Evaluation of the Coupled and Coordinated Relationship between Agricultural Modernization and Regional Economic Development under the Rural Revitalization Strategy

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Abstract: Agriculture is one of the three major industries in China, and its level of development occupies an important position in the development of the national economy. At present, China vigorously promotes the strategy of rural revitalization, which provides new opportunities for agricultural modernization. Since modern agriculture and regional economy are coupled in a mutually influencing and constraining relationship, this paper constructs a coupled and coordinated evaluation index system of agricultural modernization and regional economic development. Using the entropy value method and coupled coordination degree model, the comprehensive development level and coordinated development degree of agricultural modernization and regional economic development of 31 provinces, autonomous regions, and cities in China from 2011 to 2020 were evaluated, revealing the time evolution and spatial distribution characteristics of the two systems. The results show that: (1) In the past decade, China's agricultural modernization and regional economy have made some progress in terms of their respective development levels and the degree of coupling and coordination between them. (2) In terms of spatial evolution, there are obvious regional differences between the two systems, and the coupling coordination degree shows a "ladder" distribution pattern from the east to the central, northeastern, and western parts of the country. (3) Regions with a high level of regional economic development also have a relatively high degree of coupling and coordination between agricultural modernization and regional economic development. Our results provide insights into the economic effects of agricultural modernization in China and provide useful insights into the future direction of agricultural development programs in countries around the world.

Keywords: rural revitalization; agricultural modernization; regional economic development; coupled and coordinated relationship

1. Introduction

Agriculture is one of the three major industries in China, and its level of development occupies an important position in the development of the national economy. In 2017, the 19th Party Congress put forward the implementation of a rural revitalization strategy, insisted on making the "three rural issues" the top priority of the whole Party, promoted the coordinated development of the region, and established the strategic goal of "by the 2035 year, the basic agricultural and rural modernization will be achieved" [1]. In the new situation, to achieve rural revitalization, it is important to make the "three rural issues" a priority for the whole Party. Under the new situation, to achieve the goal of rural revitalization strategy, it is necessary to further optimize the agricultural structure and promote the continuous promotion of agricultural modernization in the context of China's regional economic development.

In the process of implementing the rural revitalization strategy, the development of China's agricultural modernization has been remarkable. On the one hand, the development of agricultural modernization drives the development of the regional economy. As an important part of the regional economy, agricultural modernization can provide raw materials and labor for the development of the economy and drive the progress of related industries. On the one hand, the development of agricultural modernization can provide raw materials and labor for the development of the economy and drive the progress of related industries [2]. On the other hand, a more mature regional economic system can provide a scientific and technological guarantee for the modernization of China's rural development and provide a material basis for the rapid development of modern agriculture in China. For example, the use of agricultural machinery, fertilizer production technology, breeding technology, pest control technology, and advanced scientific management methods in the process of modern agricultural production has facilitated the transformation of traditional Chinese agriculture into modern agriculture. The two systems of agricultural modernization and regional economic development present a coupling relationship, i.e., two or more systems are interdependent and mutually constrained to a certain extent.

Therefore, this paper adopts the coupling coordination degree model, which is used to represent the magnitude of benign coupling in the coupling interaction relationship, to analyze the coordinated development relationship between agricultural modernization and regional economy and to measure the strengths and weaknesses of the coordination status. This is an extremely important guideline for China to further accelerate the development of agricultural modernization, reduce regional disparities, and promote the harmonious development of agricultural modernization and regional economy, to ultimately achieve the ambitious goal of rural revitalization strategy. At the same time, it also provides other countries in the world, especially those with agriculture as their economic support for development, with effective methods and reference experiences for measuring the relationship between agricultural modernization and regional development.

2. Literature Review

With the continuous development of the times, traditional agriculture is gradually transforming into modern agriculture, and in this context, the study of agricultural modernization has been a hot topic in the academic field. Around the 1960s, the concept of modern agriculture began to be put forward. At this stage, the research on the agricultural economy was mostly based on the examination of various elements within agriculture. Theodore W. Schultz, an American economist, proposed the idea of introducing modern production factors to increase productivity and promote the key to the transformation of traditional agriculture, thus making agriculture a source of economic growth.

In the early 1980s, China began to place renewed emphasis on agricultural development [3], and the three issues of agriculture, rural development, and farmers became the core of the First Document. Chinese agriculture gradually changed from a highly diversified and resource recycling approach to a specialized, high external input, and resource-intensive one. In 2007, the concept of agricultural modernization was first introduced in China's Document No. 1 [4]. That is, to build agriculture based on modern science, equip it with modern science and technology and modern industry, manage it with modern economic science, and create a high-yielding, high-quality, low-consumption agricultural production system and an agroecosystem with high conversion efficiency that uses resources rationally and protects the environment [5].

From 1990 onwards, due to the varying degrees of damage to the environment on which human beings depend, the focus in various countries has gradually shifted to the study of the theory of sustainable agriculture based on the study of the theory of agricultural development. It can be understood as the realization of sustainable agricultural development, that is, based on rational management and utilization of agricultural re-

sources, the adjustment of agricultural technology, and institutional reform in the direction of sustainability to ensure that future agricultural development can continue to meet the needs of mankind. Jannat [6] et al. use two districts, Sherpur and Mymensingh, to explore the impact of agricultural modernization on sustainable livelihoods of tribal and non-tribal farmers in Bangladesh, pointing to the tremendous impact of agricultural innovation on improving the living standards of the poor. Knickel [7] et al. explore the contradictory points between the concepts of agricultural modernization and agricultural sustainability, concluding that it is possible to provide more support for the many different trajectories of agricultural modernization that practitioners pursue to achieve equity and inclusiveness between the two. Koopmans [8] et al. explored the role of multi-actor governance in reconciling agricultural modernization with sustainable rural development, arguing that the establishment of a territory-based multi-actor governance system is the first step in promoting the construction of agricultural modernization and giving specific strategies.

In recent years, in addition to research on agricultural modernization, most scholars have focused on agricultural-related policies, such as coordination of business entities, evaluation of development levels, land policies, etc. Rivera et al. [9] conducted a study on rural areas in seven countries, including Germany, Denmark, and Spain, and pointed out that in addition to economic factors, farmers' well-being should also be included in the assessment of rural prosperity. Gancone [10] et al. designed the evaluation index system of agro-ecological efficiency and evaluated the ecological efficiency of agricultural production in Latvia. Marin [11] et al. analyzed the impact of water conservation and saving technology (WCST) on the efficiency and effectiveness of agricultural irrigation using the case of agricultural production efficiency in the Guadalquivir River basin. Paudel [12] et al. explored the causes of changes in agricultural land area in Nepal, combining agricultural land area, population, and climate data, and empirical research results from 1910 to 2010 in Nepal to identify the main drivers causing changes in agricultural land area. Piotr [13] studied the fluctuation of agricultural land prices in Polish provinces and compared with other EU countries and noted that the price of agricultural land in Poland has increased significantly since it acceded to the EU. Lanz [14] et al. argued that agricultural modernization has caused the loss of biodiversity and that green development has become an important goal to pursue in agricultural modernization.

At present, the academic literature on the coupling relationship between agricultural modernization and regional economic development is relatively small, and the evaluation method for the level of agricultural development mostly adopts the entropy value method to establish the evaluation index system, and mainly focuses on the measurement of Chinese regions. For example, Wang [15] et al. used the entropy value method to measure the level of agricultural modernization in Shanxi Province. Li [16] et al. constructed an evaluation index system for the comprehensive capacity of modern agricultural development in Huizhou and used the gray GM (1, 1) prediction model to predict and analyze its development capacity. Wang [17] constructed an entropy TOPSIS model to measure the level of sustainable agricultural development in five dimensions: economic, social, environmental, ecological, and resource. The level of sustainable agricultural development was evaluated, and the main obstacle factors limiting the level of sustainable agricultural development were analyzed. In the worldwide context, there are also some discussions on the relationship between agricultural production and the economy. Based on the important role of agricultural production for Pakistan's economy and food security, Shah [18] et al. used various indicators based on the emergy accounting method to analyze the sustainability of the agriculture production systems in Pakistan from 2001 to 2015 in four provinces, creating more adaptive management practices for achieving sustainable agricultural production systems in Pakistan. Spirkova [19] et al. explored the position of agriculture in the economies of EU countries by constructing Agricultural Aggregate Index (AGRIT) and Agricultural Aggregate Index (AGRI) and used cluster analysis to identify

those countries with similar positions in agriculture. Introducing new agricultural technologies through collaborative R&D and extending the developed technologies to farmers and agribusinesses, Park [20] et al. estimated the economic effects of 23 countries receiving assistance from international agricultural programs in Korea during 2009–2017 in terms of both production and value-added induced effects. The results of a large body of literature indicate that the growth in the level of agricultural technology and science and technology has an important role in agricultural development and rural economic building, especially in some developing countries [21,22].

To sum up, through combing the existing literature, it is found that there are certain shortcomings in the current academic research on the relationship between agricultural modernization and regional economic development: (1) Most of the scholars' research on agricultural modernization and the regional economy stays at the level of individual research direction, and the research on coupling and coordination between the two is relatively insufficient. In other words, there are more vertical studies within the system, but fewer horizontal studies between the systems. (2) Most of the existing studies are based on the analysis at the local area level, such as a certain province or a certain region, and they are mostly descriptive studies, lacking the analysis at the macro-level of the whole country.

Based on the above issues, this paper makes innovations and enhancements in the following aspects in the hope of making some contributions to the optimization of the coupling between agricultural modernization and the regional economy in China and even in the world: (1) In terms of research content, this paper innovatively explores the internal relationship between the two systems of agricultural modernization and regional economic development, puts them under the perspective of coupling, explores the spatial and temporal characteristics of agricultural modernization and regional economic development in China, dissects the This paper provides important factual information on the process of agricultural modernization in China by exploring the spatial and temporal characteristics of agricultural modernization and regional economic development, analyzing the degree of coordination between agricultural modernization and regional economic development and the possible reasons behind. (2) In terms of research perspective, this study focuses on 31 provinces, autonomous regions, and municipalities in China, and explores the coupling and coordination between agricultural modernization and regional economy from a more macro level, which can, to a certain extent, reflect the overall situation of China in the past ten years more clearly, reflecting the uniqueness of the research perspective space. (3) In terms of research methodology, based on the previous research, this paper combines the entropy value method and coupling coordination degree model, screens and constructs the index system and evaluation method for the coordinated development of agricultural modernization and regional economy, and quantifies them, to provide a reference for the coupling and coordination evaluation method of agricultural modernization and regional economic development in China or other regions of the world.

3. Methodology

3.1. Theoretical Analysis of the Coupling Relationship between Agricultural Modernization and Regional Economic Development

In the socio-economic field, coupling is mainly manifested as an economic phenomenon in which information and energy are effectively transferred from one side to the other by interaction and influence between two or more subjects, producing positive or negative structures [23]. Among them, coupling and its coordination degree is the key to determining the trend of the system from disorder to order, and the coupling degree is the measure of this trend. In this paper, the coupling model of agricultural modernization and regional economic development is constructed to study the degree of coordination between the two.

Agricultural modernization and the development of the regional economies are inseparable, and they are interdependent and develop each other. The coupled development of agricultural modernization and regional economy will have a great impact on the economy and society. Well-coordinated development can make agriculture move away from traditional agriculture to modernization as soon as possible, promote a more rapid free flow of factors, and speed up the process of integration. The synergistic development of agricultural modernization and regional economy cannot be separated from the rural areas to enhance economic strength and improve agricultural production efficiency. The mechanism of mutual influence between agricultural modernization and regional economy specifically means that agricultural modernization is an important way to realize regional economic development, and regional economic development is a power source to drive the progress of agricultural modernization.

The modernization of agriculture is an important way to promote regional economic development. The development of agriculture will bring sufficient agricultural surplus, which is a necessary factor for the sustainable development of the regional economy. The development of agricultural modernization will ensure the efficiency of agricultural output and develop its economic level. In addition, the development of agricultural modernization has led to investment in many automated and efficient production equipment, which allows agricultural labor to be done with less manpower, which has led to an improved quality of life for more rural residents.

From the perspective of regional economic development, China is vigorously promoting the economic integration process of different regions, and the development of the regional economy can provide strong support for agricultural modernization. On the one hand, regional economic development can help expand the scale of agricultural production, improve the efficiency of agricultural output, develop agricultural mechanization, and provide technical support for agricultural modernization. On the other hand, as the cornerstone of agricultural modernization, regional economic development can promote the rural economy, further increase farmers' income, and enhance rural residents' sense of life and happiness.

In this paper, the relationship between the two subsystems of agricultural modernization and regional economic development that affect and interconnect each other is called the coupling effect of the two systems. Figure 1 shows the positive coupling mechanism between the level of regional economic development and agricultural modernization, i.e., there is a certain elemental complementary and mutually supportive role of each element of the two subsystems of regional economic development and agricultural modernization by cooperating and playing the advantages of each subsystem. With the continuous development of the regional economy, agricultural infrastructure investment increases, and the degree of agricultural mechanization deepens. The increase in government revenue drives the increase in investment protection in rural areas and agriculture, resulting in the optimization of agricultural industrial structure, the implementation of sustainable development policy, and the enhancement of the level of agricultural modernization. Agricultural modernization will in turn lead to increasing agricultural labor productivity and land utilization, and increasing disposable income of rural residents, which makes agricultural capital and agricultural production accumulate at the same time and become an important pillar of regional economic development.
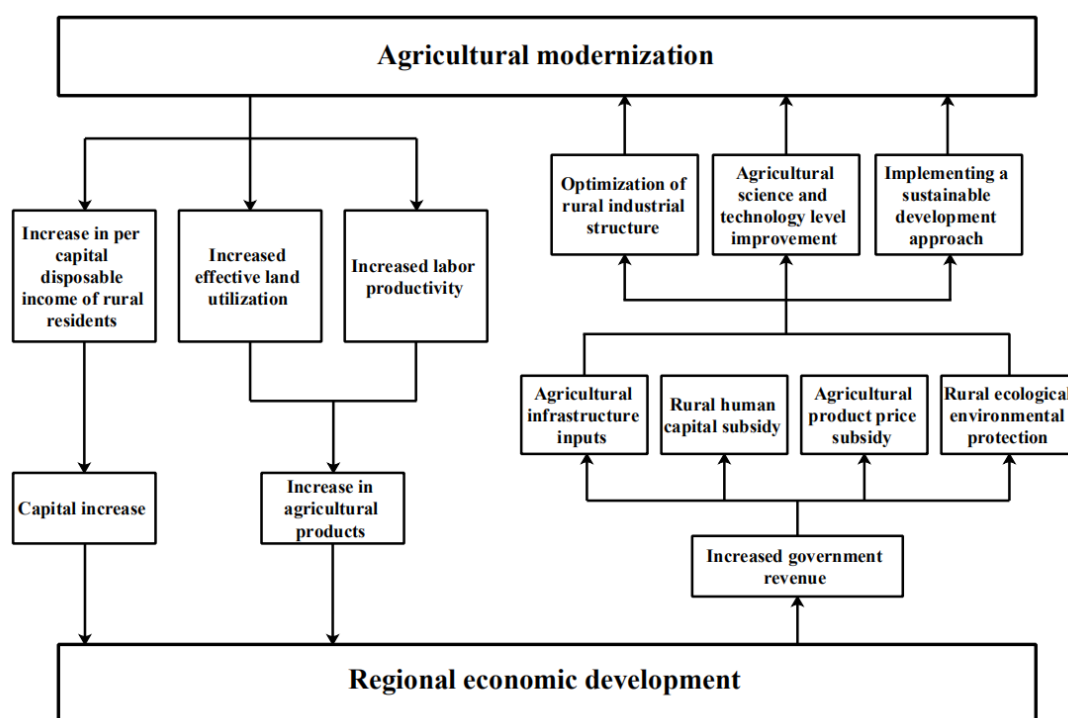
Figure 1. The coupling mechanism of agricultural modernization and regional economic development.

3.2. Research Methodology

3.2.1. Entropy Method

Since the agricultural modernization (U_1) and regional economic development (U_2) subsystems are comprehensive systems, the entropy method is applied to measure the two subsystems in an integrated manner, the reason being that the entropy method has the advantage of objective assignment, which can avoid the subjectivity of expert assignment and can realistically reflect the importance of each indicator in the integrated index [24].

(1) Standardization: Considering that the units of measurement of the indicators are not uniform, before calculating, the indicators should first be standardized to avoid the meaninglessness of the logarithm calculation when seeking the entropy value, as follows.

$$\text{Positive indicator formula.} \; x_{ij}' = \frac{x_{ij} - \min\{x_j\}}{\max\{x_j\} - \min\{x_{ij}\}}$$

$$\text{Negative indicator formula.} \; x_{ij}' = \frac{\max\{x_j\} - x_{ij}}{\max\{x_j\} - \min\{x_j\}}$$

where: x_{ij}' and x_{ij} are the standard and original values of the *j*-th indicator in year *i*, respectively; $\min(x_{ij})$ and $\max(x_{ij})$ are the minimum and maximum values of the *j*-th indicator, respectively. The data processing of each indicator in the regional economic development system Y_{ij} is the same as above.

(2) Entropy weight calculation

1. Calculate the weight of the *i*-th subsystem under the *j*-th indicator for that indicator P_{ij}:

$$P_{ij} = \frac{x_{ij}'}{\sum_{i=1}^{n} x_{ij}'}$$

2. Calculate the entropy value of the *j*-th indicator e_j:

$$e_j = -\frac{1}{\ln(n)\sum_{i=1}^{n} P_{ij}\ln(P_{ij})}$$

3. Calculate the coefficient of variation of the *j*-th indicator.

$$g_j = 1 - e_j$$

4. Calculate the weight of the *j*-th indicator to all indicators.

$$w_j = \frac{g_j}{\sum_{j=1}^{m} g_j}$$

5. Finally, the composite score of each province, region, and city is calculated as

$$U_i = \sum_{j=q}^{m} w_j x_{ij}{'}, \quad (i = 1,2 \cdots\cdots n)$$

3.2.2. Coupling Coordination Degree Model

Coupling refers to the phenomenon of two or more systems interacting and influencing each other, and the coupling coordination degree is an index used to characterize the form of the coordinated action of the two. According to the existing research results, most scholars use the coupling degree to calculate the model [25].

$$C_n = \{(U_1 \times U_2 \times \cdots \times U_n)/[\prod(U_i + U_j)]\}^{1/n}$$

Since the two systems of agricultural modernization and regional economic development are closely related to each other and have the characteristic of promoting each other's common development, the coupling coordination index is used to reflect the coupling coordination between the level of agricultural modernization and regional economic development in China during the study period. The specific calculation formula is:

$$C = \{(U_1 \times U_2)/[(U_1 + U_2) \times (U_1 + U_2)]\}^{1/2}$$

According to the comprehensive evaluation value of each province, region, and city calculated in 5, the comprehensive benefits of the two systems U_1 and U_2 can be derived. Among them, U_1 is the level of agricultural modernization, U_2 is the level of regional economic development, and *C* is the coupling degree between the two. In the coupling model, the larger the coupling degree *C*, the better the coordination effect, and vice versa, the worse the coordination effect.

However, the results that do not match the actual situation, such as the highly coordinated evaluation, may also occur when the agricultural modernization and regional economic development are at a lower level, which laterally reflects the inadequacy of a single coupling degree measurement. Therefore, to further reflect the degree of agricultural modernization and regional economic development in provinces, 31 autonomous regions, and municipalities nationwide, and to better compare the differences in the level of interprovincial coupled and coordinated development, this paper constructs a coordination degree model of agricultural modernization and regional economic development to reflect the synchronization of the two development levels. The specific model is as follows:

$$D = \sqrt{C \times T}, T = \alpha U_1 + \beta U_2$$

where: *D* is the coupling coordination degree; *C* is the coupling degree; *T* is the comprehensive evaluation index between the modernization of agriculture and the coordinated development of regional economy, α and β are the coefficients to be determined, reflecting the contribution and importance of both the modernization of agriculture and the development of the regional economy. In general, the weights of each subsystem should be obtained according to the entropy value method. However, considering that modern agriculture and regional economy are mutually influencing and promoting each other, agri-

culture is only one aspect of the regional economy, and there are many other factors affecting the regional economy, such as secondary industry, tertiary industry, as well as institutional changes and location advantages, $\alpha = 0.4$ and $\beta = 0.6$ are assigned.

To facilitate a comparison of the differences in the coupling coordination degree between 31 provinces and municipalities, the coupling coordination degree between the two systems of new agricultural modernization and regional economic development is ranked according to the magnitude of the D value of the coupling coordination degree (Table 1).

Table 1. Classification criteria of coupling coordination level.

Coupling Coordination Degree D Value Interval	Degree of Coupling Coordination
(0.0~0.1)	extreme disorder
[0.1~0.2)	Severe disorders
[0.2~0.3)	Moderate disorder
[0.3~0.4)	Mild disorders
[0.4~0.5)	On the verge of disorder
[0.5~0.6)	Barely coordinated
[0.6~0.7)	Primary Coordination
[0.7~0.8)	Intermediate Coordination
[0.8~0.9)	Good coordination
[0.9~1.0)	Quality Coordination

3.3. Indicator System Construction

The current evaluation method of agricultural modernization and regional economy is mainly a multi-indicator comprehensive measurement method. This method is derived from the hierarchical analysis method, which is also considered to be the most reasonable and widely used evaluation method at present. Most of the studies using this method construct a multilevel indicator system, then standardize the indicators without dimension, calculate the development level of each indicator one by one, and then calculate the weighted average of each evaluation object according to the weights determined by the hierarchical analysis [26–28]. The relationship between agricultural modernization and regional economic development is very complex, and it is difficult for a single indicator to accurately and comprehensively reflect their development levels and coordinated relationships [29,30], so this paper adopts a comprehensive multi-indicator measurement method to construct an index system for agricultural modernization and regional economic development.

Due to the different methods and tools used, the specific principles followed by scholars in designing the evaluation index system also differ. At present, domestic experts and scholars follow the following principles in designing the evaluation index system for agricultural modernization and regional economic development: focus, topicality, comprehensiveness, comparability, feasibility, systematicity, simplicity, etc. [31,32]. The principles followed by foreign experts and scholars in constructing the evaluation index system of agricultural modernization and regional economic development have also provided references for this paper. For example, Bonisoli et al. argue that data availability, relevance, analytical validity, flexibility, measurability, and policy relevance need to be followed when constructing an evaluation indicator system [33].

Starting from the above understanding, this paper retrieved the corresponding authoritative literature and a large number of statistical indicators for screening. Referring to the construction of the evaluation system of agricultural modernization by Wang [15], Li [16], and others, the agricultural modernization subsystem is established from four aspects: the level of agricultural input, the level of agricultural output, the level of rural social development and the level of sustainable agricultural development, and 10 specific

indicators reflecting the comprehensive level of agricultural modernization in China are selected. The reasons for the selection of specific indicators are as follows.

The group of indicators reflects the level of agricultural inputs: due to the weak nature of agriculture itself, the development of agricultural modernization cannot be achieved without a large amount of financial and technological inputs. In general, it mainly includes the application of chemical fertilizers, irrigation efficiency of water resources, and other aspects to measure. With the gradual development of modern agriculture, the development of agricultural mechanization according to local conditions and the improvement of agricultural production mechanization and other agricultural science and technology innovation has become a continuous driving force to promote the development of agricultural modernization. Therefore, the agricultural input level is selected as three indicators of agricultural fertilizer application, effective irrigation area, and total power of agricultural machinery.

The group of indicators reflecting the level of agricultural output: the construction of the system of agricultural output level mainly includes two aspects: firstly, stabilizing food production capacity and ensuring absolute national food security [34]. In addition, actively extending the agricultural industry chain, developing agricultural products processing industry and agriculture, forestry, animal husbandry, and fishery service industry, and promoting the integration of grain, warp, and feed, agriculture, animal husbandry, and fishery, and the integration of farming, raising, and processing is also an important initiative of agricultural modernization. Therefore, this paper selects the indicators of the total output value of agriculture, forestry, animal husbandry, fishery, and per capita grain output to measure the level of agricultural output.

The group of indicators reflecting the level of rural social development: agricultural modernization should focus on the modernization of the whole rural area, increase the income of farmers, and realize agricultural production in terms of quantity and quality to meet the growing needs of people for a better life, which is one of the ultimate goals of agricultural modernization. In addition, the number of people employed in agriculture is one of the important indicators of agricultural modernization. According to relevant statistics, as the economy develops, more and more of China's rural population begins to move to the cities. This development trend has led to the gradual transfer of rural arable land to large cultivators and the re-centralization of land use rights, thus providing conditions for the development of agricultural scale and intensification [35]. Therefore, the three indicators of rural electricity consumption, disposable income of rural residents, and the percentage of agricultural employees are included in the group of indicators in terms of rural social development level.

The group of indicators reflecting the level of sustainable agricultural development: In the early process of promoting agricultural modernization, the importance of ecological and environmental protection was neglected, mainly in the form of not paying attention to the efficiency of water resources utilization. In addition, to achieve the purpose of increasing soil temperature and maintaining soil moisture, a large number of plastic films are used in China's agricultural production, which leads to the problem that the films are difficult to degrade, and the resulting residues may pollute the soil and damage the soil structure. Therefore, the indicator group in terms of green development level mainly includes indicators such as the amount of agricultural plastic film used and water-saving irrigation areas.

For constructing the evaluation index system of regional economic development, different national scholars have different bases of consideration. Referring to the research ideas of Xu and Gao et al. [36,37], this paper examines the regional economic development from three aspects: economic development level, residents' living standard, and industrial economic efficiency. The group of indicators of economic development level can provide the most basic data support for measuring regional economic development and reflect the actual level of economic development. The group of living standard indicators reflects the level of regional economic development through the quantity and quality of material

goods and services consumed. The economic efficiency of industry not only reflects the relative position of a region in the national economic and trade links and inter-regional division of labor, e but also has a significant impact on the regional economic growth and income level. Thus, the level of economic development selects four indicators: gross regional product, fiscal revenue, the proportion of tertiary industry in GDP, and social fixed asset investment; the living standard of residents selects two indicators: per capita disposable income and consumer price index; the economic efficiency of the industry includes two indicators: total import and export of goods and total industrial output value above the scale.

The corresponding numbers of each indicator are obtained from China Statistical Yearbook, China Rural Statistical Yearbook, China Urban and Rural Construction Statistical Yearbook, China National Bureau of Statistics, where some missing data are filled by linear interpolation and mean value method, and the data in parentheses are the weights of each indicator, and the symbols are the nature of each indicator. The specific indicators are shown in Table 2. The mean basic characteristics of these variables are presented in Table A1.

Table 2. Evaluation index system.

Target Layer	Guideline Layer	Indicator Layer	Nature of Indicator	Weights
Agricultural Modernization U1	Agricultural Inputs	Application of agricultural fertilizers	−	0.0197
		Effective irrigated area	+	0.1344
		Total power of agricultural machinery	+	0.1228
	Agricultural output	The total output value of agriculture, forestry, animal husbandry, and fishery	+	0.0982
		Food production per capita	+	0.1111
	Rural Social Development	Rural electricity consumption	+	0.2351
		Disposable income of rural residents	+	0.0946
		Percentage of people employed in agriculture	−	0.0110
	Sustainable Agriculture	Agricultural plastic film use	−	0.0241
		Water-saving irrigation area	+	0.1541
Regional Economic Development U2	Economic Development Level	Gross Regional Product	+	0.1072
		Financial revenue	+	0.1086
		Share of tertiary sector in GDP	+	0.1155
		Total social fixed asset investment	+	0.0791
	The living standard of residents	Disposable income per inhabitant	+	0.1358
		Consumer Price Index	−	0.0055
	Industry Economic Benefits	Total import and export of goods	+	0.3380
		Total industrial output value above the scale	+	0.1103

4. Results

4.1. Time-Series Level Analysis of the Comprehensive Level of China's Agricultural Modernization and Regional Economic Development

In this paper, the entropy value method is applied to measure the comprehensive evaluation indices of the two systems of agricultural modernization (U1) and regional economic development (U2) in Table 2, and the comprehensive development levels of both are analyzed from the direction of time-series evolution through Figure 2.

In terms of the comprehensive evaluation index of the agricultural modernization subsystem, the level of agricultural modernization, in general, has effectively increased in the last decade. From 2011 to 2016, the comprehensive evaluation index of the agricultural modernization subsystem increased significantly, from 0.2883 to 0.3189, an increase of 9.6%. This indicates that during the "12th Five-Year Plan" period, with the in-depth promotion of China's "three rural" policy, agricultural inputs have been increased, agricultural production conditions have been continuously improved, agricultural productivity

has also been continuously improved, and the overall situation of rural economic operation is good. From 2016 to 2019, the comprehensive evaluation index of the agricultural modernization subsystem declined slightly, and the development of agricultural modernization became slower, showing some volatility, falling from 0.3189 to 0.3001, but then increasing rapidly to the highest value of 0.3233 in the past decade in 2020.

The reason for this is that as economic development entered a new normal, the Party Central Committee proposed implementing the rural revitalization strategy in 2017, insisted on making the "three rural issues" the top priority of the whole Party, accelerated the shortcomings of agriculture and rural areas, and made a series of top-level designs for agricultural modernization and rural industrial integration. All these created a favorable environment for the development of agricultural modernization. However, on the other hand, it also reveals some contradictions and problems in the process of accelerating the modernization of agriculture, such as excessive exploitation of agricultural resources, sloppy utilization, and pollution of the agricultural environment. Especially for the economically backward rural areas, agricultural economic production is still mainly in the form of individual business, and the business model is too fragmented, which makes China's agricultural resource constraints tighten, and it is difficult to maintain coordinated development of agricultural financial inputs. This not only affects the improvement of scale efficiency but also affects the marketing of agricultural products.

From the comprehensive evaluation index of the regional economic development subsystem, the overall level of China's regional economic development subsystem has shown a slight increase and a stabilization trend in the past ten years. The comprehensive evaluation index gradually rose from 0.3730 in 2011 to 0.3849 in 2015, with an increase of 3.19%. 2016–2017 saw a small decline, but then began to rebound in 2018, and has shown some decline in the last two years. This indicates that the level of regional economic development in China has not increased significantly in the last decade and has remained stable. The analysis of the raw observation data reveals that the contribution of the consumer price index to regional economic development remains low, with only a 2.9 percentage point increase in the regional economic development contribution rate over the ten years from 2011 to 2020. In addition, the contribution rate of total import and export of goods is also at a low level. In terms of the growth rate of each indicator, the fastest growth is in fixed-asset investment, with an average annual growth rate of 11.2%, followed by per capita disposable income (9.2%) and regional GDP (7.6%). This indicates that China's regional economic growth is mainly driven by investment and there are problems such as insufficient motivation for residents' consumption. This is in line with Liu X's [19] conclusion that efforts should be made to raise income as a way to improve agricultural labor efficiency and enhance the level of coordination between modern agriculture and the regional economy.
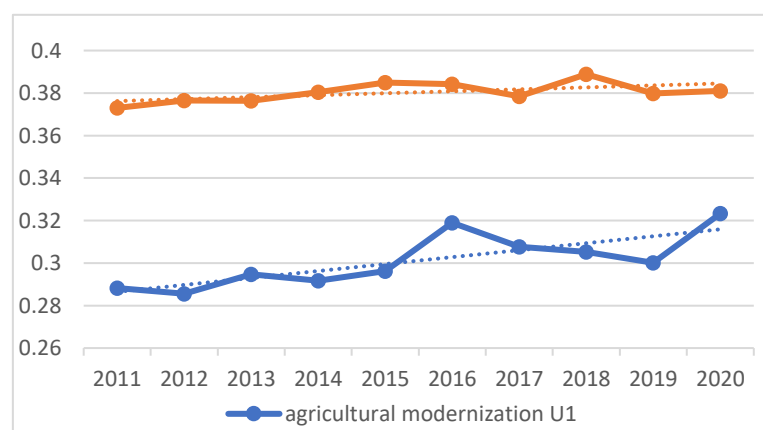
Figure 2. The trend of the comprehensive evaluation index of agricultural modernization and regional economic development.

4.2. Analysis of the Coupling and Coordination Degree of China's Agricultural Modernization and Regional Economic Development at the Time Series Level

Based on the time-series perspective, this paper uses the coupling coordination degree calculation method described earlier to obtain the data related to the coupling coordination degree of agricultural modernization and regional economic development in China from 2011 to 2020 (Table 3), and constructs a radar plot (Figure 3) of the time series curves of the level of agricultural modernization and regional economic development as well as the coupling degree C and the coupling coordination degree D between the two systems. Among them, coupling degree C reflects the degree of coupling between the two systems, and coordination degree T reflects the overall efficacy and synergistic effect of the two systems. The radar diagram then reflects the development of each system over time, realizing a combination of dynamic and static analysis of the coupling between China's agricultural modernization and regional economic development levels.

As the comprehensive evaluation index of agricultural modernization and regional economic development system steadily increases, the gap between the two continues to narrow, bringing about a continuous increase in their coordinated development. As can be seen from Table 3, the coupling degree coordination between China's agricultural modernization and regional economic development has fluctuated slightly in the past decade, but in general, it shows a significant increase. Especially since 2015, the *D*-value has always remained above 0.5, and the coupling coordination is relatively good. From the coupling stage, China is basically in the antagonistic coupling and abrasive coupling stage from 2011–2012 and rises to the high-level coupling stage from 2013–2020. In terms of coordinated development, the degree of coordinated development in China is rising year by year and the type of development is escalating.

Specifically, it can be divided into two stages: the first stage was from 2011 to 2012, which mainly showed that the regional economic development was ahead of agricultural modernization, and the degree of coordinated development was low and in a moderate and serious disorder; The second stage is from 2013–2015. In this stage, the economic development steadily improved and the gap gradually narrowed, and the increasing attention to the issue of agricultural modernization made the agricultural modernization slightly lower than the regional economic development level in this period, and its coordination degree changed to the verge of disorder and barely coordinated; The third stage is 2016–2020, with the introduction and vigorous implementation of the rural revitalization strategy, the level of agricultural modernization and living conditions of rural residents gradually achieve synchronous growth, on the one hand, the improvement of the level of agricultural modernization drives the development of rural society and economy, on the other hand, the continuous and rapid development of rural economy, the improvement of farmers' quality and the obvious improvement of agricultural production conditions counteract the agricultural modernization, thus promoting the development of agricultural modernization to reach the state of getting rid of the disorder towards the initial coordinated development.

Table 3. The time-series status of the coupling and coordination degree of China's agricultural modernization and regional economic development system.

Year	Coupling Degree *C* Value	Coordination Index *T* Value	Coupling Coordination Degree *D* Value	Degree of Coupling Coordination
2011	0.650	0.035	0.152	Severe disorders
2012	0.400	0.142	0.238	Moderate disorder
2013	0.788	0.232	0.481	On the verge of disorder
2014	0.745	0.373	0.493	On the verge of disorder
2015	0.876	0.452	0.575	Intermediate Coordination
2016	0.998	0.738	0.858	Good coordination
2017	0.980	0.422	0.643	Primary Coordination
2018	0.935	0.783	0.858	Good coordination

| 2019 | 0.994 | 0.401 | 0.631 | Primary Coordination |
| 2020 | 0.947 | 0.702 | 0.816 | Good coordination |
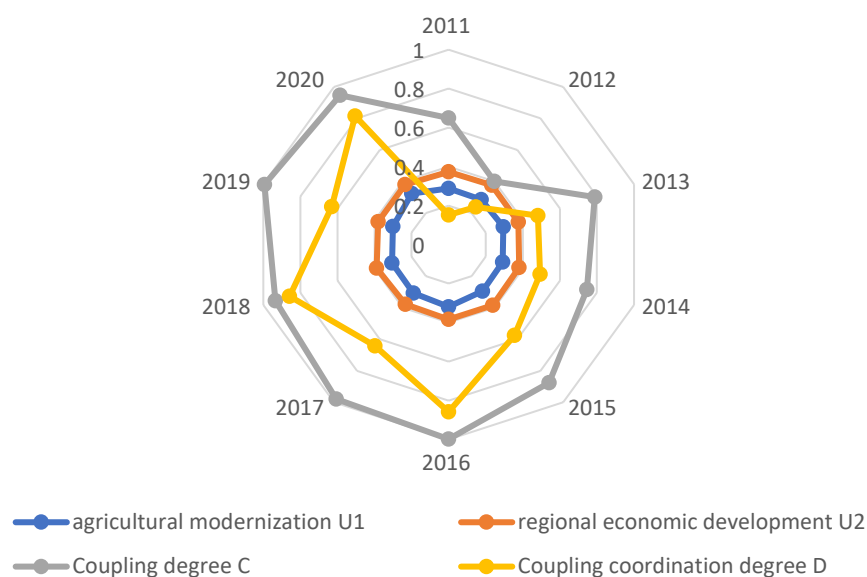
Figure 3. Time-series coupling analysis of China's agricultural modernization and regional economic development level.

4.3. Spatial Level Analysis of The Comprehensive Level of China's Agricultural Modernization and Regional Economic Development

Analysis of Table 4 shows that the overall level of the system of agricultural modernization and regional economic development in 31 provinces, autonomous regions, and municipalities in China is low and the regional development is unbalanced, and there are significant differences in the overall evaluation index of the system in each province, autonomous region, and municipality.

Specifically, the national average value of the comprehensive level of the agricultural modernization subsystem is 0.3076, with Jiangsu Province leading the way with an average value of 0.6601 for the comprehensive evaluation index, followed by Shandong, Hebei, Henan, and Heilongjiang provinces. There are 12 provinces and cities above the average value nationwide, 5 in the eastern region, 1 in the northeastern region, and 3 in the central and western regions respectively. In terms of China's four major regions, the northeastern region has the highest average level of agricultural modernization at 0.3582. The eastern region has the second-highest level of agricultural modernization, and the western region has the lowest level of agricultural modernization. Since the implementation of the rural revitalization strategy, the country has vigorously promoted the development of modern agriculture in the northeast region and accelerated the structural reform on the supply side of agriculture and various reforms in rural areas, which has enabled the northeast region to gain considerable achievements in recent years. The modernization of agriculture in the eastern and central regions has also made great progress, but there is still the phenomenon that there is an excessive gap between provinces and cities in terms of comprehensive water averages, such as 0.5542 between Jiangsu Province and Hainan Province, and 0.3165 between Henan Province and Shanxi Province. The problem of uneven development within the region needs urgent attention. The western region lags in agricultural modernization, and the comprehensive level of agricultural modernization is far below the national average, especially in Tibet and Qinghai, where the comprehensive water average is less than 0.1.

The national average of the regional economic development subsystem is 0.2224. In terms of the four major regions, 11 provinces and cities are above the average value. The eastern region has the highest overall level of regional economic development at 0.4266. 8 out of 10 provinces in the eastern region exceed the national average, and the average value in the eastern region is 0.2042 higher than the national average, with the highest value being 0.8055 in Guangdong Province. The average value of regional economic development in the remaining three regions is lower than the national average, and there is one province and one city in the northeast, one in the central and one in the west that are higher than the national average. Among them, the comprehensive level of regional economic development in the western region is the lowest, only 0.1136. The regional economic development level in China is extremely unbalanced in terms of regional distribution.

Overall, the provinces, regions, and cities with relatively high comprehensive levels of both agricultural modernization and regional economic development are mainly located in the eastern region, especially in Jiangsu, Guangdong, Zhejiang, and Shandong. The integrated level of agricultural modernization and regional economic development system in the central region is basically on par with the national average, and there is no coordination between agricultural modernization and regional economic development in the northeast, and the regional economic development does not have enough momentum, but agricultural development is advancing more rapidly. The overall level of the western region is the lowest, and the average of the comprehensive water of agricultural modernization and regional economic development is lower than the national average, and the backward status is more serious.

Table 4. The average value of the comprehensive evaluation index of agricultural modernization and regional economic development of each province and city in China from 2011 to 2020.

Region	Province and City	Agricultural Modernization	Regional Economic Development	Region	Province and City	Agricultural Modernization	Regional Economic Development
East	Beijing	0.1411	0.5140	Northeast	Liaoning	0.2771	0.2435
	Tianjin	0.1490	0.2430		Jilin	0.2774	0.1133
	Hebei	0.5466	0.2191		Heilongjiang	0.5061	0.1305
	Shanghai	0.2622	0.5266		**Northeast Average**	**0.3535**	**0.1624**
	Jiangsu	0.6601	0.6614	West	Inner Mongolia	0.3869	0.1538
	Zhejiang	0.3741	0.4817		Guangxi	0.2409	0.1256
	Fujian	0.2354	0.2516		Chongqing	0.1511	0.1652
	Shandong	0.5910	0.4726		Sichuan	0.3421	0.2276
	Guangdong	0.3931	0.8055		Guizhou	0.1558	0.0962
	Hainan	0.1059	0.0909		Yunnan	0.2133	0.1248
	Eastern Average	**0.3458**	**0.4266**		Tibet	0.0883	0.0771
Central	Shanxi	0.1923	0.1464		Shanxi	0.2009	0.1270
	Anhui	0.3678	0.1830		Gansu	0.1689	0.0713
	Jiangxi	0.2296	0.1402		Qinghai	0.0798	0.0391
	Henan	0.5088	0.2447		Ningxia	0.1262	0.0716
	Hubei	0.2947	0.2111		Xinjiang	0.4106	0.0844
	Hunan	0.3126	0.1960		**Western Average**	**0.2137**	**0.1136**
	Central Average	**0.3176**	**0.1869**	National	Average	**0.3076**	**0.2224**

4.4. Spatial Level Analysis of the Coupling and Coordination Degree of China's Agricultural Modernization and Regional Economic Development

The coupling coordination degree model was used to measure the coupling coordination degree of China's provincial agricultural modernization and regional economic development from 2011 to 2020, and the average of each value was obtained from the data in Table 5. Through the analysis, it can be found that the coupling and coordination degree

of agricultural modernization and regional economic development in Chinese provinces and cities is low overall. The coupling degree *C* value is basically at a high level, and the coordination index *T* value is generally at a poor level of coordination in all provinces and municipalities except for individual provinces and municipalities such as Jiangsu and Guangdong, where the coordination status is good. From a national perspective, we can learn that there is a certain regional variation in the coupling coordination degree of agricultural modernization and urban-rural integration level in China, which generally shows a distribution pattern of East > Central > Northeast > West.

Among them, the eastern region has the highest degree of two-system coupling coordination, with the average level of primary coordination during the study period. The central region has the second-highest degree of two-system coupling coordination, and the average level is at the barely coordinated level during the study period. The northeastern region has the second-highest degree of two-system coupling coordination, and the average level of the study period is on the verge of dissonance. The western region has the lowest degree of coupling coordination between the two systems, and the coupling coordination degree fluctuates greatly between the two systems. Except for Inner Mongolia and Sichuan, which are barely coordinated, the coupling coordination degree of all other provinces and municipalities is less than 0.5, which is in a state of dissonance. Especially, Qinghai has reached the level of serious dissonance, and the coupling situation is not optimistic.

The coupling coordination degree of China 31's provinces, autonomous regions, and municipalities tends to develop to a high level of coupling in general, but from the data of 10recent years, China's agricultural modernization and regional economic development are still at a low level of coupling, especially the synergy is weak. The main reasons are: on the one hand, in the process of rural revitalization, the importance of coupling and coordinating the development of agricultural modernization and regional economy is not fully recognized, which restricts the development of coupling between the two to a high level; on the other hand, the degree of regional coordination in the process of economic construction is not enough, although China has put forward the strategy of revitalizing the west, the strategy of rising in the middle and the strategy of revitalizing the northeast, at present. Still, China has put forward the strategy of revitalizing the west, the strategy of revitalizing the middle, and the strategy of revitalizing the northeast, at present, there is still a huge gap between the regions in China, and the western region still has a long struggle.

Table 5. 2011–2020 Average status of coupling and coordination between agricultural modernization and regional economic development system by provinces and cities in China.

Region	Province and City	Coupling Degree *C* Value	Coordination Index *T*-Value	Coupling Coordination Degree *D* Value	Degree of Coupling Coordination
	Beijing	0.724	0.416	0.549	Barely coordinated
	Tianjin	0.932	0.213	0.446	On the verge of disorder
	Hebei	0.843	0.463	0.625	Primary Coordination
	Shanghai	0.943	0.507	0.692	Primary Coordination
	Jiangsu	0.995	0.880	0.935	Quality Coordination
East	Zhejiang	0.998	0.548	0.740	Intermediate Coordination
	Fujian	1.000	0.278	0.527	Barely coordinated
	Shandong	0.977	0.688	0.82	Good coordination
	Guangdong	0.956	0.810	0.88	Good coordination
	Hainan	0.985	0.067	0.258	Moderate disorder
	Eastern Average	**0.935**	**0.487**	**0.647**	**Primary Coordination**
	Shanxi	0.988	0.168	0.408	On the verge of disorder
Central	Anhui	0.899	0.315	0.532	Barely coordinated
	Jiangxi	0.952	0.189	0.424	On the verge of disorder
	Henan	0.889	0.458	0.638	Primary Coordination

	Hubei	0.972	0.287	0.528	Barely coordinated
	Hunan	0.950	0.288	0.523	Barely coordinated
	Central Average	**0.942**	**0.284**	**0.509**	**Barely coordinated**
Northeast	Liaoning	0.993	0.300	0.546	Barely coordinated
	Jilin	0.847	0.200	0.412	On the verge of disorder
	Heilongjiang	0.711	0.368	0.511	Barely coordinated
	Northeast Average	**0.850**	**0.289**	**0.490**	**On the verge of disorder**
West	Inner Mongolia	0.84	0.306	0.507	Barely coordinated
	Guangxi	0.916	0.185	0.412	On the verge of disorder
	Chongqing	0.991	0.155	0.392	Mild disorders
	Sichuan	0.958	0.332	0.564	Barely coordinated
	Guizhou	0.968	0.105	0.319	Mild disorders
	Yunnan	0.945	0.166	0.396	Mild disorders
	Tibet	0.91	0.045	0.202	Moderate disorder
	Shanxi	0.962	0.159	0.391	Mild disorders
	Gansu	0.857	0.095	0.285	Moderate disorder
	Qinghai	1.000	0.010	0.100	Severe disorders
	Ningxia	0.965	0.066	0.253	Moderate disorder
	Xinjiang	0.618	0.268	0.407	On the verge of disorder
	Western Average	**0.911**	**0.158**	**0.352**	**Mild disorders**
National Average		**0.919**	**0.301**	**0.491**	On the verge of disorder

5. Discussion

This paper takes 31 provinces, autonomous regions, and municipalities in China as the research objects, takes 2011–2020 as the observation period, uses the entropy value method and the coupled coordination degree model to measure the comprehensive development level of China's agricultural modernization and regional economic development as well as the degree of coordinated development, reveals the time evolution and spatial and temporal distribution characteristics of the two systems, and draws the following relevant conclusions:

(1) According to the results of the empirical analysis, China's agricultural modernization and regional economy have made some progress in the last decade, both in terms of their respective development levels and the degree of coupling and coordination between them. Chen [38] explores low-carbon agriculture, but the results of his study are similar to this paper. He found that the low-carbon agriculture index and economic development index first experienced 10 years of low-level fluctuations, and then entered a stable upward phase.

The overall coupling coordination degree is at the stage of the near disorder, and the coupling coordination degree of the two systems is improving continuously during the study period, experiencing the change process from serious disorder to good coordination, and the relationship between the two gradually tends to coordinate and adapt from the teething stage. However, in general, the degree of coupling and coordination between the two systems is still at a low level. This indicates that the implementation of the rural revitalization strategy has been effective and has guiding significance for building modern agriculture with prosperous industry, ecological livability, civilized countryside, effective governance, and affluent living, but there is still some room for development in the long run.

(2) In terms of spatial evolution, this study finds that the provinces and cities with relatively high integrated levels of both systems are mainly located in the eastern region, while the integrated levels of systems in the western region are all lower than the national average, which is not optimistic and in urgent need of reforming provincial upgrading. In addition, similar to Han [39] et al.'s view that the degree of agricultural diversification in economically developed eastern provinces is significantly higher than that in other re-

gions, and that some provinces in the eastern and central regions are moving in one direction toward increasing modernization, we find that the coupling and coordination between the two systems of agricultural modernization and regional economy in China show more obvious regional differences, and the coupling and coordination in the vast majority of provinces and municipalities are rapidly improving. The overall "ladder" distribution pattern from the east to the central, northeast, and west gradually decreases, and regional linkage development needs to be paid attention to.

(3) According to the findings of Li [40] et al., it was found that the level of economic development, technological innovation, infrastructure investment, and openness of a region has a positive impact on the development of green agriculture in that region. This mirrors the findings of this paper. We found that regions with a high level of regional economic development also have a relatively high degree of coordination between agricultural modernization and regional economic development coupling, such as the eastern provinces of Jiangsu and Guangdong, which also show a high level of agricultural modernization while maintaining high-quality economic development. This reflects the great engine power of optimizing the economic spatial structure and coordinating the development levels of different regions for agricultural modernization.

In contrast, there is a certain mismatch between the degree of agricultural modernization and the level of regional economic development in some regions, such as Heilongjiang Province. Despite the low level of economic development in the region, the level of agricultural modernization shows high value. This may be because Heilongjiang is the largest province in China in terms of grain production, with plantations as the mainline of development [41]. This has led to the early exploration of agricultural modernization in Heilongjiang province, which has invested a lot of resources in improving the agricultural structure, strengthening the agricultural infrastructure, and vigorously promoting the innovation and promotion of agricultural science and technology, thus bringing about a rapid increase in the level of agricultural modernization. Relatively speaking, the development of other industries lags, so the overall regional economic development level is not high.

The assessment methods provided in this study can be easily extended to other countries or regions with similar conditions. However, there are some limitations in this paper due to the difficulty of obtaining data resources and the limitation of knowledge level. In particular, the selection and establishment of the indicator system are still inadequate. Agricultural modernization and regional economic development together form a complex and dynamic system, and the development status of each province and city varies. The specific indicators to be selected and the weights to be given remain to be investigated.

Therefore, in future research, the following aspects can be further explored: (1) Try to use new methods to select indicators and construct indicator systems, to reflect the status of agricultural modernization and regional economic development more comprehensively and precisely and make the measurement and analysis of the coupling coordination degree more accurate. (2) Extending the period of the study and adding the analysis of the migration pattern of the center of gravity of the coupling coordination degree in each province, further exploring and studying the development level and coupling coordination differences between agricultural modernization and regional economic development in different spaces and stages.

6. Conclusions

China is a large country with a large population and limited arable land area. Therefore, how to continue to develop modern agriculture and protect the degraded environment is a challenging topic in front of Chinese agriculture. Based on the results of the above data analysis, combined with the excellent experiences in agricultural development in other countries around the world, this paper summarizes the following conclusions and recommendations, to provide feasible directions for the modernization and development of agriculture in China and even the world.

(1) Placing agricultural production in the perspective of regional economic development, agriculture is guided to develop in the direction of regional and intensive modernization. With the imbalance in regional economic development already formed, it is more important to focus on how to promote the coordinated development of different regional economies and balance regional disparities [42]. The rational allocation of resources at the same time does not appear between the region of blind competition and duplication of construction, to avoid the waste of resources. Therefore, each province, region, and city must make full use of their advantages, break the geographical boundaries, and strengthen the role of regional linkage. Create their regional characteristics, make regional characteristics become the driving force of regional agricultural development, lengthen the agricultural industry chain, and transform traditional agriculture into modernization to establish a unique regional agricultural brand, thereby enhancing the advantages of regional agricultural development.

(2) Actively implement the strategy of rural revitalization and improve the relevant policy system. The government should give full play to its leading role, start from the modernization of agriculture, further improve the policy framework system to strengthen agriculture and benefit agriculture, and increase the investment in the "three rural areas". Especially for developing countries, a large amount of capital is needed for the improvement of inputs and the quality of workers, while the accumulation of agriculture in developing countries is quite limited, so the government should give full play to its macro-control function [43]. To increase the financial investment in agriculture, strengthen the financial support for agricultural infrastructure construction for agricultural modernization, improve the social security policy system for agricultural production and operation, and increase the financial investment from the policy perspective, to better utilize the advantages of agricultural resources.

(3) Promote green agricultural development to reduce the pressure on resources and the ecological environment, achieving a "win-win" situation between agricultural modernization and ecological improvement. For example, Brazil has chosen to provide appropriate training for human resources in sustainable agricultural technologies to promote the implementation of sustainable agricultural systems in the development of green agriculture [44]. In China, it is especially necessary to focus on the ecological protection of the agricultural environment in all regions of China, to reduce the intensity of agricultural resource use, to strengthen the management of environmental problems in key regions such as the black soil area in the northeast, the heavy metal pollution area in the south, the mixed agricultural and pastoral area in the north, the arid area in the northwest, and the rocky desertification area in the southwest, to slow down the trend of increasing agricultural surface pollution, and to promote the development of the agricultural economy in a green and sustainable direction [45].

The uniqueness of this study may lie in exploring the effects of both agricultural modernization and regional economic development, especially the study of the little-known coupled coordination relationship. Despite some methodological limitations, we hope that the results of this study can provide a methodological reference for the empirical study of the economic effects of agricultural modernization and provide useful insights into the future way forward for agricultural development programs in countries around the world.

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Appendix A

Table A1. Mean basic characteristics of each index.

Indicator Name	Units	Maximum	Minimum	Average	Standard Deviation
Application of agricultural fertilizers	million tons	716.10	4.40	185.73	146.54
Effective irrigated area	Thousand hectares	6177.60	109.20	2126.21	1668.67
Total power of agricultural machinery	million kilowatts	12,098.30	105.70	3152.73	2931.70
The total output value of agriculture, forestry, animal husbandry, and fishery	billion yuan	7945.80	118.30	2885.57	2039.23
Food production per capita	Kilogram	2347.00	13.00	462.12	385.81
Rural electricity consumption	Billion kWh	2011.00	0.90	287.96	422.70
Disposable income of rural residents	Yuan/person	27,825.00	3909.40	10430.14	4629.88
Percentage of people employed in agriculture	%	0.77	0.01	0.31	0.14
Agricultural plastic film use	Ton	276,935.00	1778.00	79,574.03	66,152.17
Water-saving irrigation area	Thousand hectares	4333.30	22.30	1050.26	1019.37
Gross Regional Product	billion yuan	110,760.90	605.83	24,771.36	20,583.53
Financial revenue	billion yuan	12,923.85	54.76	2643.07	2239.52
Share of tertiary sector in GDP	%	83.90	29.70	47.32	9.64
Total social fixed asset investment	billion yuan	58,766.88	1016.90	16,818.30	12,440.50
Disposable income per inhabitant	million tons	72,232.40	7510.00	23,190.70	11,150.77
Consumer Price Index	Thousands of hectares	106.30	100.60	102.51	1.17
Total import and export of goods	million kilowatts	76,410.67	21.70	9384.68	15,326.02
Total industrial output value above the scale	billion yuan	150,717.80	346.15	32,666.28	27,886.32

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