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Research on the Impact Mechanism of Green Finance on Rural Revitalization from the Perspective of Digital Economy Development Level

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Abstract: *In the context of China's aim for common prosperity and high-quality economic growth, understanding how green finance influences rural revitalization is pivotal. This study employs provincial data from 2012 to 2020 to explore this dynamic. By integrating the entropy method to weight indicators, alongside a comprehensive index approach, we assess the environmental strata of digital economic advancement, green financial metrics, and rural revitalization indices. Utilizing statistical tools such as the coefficient of variation, Theil index, and dispersion coefficient, we evaluate the temporal and spatial disparities across these dimensions. The analysis leverages a bi-directional fixed-effect model with robust clustering errors to elucidate the nexus between digital economy environments and green finance in fostering rural development. Findings reveal a consistent narrowing of regional disparities within the observed frameworks over the years. More crucially, there's robust evidence suggesting that both digital economic environments and green finance substantially boost rural revitalization. Additionally, enhancements in rural cultural and recreational spending positively correlate with rural developmental strides. Drawing from these insights, the study advocates for policy shifts towards nurturing digital green finance as a catalyst for rural revitalization, thereby steering China closer to its developmental ethos.*

Keywords: *Development of the digital economy at an environmental level; Green finance; Rural revitalization; Comprehensive measurement; Fixed effects model*

1. Introduction

The pursuit of rural revitalization stands as a pivotal component in the grand narrative of China's national rejuvenation. It aims not only at industrial growth but also at bridging the disparities between urban and rural locales, ameliorating the underdevelopment in the countryside, and promoting equitable resource distribution. Central to this strategy is the integration of green finance and digital economic advancement. Green finance, encompassing practices like green credit, insurance, and bonds, forms an essential segment of the contemporary financial paradigm. Its adoption within rural development constructs a sustainable financial infrastructure, fostering the preservation and efficient use of agricultural resources, thus accelerating rural modernization. Meanwhile, the expansion of digital technologies into rural areas brings transformative changes across social, economic, and environmental domains, enhancing the quality and efficiency of rural life and production systems. This synergistic approach heralds a new era of modern, sustainable rural environments integral to national progress.

The interplay of digital economy and green finance significantly advances rural revitalization, attracting considerable scholarly attention. Scholars like Dong Chunxiao[1] emphasize that tailored green financial activities should bolster the economic growth of rural areas to foster a sustainable revitalization strategy. Ouyang Hongbing[2] enhances this viewpoint by advocating for a stronger supply of green credit and improved quality of green insurance, alongside diversifying rural green financial products and fortifying support mechanisms.Furthermore, contributions from Ouyang Yuliang[3] and colleagues underscore that green finance cultivates rural prosperity by aiding sectors such as industrial growth, ecological sustainability, cultural development, governance, and lifestyle improvement. Xie Tingting and Feng Meiju's[4] recent findings also support that green finance elevates agricultural ecological efficiency, hence promoting rural development. However, Wu Zhijun[5] identifies regional disparities in how green finance aids rural revitalization, suggesting a need for localized strategies.On the digital front, Zhao Deqi[6] and his team delineate that digitalization propels rural revitalization by enhancing holistic value

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and establishing robust digital ecosystems. Following this, He Leihua[7]asserts that technological innovation and human capital are pivotal in leveraging the digital economy for rural rejuvenation. Nonetheless, Lei Wenying[8] points out existing hurdles in applying digital technologies to agriculture, recommending several initiatives to accelerate agronomic economic growth.These insights from varied researchers provide a comprehensive understanding of how digital economy and green finance can synergistically contribute to the sophisticated and dynamic process of rural revitalization.

Synthesising the existing literature, scholars have explored how the green finance and digital economy environments can serve rural revitalisation from a number of perspectives, and have achieved a series of research results that provide valuable references for this study. However, there are still three major shortcomings in the current study: first, although there have been studies that have theoretically explored the link between the digital economy and rural revitalisation, most of these discussions have remained at the theoretical level without forming a broad consensus, and lacked the support and validation of empirical experience. Second, there are fewer analyses of regional differences in the three areas of green finance, digital economic environment and rural revitalisation, and more research is needed to reveal the differences in these three systems and their causes in different regions. Finally, there is a lack of research in the existing literature on the impact of combining the two systems of digital economic development environment and green finance on rural revitalisation in the context of different levels of economic development. This study attempts to fill these gaps, and its marginal contributions are mainly reflected in the following two aspects: first, this paper explores the impact mechanism of green finance on rural revitalisation from the perspective of the level of development of digital economy through the method of empirical analysis, which provides new perspectives and data support for understanding the relationship between the two. Second, the empirical analysis in this paper reveals the changing trend of the differences between the three systems of green finance, digital economic environment and rural revitalisation across different provinces, i.e., these differences are gradually decreasing over time, which helps us to recognize that the balance of development in these areas is increasing across the region.

2. Theoretical Analysis and Research Methods

2.1 Theoretical analysis

First, green finance, as an important part of the modern financial system, covers such business areas as green credit, green insurance and green bonds. Its core purpose is to protect the environment, enhance the efficiency of resource use and achieve a sustainable cycle of social progress and resource use. Introducing green finance into rural revitalisation has become a general trend, [9]which helps to build a green financial system based on the unique resources of the countryside, so as to protect and rationally use agricultural resources and accelerate the pace of rural construction. The positive impact of green finance on rural revitalisation is manifested in many ways: it can meet the financing needs of rural development, strengthen the environmental management of rural areas, and promote the development and upgrading of new industries[10]. As the concepts of green production and sustainable development continue to take hold, the public's concern for sustainable rural development is increasing. This concern has enabled us to gain a deeper understanding of the current situation and challenges of rural governance. Therefore, green finance plays a crucial role in rural governance and development. It not only promotes innovation, entrepreneurship and talent attraction in the countryside, but also provides solid support and direction guidance for rural governance. Based on the above discussion, this paper proposes the following impact hypotheses:

H1:[11]The development of green finance can promote rural revitalization, and the development of high-quality green finance will promote the construction of rural revitalization.

Secondly, for the digital economy, with the deepening of networking and digitalization, the economy, society, environment and other fields are undergoing unprecedented changes. Digital technology is continuing to spread and penetrate into rural areas, resulting in significant changes in the material and social and cultural space of rural production and living systems. Rural development is gradually integrating into the mode and characteristics of the digital economic development environment,[12] showing new vitality and vitality.

On the one hand, the development environment of digital economy has improved the quality of rural life. The emergence of digital services enables farmers to trade through the network platform, which not only reduces transportation costs, but also reduces energy consumption and emissions caused by transportation. At the same time, the development environment of digital economy also promotes the

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diversified development of rural economy. On the other hand, the construction of digital infrastructure provides facilities and technical support for the improvement of rural livable environment. Farmers are the main body of energy saving and emission reduction in rural life. Rural[13]digital popularization provides digital environment support for accelerating the transformation of farmers' green and low-carbon lifestyle.Through the digital platform, farmers can learn advanced agricultural technology and improve agricultural production efficiency. In addition, the development environment of digital economy can promote the construction of rural ecological civilization. Policies and measures such as returning farmland to forestry and crop rotation and fallow have promoted the process of rural ecological environment management. Based on this, this paper puts forward the following assumptions:

H2: The development environment of digital economy plays a driving role in rural revitalization and development, and can play an effective role in agricultural production and rural life.

2.2 Research methods

(1) Entropy weight comprehensive index method

Entropy is a measure of the degree of dispersion of an index. It was first introduced by Clausius, a German physicist, in the course of studying energy conversion. Later, scientists discovered that entropy could be used to measure randomness and disorder. The greater the degree of dispersion of the index, the greater its influence on the comprehensive evaluation, and the smaller the entropy value. The entropy method involves these steps: first, selecting n regions and m indices representing the values of the jth index of the ith region; second, carrying out uniform processing on the indices, which includes standard processing to eliminate dimensional effects, and dividing the indices into positive and negative indices for dimensionless processing. The specific methods are the following:

$$X_{ij} = \frac{Xij - \min\{X_{ij},...,X_{nj}\}}{\max\{X_{1j},...,X_{nj}\} - \min\{X_{1j},...,X_{nj}\}} \quad (1)$$

$$Xij = \frac{\max\{X_{1j},...,X_{nj}\} - X_{ij}}{\max\{X_{1j},...,X_{nj}\} - \min\{X_{1j},...,X_{nj}\}} \quad (2)$$

Next, calculate the specific gravity:

$$P\mathrm{ij} = \frac{X\mathrm{ij}}{\sum_{\mathrm{i}=1}^{\mathrm{n}} X\mathrm{ij}}, \quad \mathrm{i} = 1,...,n, j = 1,...,m \quad (3)$$

Then, the entropy value and the information entropy redundancy are calculated:

$$ej = -k\sum_{i=1}^{n} pij \ln(pij) \quad (4)$$

$$\mathrm{dj} = 1 - \mathrm{ej} \quad (5)$$

Finally, calculate the weight of each index:

$$\mathrm{wj} = \frac{\mathrm{dj}}{\sum_{\mathrm{j}=1}^{\mathrm{m}} \mathrm{dj}} \quad (6)$$

On the basis of obtaining the weight of each index, the comprehensive index method is used to calculate the comprehensive index. Its measure formula is as follows:

$$F_{ij} = 1 - \frac{\sqrt{(w_1 - E_{1,ij})^2 + (w_2 - E_{2,ij})^2 + \cdots + (w_k - E_{k,ij})^2}}{\sqrt{w_1^2 + w_2^2 + \cdots + w_k^2}} \quad (7)$$

The given equation represents the weight of the kth dimension, where the index ranges from 0 to 1. An F value of 1 indicates the highest development level of inclusive finance at present, while an F value of 0 indicates the lowest. The equation $E_{\{k,ij\}} = w_k * X_{\{\{k,ij\}}$ is used to calculate the normalized value of the kth index in the jth year of the ith province.

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(2) Coefficient of variation, Theil index and coefficient of dispersion

Coefficient of variation is a statistical measure expressing the ratio of standard deviation to mean and is used to effectively reflect variation between individuals. The calculation process is as follows:

$$Vi = \frac{\sigma_i}{x_i}(i = 1,2,...,m) \tag{8}$$

This is computed by taking its coefficient of variation, its standard deviation and its average. The Theil index is a measure of the difference in level between the three systems of digital economic development environment, rural revitalisation and green finance. The model is as follows:

$$Tl = \frac{1}{n}\sum_{i=1}^{n}\left(\frac{D_{\theta i}}{\overline{D_{\theta i}}} \times \ln\frac{D_{\theta i}}{\overline{D_{\theta i}}}\right) \tag{9}$$

Among $D_{\theta i}$ Represents the average value of the three systems of the ith province, the closer the Theil index is to 0, the smaller the difference between provinces; The closer to 1, the greater the difference. The dispersion coefficient is a statistical measure of data dispersion. It is used to compare the degree of dispersion of two or more items when the unit of measurement is different from the average. A smaller dispersion coefficient indicates better stability, while a larger one indicates worse stability. The specific calculation formula is:

$$CV = \frac{s}{V} \tag{10}$$

where the numerator is the standard deviation and the denominator is the mean.

(3) Fixed effects model

This paper employs the two-way fixed effect model with clustering robust standard error for analysis. The model is set as follows:

$$Y_{it} = \alpha + \beta_1 X_1 + \beta_2 X_2 + \mu_i + \varepsilon_t + \delta_{it} + Z \tag{11}$$

Where i represents the region, t represents the year;μi fixed effect representing an individual;εt represents the fixed effect of time; δit Represents a random interference term; X1 represents the environmental level of digital economic development;X2 represents green finance, Y represents rural revitalization, and Z is the control variable.

3. Empirical analysis

3.1 Index system construction and data sources

Table 1: Rural revitalization evaluation index system

Level 1 indicator	Secondary indicators	Description of indicators	Attribute
The industry is flourishing	The basis of agricultural production capacity	Total power of agricultural machinery (10,000 kW) (X1)	+
		Grain per capita (kg/person) (X2)	+
	Agricultural production efficiency	Agricultural labor productivity (100 million yuan/10,000 people)(X3)	+
Ecological livability	Governance of Rural Human Settlement Environment	Number of public toilets (seats) (X4)	+
		The ratio of domestic waste transfer stations and special sanitation vehicles and equipment to the rural population. (%) (X5)	+
Rural civilization	Spread of traditional culture	Proportion of the number of rural cultural stations in the number of townships (%)(X6)	+
Governance is effective	Life of rural residents	Effective irrigation area of land (1000 hectares)(X7)	+
Live a rich life	Farmers' income level	Per capita net income of farmers (yuan)(X8)	+
		Rural retail sales of social commodities (100 million yuan)(X9)	+

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This paper uses the Rural Revitalization Index as the explanatory variable, along with the Green Finance Index and the Digital Economy Development Environment Level Index. The control variables are the rural green coverage rate and the per capita cultural and entertainment consumption expenditure of rural residents. The aim is to ensure accurate estimation results. To achieve rural revitalization, a comprehensive evaluation index system with five dimensions has been constructed, which is based on the principles of scientificity and rationality, and takes into account the "20-word policy" of the rural revitalization strategy outlined in the Report of the Nineteenth National Congress of the Communist Party of China. The research results of Cao Kaijun et al.[14](20-22) and Yang Xue[15](20-23) have also been referenced, while ensuring the availability and smoothness of data. Table 1 shows five first-level indicators of industrial prosperity, ecological livability, rural civilization, effective governance, and affluent life, along with their corresponding second-level indicators.

Green finance refers to investment and financing activities that can generate environmental benefits in support of sustainable development.This paper constructs the evaluation index system of green finance from three dimensions of green credit, green securities and green support[16]. As shown in table 2.

Table 2: Green Finance Evaluation Index System

	Level 1 indicator	Secondary indicators	Calculation or description of indicator	Attribute
Index system of green finance	Green Credit	Proportion of industrial interest expenditure with high energy consumption	Interest expenditure of six energy-intensive industries/total industry(Y1)	+
		Loan scale of environmental protection listed companies	Loans from A-share environmental protection listed companies/loans from A-share listed companies(Y2)	+
	Green Securities	Market value proportion of listed companies with high energy consumption	Total market value of six energy-intensive industries/total market value of a share(Y3)	+
		Proportion of market value of environmental protection enterprises	Total output of environmental protection companies/total market value of shares(Y4)	+
	Green support	Proportion of fiscal expenditure on environmental protection	Fiscal expenditure on environmental protection / General government fiscal expenditure(Y5)	+

In terms of the environment level of digital economic development, the digital rural development action plan (2022-2025) points out that the digital upgrading of rural information environment, service environment and application environment should be realized through the reliance on digital technology, and the evaluation index system of the environment level of digital economic development should be constructed from digital facilities, digital service environment and digital application environment. As shown in Table 3, the entropy weighting method is used to comprehensively measure the development environment index of rural digital economy[17].

Table 3: Index of the Level of Development of the Digital Economy

	Level 1 indicator	Secondary indicators	Calculation or description of indicator	Attribute
Environmental level of digital economy development	Digital facilities	Network popularity	Number of broadband internet connections (10,000 households)(Z1)	+
			Number of domain names on the Internet (10 thousand)(Z2)	+
		Mobile phone penetration	Density of mobile phone base stations (unit/km2)(Z3)	+
		Breadth of information dissemination	Optical fibre length per unit area(10,000/km)(Z4)	+
	Digital service environment	Software and Information Technology Services	Revenue from information services as a percentage of GDP (%)(Z5)	+
		Development level of post and telecommunications industry	Quantity of express delivery (10,000 pieces)(Z6)	+
		Environmental degree of enterprise digital economy development	Enterprise e-commerce transaction volume (100 million yuan)(Z7)	+
	Digital application environment	Digital innovation capability	Total transaction amount of technical contract (10 thousand yuan)(Z8)	+

These variables were measured by the ratio of rural green areas to total rural areas, and the ratio of

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rural cultural and recreational consumption spending to total rural spending[18].This article takes 30 provincial, autonomous regions and municipalities of China as the research sample. The data are obtained from China Statistics Yearbook, China Industry Statistics Yearbook, China Environment Statistics Yearbook, China Rural Statistics Yearbook, EPS database, China Leisure and Agricultural Statistics Yearbook, China Population and Employment Statistics Yearbook, Guotai'an CSMAR database, National Greenhouse Data System, Provincial Yearbook, etc. Outlier treatment was applied to the missing data, and normalization treatment was applied to the dimension difference.

3.2 Measurement results

Weighted scores for digital economy development environment level, green financing indexing scores, and rural revitalization indexing scores are presented in Table 4, Table 5, and Table 6, respectively. Due to space limitations, only the results of even years are shown in this article.

The weighting obtained using the green financial indicators system is presented in Table 4, which reflects the importance and influence of each index in the green financial system. Such as, the borrowing scale of environmental protection listed companies increased from 0.0098 in 2012 to 0.1960 in 2020, which shows that the proportion of borrowing scale of environmental protection listed companies in green finance has increased. This may mean that financial institutions are increasingly inclined to support the development of environmental protection enterprises.

Table 4: Weights of green financial indicators

Green finance weight result					
Index	2012	2014	2016	2018	2020
Y1	0.0098	0.0246	0.0261	0.3104	0.1960
Y2	0.1926	0.3637	0.5817	0.3440	0.2884
Y3	0.3846	0.1681	0.0775	0.0675	0.0735
Y4	0.2791	0.2614	0.1428	0.1586	0.2194
Y5	0.1338	0.1822	0.1720	0.1194	0.2226

The share of energy-intensive industries reached its highest level in 2014 at 0.3637, and then declined, but remained at a high level. This shows that high energy-consuming industries still occupy a place in the green financial system, but their proportion may fluctuate due to the influence of policies and markets. The share of the market value of environmental protection companies gradually decreases from 0.3846 in 2012 to 0.0735 in 2020, indicating that the share of the market value of environmental protection companies in green finance is decreasing. This may be due to the expansion of the market size and the increase of other types of green enterprises and projects, resulting in changes in the relative proportion.

Table 5: Weighting Results of Environmental Indicators for Digital Economy Development

Weighting Results of Digital Economy Development Environment					
index	2012	2014	2016	2018	2020
Z1	0.0411	0.1567	0.2136	0.2328	0.1728
Z2	0.0780	0.2238	0.2404	0.2584	0.2453
Z3	0.0701	0.1919	0.2815	0.1914	0.0477
Z4	0.0059	0.0381	0.0363	0.0393	0.1022
Z5	0.0307	0.1925	0.1191	0.1144	0.1229
Z6	0.0277	0.0740	0.0282	0.0435	0.0973
Z7	0.0001	0.0017	0.0059	0.0171	0.0599
Z8	0.7244	0.0337	0.0248	0.0455	0.0632
Z9	0.0220	0.0876	0.0502	0.0577	0.0887

The weight scores for the environment for the growth of the digital economy reflect the evolution of different aspects of the digital economy. In particular, the weights for the quantity of internet connections and the number of broadband users increase over time, indicating that internet infrastructure is becoming increasingly important for the evolution of the digital economy. The weight of the number of domain names decreased slightly after reaching the highest level in 2014, reflecting the relative importance of the number of domain names on the Internet over time. The weight of mobile base station density has increased, indicating that the contribution of mobile communications infrastructure to the digital economy has increased. The weight of long-distance optical cable length per unit area remains high, indicating that communication infrastructure is crucial to the development of digitalization. The increase in the share of income from information technology services in GDP indicates that the status of the information technology services industry in the national economy has improved. The increase in the

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weight of express delivery reflects the importance of the logistics industry in digital transformation. The e-commerce transaction volume of enterprises is still one of the key indicators to measure the development of the digital economy. The weight of the total turnover of technology contracts shows the importance of technological innovation and technology transfer in the development of digitalization.

Table 6: Rural Revitalization Index Weight Results

Weight results of Rural Revitalization					
Index	2012	2014	2016	2018	2020
X1	0.2818	0.2384	0.1277	0.1177	0.1121
X2	0.0777	0.0721	0.0676	0.0960	0.1181
X3	0.0350	0.0399	0.0464	0.0526	0.0842
X4	0.0395	0.0468	0.0185	0.0310	0.0204
X5	0.0420	0.1427	0.1680	0.1214	0.2119
X6	0.0397	0.0025	0.0097	0.0045	0.0039
X7	0.3603	0.2972	0.3078	0.2607	0.2235
X8	0.0494	0.0464	0.0661	0.0818	0.0858
X9	0.0745	0.1140	0.1882	0.2343	0.1401

The weight results of each evaluation index of the regeneration of rural areas show the importance of all aspects of the regeneration of rural areas. For example, the weight of total power of agricultural machinery decreased from 0.2818 in 2012 to 0.1121 in 2020, indicating that its relative importance decreased over time. The weight of grain holdings per capital has risen to 0.1181 in 2020, indicating an increased focus on food security. The weight of agricultural labour productivity increased over time, from 0.0350 in 2012 to 0.0842 in 2020, reflecting the importance of improving production efficiency. The weight of public toilets decreases from 0.0395 in 2012 to 0.0204 in 2020, indicating a slowdown in the growth rate of infrastructure construction. The weight of the total amount of domestic waste transfer stations and sanitation vehicles increased to 0.2119 in 2020, indicating that environmental protection and sanitation facilities have become the focus.

From 2012 to 2020, the average level of the three index systems across provinces increases each year, as shown in Table 7: First, for the digital economy, it has gradually increased from 0.0546 in 2012 to 0.2284 in 2020, which shows that the digital economy is playing an increasingly important role in the economic environment as a whole. Secondly, for Rural Revitalization, the index fluctuated from 0.2647 in 2012 to 0.2679 in 2020, which shows that the state continues to pay attention to and invest in Rural Revitalization. Although the growth rate fluctuates, the overall level remains relatively stable, indicating that the policy support for Rural Revitalization has been strong. The steady progress of rural revitalization will help reduce the gap between town and country, enhance the living standards of rural residents, and provide a wide range of applications and market potential for the digital economy. Finally, for green finance, it increased from 0.2326 in 2012 to 0.3761 in 2015, and then decreased to 0.3104 in 2020. The evolution of green finance reflects the importance society attaches to sustainable development, particularly in the areas of environmental protection and climate change. This fluctuation may be related to global and domestic economic policies, market demand and technological innovation.

Figure 1, Figure 2 and Figure 3 show the trends of three different coefficients between 2012 and 2022. Specifically, there are Coefficient of variation, Theil index, and Diffusion coefficient. The three charts show the difference between the composite index of each region in each year. The smaller the difference, the more balanced the development of each region. Figure 1 shows the analysis chart of regional variations in the evolution of the digital economy. With the speed of advances in science and engineering, especially the proliferation of the Internet and mobile communications technology, the digital economy has expanded rapidly, enabling more regions and enterprises to participate in the digital economy.

Table 7: Diverse Year Averages of the Composite Index for the Three Systems

Indicators	Digital economy development environment	Rural revitalization	Green Finance
2012	0.0546	0.2647	0.2326
2013	0.0762	0.2118	0.2740
2014	0.0899	0.2504	0.3292
2015	0.1449	0.2485	0.3761
2016	0.1646	0.2542	0.3977
2017	0.1605	0.2597	0.2746
2018	0.2176	0.2597	0.2604
2019	0.2270	0.2632	0.2979
2020	0.2284	0.2679	0.3104

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Figure 2 shows the difference analysis chart of Rural Revitalization. From 2010 to 2020, these indicators show different degrees of fluctuation and change. The dispersion coefficient showed an upward trend in most years, while the dispersion index and the Theil index showed a more complex pattern of fluctuation. On the whole, the differences among the three coefficients become smaller. Figure 3 shows the difference analysis chart of green finance. It can be observed that from 2010 to 2014,the difference between regions showed a downward trend year by year. In 2016, the difference suddenly increased. It is possible that the government's policy support for green finance may be different in different regions. Some regions may introduce more policies to encourage and support the growth of green finance, while other regions have relatively few relevant policies. After 2016, the regional differences gradually returned to normal.

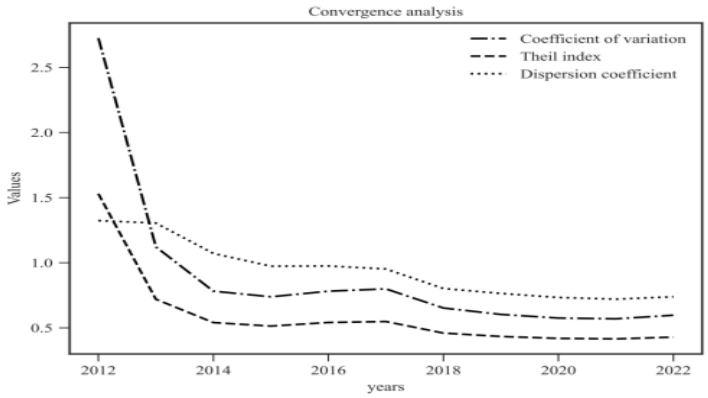

Figure 1: Analysis of Environmental Differences in Digital Economic Development

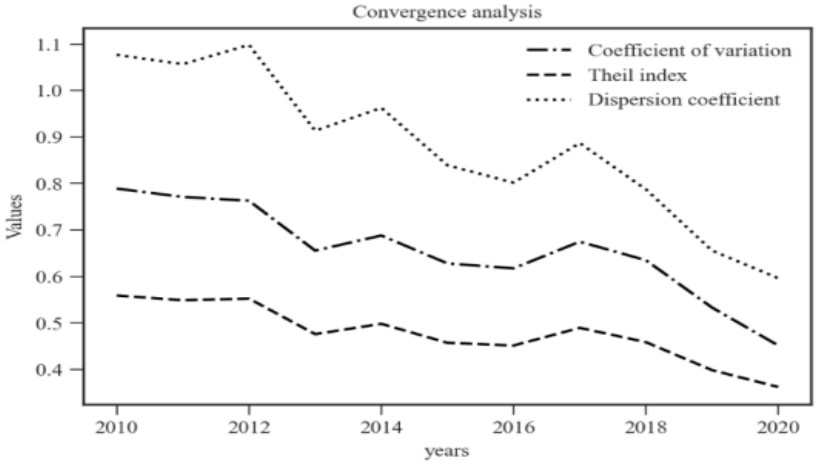

Figure 2: Difference Analysis of Rural Revitalization

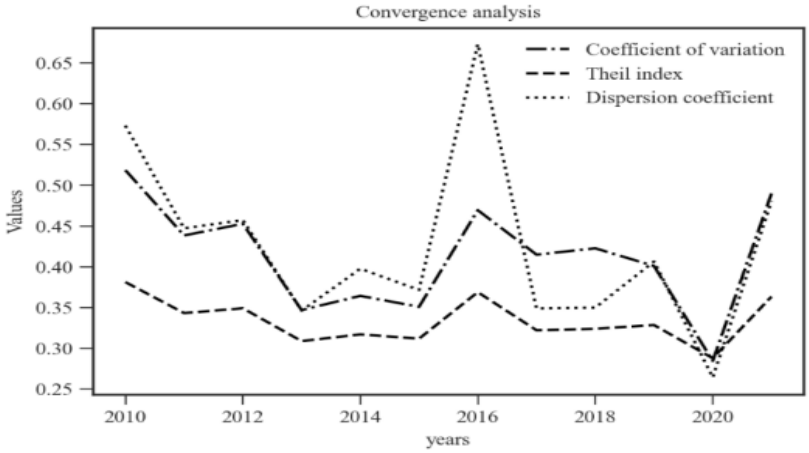

Figure 3: Difference Analysis of Green Finance

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3.3 Mechanism of influence

From Table 8, we find that the enhancement of the development environment of the national digital economy and the development of green finance, as well as the increase in the per head expenditure of rural residents on cultural and amusement consumption, have a significant positive effect on the revitalisation of rural areas.

For example, with the popularisation of broadband network and mobile internet in rural areas, the digital infrastructure in rural areas has been significantly improved, which provides the basic conditions for the digital transformation of rural economy. At the same time, green finance can promote the development of energy-saving and emission-reduction projects and environmental protection industries in rural areas through the provision of financial assistance, which will greatly facilitate the implementation of the rural revitalisation policy.

Table 8: Fixed effect model results

Index	Coef.	Robust Std. Err.	t	P>ltl
Number	0.4598043	0.1897793	2.42	0.022
Green	0.3278948	0.1624556	2.02	0.053
consume	0.0002801	0.0001153	2.43	0.022
Green1	0.0182101	0.0155994	1.17	0.253
Area	yes	yes	yes	yes
Year	yes	yes	yes	yes

4. Conclusions and recommendations

This paper empirically analyses the impact of green finance and digital economy development environment on rural revitalization development through the panel data model.First, the level of digital economy development environment, green finance and rural revitalization development index are measured through the entropy method by selecting provincial panel data from 2012 to 2020. Second, using two-way fixed effects models, we find the level of digital economy development environment and green finance are important in promoting rural revitalization. Third, the development of rural revitalisation will also be improved by improving the per capita cultural and entertainment consumption expenditure of rural residents. This paper puts forward the following suggestions based on the conclusion of the call:

Firstly, it proposes to take an active role in promoting the development of green finance. It will effectively reduce environmental damage, improve the income level of local people and provide sustainable development power for rural agriculture. Given this, it is proposed that green financial activities, such as green credit and carbon finance, should be given preferential tax treatment. Competent departments should establish and improve incentive mechanisms to encourage wider implementation of green finance in rural regions. Meanwhile, practice has shown that the role of green finance in promoting rural regeneration differs in areas with different levels of economic progress.

Secondly, in order to promote the overall revitalization of the countryside, this paper suggest that we should further strengthen the digital construction of the countryside. The digitalization of rural areas plays a vital role in improving the operational efficiency and service quality of green finance. By strengthening the construction of digital countryside, this paper suggest that we can improve the scientific decision-making level and talent cultivation ability in rural development, build a "green financial data platform", and then improve the supporting system of green finance, so as to provide solid green financial support for the realization of rural revitalization.

Thirdly, in order to strengthen agricultural support, relevant policies must be formulated. Relevant government departments should proceed from the overall situation, carefully plan the allocation of financial funds for supporting agriculture, and increase financial investment in agriculture, forestry and water affairs and projects of returning farmland to forestry. Government departments should increase financial subsidies for forestry and deepen cooperation with farmers in order to continuously release the positive effects of forestry economy on rural revitalization.

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