The Circulation Efficiency of Fresh Agricultural Products in Heilongjiang Province under the Background of Agricultural Supply Side Reform

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Abstract: Agriculture as a primary industry has an important relationship with the development of the people's livelihood. Agricultural products are the primary products of agriculture and are essential in people's daily life. Fresh agricultural products are most closely related to people daily lives and play an important role in the entire agricultural industry structure. The agricultural development of Heilongjiang Province has great influence in the country and is an important production base for fresh agricultural products. With the development of domestic supply-side reforms, the circulation efficiency of fresh agricultural products has changed. This paper evaluates the operational efficiency of the agricultural product circulation system in Heilongjiang Province by constructing a model. The results show that the two indicators that mainly affect the circulation efficiency of agricultural products in Heilongjiang Province are speed efficiency and economic efficiency. Based on the analysis of the development trend of circulation efficiency of fresh agricultural products in Heilongjiang Province and the relevant research results and experience of developed countries, this paper puts forward some suggestions for the development of circulation mode of fresh agricultural products in Heilongjiang Province. It is of great practical significance to study the circulation mode of fresh agricultural products in Heilongjiang Province.

1. Introduction

In December 2015, General Secretary Xi Jinping of the Central Rural Work Conference proposed for the first time "a structural reform of the supply side of agriculture", pointing out that it is necessary to actively promote the reform of the supply side structure of agriculture, improve the continuation of the agricultural supply system, significantly improve the quality and efficiency of agricultural products, and supply agricultural products. The types and quantities can effectively

meet the market demand, and meet the requirements of reasonable supply structure of agricultural products, variety of supply, and excellent supply quality. The reform of the agricultural supply side structure [1] refers to adjusting the supply structure of agricultural products with the focus on the reform of the supply side of agricultural production, transforming the irrational agricultural development mode and improving the efficiency of agricultural production. Vigorously implementing the reform of China's agricultural supply-side structure, the key is to continuously adjust agricultural production on the basis of effective market demand, improve the current agricultural production relationship, adapt the superstructure to the development of agricultural productivity, improve the supply of agriculture in China's system, and ensure the quality of agricultural products supply [2]. The supply is sufficient and the supply is diversified, so that the agricultural product supply system can effectively meet the demand of the agricultural product market. While implementing the reform of the agricultural supply side structure, we must constantly adjust the agricultural production structure and regional layout, continuously reduce the cost of agricultural production, continuously reduce the shortcomings of agricultural development, improve the efficiency of agricultural production, enhance the competitiveness of the agricultural market, and increase the construction of agricultural infrastructure. Through a variety of measures and multi-faceted reforms, the bottleneck of agricultural development can be lifted and the grand goal of sustainable development of China's agriculture can be achieved. The emergence of the concept and ideas of "supply-side reform" has triggered discussions and research on issues in this field. Different scholars have also put forward their own views and opinions. In 2016, some researchers proposed that supply-side reforms are innovations in theory, economic development dynamics, and institutional supply. Some scholars believe that the supply-side reform is a new way of thinking that it is difficult for the demand side to promote the sustained and healthy development of the social economy, a new growth point and an inevitable choice for promoting social and economic development, and is the top priority for promoting the efficient and healthy development of China's economy. The key lies in the government departments to relax control, activate the market, strengthen effective system supply, reduce costs and the establishment of modern supply system is an important factor affecting the development of China's social and economic modernization. Supply-side reforms cover all areas of the social economy, and supply-side reforms in the agricultural sector are also included. This paper expounds the concept connotation of the supply-side reform of the research on the circulation efficiency of fresh agricultural products in Heilongjiang Province under the background of supply-side reform, and has important theoretical guiding significance.

Agriculture is the primary industry, and its level of development is closely related to the national economy and people's lives. The first document of the Central Committee focused on "agriculture, rural areas and farmers" for 11 consecutive years, reflecting the importance of agriculture in our country. Agricultural products refer to the main products of agriculture. Unlike other agricultural products, fresh produce has natural characteristics that are perishable and perishable. The definition of fresh agricultural products in the national standard GB/T22502-2008 of the People's Republic of China refers to vegetables, fruits, flowers, meat, eggs, milk and aquatic products. They come from untreated or primary treatments such as planting, aquaculture, collection, and fishing. In this paper, fresh produce is defined as fresh vegetables, meat, custard, fruit, and fresh aquatic products that are closely related to residents' lives. And agricultural and sideline products can reach the table of fresh green food, excluding processed products. Agricultural products are vital to people's daily lives, and fresh produce is closely related to people's daily lives, ensuring that meat, eggs, milk, vegetables and fruits are served three meals a day. It plays an important role in the structure of the agricultural

industry. The production of fresh agricultural products is seasonal and regional; especially the growth of vegetables and fruit products is affected to a certain extent by the natural climate. And it has a distinct low peak period. The regional growth of different characteristic products leads to an increase in transportation costs, an increase in circulation costs and a significant price fluctuation. Fresh agricultural products are easy to corrode, are naturally produced, have a certain service life, high water content and a short shelf life. These natural characteristics have strict requirements on the storage and preservation technology [3-4] of fresh produce. Therefore, the circulation of fresh produce must adapt to the natural characteristics of fresh produce. The market attributes of fresh produce depend on their natural attributes. Unlike other large-scale agricultural products, fresh agricultural products are vital to people's uncertain lives, with large demand and low elasticity of demand. The market demand for fresh agricultural products is affected by factors such as consumption levels, seasonal climate, and physiological needs. For example, natural disasters will lead to oversupply and higher prices.

The circulation efficiency of agricultural products refers to the proportion of production circulation and circulation in a certain period of circulation of agricultural products, that is, direct and indirect comparison between production entities and circulation production links. If we only look at loop output or loop input, the loop efficiency is not comprehensive. In the process of agricultural product circulation, circulation investment refers to the sum of various transaction costs and logistics costs of agricultural products in various circulation links. Circulation production refers to the sum of various added values of agricultural products in all circulation links. Under normal circumstances, when the liquidity increases, the circulation investment will also increase, the circulation will decrease, and the circulation will decrease. Therefore, the increase in cyclic investment [5] is not equal to the efficiency of cycle efficiency. Only by combining the analysis of the two, can we get the conclusion that "circulation" is effective and determine the level of circulation efficiency according to the ratio of the two, that is, to exchange the minimum circular input for the established circular output, or to use the established circular investment for the maximum circular output. Essentially, it enables the efficient allocation of resources, reflecting the capacity for sustainable development [6] and the ability to invest and produce in the circulation process. In recent years, the development of fresh agricultural products in China has been very rapid, and the output of fresh agricultural products is on the rise. However, with the development of society, the contradiction between supply and demand of fresh agricultural products is not balanced. In 2007, Hainan bananas rotted in the fields. The phenomenon that "cheap fruit hurts farmers" occurs from time to time. At the same time, from the recent "Do You Play" and "Garlic You" incidents, we can see the embarrassing phenomenon of manufacturers "hard selling" [7-8] and consumers "buying expensive". These phenomena show that there are some problems in the circulation system of fresh agricultural products, such as cumbersome cycle, low cycle efficiency and serious losses. Constrained by the traditional concept of "regeneration, light cycle", the development of agricultural product circulation lags far behind agricultural production. However, small-scale farmers have not received special training, and because of their personal qualities and restrictions on circulation of information services, they cannot understand this information in the first place. It is difficult to make production decisions and promote undefined income. For fresh produce, its own characteristics require high refrigeration equipment, so the cold chain [9] technology and low use of backup storage facilities [10] lead to waste of resources and high costs.

As a pillar industry of agricultural development in Heilongjiang Province, fresh agricultural products have always attracted the attention of the society. The more advanced the circulation model, the higher the circulation efficiency. On the basis of introducing the related concepts and

basic theories of fresh agricultural products circulation, this paper analyzes the current situation of the circulation of fresh agricultural products in Heilongjiang Province and scientifically evaluates the influencing factors of the development of circulation methods. The development trend of circulation mode of fresh agricultural products in Heilongjiang Province was analyzed. Drawing on the relevant research results and experience of developed countries, this paper proposes the development mode of the circulation model of fresh agricultural products in Heilongjiang Province, and further enriches the application fields and related theoretical research results.

2. Proposed Method

2.1. Circulation Efficiency Measurement Index

In order to study the efficiency evaluation of China's agricultural product circulation system, it is necessary to say that the Song Dynasty contributed to this. Some scholars have established a set of 11 systems covering 50 total circulation, contribution rate, organization level, structure and personnel quality, 50 first-class indicators and 30 second-level indicators. It is the "first mover" in the efficiency evaluation of the modern domestic research agricultural product circulation system. For the later scholars to provide an important theoretical framework and basic research ideas, scholars also selected appropriate indicators to build an efficiency assessment system based on the evaluation system. In 2014, some researchers absorbed these two essences, further improved and revised some indicators, and built a modernization evaluation index system for agricultural products circulation. This paper mainly follows Zhou Hongru's evaluation system, combined with the index system summarized by some researchers on the basis of empirical analysis of circulation efficiency in China. At the same time, combined with the research of relevant scholars, this paper selects three first-level indicators and eight second-level indicators to measure Heilongjiang. The composition of the specific indicator system is shown in Table 1.

Table 1. Heilongjiang Province agricultural products circulation efficiency measurement index system

Primary indicator	Secondary indicators	Variable
Turnover indicator (representing speed efficiency)	Agricultural product wholesale and retail industry production and sales rate	X1
	Liquidity turnover rate of garment products wholesale and retail	X2
	Agricultural product wholesale and retail fixed assets turnover rate	X3
	Agricultural product wholesale and retail industry inventory turnover rate	X4
Scale indicator (representing scale efficiency)	Agricultural product wholesale and retail concentration	X5
	Agricultural product batch and zero industry coefficient	X6
Benefit indicator (representing economic efficiency)	Agricultural product wholesale and retail profit margin	X7
	Labor productivity of agricultural products wholesale and retail workers	X8

The relevant indicators are calculated as follows:

$$SR(\%) = \frac{PS}{TO} \times 100\% \; ; TR(Times) = \frac{BI}{TL} \; ; FTR(Times) = \frac{BI}{FA} \; ; ITR(Times) = \frac{RE}{IRE} \; ;$$

$$RC(\%) = \frac{CS}{ARC} \times 100\% \; ; ZIC = \frac{BS}{PRS} \; ; PM(\%) = \frac{RB}{BI} \times 100\% \; ; RW(Ten\ thousand\ people) = \frac{GO}{BZI}$$

Where SR represents the production and sales rate of agricultural products wholesale and retail, PS denotes the sales volume of agricultural products of related enterprises, TO indicates that the total output of agricultural products is available for sale. TR represents the turnover rate of agricultural products wholesale and retail industry, BI expresses the income of the main business of the relevant enterprise. TL represents the total liquid assets of the relevant enterprise. FTR represents the fixed asset turnover rate of agricultural products wholesale and retail. FA represents the net value of fixed assets. ITR represents the inventory turnover rate of agricultural products wholesale and retail industry. RE represents the total amount of agricultural products sold by related companies. IRE represents the total inventory of agricultural products of related enterprises. RC represents the concentration of agricultural products wholesale and retail. CS represents the sales of related leading companies. ARC represents the sales of agricultural products of all related companies. ZIC represents the coefficient of agricultural industry approval. BS represents the sales of agricultural products wholesale enterprises. PRS represents the sales of agricultural products wholesale enterprises. PM represents the profit margin of agricultural products wholesale and retail. RB represents the total profit of the related business of the relevant enterprise. BI represents the income of the main business of the relevant enterprise. RW represents the labor productivity of agricultural products wholesale and retail workers. GO denotes the total output value of the relevant enterprises. BZI represents the total number of employees in the batch and zero industry.

2.2. Measurements and Evaluation of the Comprehensive Index of Efficiency Evaluation of Agricultural Products Circulation System

This paper uses entropy method and comprehensive evaluation method to evaluate the efficiency of Heilongjiang agricultural product circulation system, and then analyzes the comprehensive evaluation results.

Information entropy

The entropy method is an objective method to get rid of human factors. The smaller the information entropy of each indicator obtained by the entropy method, the lower the information disorder. The bigger the information utility is, the bigger the index weight is. Conversely, if the information entropy is larger, it is higher. If there are m items to be evaluated, n evaluation indicators constitute the original indicator data matrix.

$$M = \left\{ X_{ij}^{'} \right\}_{m \times n} \left(0 \le i \le m, 0 \le j \le n \right) \quad (1)$$

Equation (1) represents the index value of the i-th indicator in the j-th year.

There are many ways to standardize matrix data metrics today. Since the established indicator system contains more indicators, these indicators are different in units, and the types of indicators are also inconsistent. There are positive and negative indicators. Both the indicator unit and the type need to be relatively vague, that is, the index system data is processed in a dimensionless manner. In order to standardize the data, this paper uses the j-th to evaluate the value of the indicator and the maximum or minimum of the index. For forward or reverse indexing, there are: errors! The reference source could not be found.

$$X_{ij} = X_{ij}^{'} / X_{max}^{'} \quad (2)$$

Or

$$X_{ij} = X_{min}^{'} / X_{ij}^{'} \quad (3)$$

Then multiply the obtained index values by 100 to get a new matrix.

$$Y = \{X_{ij}\}_{m \times n} \left(0 \leq X_{ij} \leq 1\right) \quad (4)$$

After the listed matrix is dimensionless (standardized), the information entropy of each evaluation index can be calculated according to the information entropy definition. If E_j is used to represent j information entropy, its formula is:

$$E_j = -k \sum_{i=1}^{m} P_{ij} \ln\left(P_{ij}\right) \quad (5)$$

E_j is the information entropy, $0 < E_j < 1$. Where k is a normal number, $k = 1/lnn > 0$, $P_{ij} = X_{ij}^{'} / \sum_{j=1}^{n} X_{ij}$, $lnn > 0$ error! The reference source was not found.

For a given i indicator, X_{ij} is wrong! The reference source was not found. As the difference coefficient becomes smaller, E_j becomes larger. When X_{ij} is equal, $E_j = E_{max} = 1$, and there is no effect on X_i at this time. The larger the difference between the index values of each scheme, the smaller the E_j is, and the higher its effect.

The difference coefficient $d_j = 1 - E_j$, then the weight of the i-th indicator is $q_j = d_j / \sum d_j$ error! The reference source was not found.

(1) Comprehensive evaluation method

Using the weight obtained by information entropy, a comprehensive evaluation method is used to calculate a comprehensive calculation index. The calculation formula is as follows:

$$ESI = \sum q_j \times X_{ij} \quad (6)$$

The ESI in the above formula is a comprehensive evaluation index, q_j is the weight value of the j-th index, and X_{ij} is the index value processed by the normalization.

3. Experiments

3.1. Evaluation Indicators Raw Data

In the first step, the raw data is collected and the indicator data is calculated. According to the indicator system established above and consulting relevant statistics, the raw index data is collected as shown in Table 2.

Table 2. Index data of enterprises related to agricultural products wholesale and retail in Heilongjiang Province (2008-2016)

Related company indicator name	Years			
	2008	2009	2010	2011
Agricultural product sales (10,000 tons)	270.22	522.07	418.29	668.27
Available agricultural products (10,000 tons)	322.19	609.41	506.09	763.38
Main business income (ten thousand yuan)	3638277	4245662	5642475	8007083
Total current assets (ten thousand yuan)	1580362	2302673	2948284	3624143
Net fixed assets (ten thousand yuan)	528023	573202	561144	554082
Wholesale sales of agricultural products (ten thousand yuan)	3894429	4791403	7937280	13904530
Retail sales of agricultural products (ten thousand yuan)	123901	233706	2089011	3863827
Main business profit (10,000 yuan)	714606	940662	897212	626859
Gross output value (ten thousand yuan)	3914054	5723448	12203391	20384902
Number of employees (person)	25763	26684	27352	27767

Continued

Related company indicator name	Years				
	2012	2013	2014	2015	2016
Agricultural product sales (10,000 tons)	583.17	844.65	522.07	873.28	728.30
Available agricultural products (10,000 tons)	693.15	751.93	814.2	875.25	771.62
Main business income (ten thousand yuan)	11076861	14789008	13836916	12428810	1160493
Total current assets (ten thousand yuan)	5437828	6529425	10190535	10342527	1226212
Net fixed assets (ten thousand yuan)	513380	631305	612425	746625	83790
Wholesale sales of agricultural products (ten thousand yuan)	17433065	20267904	25113310	115930001	14945300
Retail sales of agricultural products (ten thousand yuan)	5225075	6693000	8189958	5977439	6110231
Main business profit (10,000 yuan)	720991	713621	1062931	863607	800141
Gross output value (ten thousand yuan)	22389021	27083307	33778910	28830103	24855531
Number of employees (person)	27664	25119	27151	24262	23805

Source: (2009-2017) Heilongjiang Statistical Yearbook, China Rural Statistical Yearbook, Heilongjiang Province Statistical Bulletin
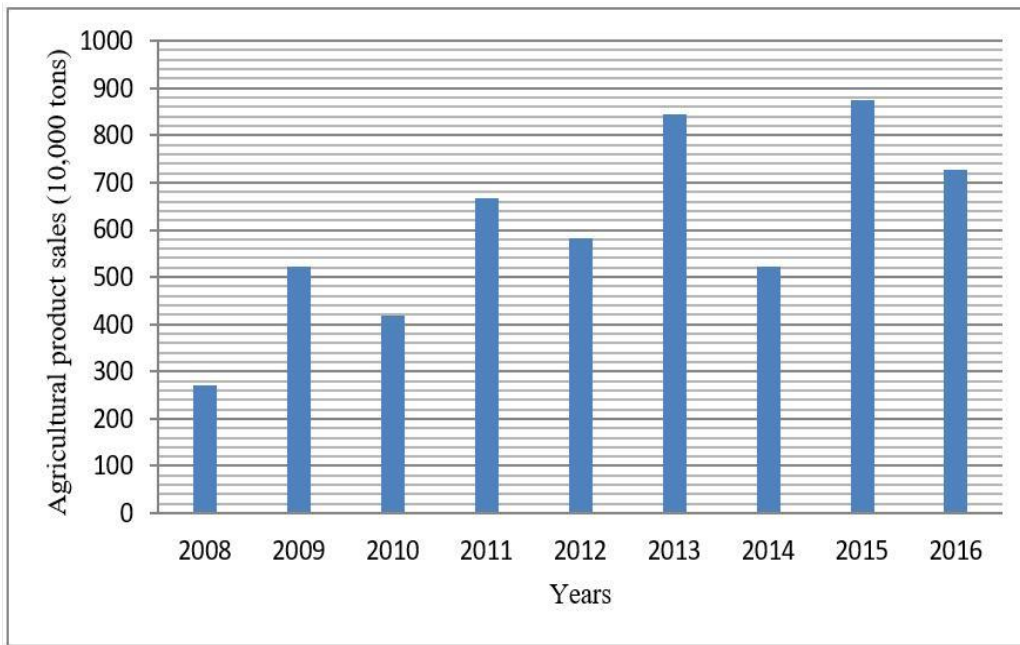
Figure 1. Heilongjiang agricultural product sales from 2008 to 2016
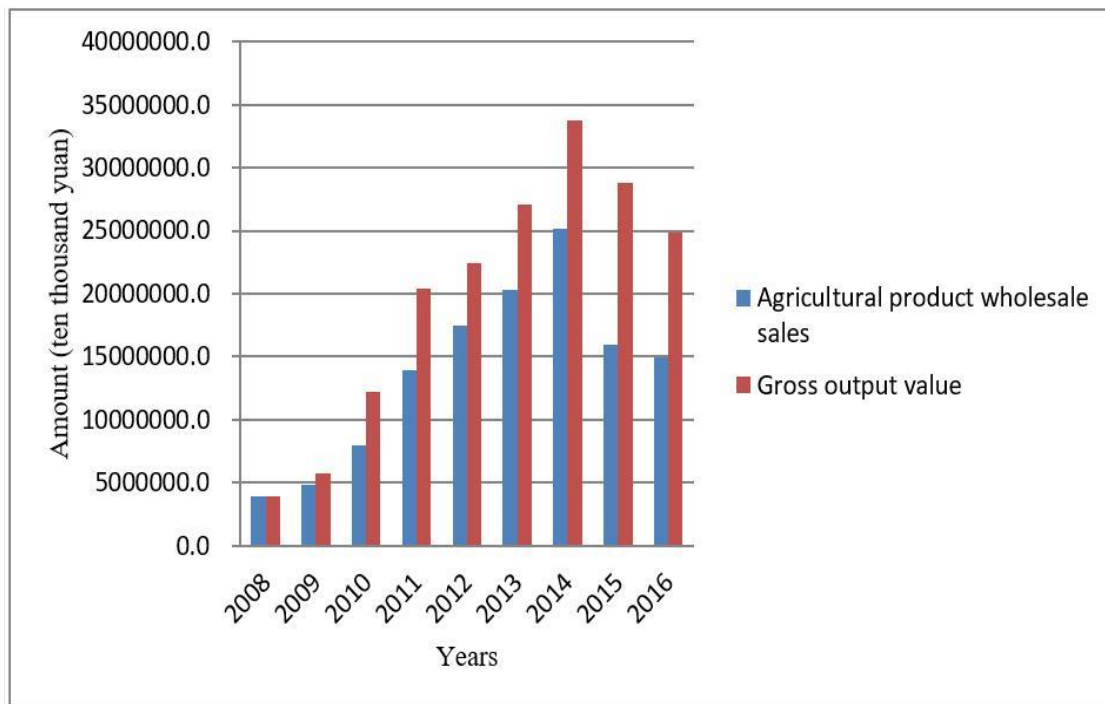

Figure 2. Heilongjiang agricultural product sales and total output value from 2008 to 2016

According to the data listed in Table 2, the data of the series of agricultural product circulation efficiency measurement in Heilongjiang Province are shown in Table 3.

Table 3. Data series of agricultural product circulation efficiency measurement in Heilongjiang Province

Years	X1	X2	X3	X4	X5	X6	X7	X8
2008	83.80	2.30	6.89	2.62	69.5	32.15	19.6	151.92
2009	85.69	1.84	7.42	4.01	83.71	20.50	22.1	214.49
2010	86.59	1.91	10.05	2.70	65.04	3.81	15.9	446.16
2011	87.54	2.21	14.45	7.03	59.69	3.60	7.83	734.14
2012	84.13	2.04	12.86	5.30	56.32	3.37	6.50	809.31
2013	89.02	2.26	11.42	8.11	80.05	3.03	4.82	1078.20
2014	91.65	1.36	13.59	1.79	72.05	3.07	7.68	1244.11
2015	93.77	1.20	16.64	443.29	59.41	2.67	6.95	1188.28
2016	94.42	0.95	13.85	13.36	68.21	2.45	6.89	1044.13

The second step: standardization processing, because the selected indicator units are not uniform and the numerical values are different, so the data is first standardized. Then, after the appropriateness test, the main factor is extracted by interpreting the variance, the factor load matrix is established, and the main factor score matrix is calculated. Finally, the main factor score calculated in each year is substituted into the above formula to obtain the agricultural product circulation efficiency score F of each year. The calculation results are shown in Table 4.

Table 4. Final score table

Years	Score
2008	-0.95024
2009	-0.69134
2010	-0.34073
2011	-0.11083
2012	-0.21509
2013	-0.18128
2014	0.421792
2015	1.358757
2016	0.708976

4. Discussion

In the process of factor analysis, the factors affecting the circulation efficiency of agricultural products in Heilongjiang Province have been obtained. The main factor F1 has strong correlation with variables x1, x2, x3, x6, x7 and x8; F2 and x2, x5 have stronger Correlation; F3 has a strong correlation with x4. Therefore, it can be considered that the following indicators are most closely related to the circulation efficiency of agricultural products in Heilongjiang Province, which is the most important factor, as shown in Table 5.

Table 5. Main factors affecting the circulation efficiency of agricultural products in Heilongjiang Province

Primary indicator	Secondary indicators
Speed efficiency	x1 agricultural product wholesale and retail industry production and sales rate
	x2 agricultural product wholesale and retail industry liquidity turnover rate
	x3 agricultural product wholesale and retail industry fixed assets turnover rate
Economic efficiency	x5 agricultural product wholesale and retail profit margin
	x6 agricultural product wholesale and retail personnel labor productivity

As can be seen from Table 5, speed efficiency and economic efficiency are two indicators that affect the circulation efficiency of agricultural products in Heilongjiang Province. Among the speed efficiency indicators, the production and sales rate of agricultural products in batches and zero industries, the turnover rate of current assets, the turnover rate of fixed assets and the profit rate of zero-industry of agricultural products are all improved in the speed-up efficiency index, and the labor productivity of employees is improved in Heilongjiang Province. The labor productivity of employees is the most effective way to improve the circulation efficiency of agricultural products in Heilongjiang Province. Analyze the evolution trend of agricultural product circulation efficiency in Heilongjiang Province. According to the above experimental results, Figure 3 can visually show the evolution trend of agricultural product circulation efficiency in Heilongjiang Province from 2008 to 2016.
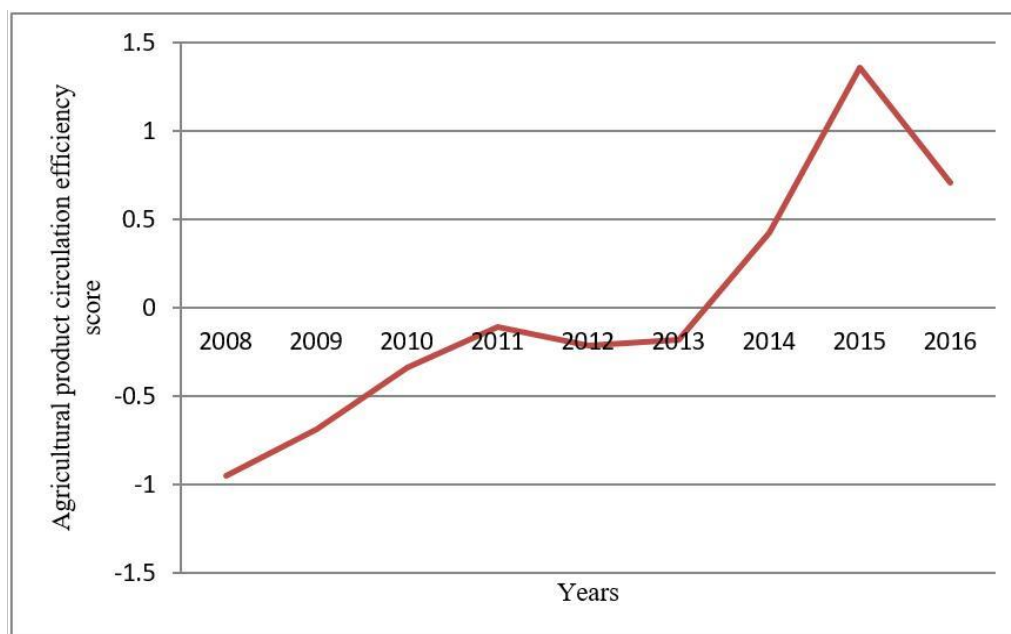

Figure 3. Trends in agricultural product circulation efficiency in Heilongjiang Province from 2008 to 2016

As can be seen from Figure 3, the circulation efficiency of agricultural products in Heilongjiang

Province increased the fastest from 2013 to 2015, and slowed from 2015 to 2016. From 2008 to 2011, the overall circulation efficiency of agricultural products in Heilongjiang Province showed a linear relationship, mainly from 2008 to 2010. The state has put forward some views on strengthening the construction of agricultural infrastructure, which has further promoted the income of farmers in increasing farmers' income. While promoting the stable development of agriculture and increasing the income of farmers, we have strengthened some views on urban and rural development, further consolidating the foundations of agriculture and rural development, and clarified the direction of agricultural construction in various provinces. Heilongjiang Province has actively and effectively increased the speed and economic benefits of agricultural product circulation. In 2008, Heilongjiang Province successfully completed the first batch of "100 villages and five thousand villages" new rural construction pilot work, and established two agricultural comprehensive development pilot zones in the plain. The trade-processing zone between Ha Yudong and Russia is to improve the distribution of agricultural products. In 2009, the main direction of Heilongjiang Province was to improve agricultural production conditions, which played a very positive role in improving the labor productivity of agricultural workers. By the end of the year, the total agricultural machinery power of the province was 34 million kilowatts, an increase of 12.7% over the same period of last year, and 1.3 million agricultural tractors, an increase of 8.3% over the same period last year. The effective irrigated area of cultivated land was 3.406 million hectares, an increase of 9.1% over the same period of last year. In 2010, Heilongjiang Province's grain output was 10.026 billion jin. In 2017, Heilongjiang focused on the development of infrastructure, with a mileage of 12,700 kilometers and a hardening rate of 99.8%. The newly hardened streets in the village reached 1,713 kilometers, an increase of 20% and 17% over the same period last year. The improvement of these infrastructures has made agricultural products circulation channels more open and promoted the speed and efficiency of agricultural product circulation. 2011 is the beginning of the 12th Five-Year Plan. It is pointed out that it is necessary to increase investment in scientific research and achieve agricultural modernization. In this year, Longjing No.31, a new rice variety planted by the Heilongjiang Academy of Agricultural Sciences, was identified as a super rice of early-maturing japonica rice in the northeast by the expert group of the Ministry of Agriculture. "Keshan" corn can even compete with the foreign variety Demeiya No. 1. "Soybean narrow line planting technology" has set a record for the highest soybean yield in Heilongjiang Province and improved the quality of agricultural products. In short, these policy measures will help improve the efficiency of agricultural products circulation in Heilongjiang Province in 2011.

Although the circulation efficiency of agricultural products in Heilongjiang Province decreased slightly in 2013, the overall circulation efficiency of agricultural products in Heilongjiang Province was relatively stable. From 2013 to 2015, the circulation efficiency of agricultural products in Heilongjiang Province achieved leap-forward growth, mainly due to the acceleration of modern agricultural development proposed by the state in 2013-2015, comprehensive deepening of rural reform proposals, stimulating rural economic and social vitality, and improving the effectiveness of agricultural subsidy policies. Agricultural policy programs, such as improving the price formation mechanism of agricultural products, are very effective in improving the circulation speed and economic benefits of agricultural products. Heilongjiang Province Implementation Plan In 2013, Heilongjiang Province officially promulgated the overall implementation plan for the comprehensive agricultural reform experiment in Heilongjiang Province. This was the only pilot project involving agricultural production carried out by the state at that time. The two plains (the Songnen Plain, Sanjiang Plain) have become the core area of the national commodity grain base,

and the leading area of high-efficiency ecological agriculture has become the core area of the national commodity grain base. In 2014, Heilongjiang Province launched an innovative rural financial service promotion plan. In 2015, the agricultural loan business increased by about 20% compared with the same period of last year. In addition, in 2014, Heilongjiang Province successfully carried out agricultural cooperative information sharing and mutual financial services, and established rural cooperative financial companies and rural financial leasing companies. This undoubtedly provides a strong financial guarantee for the circulation of agricultural products. In 2015, Heilongjiang Province promulgated the "12th Five-Year Plan" of "Heilongjiang Logistics Industry Development", which put forward clear requirements for the construction of agricultural logistics system: First, carry out logistics construction around the agricultural comprehensive experimental zone, and develop the Songnen Plain and Sanjiang Plain; Second, we must pay attention to the promotion and application of modern logistics management concepts and technologies in agriculture. Third, we must improve the construction of agricultural products circulation infrastructure, focus on the development of grain logistics and cold chain logistics, and establish a provincial agricultural logistics service system. These planning proposals have a very positive impact on increasing the speed and efficiency of agricultural product circulation.

From 2015 to 2016, the circulation efficiency of agricultural products in Heilongjiang Province decreased significantly. The reason for this situation is closely related to the reform of the supply-side structure proposed by the country at the end of 2015 in China's Central Rural Work Conference held in Beijing on December 24, 2015. The meeting emphasized the need to strengthen structural reforms in agricultural supply and improve the quality and efficiency of the agricultural supply system, with a focus on reducing the area of corn planting, over-digesting corn production capacity and promoting master planning for food and fish farming, agriculture, animal husbandry and fisheries. Among them, solving the corn production capacity has become the focus of reform. On March 28, 2016, the National Development and Reform Commission announced the cancellation of the temporary corn storage and storage policy issued in 2007 in the three northeastern provinces of Inner Mongolia and Inner Mongolia Autonomous Region. The market will form corn prices and producers will sell corn on the market. This policy has a great impact on the corn industry in Heilongjiang Province. Heilongjiang Province has been the main corn-growing province. In 2016, the total corn production in Heilongjiang Province was 31.27 million tons, accounting for 1/7 of the country's total output. The 2007-2016 national reserves has been the mainstay of corn purchases in Heilongjiang Province. According to the eight-year national reserve acquisition policy, Heilongjiang farmers have become accustomed to planting corn. There are few concerns about corn sales. However, with the cancellation of the state's temporary collection and storage policies, coupled with problems in Heilongjiang Province, such as the pressure on corn stocks, the deep processing capacity is weak, the corn sales in Heilongjiang Province is serious, and the price of corn has risen across the board. By the way, the price of second-class grain in the main corn producing areas near Harbin has reached 1,200 yuan / ton, and the market is extremely bleak. About 30% of the price of corn in Mulan County has reached the lowest price of "one yuan and three pounds". In addition, the sales of feed corn are not optimistic, mainly due to the phenomenon of "lack of pigs". In 2016, the province stored 12.76 million pigs, down 2.9% from the previous year; the annual sales of pork were 18.477 million, down 1% from the previous year. In short, the above reasons directly lead to a decrease in enthusiasm for corn production, a decrease in corn growers' income, a decrease in corn cycle speed efficiency and economic efficiency, and corn production has been the highest among all agricultural products. In Heilongjiang Province, this paper believes that the decline in corn cycle efficiency is the main reason for the decline in

agricultural product circulation efficiency in Heilongjiang Province from 2015 to 2016.

It is worth pointing out that due to the current overcapacity of corn, the low quality of corn, the elimination of corn production capacity and the improvement of corn quality has become the key to the rationalization of agricultural production structure in China. Therefore, Heilongjiang Province's "hard war" 2016 must be played. Strengthening the development of the corn deep processing industry and changing the grain to feed has become the key to solving the corn production capacity in Heilongjiang Province. Recently, Heilongjiang Province issued guidelines for the development of corn deep processing industry, focusing on production projects with a corn processing capacity of more than 600,000 tons/year deep processing project and corn fuel ethanol production exceeding 300,000 tons/year. In addition, Heilongjiang Province also introduced the implementation plan for food feeding in Heilongjiang Province in 2017, began to implement the grain subsidy policy, adopted the farming method, and implemented appropriate policy subsidies for food to promote grain reserves. Production of silage, guiding pigs, cattle, sheep and other animals from the straw concentrated feed mode to the direct feeding of the whole silage. It is believed that with the introduction of relevant policies and strong support from the state, the efficiency of the corn circulation in Heilongjiang Province will increase, which will lead to the recovery of agricultural product circulation efficiency in Heilongjiang Province.

The mismatch of the supply structure of agricultural product circulation objects is mainly reflected in the mismatch between crop production structure and consumption demand. First, the proportion of various crops needs to be re-adjusted. Specifically, more than a decade ago, due to various factors, Heilongjiang Province redistributed the weight of grain cultivation. Earlier, soybean was the core and main part of grain planting in Heilongjiang Province. Through this adjustment, the weight distribution is no longer just soybeans, but also increases the cultivation of corn and rice. At the same time, the reduction in the area planted with other types of crops has led to a rapid increase in soybeans, corn and rice, accounting for around 97% of the province. However, excessive concentration of crop varieties increases the risk of agricultural products. In recent years, the demand for soybeans has increased. According to statistics, in 2016, China purchased a large amount of food from abroad, the largest of which was soybeans, accounting for two-thirds of the total, reaching 1763.70 pounds. The main difference in domestic food is soybeans, but corn is the most productive. However, corn and soybeans are not irreplaceable, meaning that no amount of corn can replace the soybean gap. Second, the quality structure of agricultural products needs to be improved. Although there are many kinds of green agricultural products in Heilongjiang Province, there are few green agricultural products with well-known brands. The supply cannot meet the needs of consumers to improve the quality of life of branded agricultural products. Many agricultural products in Heilongjiang Province are directly sold, and the added value of agricultural products is low. The competitiveness of agricultural products in Heilongjiang Province is low.

5. Conclusion

The agricultural development of Heilongjiang Province has an important impact in China, and the development of fresh agricultural products has certain potential. In recent years, the Heilongjiang provincial government has attached great importance to the circulation of new agricultural products and actively encouraged various market participants to participate in the operation of new agricultural products, and has made great progress. From the perspective of agricultural supply side reform, this paper uses the relevant data from 2008 to 2016 to empirically test the factors affecting the circulation efficiency of agricultural products in Heilongjiang Province.

Through the discussion on the current situation of agricultural products circulation in Heilongjiang Province, the circulation efficiency of agricultural products in Heilongjiang Province was calculated, and the following conclusions were drawn: First, the circulation efficiency of agricultural products in Heilongjiang Province increased the fastest from 2013 to 2015. In 2016, the growth rate slowed down, showing the following four stages: The first stage is 2008-2011, the overall circulation efficiency of agricultural products in Heilongjiang Province is on a straight upward trend; the second stage is 2011-2013, the overall circulation efficiency of agricultural products in Heilongjiang Province is relatively stable. In the third stage, from 2013 to 2015, the circulation efficiency of agricultural products in Heilongjiang Province has advanced by leaps and bounds. From 2015 to 2016, the circulation efficiency of agricultural products in Heilongjiang Province dropped significantly. Second, the main factors affecting the circulation efficiency of agricultural products in Heilongjiang Province are speed efficiency and economic benefits. Improving the production and sales rate of agricultural products circulation industry, current asset turnover rate, fixed asset turnover rate, profit rate and labor productivity are the most effective ways to improve the circulation efficiency of agricultural products in Heilongjiang Province. Finally, this paper believes that the main reason for hindering the improvement of the circulation efficiency of agricultural products in Heilongjiang is the single sales channel of agricultural products. The circulation of agricultural products is too much, the development of agricultural products futures market is slow, and the development level of cold chain logistics is backward. Combined with the above empirical conclusions, the following countermeasures are proposed:

(1) Adhere to the reform of the supply side of corn, broaden the sales channels of agricultural products, reduce the circulation of agricultural products, vigorously carry out agricultural futures trading, and develop the "combination of agriculture and artificial intelligence" model.

(2) Actively introduce e-commerce trading platform. The introduction of e-commerce trading platform can greatly reduce the transaction cost of agricultural products circulation, improve the circulation efficiency of agricultural products, and increase the economic benefits of farmers. The introduction of e-commerce trading platform is also an effective way to solve the "three rural" problems that have long plagued China in the new normal. It is the correct way to link structural reforms and is a combination of the structural reform of agricultural supply side.

(3) Improve the circulation system of agricultural products and improve the efficiency of system operation. An effective system must consider the matching of formal and informal rules and consider how to improve the adaptability of the system. Formulate and improve the corresponding agricultural product circulation system and mechanism to ensure the continuity and standardization of the implementation of the corresponding institutions.

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Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

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