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The contemporary value, basic framework and realization mechanism of the rule of law in rural revitalization

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Abstract

With the goal of exploring the efficiency of the rule of law in rural revitalization, this paper analyzes the governance outcomes of the rule of law in rural revitalization from three aspects: the value of the times, the basic framework, and the mechanism of realization. The process of rural rule of law institutional change can be constructed by analyzing the mechanism characteristics of institutional change. The super-efficient SBM model is constructed based on the DEA method, and the modernization of rural governance capacity is solved by combining the governance theory, so as to achieve the effect of measuring the efficiency of rural revitalization of the rule of law. Improve the accuracy of efficiency measurement by adding the Malmquist index. The efficiency test model for rural revitalization rule of law is constructed to test the effects of rural rule of law. The results show that the epochal value of the rule of law in rural revitalization is mainly reflected in the scientific, digital and normative aspects, and the digital value embodied in the highest proportion of 0.8137, followed by normative, the value embodied in the degree of 0.7908. The content of ecological revitalization rapidly increases from 4 to 70 after the 5th cycle, and the degree of influence peaks in the 12th cycle. The research in this paper provides a new governance direction for the rule of law in rural revitalization, which can further improve the rule of law system in rural areas.

Keywords: SBM model; Malmquist index; DEA method; Efficiency test model; Rural rule of law.

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1 Introduction

With the rapid development of economic and social diversification, an undesirable social trend is also quietly growing, the blind pursuit of profit under the stimulation of the market is easy to blind people, the rule of law faith is missing, which is not conducive to the stability of the social order in the countryside as well as the orderly development of the villagers' self-governance [1]. The emergence of big data and network technology has brought convenience to rural revitalization, but also has certain disadvantages [2]. The construction of a beautiful countryside, prompting the stable and orderly development of rural society is naturally inseparable from the construction of the rule of law in the countryside [3]. The construction of the rule of law for rural revitalization is one of the important contents of the rural revitalization strategy [4]. Rural revitalization of the rule of law is a solid guarantee to ensure social stability in the countryside, is an inevitable requirement for the state to promote the rule of law in a comprehensive manner, and is also an important path to cope with the change of the main contradictions of society in the new era [5-6].

In the rule of law in rural governance, the grass-roots party and government organs continue to strengthen the rule of law cognition in the process of practice and use it as a guideline for dealing with various rights relations, to ensure that villagers' autonomy is effectively carried out in the framework of laws and regulations, and to continuously build a new harmonious order in the rural society. The legalization of rural revitalization is also a necessary prerequisite for the country to promote the process of rural revitalization, and its contemporary value, basic framework and mechanism are what the country is exploring [7-8].

This paper first analyzes the governance path of rural revitalization under the rule of law, and puts forward the path-dependent steps from the perspective of the mechanism characteristics of institutional change. The combination of institutional change and the governance of rural revitalization by rule of law is used to formulate the implementation mechanism of rural revitalization by rule of law. It focuses on exploring the role of governance theory in the rule of law in the countryside, and realizing the overall interest of the countryside by guaranteeing the rights of citizens. Secondly, the efficiency of rural revitalization rule of law is measured to assess the governance of rural revitalization rule of law. Using the super-efficient SBM model for the comprehensive measurement of rule of law governance in rural areas, the efficiency influences of different decision-making units are separated, so as to obtain the efficiency value that only comes from the influence of management inefficiency. Combined with the Malmquist index to improve the accuracy of the efficiency measurement of the rule of law in rural revitalization, a test model for the efficiency of the rule of law in rural revitalization is constructed on the basis of the SBM model. Finally, it analyzes the epochal value of the rule of law in rural revitalization by combining the efficiency measurement method of the rule of law in rural revitalization, and explores the effect of rural governance from the perspective of target value and digitalization. By analyzing the basic content of rural governance, the basic framework of rural rule of law is analyzed. Combining the analyzed data, necessary measures for implementing the rule of law in the countryside are proposed.

2 Related work

Tan, M et al. argue that rural autonomy plays an important role in rural governance, and that improving the rules and laws within the village is an important prerequisite for the implementation of autonomy in the countryside, as well as an important measure to improve the functioning of the countryside [9]. German, L et al. argue that the growth of the emerging economy can to some extent influence the formulation and improvement of legal protection, pointing out the basis of human agriculture in shaping the outcome. The relationship between the formulation of copyright protection

policies and the actual is explored [10]. Huang, L et al. believe that the integration of ecological forestry and cultural forestry can solve the rural development dilemma by unifying the ecological forestry and the cultural industry, and by strengthening the legalization of the forestry governance [11]. Yue, X. Y believes that the purpose of rule of law education is to improve the backward cultural concepts in rural areas [12]. Lin, G et al. believe that the main prerequisite of rural revitalization strategy is the rural ecological protection, and put forward the means to improve the legal awareness of the masses by exploring the current problems of rural ecological protection [13].

Magin, P et al. argued that the dynamics of land expropriation may have had a greater negative impact on rural communities, and that the development of strict legal policies regarding rural land could improve rural legalized governance to a certain extent [14]. Cai, Y focused on the internal political behaviors of the state and the rural communities, and through the collection of data and review of the literature, aimed to address the political-legal issues that exist at the present time [15]. Liu, D argues that the ultimate purpose of the rule of law is to protect the rights of citizens, and the same is true for the legalization of rural governance, which to a certain extent protects the individual rights of rural villagers [16]. Deng, H et al. explore measures related to mitigating climate warming and realizing sustainable development from the perspective of carbon emissions, and put forward a framework for the implementation of rural cooperation [17]. Wang, W et al. explored the evaluation of farmers' rural land consolidation and their attitudes towards the rule of law in the countryside [18]. Huang, X et al. argued that the implementation of rule of law governance in rural China has a significant impact on the preservation of rural resources, and developed a system of indicators for assessing the rule of law in the countryside by using the method of co-citation analysis [19]. Wu, B et al. argued that rural revitalization is relevant laws as well as policies need to be enacted in order to achieve a balance between the two [20]. Guo, Y et al. mainly analyzed the relationship between land and rural development, and explored the impact of land partitioning and poverty alleviation mechanisms on rural revitalization, and that the combination of land production and livelihoods with ecological functions can promote the development of rural governance [21].

3 Establishment of the Rule of Law Efficiency Model for Rural Revitalization

3.1 Rule of law path dependency and governance for rural revitalization

3.1.1 Rule of law path dependence for rural revitalization

Paul David in describing the mechanism of institutional change characteristics for the first time put forward the term “path dependence”, he pointed out that when a certain technology because in the conditions of incremental payoffs will continue to develop along the previous route, will ignore other alternative paths or other technologies, and a large part of the results of this development may not be the optimal path, which leads to a waste of resources in the institutional change, the role of path dependence in not subject to the transfer of the will of the people at the same time, but also implies the objective laws of the economy [22-23].

The steps of path dependence are shown in Fig. 1, and the chance occurrence of alternative paths is a prerequisite for path dependence. Initiation mechanism is the beginning of path dependence, which is accomplished through a series of steps such as setting up cost, learning and coordination to complete the path dependence initiation, and the formation state is a certain specific result of path dependence, which is the state that appears in the case of incremental benefits. And exit closure symbolizes the completion of path dependence and marks the end of path dependence.

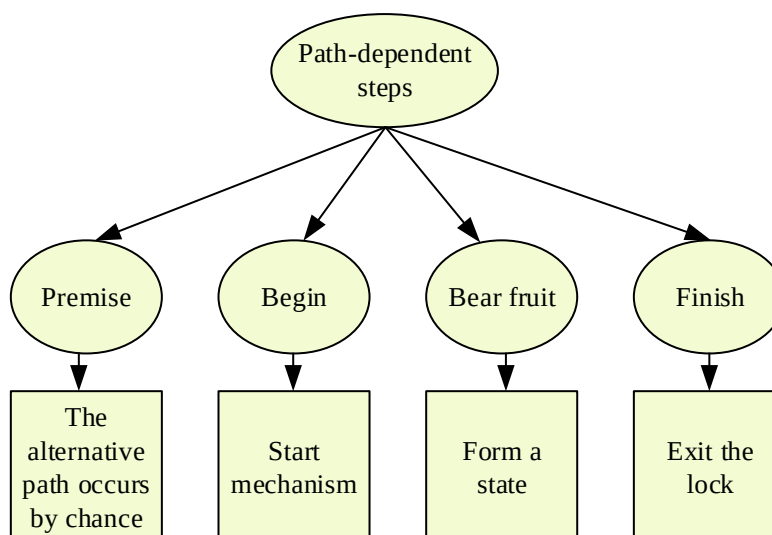


Figure 1. Path-dependent step

Therefore, the so-called “path dependence” refers to the fact that in the process of institutional change, the formation of a certain system will continue for a certain period of time, and there exists the “inertia” of following such a path, and it is affected by the incremental payoffs and self-reinforcement, which will have a certain constraining effect on the future institutional innovation.

3.1.2 Rural governance

Governance theory began to emerge in the 1980s, focusing on the change of subjects and emphasizing the application of a polycentric system to achieve the optimal allocation of resources in the process of allocating public resources and services. Zeng Shengcong said, “From the perspective of administrative science, governance theory is characterized by pluralism, democracy and cooperation. Analyzed from the perspective of political science, governance is a process that covers the basis of norms, the way of dealing with affairs, and the management of resources.” Compared with the traditional theory of social management, governance theory, first of all, in terms of the subject of management, is no longer a single subject of management but a multi-center subject to jointly manage its affairs, and the subject of its management is diverse [24-25]. The second is to decentralize the power of “hands”. The government should gradually decentralize the power in their own hands according to the needs of the times, and increase the strength of decentralization and expand the scope of decentralization. It should be decentralized to the grassroots society and civil society, so that the grassroots society and civil society can share the responsibility of governance with the government, so as to form a cross-functional relationship among the governmental institutions, social institutions and private organizations, and to break through the original boundaries of each purpose to form a synergy. Finally, a new governance system must be constructed to meet the new governance requirements. Due to the interdependence and complementary functions of different organizations, the original management model that relied solely on government administrative orders has been broken through to form a new governance model based on dialogue and consultation. Modernization of rural governance helps to realize the democratization of rural society and the rule of law, in order to safeguard the fundamental interests of peasants, and then optimize the overall interests of the countryside. Therefore, it is of far-reaching significance to apply governance theory to guide and solve the problem of modernizing rural governance capacity.

3.2 Measuring the efficiency of the rule of law in rural revitalization

3.2.1 Super-Efficient SBM Modeling

DEA is the abbreviation of Data Envelopment Analysis (DEA), which can calculate the comprehensive analysis results of each decision-making unit without converting each input and output indicator into the same unit [26]. In view of the applicability of the DEA method to the evaluation of environmental governance efficiency, this paper also chooses this method as the basic method of this study. Throughout the literature related to environmental governance efficiency in recent years, most scholars in China have adopted traditional DEA models for environmental efficiency evaluation, such as CCR model and BCC model. However, the traditional DEA model can only adjust the inputs and outputs radially in the way of equal proportional scaling, in order to avoid the shortcomings of the traditional DEA model, Tone established a non-radial and non-angle, relaxation variable-based DEA measurement model SBM model [27].

1) Super-efficient SBM model in the first stage

In the first stage, the super-efficient SBM model based on variable governance costs is used to measure the efficiency of comprehensive governance of the rule of law in rural areas of 29 provinces and municipalities. The SBM model is shown below.

$$\min_{\lambda, s^-, s^+} \rho = \frac{1 - \frac{1}{m} \sum_{i=1}^m s_i^- / x_{i0}}{1 + \frac{1}{s} \sum_{r=1}^s s_r^+ / y_{r0}} \quad (1)$$

$$\text{Subject to } \begin{cases} x_0 = X\lambda + s^- \\ y_0 = Y\lambda - s^+ \\ \lambda \geq 0, s^- \geq 0, s^+ \geq 0 \end{cases} \quad (2)$$

If the order:

$$\begin{cases} \alpha_i = \frac{1}{m} \frac{s_i^-}{x_{i0}} & (i=1, 2, \dots, m) \\ \beta_r = \frac{1}{s} \frac{s_r^+}{y_{r0}} & (r=1, 2, \dots, s) \end{cases} \quad (3)$$

Then there is:

$$\rho = \frac{1 - \sum_{i=1}^m \alpha_i}{1 + \sum_{r=1}^s \beta_r} \quad (4)$$

In order to differentiate between multiple efficient decision units, Tone proposed the super-efficient SBM model as follows.

$$\min \delta = \frac{1}{m} \sum_{i=1}^m \bar{x}_i / x_{i0} \quad (5)$$

$$\text{Subject to } \begin{cases} \bar{x} \geq \sum_{r=1}^s \lambda_r x_r \\ \bar{y} \leq \sum_{r=1}^s \lambda_r y_r \\ \bar{x} \geq x_0, \bar{y} \geq y_0, \lambda \geq 0 \end{cases} \quad (6)$$

$$p(x_0, y_0) = \left\{ (\bar{x}, \bar{y}) \mid \bar{x} \geq \frac{1}{m} \sum_{r=1}^s \lambda_r x_r, 0 \leq \bar{y} \leq \frac{1}{m} \sum_{r=1}^s \lambda_r y_r, \lambda \leq 0 \right\} \quad (7)$$

2) Second-stage stochastic frontier regression analysis model

The efficiency of decision-making units is mainly affected by three aspects, namely management inefficiency, environmental factors and statistical noise. In order to further analyze the real efficiency differences between individual decision-making units, these three influences need to be separated. The purpose of stochastic frontier regression analysis is to separate these three influences, so as to get the efficiency value only from the influence of management inefficiency, in order to draw more objective and real evaluation results. The adjustment formula of SFA regression analysis is shown below.

$$X_{ni}^A = X_{ni} + \left[\max \left(f(Z_i; \hat{\beta}_n) \right) - f(Z_i; \hat{\beta}_n) \right] + \left[\max(v_{ni}) - v_{ni} \right] \quad (8)$$

($i = 1, 2, \dots, I; n = 1, 2, \dots, N$)

3) Adjusted Super-Efficient SBM Model for Phase III

The model used in the third stage is the same as in the first stage, still using the super-efficient SBM model, the difference between the third stage and the first stage is the change in the input data. The output data used at this point is still the same raw output data as in Stage 1, but the input data is new data obtained after adjusting for the Stage 2 SFA regression. Since the new input data have been stripped of the influence of environmental factors and random errors, the efficiency values measured at this point are closer to the actual values and the conclusions drawn are more realistic and reliable.

3.2.2 Malmquist Index

Since the Malmquist index was first proposed by the economist Sten Malmquist in 1953, this model is named after him. In 1982, Cave and other scholars measured the change of production efficiency for the first time by using the Malmquist index [28]. In 1994, Fare and other scholars improved this model, and by combining this model with the DEA method to construct the Malmquist index of total factor efficiency growth, which made the Malmquist index widely used [29]. The formula of the Malmquist index model is shown below.

$$\begin{aligned}
M^{t,t+1}(x^t, y^t, x^{t+1}, y^{t+1}) &= \left[\frac{d^t(x^{t+1}, y^{t+1})}{d^t(x^t, y^t)} + \frac{d^{t+1}(x^{t+1}, y^{t+1})}{d^{t+1}(x^t, y^t)} \right]^{\frac{1}{2}} \\
&= \frac{d^{t+1}(x^{t+1}, y^{t+1})}{d^t(x^t, y^t)} \times \left[\frac{d^t(x^{t+1}, y^{t+1})}{d^{t+1}(x^{t+1}, y^{t+1})} + \frac{d^t(x^t, y^t)}{d^{t+1}(x^t, y^t)} \right]^{\frac{1}{2}} \\
&= tch(x^t, y^t, x^{t+1}, y^{t+1}) \times ech(x^t, y^t, x^{t+1}, y^{t+1})
\end{aligned} \tag{9}$$

Where tch is governance progress, when $tch > 1$, it indicates that there is governance progress from moment t to moment $t+1$, and vice versa, it indicates governance regression. ech is governance efficiency, when $ech > 1$, it indicates that governance efficiency improvement occurs from moment t to moment $t+1$, and vice versa. Based on the assumption of variable governance costs, governance efficiency can be decomposed into pure governance efficiency and scale efficiency, and the formula for decomposition is shown below.

$$\begin{aligned}
M^{t,t+1}(x^t, y^t, x^{t+1}, y^{t+1}) &= \frac{d^{t+1}(x^{t+1}, y^{t+1}, C) / d^{t+1}(x^{t+1}, y^{t+1}, V)}{d^t(x^t, y^t, C) / d^t(x^t, y^t, V)} \times \\
&\frac{d^{t+1}(x^{t+1}, y^{t+1}, V)}{d^t(x^t, y^t, V)} \times \left(\frac{d^t(x^{t+1}, y^{t+1})}{d^{t+1}(x^{t+1}, y^{t+1})} \times \frac{d^t(x^t, y^t)}{d^{t+1}(x^t, y^t)} \right) \\
&= pech \times sech \times tch
\end{aligned} \tag{10}$$

3.3 Rule of Law Efficiency Testing Model for Rural Revitalization

The value of the rule of law in rural revitalization and the test steps of the implementation effect are mainly as follows:

- 1) Group all villages according to the rural scale, and within the group then divided into groups according to the efficiency of the rule of law.
- 2) Construct the combination of rule of law in villages within groups and rule of law within groups within groups, respectively, and the cost of rule of law may be taken to be equal [30]. Based on the efficiency of various rule of law governance, the actual efficiency of the rule of law portfolios within the group and within the group is calculated separately R_{it} .
- 3) Calculate the normal rate of return on the in-group and intra-group portfolios based on the super-efficient SBM model NR_{it} . where the risk-free rural rule of law efficiency R_f can be the efficiency of rural governance over the sample interval:

$$NR_{it} = R_f + \beta_i (R_{Mt} - R_f) \quad \beta_i = \frac{\text{cov}(R_{Mt}, R_{it})}{\text{var}(R_{Mt})} \tag{11}$$

- 4) Subtract the corresponding normal efficiencies from the rule of law efficiencies of the in-group and intra-group efficiency portfolios, respectively, to obtain the risk-adjusted Efficiency

AR_{it} and Average Efficiency $\overline{AR}_{N_i}$ for the rule of law portfolios in the in-group and intra-group:

$$AR_{it} = R_{it} - NR_{it} \quad \overline{AR}_{N_i} = \frac{1}{N_i} \frac{1}{T} \sum_{i=1}^{N_i} \sum_{t=1}^T \overline{AR}_{it} \quad (12)$$

- 5) The risk-adjusted average efficiency of the rural rule of law portfolios within the group is ranked in order of size and compared with the order of size of the subgroups, and if the risk-adjusted average efficiency of the small-scale rule of law portfolios significantly exceeds that of the large-scale rule of law portfolios, it indicates that there is a significant rural revitalization rule of law effect.

4 Study on the contemporary value, basic framework and realization mechanism of the rule of law in rural revitalization

4.1 Analysis of the contemporary value of the rule of law in rural revitalization

4.1.1 Analysis of the target value of the rule of law for rural revitalization

Currently, China's rural governance mechanism has been alienated in the development process for the reasons mentioned above, and in reality, rural governance often relies on existing strong forces to promote governance, departing from the rule of law governance track. With the establishment of the national policy of ruling the country according to law, the requirements of building a new socialist countryside, the farmers' awareness of the main body and the concept of the rule of law, etc. have decided that the rural governance can only take the road of the rule of law in order to ensure the long-term, healthy and sustainable development of the countryside. Especially with the in-depth development of China's new rural construction, the rural society in all aspects of production and life, rural customs and village appearance have undergone radical changes, which also requires rural governance to the rule of law governance mode change to adapt to the current increasingly complex rural situation. The target value of the rule of law for rural revitalization is shown in Table 1, which is mainly embodied in the three aspects of common prosperity, national rejuvenation and legal protection. The degree of embodiment of the target value of common prosperity, national rejuvenation and legal security is 0.8754, 0.8972 and 0.9137, respectively, and the degree of effect of the three on the rule of law for rural revitalization is also different, with the degree of effect of common prosperity being 0.7991, the degree of effect of national rejuvenation being 0.8134, and the degree of effect of legal security being 0.8645.

Table 1. The goal value of rural revitalization ruled by law

Target value embodiment	Common prosperity	Revival of nationhood	Legal protection
Dimension	Target dimension	Strategic dimension	Rule of law dimension
Representation degree	0.8754	0.8972	0.9137
To the rule of law of rural revitalization to use the degree	0.7991	0.8134	0.8645

4.1.2 The contemporary value of the rule of law in rural revitalization

With the continuous development of Internet technology, the application of big data in social governance is becoming more and more widespread, and digital technology is being applied to rural governance to solve traditional rural governance problems through digital technology and provide

strong support for the digital transformation of rural governance. The traditional rural governance model is often based on the past experience of grassroots cadres to make decisions, or in accordance with the management requirements of the higher authorities to make decisions, while the countryside belongs to the “society of acquaintances”, and there is a human factor in rural governance, so the traditional rural governance decision-making lacks scientific, and is unable to meet the increasingly complex needs of rural governance. The modernization of rural governance is different from the traditional rural governance mode of relying on empiricism to make decisions, but through the collection, collation and analysis of data, to find out the intrinsic connection between the data, to find out the common basis of rural governance and individuality performance, for different rural governance problems, based on the big data to formulate the corresponding decisions, to minimize the adverse impact of conflicts and disputes, to ensure the scientific nature of rural governance decisions. The contemporary value of the rule of law in rural revitalization is shown in Table 2, and the contemporary value of the rule of law in rural revitalization is mainly embodied in scientific, digital and normative. The proportion of the embodiment of the three values, digital value embodiment of the highest proportion of 0.8137, followed by normative, value embodiment degree of 0.7908. Which scientific rural revitalization governance on rural rule of law is 0.8724, normative governance on rural rule of law influence degree of 0.8116, digitalization of the degree of influence on rural governance is 0.7561.

Table 2. The era value of the rule of law in rural revitalization

The value of The Times	Scientificity	Digitalize	Normalization
Reflect the proportion	0.7893	0.8137	0.7908
The rule of law affects rural revitalization	0.8724	0.7561	0.8116
Rural governance	0.7483	0.7359	0.7905
The relevance to rural revitalization	0.7376	0.7862	0.8104

4.2 Analysis of the basic framework for the rule of law in rural revitalization

The supply of agricultural products and food security, ecological environmental protection, and the inheritance of the traditional excellent culture of the Chinese nation are taken as the basic functions of the rule of law for rural revitalization. The influence of the five revitalization contents on the rule of law in rural revitalization is shown in Figure 2, the cultural revitalization content has been fluctuating in the (40,60) range in the 1-6 cycle, and after the 6th cycle, it has rapidly risen from the influence of 40 to the influence of 70. In cycles 7-12, it fluctuates in the range of (60,90), indicating that the influence of cultural revitalization becomes deeper and deeper as the cycle grows. The ecological revitalization component starts with an impact level of 40 and drops to 4. After cycle 5, it rapidly rises from 4 to 70, peaking at cycle 12.

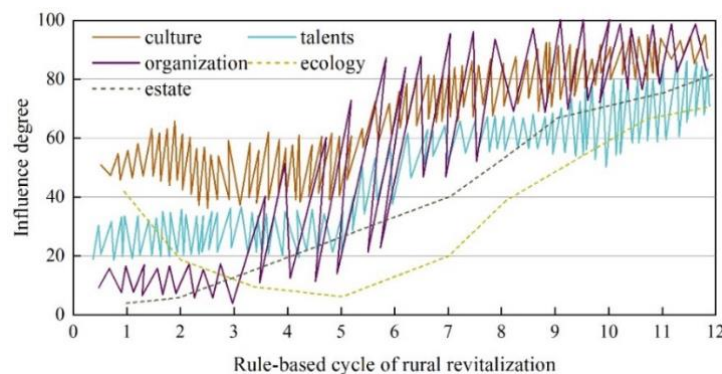


Figure 2. Legal influence of rural revitalization

4.3 Exploration of mechanisms for realizing the rule of law in rural revitalization

4.3.1 Sound legal and regulatory system

The premise and foundation of the rule of law in rural governance is a sound and perfect system of laws and regulations, so as to ensure that there is a law to follow in the process of rural governance, there is a law to investigate, and comprehensively safeguard the basic rights and interests of farmers. National governance system in the countryside is an important part of the country's stable development of all sectors of a basic content, and want to better implement the management of rural governance, it is indispensable to improve and sound laws and regulations. The current situation of rural governance, due to the national conditions and rural law and other aspects of the construction of insufficient, so that the overall effectiveness of governance is not ideal, but also need to continue to improve the legal and regulatory system, so as to better guide China's farmers to establish a sense of ownership, and to enhance their participation in the rural governance of the work of the enthusiasm. Therefore, in the future, all parts of China in rural governance need to raise the rule of law thinking to a new height, will be some unwritten provisions in the form of law to be clear. This is a crucial factor in ensuring the rule of law in rural governance. The role of sound laws and regulations in the implementation of the rule of law in rural revitalization is shown in Table 3, mainly in promoting the implementation of the rule of law in the countryside, improving the enthusiasm of the villagers and enhancing the rule of law security in these three aspects. The degree of the role of sound laws and regulations in promoting the rule of law in villages is 0.8652, the role in improving the enthusiasm of villagers is 0.7543, and the safeguard of the rule of law in villages has been enhanced to a certain extent, which plays a role of 91.37%. The degree of influence of these three roles on rural revitalization is 0.8114, 0.8517, and 0.8734 respectively.

Table 3. Improve the role of laws and regulations

The role of a sound legal system is reflected	We will promote the rule of law in rural areas	Improve the enthusiasm of the villagers	We will strengthen protection for the rule of law
Function degree	0.8652	0.7543	0.9137
The impact on rural revitalization	0.8114	0.8517	0.8734
Mutual degree	0.6971	0.7126	0.7462

4.3.2 Clarify the powers and responsibilities of governance entities

In terms of rural governance, the main bodies of governance are diversified, rather than being unified by a single body. The plurality of subjects includes government departments, grass-roots social organizations, and farmers themselves. Governance subjects are not restricted or inhibited by one another, but each has their unique role to play, with distinct political responsibilities and operational powers. This is of great significance for reflecting on the development of the rule of law in rural governance. The role of clarifying the powers and responsibilities of governance subjects is shown in Figure 3, which shows that the objects involved in the rule of law governance of rural revitalization mainly include villagers, the government and organizations. Villagers in the rural revitalization of the rule of law in the main position, the government's play a role in safeguarding, organizations in rural revitalization play a role in the role is mainly to assist, the three effective degree of rural revitalization is 0.65, 0.8, 0.75. The degree of participation of villagers in rural governance is 0.85, the degree of participation of the government in rural governance is 0.8, and the degree of participation of organizations in rural governance is 0.7, which indicates that the degree of participation of all three is relatively even, and that they are able to better promote the revitalization of the rule of law and governance in the countryside.

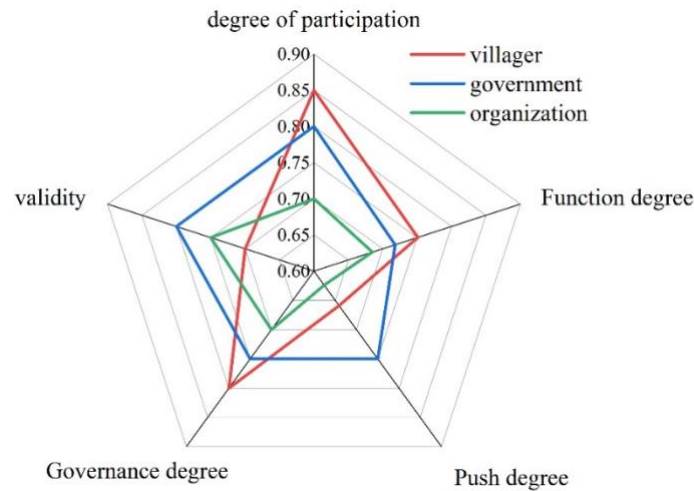


Figure 3. The role of the power and responsibility of governance subjects

In clarifying the rights and responsibilities of the main bodies of governance, the government's role should be limited and rights should be clearly defined. Rural governance is dominated by the government. In addition, the leadership team responsible for each stage is also specified, avoiding the phenomenon of responsibility for no one. Such a clear and perfect organizational system provides a greater basic guarantee for the development of rural governance.

Comprehensively safeguarding the right to grass-roots self-government in the countryside. The main point of this is to emphasize the peasantry's position as the main body of rural governance, since the peasantry is an important participant and practitioner in the entire process of rural governance, and is the de facto main body of rural governance. In developed countries, farmers are given great respect and allowed to manage rural affairs autonomously within the limits of the law, according to an analysis of rural governance in developed countries. Finally, it is essential to point out the importance of social organizations as aid in rural governance. The main body of rural governance is diverse, and the participation of social organizations in rural governance can effectively make up for the lack of public power and autonomy. The participation of social organizations in rural governance work shows that the wider the penetration of social organizations and the more they are involved, the better the implementation of the rule of law governance of rural revitalization. This demonstrates the adaptability and development potential of non-profit organizations.

5 Conclusion

This paper combines the super-efficient SBM model and Malmquist Index to budget the efficiency of the rule of law for rural revitalization, and on this basis, analyzes the value of the times, the basic framework and the realization mechanism of the rule of law for rural revitalization. Here are the main conclusions:

- 1) The target value of the rule of law for rural revitalization is mainly embodied in the three aspects of common prosperity, national rejuvenation and legal protection. The target value of common prosperity is 0.8754, the value of national rejuvenation is 0.8972, and the value of legal protection is 0.9137. The value of the rule of law in rural revitalization is mainly embodied in the science, digitalization and standardization. In the proportion of the embodiment of the three values, the proportion of digitalization value embodiment is the highest at 0.8137, followed by normative, with a value embodiment degree of 0.7908.

- 2) The basic content framework of the rule of law for rural revitalization is dominated by the five major revitalizations. The content of cultural revitalization has been fluctuating in the interval of (40,60) in cycle 1-6, and in cycle 7-12, it has been fluctuating in the interval of (60,90), indicating that the influence of cultural revitalization becomes deeper and deeper as the cycle grows.
- 3) The realization mechanism of the rule of law for rural revitalization is mainly based on sound laws and regulations as well as clarifying the rights and responsibilities of governance subjects. The role of sound laws and regulations in promoting the rule of law in the countryside is 0.8652, and the role of improving the enthusiasm of villagers is 0.7543. The participation of villagers in rural governance is 0.85, and the participation of the government in rural governance is 0.8, which indicates that the participation of all three is relatively even, and can better promote the rule of law governance of rural revitalization.

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References

- [1] Xu, S. (2021). Analysis method for structured big data feature based on hypernetwork model. *International journal of internet protocol technology*(3), 14.
- [2] Li, L. (2017). Integration of information security and network data mining technology in the era of big data. *Acta Technica CSAV (Ceskoslovensk Akademie Ved)*, 62(1), 157-165.
- [3] Batalla, J. M., Mastorakis, G., & Mavromoustakis, C. X. (2017). Special issue on management of the internet of things and big data. *International Journal of Network Management*, 27(3).
- [4] Yan, S., Hugues-Salas, E., Rancano, V. J. F., Shu, Y., Saridis, G. M., & Rahimzadeh Rofoee, B., et al. (2015). Archon: a function programmable optical interconnect architecture for transparent intra and inter data center sdm/tdm/wdm networking. *Journal of Lightwave Technology*, 33(8), 1586-1595.

- [5] Zhang, Q., Ye, C., & Duan, J. (2022). Multi-dimensional superposition: rural collaborative governance in liushe village, suzhou city. *Journal of Rural Studies*.
- [6] Conway, D. M. (2018). The cognitive dissonance between the rule of law and rural realities: reading gillian hadfield's rules for a flat world in the context of rural identity and politics. *SSRN Electronic Journal*.
- [7] Hu, Y., & Dong, L. (2019). Perfect rural governance system combining autonomy, rule of law and rule of virtue. *DEStech Transactions on Environment Energy and Earth Science(icner)*.
- [8] Leslie, Nicola, K., Lamb, Sophie, & J., et al. (2015). The future of investor-state dispute settlement in the energy sector: engaging with climate change, human rights and the rule of law. *Journal of World Energy Law & Business*.
- [9] Tan, M., Yan, X., & Feng, W. (2019). The mechanism and empirical study of village rules in rural revitalization and ecological governance. *REVISTA DE CERCETARE SI INTERVENTIE SOCIALA*, 64, 276-299.
- [10] German, L., Schoneveld, G., & Mwangi, E. (2013). Contemporary processes of large-scale land acquisition in sub-saharan africa: legal deficiency or elite capture of the rule of law?. *World Development*, 48(3), 1-18.
- [11] Huang, L., & Cao, Y. (2022). Review of the integrated development of ecological and cultural forestry. *Sustainability*, 14.
- [12] Yue, X. Y. (2017). An exploration and discussion of rural rule of law education based on local resources. *DEStech Transactions on Social Science Education and Human Science(mess)*.
- [13] Lin, G. (2019). Rule of law in Rural Ecological Conservation. *International Conference on Humanities Education and Social Sciences*.
- [14] Magin, P. (2015). Rule of law for whom? : questioning the beneficiaries of Mozambican land and resource rights.
- [15] Cai, Y. (2015). Patronage and power: local state networks and party-state resilience in rural china. *The China quarterly*(222), 557-558.
- [16] Liu, D. (2016). Research on the operation mechanism of claim in civil procedure law and the applications on court trial way reform. *International Journal of Technology, Management*.
- [17] Deng, H., Su, Y., Liao, Z., & Wu, J. (2022). Proposal of implementation framework of cooperative approaches and sustainable development mechanism. *Sustainability*, 14.
- [18] Wang, W., Yu, L., Zhou, W., Marcouiller, D. W., & Luo, B. (2019). Estimating the mechanism of farmers' effective participation in chinese rural land consolidation. *China Agricultural Economic Review*, 11.
- [19] Huang, X., Li, H., Zhang, X., & Zhang, X. (2018). Land use policy as an instrument of rural resilience – the case of land withdrawal mechanism for rural homesteads in china. *Ecological Indicators*, 87(APR.), 47-55.
- [20] Wu, B., & Liu, L. (2019). Social capital for rural revitalization in china: a critical evaluation on the government's new countryside programme in chengdu. *Land Use Policy*, 91, 104268.
- [21] Guo, Y., & Liu, Y. (2021). Poverty alleviation through land assetization and its implications for rural revitalization in china. *Land Use Policy*, 105(3), 105418.
- [22] Vasques, R., & Larsen, E. W. (2013). A generalized theory for non-classical transport with angular-dependent path length distributions 1: theory. *annals of nuclear energy*, 70(3), 292–300.
- [23] Ji, X., & Ao, X. (2021). Travelers' bi-attribute decision making on the risky mode choice with flow-dependent salience theory. *Sustainability*, 13(7), 3901.
- [24] Arora-Jonsson, S., & Larsson, O. (2021). Lives in limbo: migrant integration and rural governance in sweden. *Journal of Rural Studies*, 82, 19-28.

- [25] Dang, T. D., & Tran, T. A. (2020). Rural industrialization and environmental governance challenges in the red river delta, vietnam. *The Journal of Environment & Development*, 1-29.
- [26] Wen, G., Tao, S., & Hongjun, D. (2017). Efficiency allocation of provincial carbon reduction target in china's "13·5" period: based on zero-sum-gains sbm model. *Sustainability*, 9(2), 167.
- [27] Xiao, Q. H., Wei, G. Q., Yang, Z. M., Xu, X., Tian, W. B., & Zhang, Y. P. (2014). Experimental evaluation on well pattern adaptability of ultra-low permeability reservoir using sandstone flat model. *Journal of Central South University*, 21(6), 2334-2340.
- [28] Piot-Lepetit, I., & Tchakoute Tchuigoua, H. (2022). Ownership and performance of microfinance institutions in latin america: a pseudo-panel malmquist index approach. *The Journal of the Operational Research Society*(5), 73.
- [29] Xue, W., Li, H., Ali, R., Rehman, R. U., & Gonzalo Fernández-Sánchez. (2021). Assessing the static and dynamic efficiency of scientific research of heis china: three stage dea–malmquist index approach. *Sustainability*, 13(15), 8207.
- [30] Oh, T. S., Kim, S. H., Kim, W. K., Lee, H. Y., & Shin, M. H. (2014). Model test on operation efficiency in the screw conveyor of shielded tbm in soft ground.

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