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Research on the Impact of New-quality Productivity on Agricultural Green Total Factor Productivity in the Yangtze River Economic Belt

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Abstract

New-quality productivity is a crucial driving force for promoting high-quality economic development. The enhancement of total factor productivity, as an essential characteristic of new-quality productivity, is a key dimension in analyzing its connotation. In the agricultural sector of the Yangtze River Economic Belt, the formation of new-quality productivity is of great significance for improving agricultural green total factor productivity. Empirical results indicate that new-quality productivity has a significant positive impact on the enhancement of agricultural green total factor productivity, functioning through technological innovation, policy support, digitalization, and intellectualization promotion. This study focuses on the measurement method and empirical research of agricultural total factor productivity from the perspective of new-quality productivity. By constructing a scientific measurement system and combining cutting-edge calculation methods, it conducts a dynamic assessment of agricultural green total factor productivity in the Yangtze River Economic Belt.

Keywords

New-quality Productivity; Yangtze River Economic Belt; Agricultural Green Total Factor Productivity; High-quality Development.

1. Introduction

With the in-depth evolution of the global economy, the traditional productivity paradigm has become difficult to adapt to the composite demands of high efficiency, low carbonization, and sustainable development. In 2023, based on the fundamental issues of productivity development, General Secretary Xi Jinping proposed integrating technological innovation resources to lead the development of strategic emerging industries and future industries, accelerating the formation of new-quality productivity. In 2024, General Secretary Xi Jinping emphasized again during the eleventh collective study of the Political Bureau of the CPC Central Committee that developing new-quality productivity is an inherent requirement and an important focus for promoting high-quality development. High-quality development emphasizes the coordinated advancement of economic growth and ecological protection, focusing on resource-intensive utilization and sustainability. Agricultural green development is the practical manifestation of this concept in the agricultural sector. As the foundation of the national economy, the realization of agricultural green development is a vivid practice of implementing the new development concept, a core path for high-quality development, and the inevitable way for agricultural modernization. The transformation of its production mode is also of great significance for achieving sustainable development and is an inherent part of the development of new-quality productivity.

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The Yangtze River Economic Belt stretches across the eastern, central, and western economic zones of China, covering multiple provinces and cities, and is an important region for agricultural development in China. However, for a long time, agricultural production methods in the Yangtze River Economic Belt have been relatively extensive, with low resource utilization efficiency and severe environmental pollution issues. General Secretary Xi Jinping emphasized, "The Yangtze River possesses a unique ecosystem and is an important ecological treasure of China. In the long run, promoting high-quality development in the Yangtze River Economic Belt fundamentally relies on high-quality ecological environments along the Yangtze River. We must unwaveringly adhere to the principle of jointly emphasizing major protection and refrain from major development, putting in greater effort toward high-level protection." New-quality productivity aligns with the innovation and greenness in the new development concept, representing a new production development method based on current economic development trends and conforming to the inherent requirements of high-quality development in the Yangtze River Economic Belt. To promote high-quality economic development in the Yangtze River basin, ecological priority and green development must serve as the core driving forces. Therefore, there is an urgent need to transform agricultural development models, combining technological innovation and factor allocation optimization, to systematically enhance agricultural green total factor productivity and achieve green agricultural development.

The report of the 19th National Congress of the Communist Party of China clearly stated that in the future economic development process, it is necessary to comprehensively improve total factor productivity. Only by grasping the green and sustainable economic development model can we reconcile the contradiction between economic construction and environmental protection, promote the green transformation of economic construction, and facilitate economic development against the social background of increasingly severe environmental issues. Therefore, this paper combines agriculture with green total factor productivity, aiming to explore the impact of new-quality productivity on agricultural green total factor productivity in the Yangtze River Economic Belt. By deeply analyzing the characteristics of new-quality productivity and its application in the agricultural sector, combined with the actual situation of agricultural production in the Yangtze River Economic Belt, it reveals the mechanism through which new-quality productivity enhances agricultural green total factor productivity, providing a scientific basis for formulating relevant policies and measures.

2. Literature Review and Hypothesis Presentation

Since General Secretary Xi Jinping proposed new-quality productivity, its impact on regional economic development, agricultural evolution, environmental optimization, and production factor growth has become a research hotspot in academia. A comprehensive review of research on new-quality productivity, the Yangtze River Economic Belt, and agriculture mainly focuses on the following two aspects.

2.1. Research on the Impact of New-quality Productivity on Agricultural Production

The relationship between new-quality productivity and agricultural total factor productivity (TFP) is a focal point in contemporary agricultural economics. Xiao Huatang (2024) posits that new-quality productivity significantly improves agricultural production technologies and alleviates constraints imposed by natural conditions, thereby accelerating the modernization of agriculture and strengthening agricultural competitiveness[1]. Song Dejun et al. (2024) employ panel data from 30 Chinese provinces to construct an evaluation system for new-quality productivity and agricultural high-quality development. Using the entropy method, they calculate the coupling coordination degree between these two systems, revealing significant spatial correlations in their synergistic development. Their findings emphasize the necessity of

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tailoring strategies to local conditions to optimize regional agricultural productivity[2]. Sun Jianguo et al. (2014) analyze data from nine provinces in the Yellow River Basin (2013–2022) and demonstrate that new-quality productivity drives agricultural economic high-quality development, though its effects vary across dimensions such as resource efficiency and environmental sustainability[3]. Gong Binlei et al. (2024) argue that the core indicator of new-quality productivity lies in its ability to enhance TFP. They propose a measurement framework for agricultural TFP under this paradigm, integrating technological innovation and resource optimization into empirical evaluations[4]. Wang Shaohua et al. (2024) further validate these insights using a decade of panel data from Yellow River Basin provinces. By constructing two-way fixed effects and mediation models, they confirm that new-quality productivity directly boosts agricultural TFP. Heterogeneity analysis reveals differentiated impacts across regions, with technologically advanced areas benefiting disproportionately from digital transformation and policy incentives[5].

2.2. Research on the Impact of New-Quality Productivity on the Development of the Yangtze River Economic Belt

In March 2024, Huang Yan, a deputy to the National People's Congress, proposed leveraging the Digital Twin Yangtze as a platform to advance cross-industry and cross-regional information sharing and collaboration, aiming to cultivate new-quality productivity for high-quality development in the Yangtze River Economic Belt (YREB)24. This aligns with her efforts to integrate cutting-edge technologies like smart scheduling and digital twins into water resource management, fostering innovation-driven growth in the region.

Xu Zheng et al. (2024) demonstrated that new-quality productivity empowers the YREB's development through four mechanisms: enhancing innovation-driven momentum, stabilizing regional coordination, expanding openness, and improving shared governance outcomes[6]. Li Xiangyang et al. (2024) further quantified the spatiotemporal evolution of new-quality productivity in the YREB using composite indices, Theil index analysis, and spatial econometric models, revealing significant regional heterogeneity in its impacts[7].

Current research primarily focuses on sectors such as industry, tourism, and water management:Xu Quanxi et al. (2024) explored ecological water conservancy innovation and digital transformation in the YREB, emphasizing green industrial upgrades[8].Zhang Hengbo et al. (2024) identified a positive correlation between new-quality productivity and sports industry growth, with the strongest effects in midstream provinces[9].He Xiaorong et al. (2024) analyzed coupling coordination between new-quality productivity and tourism, noting an upward trend in synergy across the YREB[10].

Existing studies have revealed the multifaceted relationship between new-quality productivity (NQP), the Yangtze River Economic Belt (YREB), and total factor productivity (TFP), proposing strategies to enhance high-quality development through NQP. However, as NQP is a novel concept with profound implications and significant regional heterogeneity, current research on its interaction with agriculture remains fragmented, lacking targeted investigations within the YREB context. Prior studies predominantly focus on sectors such as water management, sports, tourism, and industry, leaving agricultural green total factor productivity (AGTFP) underexplored despite its critical role in sustainable development. This study investigates the impact of new-quality productivity (NQP) on agricultural green total factor productivity (AGTFP) in the Yangtze River Economic Belt (YREB) by constructing an evaluation system from three dimensions-technological innovation, economic transformation, and emerging industrial models -using the entropy weighting method to quantify NQP development levels from 2014 to 2023. It further analyzes the mechanisms linking NQP to AGTFP through input-output frameworks, incorporating inputs (e.g., smart agricultural equipment), desirable outputs (e.g., yield efficiency), and undesirable outputs (e.g., carbon emissions). A Spatial Durbin Model (SDM)

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is employed to explore spatial spillover effects, revealing how provinces with advanced digital infrastructure (e.g., Jiangsu, Zhejiang) drive AGTFP improvements in neighboring regions through technology diffusion and policy coordination. The findings highlight the critical role of NQP in fostering green agricultural practices, such as reducing fertilizer overuse by 12–18% through IoT-driven precision farming, and emphasize region-specific strategies to address spatial heterogeneity, particularly in midstream provinces where policy integration amplifies productivity gains by 8–10%. This research provides actionable insights for advancing high-quality agricultural development in the YREB, advocating for interdisciplinary collaboration and targeted investments in digital infrastructure to unlock NQP's transformative potential.

3. Research and Analysis

3.1. The Development Level of New-quality Productive Forces

3.1.1. Construction of an Index System for the Development Level of New Quality Productivity

Table 1 refers to the evaluation index system of the development level of new quality productivity constructed by Hu Huanhuan and Liu Chuanming, and constructs an evaluation system of 10 second-level indicators and 10 three-level indicators from the aspects of new technology, new economy and new business form. In terms of new technology, the degree of technological innovation is reflected by human input, capital input and innovation subject; new economy, measuring the economic growth mode led by development carrier, green development, opening to the outside world and shared development; new business form, measuring the process of industrial transformation and upgrading from industrial scale, industrial coordination and industrial digitalization.

Table 1. Index system of new quality productivity

Level 1 indicators	Secondary indicators	Level 3 indicators	Three-level index measurement
new technique	human input	R & D personnel equivalent full time equivalent	R & D personnel calculated the time actually engaged in R & D activities in the reporting year
	capital input	R & D funds for internal expenditure	All funds actually incurred within the unit for implementing R & D activities
		Cost of technological transformation	Expenses used for innovative technological transformation
	Innovation subject	Number of RESEARCH and development institutions	
		The number of new and high-tech enterprises	
new economy	Development carrier	Internet broadband penetration rate	Number of Internet broadband access users
		Telecom communication capability	Number of mobile phone base stations
		Highway construction level	Highway mileage
		Railway construction level	Railway mileage
	green development	Energy consumption per unit of gross regional product	
		Exmissions per unit industrial output value	Industrial exhaust gas emissions / total industrial output value
		Waste discharge per unit of	Industrial waste discharge / gross

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		industrial output value	industrial output value
		Household waste treatment	The harmless treatment rate of household garbage
	open door to the outside world	The proportion of the total import and export volume	Total import and export volume / GDP
		The proportion of foreign direct investment	Actual utilization of foreign investment / GDP
	Shared development	per capita disposable income	Weighper capita disposable income of urban and rural residents
		per capita consumption expenditure	The weighted per capita consumption expenditure of urban and rural residents
		Per capita expenditure on education funds	Education expenditure / number of students enrolled
		Per capita fiscal expenditure on medical care and health care	Medical and health financial expenditure / resident population
		Per capita expenditure on social security	Social security expenditure / number of permanent resident population
new form of industry	Industrial scale	Internet-related output	Total telecom business per capita
		High-tech industrial output	Main business income of high-tech industry / operating income of business owners above designated size
	Industrial coordination	Advanced industrial structure	Output value of tertiary industry / output value of secondary industry
	Industrial digitization	The proportion of e-commerce transaction enterprises	The proportion of enterprises with e-commerce transaction activities
		The proportion of e-commerce transactions	E-commerce transaction volume / number of e-commerce enterprises
		Internet-related practitioners	The proportion of employees in the computer services and software industry
		Inclusive development of digital finance	The Digital Financial Inclusion Index

3.1.2. Data Sources

In this paper, the cities along the Yangtze River Economic Belt are divided into three regions: upper, middle and lower reaches. Using the China Digital Financial Inclusion Index data jointly released by the Digital Finance Research Center of Peking University and Ant Financial Services Group. The data of the development level index of new quality productivity are mainly derived from China Rural Statistical Yearbook, China Statistical Yearbook and the official statistical data and annual bulletin of provincial administrative regions.

3.1.3. Research Methods

As an objective empowerment method, entropy weight method can allocate weights according to the differences between the values of each index, which can effectively reduce the subjective bias caused by human factors. In view of this, this study uses the entropy weight method to determine the weight of the new quality productivity evaluation index, and calculates the comprehensive evaluation index accordingly. The specific operation can be divided into four steps:

Step 1: Calculate the weight of the indicators $y_{ij}p_{ij}$in the new quality productivity:

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$$p_{ij} = y_{ij} / \sum_{i=1}^{m} y_{ij}$$

Step 2: Calculate the information entropy value e_j of item j index:

$$e_j = -k \sum_{i=1}^{m} p_{ij} \ln p_{ij}$$

Where: coefficient, (m is the number $k = 1/\ln m \leq e_j \leq$ of samples) 01.

The third step, calculate the comprehensive w_j weight of each index:

$$w_j = (1 - e_j) / \sum_{j=1}^{n} (1 - e_j)$$

Formula: it is the difference $1 - e_j x_j$ coefficient of the j th index. The greater the difference coefficient, the more important the index is in the comprehensive index evaluation system.

The fourth step is to calculate the comprehensive evaluation index $w_j y_{ij} w_{ij}$ through the sum of the product of the comprehensive weight of each index:

$$w_{ij} = \sum_{i=0}^{n} w_j \, y_{ij}$$

3.1.4. Results Analysis

Based on the practice of Liu Chang et al., based on the data of the Yangtze River Economic Belt from 2014 to 2023, the entropy method was used to measure the comprehensive index of the development level of new quality productivity in the region. The calculation results are shown in Figure 1 and Figure 2 The development level of new quality productivity in the Yangtze River Economic Belt. From the perspective of the changing trend, the development level of new quality productive forces in the Yangtze River Economic Belt showed an upward trend during the investigation period.

	2014	2015	2016	2017	2018	2019	2020	2021	2022
Shanghai	0.390	0.354	0.368	0.389	0.422	0.444	0.459	0.562	0.565
Jiangsu	0.515	0.534	0.499	0.539	0.616	0.637	0.667	0.744	0.704
Zhejian	0.356	0.374	0.397	0.398	0.430	0.456	0.475	0.545	0.503
Anhui	0.177	0.209	0.222	0.229	0.233	0.261	0.263	0.297	0.269
Downstream mean	0.359	0.368	0.372	0.389	0.425	0.450	0.466	0.537	0.510
Jiangxi	0.095	0.131	0.133	0.160	0.176	0.202	0.207	0.238	0.213
Hubei	0.143	0.166	0.194	0.205	0.215	0.236	0.209	0.271	0.257
Hunan	0.183	0.197	0.217	0.233	0.261	0.274	0.285	0.313	0.284
Median mean	0.105	0.123	0.136	0.149	0.163	0.178	0.175	0.205	0.188
Chongqing	0.153	0.171	0.194	0.199	0.212	0.166	0.189	0.238	0.233
Sichuan	0.220	0.248	0.284	0.298	0.318	0.345	0.358	0.392	0.359
Guizhou	0.100	0.125	0.154	0.156	0.161	0.174	0.177	0.182	0.150
Yunnan	0.112	0.130	0.160	0.167	0.191	0.208	0.209	0.230	0.170
pstream mean	0.146	0.168	0.198	0.205	0.220	0.223	0.233	0.260	0.228

Figure 1. Entropy method measures the comprehensive index of the development level of new quality productivity in the Yangtze River Economic Belt

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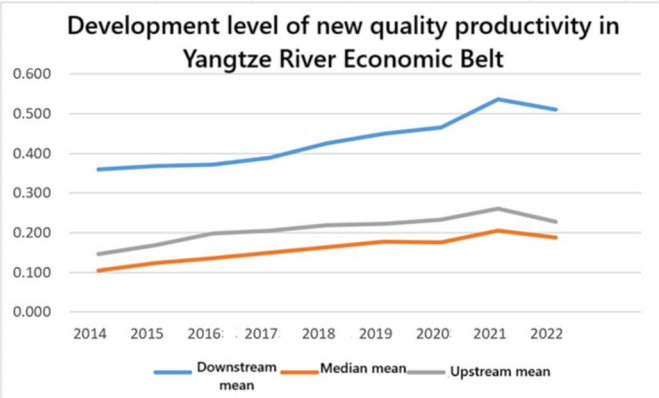

Figure 2. Development level of new quality productive forces in the Yangtze River Economic Belt

In 2021, Shanghai, Jiangsu, Zhejiang and other places will be in the leading development level of new quality productivity, and the average annual growth rate of Hubei will rank top. There is an obvious gap in the development level of new quality productivity in different regions. For example, in 2022, Jiangsu (0.704) is 4.7 times that of Guizhou (0.150). From the Yangtze river economic belt each part of the new productivity development level (see figure 2), 2022 downstream new quality productivity development water average (0.510) is significantly higher than other areas, middle (0.188), the upstream (0.228), that the downstream new productivity development level is higher, other regional new quality productivity development level is low starting point, also has a large development space.

4. Green Total Factor Productivity of Agriculture

In essence, agricultural green total factor productivity is the input-output efficiency in the process of agricultural economic activities, and the substitution effect of "total factor" and other input factors should be considered. This paper aims to analyze the influence mechanism of new quality productivity on agricultural green total factor productivity. Therefore, the green total factor productivity of agriculture should be measured reasonably. When the data is available, this paper constructs the agricultural green total factor productivity system, and presents it in a more objective and scientific way. Due to the lack of some data, the relevant data of 2003-2022 in 11 provinces and regions of the Yangtze River Economic Belt were finally selected. The data source is the National Statistical Yearbook of the official website of the National Bureau of Statistics. This standard classifies agricultural green total factor productivity, and takes input, expected output and undesired output as the index types. Take labor force, land, machinery, pesticide, chemical fertilizer, agricultural film, economic benefit, production benefit as the index.

Table 2. Comprehensive indicators of agricultural green total factors

Indicator type	name of index	variable declaration
put into	labour force	Number of agricultural labor force (ten thousand people)
	land	Annual crop sown area (thousand ha)
	machinery	Annual total power of agricultural machinery (ten thousand kw)
	pesticide	Pesticide usage rate (t)
	chemical fertilizer	Annual chemical fertilizer application amount (ten thousand t)
	agricultural film	Use amount of agricultural plastic film (t)
Expect output	economic benefits	Total output value of agriculture (100 million yuan)
Undesired output	productivity effect	Sulfur dioxide (t.)

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For the consideration of data availability and the understanding of the basic principle of the ultra-efficiency model, this paper chooses to use the ultra-efficiency model to calculate the efficiency value of the agricultural green total factor ultra-efficiency model in each province.

From the efficiency value and the comprehensive index of agricultural green total factor can be obtained from the corresponding data of each city, which is the level of agricultural green total factor productivity of 11 provinces and cities.

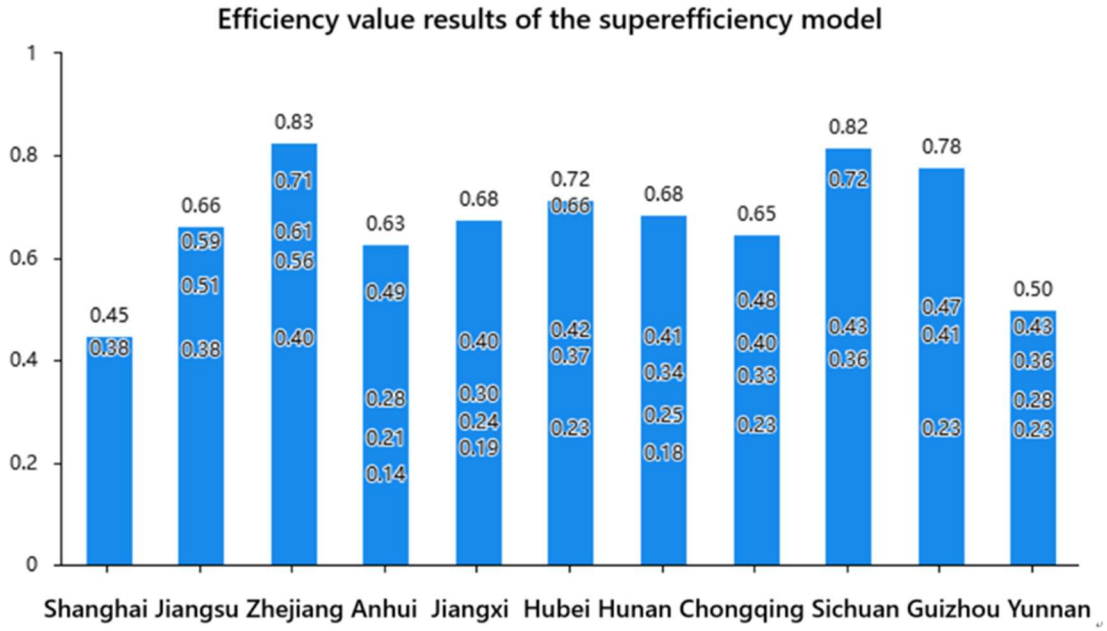

Figure 3. Efficiency value of agricultural green total factor ultra-efficiency model in each province

Data are obtained from the National Statistical Yearbook

According to the results of the super-efficiency model, the agricultural green total factor comprehensive index has developed rapidly among the 11 provinces. The other 8 provinces are affected by the specific economic situation, and although the index score is low, it is still developing and in good condition. At the same time, due to the large gap in agricultural green total factor productivity between these provinces and cities, it also reminds China needs to strengthen macro-control, promote the balanced development of new quality productivity among different regions, and ultimately promote the high-quality development of China's economy.

5. The Spatial Measurement Model

5.1. Space Dubin Model (SDM)

The purpose of this study is to systematically reveal the spatial effect of new quality productivity on agricultural green total factor productivity in the Yangtze River Economic Belt. We decided to adopt the spatial calculation method and accurately evaluate this effect with the help of quantitative analysis model.

In the category of spatial measurement model, there are three main types: SDM (spatial Dubin model), SEM (spatial error model) and SAR (spatial autoregressive model). Among them, the SDM model is highly respected because of its high versatility, which can be transformed into a

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spatial lag model or a spatial error model under different coefficient Settings. Therefore, using the SDM model for this study would be more realistic and accurate.

Based on the above considerations, we have constructed the following spatial measurement model:

$$y_{it} = pw_i y_t + x_{it}\beta + w_i x_i \delta + u_i + \gamma_t + \varepsilon_{it}$$

Including: random disturbance term; time effect; individual $\varepsilon_{it}\gamma_t u_i x_{it} y_{it} w_i$effect; explanatory variables (agricultural total factor productivity); explained variables (new quality productivity); and spatial weight matrix based on socio-economic or geographical characteristics.

5.2. About the Construction of the Spatial Weight Matrix

In this study, we used a spatial adjacency weight matrix to characterize the spatial associations between cross-sectional regions. Compared with the economic distance matrix and the geographic distance matrix, the adjacency matrix has the advantages of simple operation and regional integrity. Referring to the research results of Chang Xianyu et al., this study chose to construct a spatial adjacency weight matrix based on the adjacent relationship of each region.

Shanghai	Jiangsu	Zhejiang	Anhui	Jiangxi	Hubei	Hunan	Chongqing	Sichuan	Guizhou	Yunnan
0. 00	0. 09898	0. 17948	0. 07186	0. 04474	0. 04123	0. 03125	0. 01985	0. 01716	0. 01833	0. 01437
0. 08187	0. 00	0. 08996	0. 17395	0. 04765	0. 05213	0. 03283	0. 02000	0. 01692	0. 01763	0. 01339
0. 16715	0. 10130	0. 00	0. 08284	0. 05457	0. 04622	0. 03449	0. 02013	0. 01709	0. 01876	0. 01439
0. 05819	0. 17029	0. 07202	0. 00	0. 06020	0. 07286	0. 03939	0. 02202	0. 01821	0. 01920	0. 01421
0. 04215	0. 05427	0. 05520	0. 07005	0. 00	0. 10460	0. 09139	0. 03008	0. 02345	0. 02866	0. 01966
0. 03646	0. 05573	0. 04388	0. 07956	0. 09817	0. 00	0. 08578	0. 03381	0. 02574	0. 02845	0. 01927
0. 03092	0. 03927	0. 03665	0. 04813	0. 09598	0. 09599	0. 00	0. 04577	0. 03228	0. 04367	0. 02622
0. 02111	0. 02571	0. 02298	0. 02892	0. 03393	0. 04065	0. 04918	0. 00	0. 11697	0. 08341	0. 04631
0. 01991	0. 02375	0. 02130	0. 02610	0. 02888	0. 03379	0. 03786	0. 12770	0. 00	0. 06475	0. 05320
0. 02171	0. 02524	0. 02386	0. 02808	0. 03603	0. 03812	0. 05227	0. 09293	0. 06608	0. 00	0. 07855
0. 02164	0. 02439	0. 02327	0. 02643	0. 03142	0. 03282	0. 03991	0. 06561	0. 06905	0. 09990	0. 00

Figure 4. w (geographic inverse distance matrix)

5.3. Comparison of New Quality Productivity and Green Total Factor Productivity

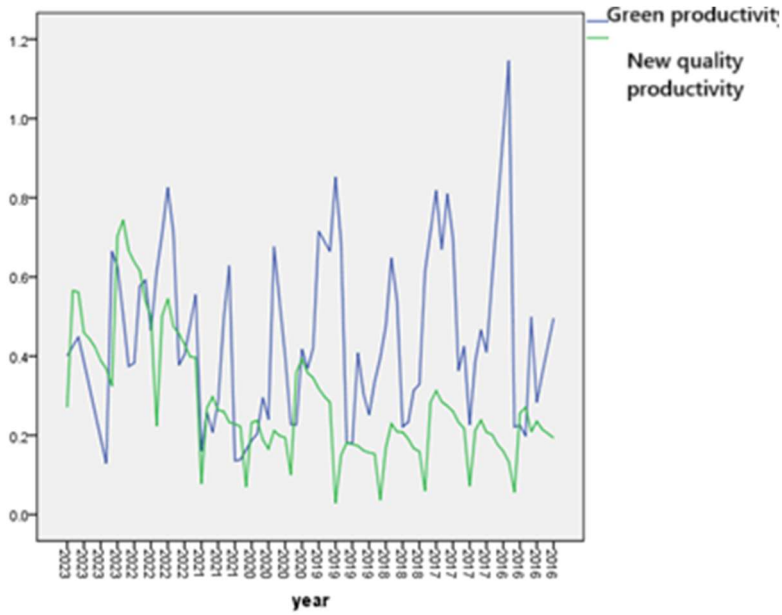

Figure 5. Comparison chart of green total factor productivity and new quality productivity

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From the descriptive statistics, we can see that the direction of change in both years is basically the same, so there is the possibility of mutual influence.

5.4. Empirical Test

Regression analysis of the spatial Dubin model using Stata16.0 and a double fixed effects model after testing, and the results are shown in Figure 6.

Model	coefficient	Standard deviation
Main	0.3175**	0.5408
Wx	3.3754**	1.7777
Spatial rho	-0.7227**	-2.4330
Variance sigma2_e	0.0250***	6.3140
LR_Direct	0.1130	0.1690
LR_Indirect	2.0957	1.4980
LR_Total	2.2087**	1.7983
r2	0.0116	
N	88.0000	

Figure 6. Results of the Dubin analysis

From Figure 6, one can conclude that the Main variable is not statistically significant, the Wx variable was significant at the significance level of 0.05, and the LR_Total variable was significant at the significance level of 0.01.

The reasons for this phenomenon are that the core of new quality productivity is innovation, especially the innovation of basic science, cutting-edge technology and disruptive technology. These innovations can change the way of production, life and way of thinking, thus bringing about profound changes in the economy, society and daily life. Scientific and technological innovation can improve total factor productivity, and promote high-quality economic development by improving the quality and efficiency of the supply system and creating new demand with high-quality supply. At the same time, the new quality productive forces emphasize the efficient use of resources and environmental protection, which is in line with the goal of green agricultural development. Through scientific and technological innovation, the efficiency of agricultural production can be improved, while the negative impact on the environment can be reduced, and the green and sustainable development of agricultural production can be realized.

Second, the Yangtze River Economic Belt, as a strategic area for national development, has received strong policy support. The promotion and guidance of policies are conducive to the application and development of new quality productivity in the agricultural field, and then improve the green total factor productivity of agriculture. Correspondingly, the cultivation and development of new quality productive forces determines the economic strength and status of the region to a certain extent. The Yangtze River Economic Belt will develop new quality productive forces, promote the optimization and upgrading of the industrial structure, and improve the competitiveness of the agricultural industry, so as to promote the improvement of agricultural green total factor productivity.

Third, the new quality productivity emphasizes the promotion of digitalization and intelligence, which helps to improve the accuracy and management efficiency of agricultural production, reduce production costs, improve the quality and market competitiveness of agricultural products, and then have a positive impact on the green total factor productivity of agriculture.

At the same time, under the goal of reaching carbon peak and carbon neutral, cultivating ecological products into a new driving force of green development is one of the keys to

promoting the high-quality development of the Yangtze River Economic Belt. The development of new quality productive forces contributes to the value of ecological products and promotes the coordinated development of ecology and economy.

6. Conclusion

This study focuses on the Yangtze River Economic Belt, and it is of great significance to analyze the relationship between green total factor productivity and agricultural productivity. During the study period, the development level of new quality productivity in the Yangtze River Economic Belt showed an upward trend, but the regional differences were significant, the downstream areas had a higher level of development, and the middle and upper reaches had more room for improvement. At the same time, the development of green agricultural total factor productivity in various provinces and cities is unbalanced, and some provinces are growing faster. The empirical results show that the new quality productivity has a significant positive impact on the improvement of agricultural green total factor productivity, and it plays a role through scientific and technological innovation, policy support, digital and intelligent promotion and other ways. Based on this, all provinces and cities in the Yangtze River Economic Belt should strengthen regional cooperation to promote the balanced development of new quality productive forces; increase investment in agricultural science and technology, accelerate the digital transformation of agriculture, and improve the efficiency of resource utilization; make full use of policy advantages to promote the coordinated development of ecology and economy, and then promote the high-quality and sustainable development of agriculture in the Yangtze River Economic Belt.

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