructed. The final results show that improving the ability of financial institutions to serve RR and continuously improving rural basic financial services are effective paths for RR.

## 2. Review of RR

### 2.1 Integration and Development Stage of Rural Industries in Yunnan Province

With the development of productivity and the reform of the market economy system, the integration of rural industries in Yunnan Province has achieved remarkable results, mainly in the following aspects: The first is to adhere to the development of “specialization” and continuously enhancing industrial competitiveness; the second is to adhere to the “diversification” of business formats and continuously extend the industrial chain; the third is to adhere to the “scale” of operation, and various entities continue to grow [9-10]. Due to the inseparable relationship between RR and rural industrial integration, only by developing rural industries can comprehensive development of the rural economy be achieved and the RR strategy be comprehensively promoted [11-12]. According to the relevant theoretical achievements of RR policies since the reform and opening up, the roughly experienced stages of rural industrial integration development in Yunnan Province are shown in Table 1:

Table 1. The development process of rural industrial integration in Yunnan Province

Period	Strategy
Reform And Opening	Promote continuous adjustment and optimization of agricultural industry structure
The Sixteenth congress	From a single agriculture to the integration of one or two rural industries
The Eighteenth Congress	Yunnan Province encourages the integrated development of one, two, one and three industries in rural areas
The Nineteenth Congress	Integrated development of rural one, two and three industries to create highland special agriculture

It can be seen from the above table that the four time nodes of the development process of rural industrial integration in Yunnan Province are the reform and opening up, the 16th, 18th and 19th National Congresses. The main policies are to transform the single structure into plateau featured agriculture, and integrate the development of the rural primary, secondary and tertiary sector of the economy [13-14]. The rural industry industry is integrated with the rural Primary sector of the economy, that is, planting and breeding industry, the Secondary sector of the economy, that is, agricultural product processing industry, and the rural Tertiary sector of the economy, that is, tourism industry. The

three major rural industries are integrated and developed under the support of Internet finance in the context of “digital economy”. By integrating different rural industries, rural economic development is promoted to achieve RR.

## 2.2 Investigation on RR and Financial Support

Internet finance research on the effectiveness of agricultural and rural economic development has attracted widespread attention [15-16]. Whether developing rural finance to promote the realization of agricultural modernization or rural finance to support RR, the ultimate goal is to achieve common prosperity. Therefore, according to the concept of Internet financial support in the context of the digital economy, the relevant research on RR and financial support is completed as shown in Figure 1:

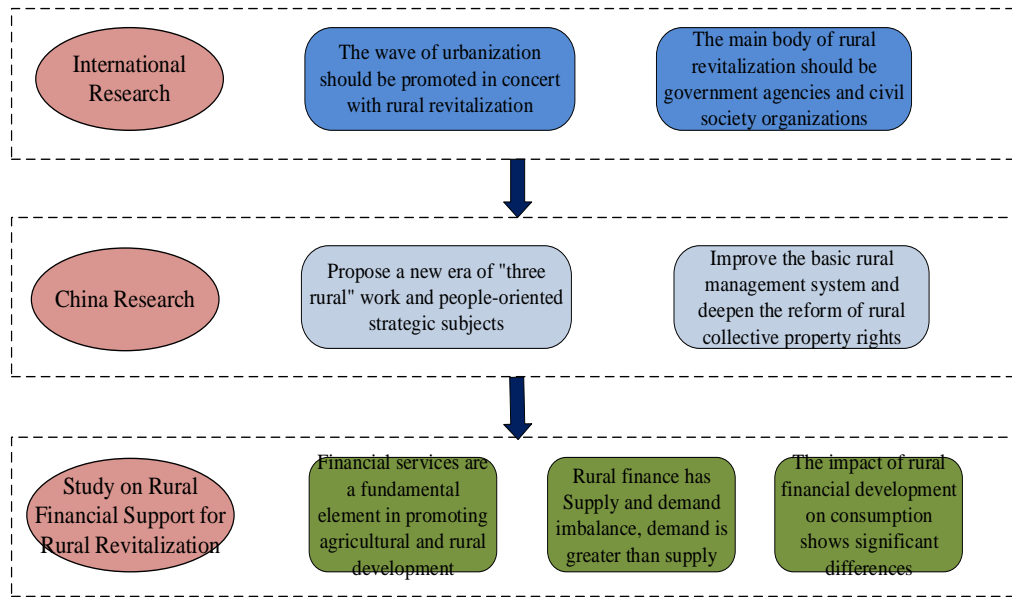


Figure 1. Research on RR and financial support

In summary, in international research, it is believed that RR should be coordinated with urbanization and achieve rural economic development under the leadership of the government and civil organizations. In Chinese research, it is believed that RR should first improve and consolidate the economic system in rural areas, and ensure the work of agriculture, rural areas, and farmers with the people at the center [17-18]. The support of internet finance in the context of the digital economy is not only a fundamental factor in promoting agricultural and rural development, but also helps to improve the imbalance between supply and demand in rural finance. Therefore, the study of the path of internet finance supporting RR is of great significance [19-20].

## 3. RR Path and Performance Evaluation

### 3.1 Evaluation of Yunnan RR Path

In the context of the digital economy, the path of financial support for RR in Yunnan can be studied at three levels: government organizations, financial institutions, and farmers themselves. The government mainly improves the regulation system of the agricultural product market and strengthens the management of supporting agriculture. Financial institutions require guarantees for the level of financial services and investment in financial resources. Farmers themselves must comply with their needs and adapt to local conditions, and develop distinctive rural industries. The analysis of the path of internet finance supporting RR in Yunnan Province is shown in Table 2:

Table 2. Policy analysis on the path of financial support for RR in Yunnan Province

Policy	Content
Make good supply of important agricultural products	Sound and perfect agricultural market regulation and control system to promote the balance of supply and demand to a higher level
Stabilize the foundation of modern agriculture	Stabilize the basic plate of agriculture, must strengthen the basic support of modern agriculture
Sustainable development of rural industries	In line with the demand, according to local conditions, the development of characteristics is the fundamental development of rural industries
Steady improvement of rural construction	Accelerate the preparation of village planning and strengthen the construction of rural public infrastructure
Consolidate the results of poverty eradication	Solidifying and expanding the achievements of poverty eradication is the bottom-line task to comprehensively promote RR.

In addition, enhancing the ability of financial institutions to serve RR and continuously improving rural basic financial services is also an important path for internet finance to support RR in Yunnan Province. It refers to conducting new thinking and in-depth analysis of financial services for RR, and exploring a rural financial service system suitable for agricultural and rural characteristics. The research on the path of financial support for RR under the background of digital economy in Yunnan Province aims to help the integration and development of rural industries in Yunnan break away from the initial stage and achieve balanced economic development.

### 3.2 Construction of Performance Evaluation Model Based on DEA

DEA is a new field of cross research among operations research, management science and mathematical economics. The main goal of this method is to establish a Linear programming model, which uses multiple input indicators and multiple output indicators to express the ratio of output to input. Based on the research and analysis of the development process of rural industry integration in Yunnan Province, combined with the definition of concepts related to RR and financial support, and the analysis of the path of RR in Yunnan, the performance evaluation model for RR based on DEA is divided into input indicator modules and output indicator modules. Therefore, the construction of a performance evaluation model for financial support for RR in the context of digital economy based on DEA is shown in Figure 2:

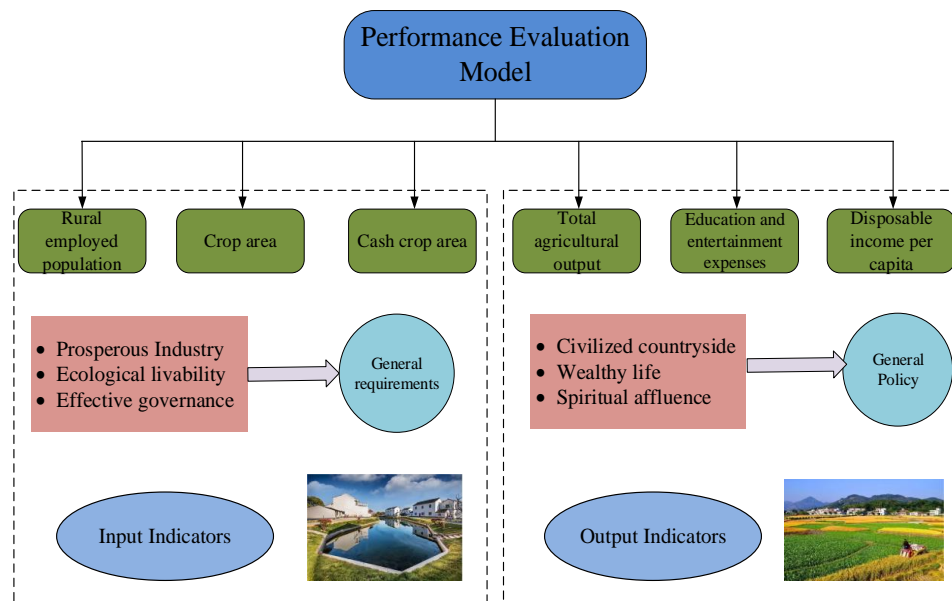


Figure 2. Performance evaluation model based on DEA

When analyzing the path and performance evaluation of internet finance support for RR in Yunnan under the background of the “digital economy”, the calculation of DEA evaluation decision-making

units is an important step in verifying performance results. According to the performance evaluation model designed above, there are three input indicators and three output indicators. Therefore, the Linear programming model of DEA evaluation decision-making unit is shown in Formula 1 and Formula 2:

$$\text{Min}T_D = \theta \quad (1)$$

$$s.t. \begin{cases} \sum_{i=1}^n x_i \lambda_i + S = \theta x_i \\ \sum_{i=1}^n y_i \lambda_i - S = y_i \end{cases} \quad (2)$$

Among them,  $\theta$  and  $\lambda$  represent decision variables; S represents the relaxation variable; x and y represent the input and output quantities of different decision-making units; the subscript i represents the i-th type.

#### 4. Experimental Results and Evaluation

After completing the design of the performance evaluation model of financial support for RR in the context of the digital economy based on DEA, in order to test the actual effect of the model's application in specific villages, districts and counties in Yunnan Province, the Linear programming calculation model and DEA model were used for analysis and discussion.

Due to the limited sample size of the selected districts and counties, in order to ensure the feasibility of the calculation, this experiment selects six economically underdeveloped vulnerable counties in Yunnan Province, which are Yuanyang County, Qiubei County, Fugong County, Guangnan County, Dagan County and Weixin County respectively according to the per capita GDP from large to small in 2022. This is the data set sample for testing. According to the 2022 statistical yearbook of six counties and districts, the performance model indicator system mentioned above has been utilized to collect and organize data. Firstly, after dimensionless processing of the data to eliminate the impact of errors, the pure TE, scale efficiency, and comprehensive TE of the six vulnerable counties can be obtained by substituting the data into Formulas 1 and 2. The specific results of the efficiency values of the six counties in Yunnan Province are shown in Table 3:

Table 3. Efficiency values of six vulnerable counties in Yunnan Province

Region	GDP per capita in 2022 / million yuan	Pure technical efficiency	Scale efficiency	Integrated technical efficiency
Yuan Yang County	2.85	1	0.6323	0.6323
Qiu Bei County	2.68	0.8763	0.7624	0.6681
Fu Gong County	2.61	1	1	1
Guang Nan County	2.44	0.8315	1	0.8315
Da Guan County	2.44	0.8021	0.9863	0.7911
Wei Xin County	2.36	1	1	1

It can be seen that the pure TE and scale efficiency of Fugong County and Weixin County reach 1 at the same time, which means that the comprehensive TE is effective in performance evaluation. Yuanyang County only achieved a pure TE of 1, indicating that there is still significant room for improvement in scale efficiency. The scale efficiency of Guangnan County only reached 1, indicating that its pure TE still needs to be improved. Both Qiubei County and Dagan County have not reached 1, indicating that their pure TE and scale efficiency need to be improved, and there is still much room for

progress under the general policy of RR. This indicates that the performance evaluation model based on DEA has good practical application results.

After discussing the above efficiency results, the questionnaire survey experiment on financial support for RR path was continued. To ensure the accuracy of the survey results, ten returning college students from the six counties and districts mentioned above in Yunnan Province were randomly selected and numbered 1-10. At the same time, their satisfaction evaluation of the financial support rural path policy in Table 2 was investigated, and the average satisfaction score of each path strategy was calculated. The survey results after investigation are shown in Figure 3:

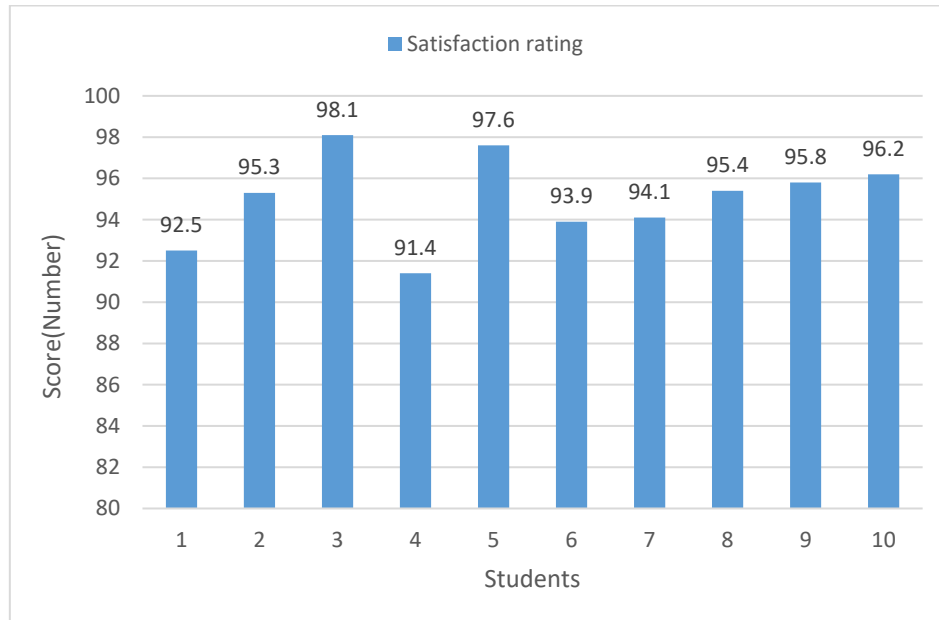


Figure 3. Satisfaction score results after questionnaire survey and research

Among them, the blue column represents the satisfaction evaluation results of ten returning college students from disadvantaged counties in Yunnan Province on the path of internet finance supporting RR. It can be seen that all returning college students have a satisfaction score of over 90 points on the financial support for RR path, with a comprehensive average satisfaction score of 95.03 points. It can be considered that the financial support for RR path policy mentioned above is effective.

## 5. Conclusions

In the context of the increasingly rapid development of the digital economy, a performance evaluation model for financial support for RR based on DEA can be widely applied to analyze the path of RR in various counties and districts in Yunnan Province. This article was based on the development process of rural industry integration in Yunnan Province. Through relevant research on RR and financial support, a performance evaluation model based on DEA was constructed, and a questionnaire survey experiment was conducted on it. It was concluded that the model had good practical application effect, and the policy of financial support for RR path was effective. This article aimed to provide a DEA based financial support performance evaluation model for RR in China through theoretical and empirical research. Due to the limited selection of sample variables from counties and districts in Yunnan Province, as well as the incomplete analysis of the definition of the path to RR in Yunnan, there were still many shortcomings and shortcomings in the discussion of the path and performance evaluation of internet finance support for RR in Yunnan under the background of the “digital economy” studied in this article. Further improvement and improvement would be made in future research.

## Acknowledgement

Funding: This work was supported by Scientific Research Project of Yunnan Provincial Department of Transportation (project number: 2022J1063).

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