

Formation Mechanism of Pig Price Index and the Market Analysis of National Trade

Yan Pang

Kunming University, Yunnan, China

pangyan@kmu.edu.cn

Keywords: Breeding Subject Behavior, Pig Price, Formation Mechanism, Countries Trade

Abstract: Pig price is closely related to the national life of China. Pig trade occupies an important position in China's market trade. At the present stage, research shows that the behavior of breeding subjects will have a certain impact on the formation of pig price index. Based on this, it is of great significance to explore the formation mechanism of pig price index and the market situation of China's pig trade. The purpose of this paper is to explore concrete measures to stabilize the hog price by analyzing the formation mechanism of the hog price index and the market situation of national trade. This paper first analyzes the behavior of the main body of farming and the influencing factors of pig price, and then carries on the inquiry experiment of pork price by means of field investigation and data analysis. This paper makes an in-depth analysis on the specific formation mechanism of China's pig price index and the national trade pig market, and puts forward the specific strategies to stabilize the pig price. The experimental results show that the behavior of breeding subjects has a profound impact on the formation mechanism of the pig price index. In addition, the import quantity of pigs in China from 2014 to 2019 keeps rising, gradually rising from 31.24% in 2014 to 36.72%. The proportion of pig exports has been declining, from 45.12% in 2014 to 38.13% in 2019. In general, China's pig trade in the world is not optimistic.

1. Introduction

In recent years, the overall fluctuation of pig price in China is characterized by large scale and periodicity. Most scholars believe that the main reason for the periodic and large fluctuation of pig prices is the existence of free-range farmers. They also believe that the stability of pig prices can be achieved by means of large-scale breeding. However, at the present stage, the necessary condition to stabilize the hog price is not pig large-scale breeding. It will play an important role in promoting the stability of hog price and the development of hog trade by exploring the specific influence of

different breeding subjects' behaviors on the fluctuation of hog price and analyzing the specific formation mechanism of hog price.

As the price of pigs is closely related to People's Daily life and occupies a certain proportion in national trade, domestic and foreign scholars have conducted a series of studies on it [1]. In literature [2], the author analyzed the factors affecting the price fluctuation of pigs from the perspectives of supply and demand, money supply and price index. The research results showed that the price of pigs was influenced by various factors. In literature [3], the author analyzed the specific situation of China's pig trade with the world, combined with the existing international rules, analyzed the main restrictive factors affecting China's pork export, and proposed specific strategies to promote international pork trade on this basis. In literature [4], based on the basic situation of social and economic environment development, the author explored the specific impact of different breeding subjects' behaviors on pig prices. The results showed that different breeding subjects' behaviors also had different impacts on pork prices. In literature [5], the author explores the basic situation of China's pig trade market under the market economy. The study shows that the market situation of China's pig trade is not optimistic due to the role of breeding environment and market competition.

In order to deeply explore the specific effect of breeding subject behavior on the formation mechanism of pig price index, and analyze the specific situation of China's national pig trade [6], the author first made a specific analysis on the behavior of breeding subject and the influencing factors of pig price. Then, with the help of on-the-spot investigation and data analysis, the relevant inquiry experiments were carried out [7]. This paper makes an in-depth analysis on the specific formation mechanism of China's pig price index and the national trade pig market, and puts forward the specific strategies to stabilize the pig price [8]. The study of this paper is not only conducive to the expansion of China's pig market and price stability, but also laid a theoretical foundation for related research [9].

2. Theoretical Overview

2.1. Breeding Subject Behavior and Pig Price Index

To study the behavior of breeders and the specific formation mechanism of pig price, it is necessary to describe the price of pigs, and finally describe the optimal behavior results of different farmers [10]. This kind of exploration is great significant: first, the behavior of the main body of culture determines the price to a certain extent. Therefore, the investigation of the price formation mechanism of pigs is the investigation of the behavior of the main body of breeding. This can promote the effective solution to the problem of "price black box". Second, it can effectively analyze the specific effects of the behavior of breeding subjects and their changes on pig prices. The main perspective of studying the formation mechanism of pig price is the study of the main body of breeding. At the present stage, the main body of breeding in China shows the current situation of differentiation, which hinders the formation of pig price to a certain extent. In the structure theory of micro market, price is a key component, which can promote the maintenance of market equilibrium for a long time and the relationship between individual market behavior and prices. Generally speaking, there is a close relationship between the behavior of breeding subjects and pig price index.

2.2. Influencing Factors of Pig Price

(1) Supply-demand relationship

The supply and demand relations have a direct impact on the price of pigs. The most important

supply factors mainly include production cost and breeding structure, while the demand factors mainly include the total population, average income and the price of pork substitutes. First of all, from the perspective of production cost, material service cost and labor cost are two important components of pig production cost. Material service cost is mainly composed of various indirect costs, including insurance premium, management fee and feed cost. The production cost is directly proportional to the price of pigs, that is, the higher the production cost is, the higher the price of pigs will be. Secondly, from the perspective of breeding structure, pig farmers' pig supply side, retail breeding and large-scale breeding are the two main breeding structures. With the continuous expansion of large-scale breeding and urbanization construction, a large number of labor force is lost in rural areas, and the number of individual pig farmers is also significantly reduced. The overall number of pig farmers is gradually increasing, which also has an important impact on the price of pigs to some extent. Then, from the level of pork demand, pork in China's meat consumption structure accounts for a large proportion, China's basic all residents have a demand for pork. With the continuous rise of China's population in recent years, the total demand of Chinese residents for the number of pigs is also increasing, which has played a role in the specific price of pigs to a large extent. Not only that, due to the continuous development of China's economic level, people's income is constantly increasing, so people's demand for pork quantity gradually turns to the demand for pork quality, the quality of pork has increased, its price will be correspondingly increased; Finally, in terms of substitute prices, the common substitutes for pork include cattle, sheep and poultry eggs, whose substitute prices are usually inversely proportional to the price of pork itself.

(2) Money supply

Money supply is another important factor affecting pig price. Some scholars' research shows that there is an obvious positive relationship between pig price, nominal exchange rate and money supply quantity. When the nominal exchange rate and the total money supply increase by about 1%, the price of pigs will increase by 548.4971% and 45.5220% respectively, which is very significant. Many existing research data prove that the increase of nominal money supply and exchange rate can greatly promote the increase of pork price, and the fluctuation of pork price is more obvious than that of other types of industrial products in the same period.

3. Exploration Experiment of Pork Price Formation Mechanism and Trade Market

(1) Experimental steps of pork price survey

To explore the pork price formation of the specific value and the actual development of the trade market present situation, the author conducted the pork price formation mechanism and the specific situation of the trade market, this article with the help of different provinces in mainland China in 2010-2019 live pig breeding of specific data for example, 10 provinces including Sichuan, Gansu, Anhui. The pork price survey includes the scale of breeding subjects, breeding status and the price of pigs. In addition, the online questionnaire was used to investigate and analyze the pork price and the situation of the breeding subjects, including the breeding subjects, personnel of pig management departments, experts and scholars. In this paper, a total of 400 valid questionnaires were issued and 371 valid questionnaires were recovered. Based on the basic theory of market microstructure, this pork price survey analyzed the price of pigs raised by different subjects of different sizes, established the corresponding model, and analyzed the specific influencing factors of pork price fluctuation on the basis of this model, and explored the formation mechanism of pig price in China.

(2) Acquisition of original data

In order to ensure the accuracy and scientificity of the experimental results obtained in this paper, the author logged on the data research websites of Wanfang and CNKI and sorted out and classified

the existing research materials. The author consulted a total of 73 research materials in this field, and carefully sorted out and analyzed the research data and conclusions. In addition, the author also consulted the relevant data website, and analyzed the specific data of China's current hog price and trade. The existing research data and the pig price fluctuation data together constitute the original data of the pork price survey experiment in this paper. The data comes from the author's literature analysis and network survey, which provide sufficient data support for the pork price survey experiment.

(3) Data analysis and collation

After the completion of relevant investigations and experiments, the obtained experimental data should be analyzed and sorted out. In this paper, with the help of SPSS statistical analysis technology, the experimental data were sorted out, and the computer software was used to draw a data chart. On the basis of the data chart analysis, the specific conclusions about the formation mechanism of pork price and the development of the trade market were drawn. The algorithm used

$$M_0 = U - \frac{f_m - f_{m+1}}{(f_m - f_{m-1}) + (f_m - f_{m+1})} * d$$

by SPSS statistical analysis software in this experiment is:

In this algorithm, M_0 represents experimental data results, U represents total data value, F_m represents data sequence, and D represents data tolerance value.

4. Discuss

4.1. Experimental Results

In the experiment of this paper, $U=124$, $FM=14*2$, $d=1.24$. By using these values to calculate different types of experimental data, the data analysis results of this paper are finally obtained. In this paper, the author divided the breed of pig producers according to the specific number of pigs produced each year, which was mainly divided into four types: free-range farmers, small-scale farmers, medium-scale farmers and large-scale farms. The specific number of pigs produced each year was 1-49, 50-499, 500-9999 and more than 10,000. The existing research also shows that these four breeding subjects are representative groups in the current pig breeding market. The specific data of each breeding subject are shown in Table 1 and Figure 1. The data in the table are derived from the author's experimental results.

Table 1. Statistical results of breeding subjects

Year	2011	2014	2017	2018	2019
Cage-free households	92986809	87502572	80104750	69960452	59086923
Small scale	897227	1385604	2119659	2257275	2428051
Medium-sized	25754	50377	122788	161602	216687
Large scale	763	1092	1853	2501	3679
*Data are from the results of the experiment					

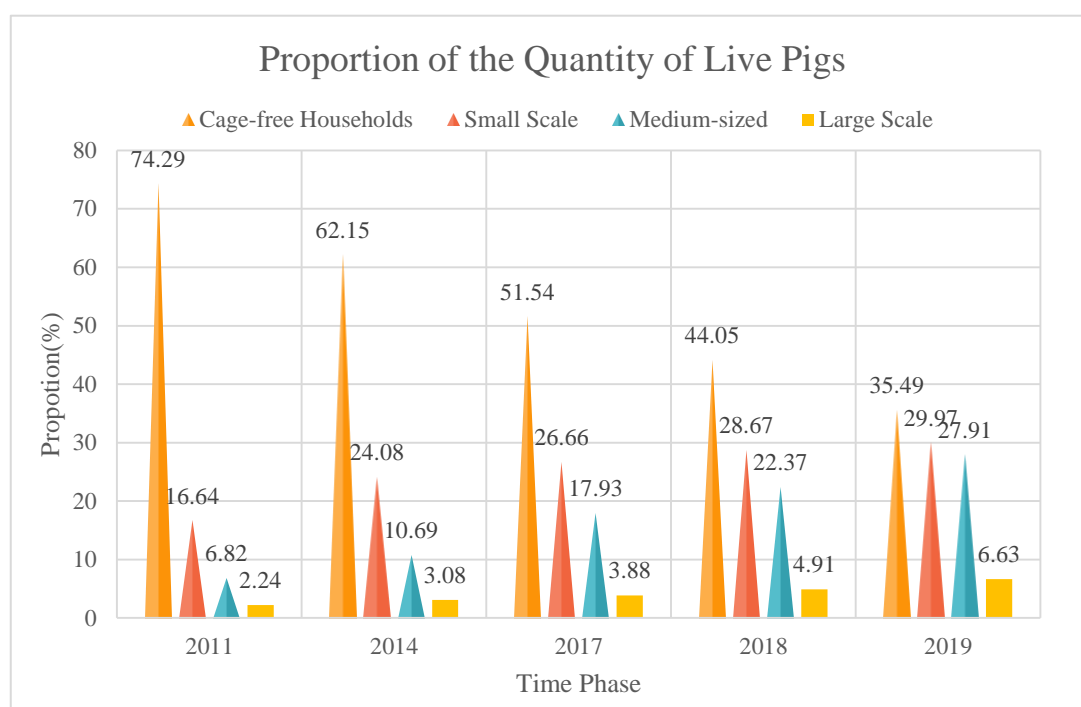


Figure 1. Proportion of the quantity of pigs to be produced

From the data in Figure 1 and Table 1, it can be seen that from 2011 to 2019, the main body of pig breeding in China showed a relatively significant trend of differentiation, with the overall number of free-range farmers rapidly decreasing and the overall number of large-scale farmers rapidly increasing. From the perspective of the number of pig farmers, the number of free-range pig farmers in 2019 and 2011 decreased by about 40%, but the number of small, medium and large-scale pig farmers showed an upward trend. In terms of the specific proportion of the total number of pigs produced, the proportion of the right amount of pigs produced by free-range farmers decreased significantly, while the number of pigs produced by national model farmers increased significantly. Compared with 2001, the proportion of the total number of pigs produced by free-range farmers in 2019 showed an obvious trend of decline, with an average rate of decline of 8.4%. On the contrary, the proportion of small, medium and large-scale breeding subjects showed an increasing trend, with the average annual increase rate of 7.45%, 15.53% and 12.16%. In conclusion, among the common centralized pig breeding subjects in China, free-range farmers are showing a trend of accelerating the introduction, and the average growth rate of large-scale breeding subjects is accelerating and occupying the market space after the introduction of free-range farmers step by step. However, data from the chart we can see, at present the size of the different breeding subject its specific changes in the quantity and output quantity also showed no consistency, the development speed of large scale farms by significantly faster than small scale farmers, it is proved in recent 10 years, the main body in pigs appeared more obvious differentiation.

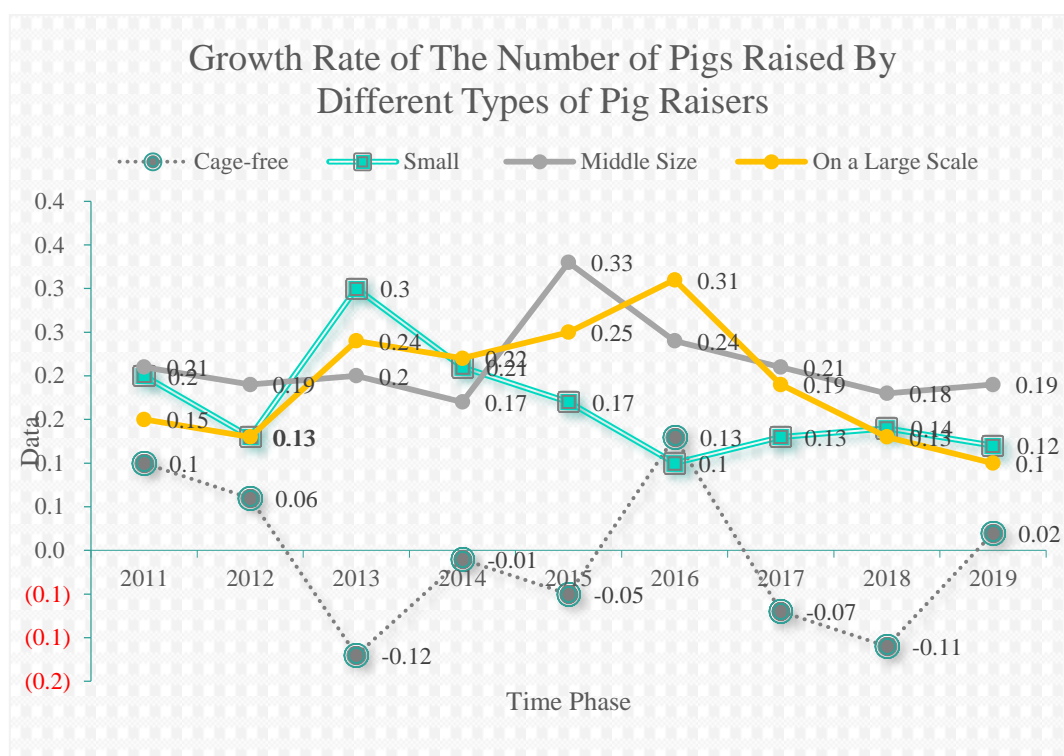


Figure 2. Growth rate of pig production from 2011 to 2019 by different types of pig producers

From figure 2 pig market rate and specific changes trend of pork price is different, we can found that farmed subject their specific breeding behavior also presents different characteristics, its characteristic is mainly manifested in the following aspects: first, the range between households and small-scale farmers live pig price and the number of live pig market showed a negative relationship between growth rate and the performance of the specific situation for "chasing down to sell up", this phenomenon when prompted pork prices rise and fall of the key forces. After analyzing the reasons, it was found that most free-range and small-scale pig farmers replenished piglets according to the pig price at that time period. Because pig breeding requires a relatively long breeding cycle, the price of pigs may have reversed to a large extent when pigs were in the field. Second, the growth rate of pig output of medium-sized farmers is relatively stable, which is correlated to the price of pork to some extent. This means that the behavior of the breeding subject can exist independently of the pig breeding cycle and play an important role in stabilizing the pork price. Third, there is a positive correlation between the specific growth rate and the price of pork in large-scale pig breeding, showing a trend of "chasing the rising and killing the falling". The above analysis also suggests that there is a negative correlation between the hog production speed formed by free-range farmers and small-scale farmers and the hog price, which means that there is a systematic cognitive bias in the pig breeding behavior to some extent, and this bias contributes to the rising or falling of the hog price. The growth rate of pig production in medium-sized pig farms is relatively stable, and the behavior of pig producers can be independent of the pig breeding cycle, playing an important role in the stability of pig prices in China. The growth rate of the total number of pigs produced by large-scale farmers shows a trend of "chasing after the rising and fighting against the falling", which will continuously enhance the specific range of the price fluctuation of pigs.

4.2. Conclusion on Breeding Subject behavior and Pig Price

In this paper, the experiment on the basis of the total output quantity pig year farming main body

is divided into four categories, were the subjects of free-range breeding, small-scale farming volume mass cultivation medium scale cultivation, the main body of the main body, and with the aid of within the scope of the various provinces and cities in mainland China in 2011-2019 pig industry specific dynamic data and field investigation about the main body behavior of farming, breeding subject behavior differences and the formation mechanism of price of live pigs has carried on the exploration of concreteness, research results show that: First, there are obvious differences in pig breeding behaviors among different types of breeding subjects. Among them, there is a certain systematic psychological deviation between free-range breeding subjects and small-scale breeding subjects. The breeding behavior of medium scale breeding subjects is obvious and can exist independently compared with the breeding cycle. Large-scale breeding subjects generally adopt the procyclical production behavior of "chasing the rising and killing the falling". Second, the price of pigs is influenced by the behavior of producers. There is a negative correlation between the growth rate of hog production and hog price between free-range and small-scale producers. There is a relatively low correlation between the growth rate of pig production and the price of pigs, which plays an important role in stabilizing the price of pigs. There is a positive correlation between the growth rate of the total hog output of large-scale breeding subjects and the hog price, that is, the higher the total hog output, the more likely the hog price will rise. Third, the specific process of pig price formation is essentially a process of continuous action between the breeding subjects. Among them, the main force to promote the overall price fluctuation of pigs lies in free-range breeding and small-scale breeding subjects. Medium-sized farms play an extremely important role in stabilizing the specific price of pigs. Large-scale breeding subjects have certain market information advantages and generally adopt the breeding strategy of "chasing the rising and killing the falling", thus becoming an important force to raise the price of pigs.

This conclusion in the construction aspect of promote fair system of live pig market in colleges and universities is of great importance: first, large-scale farms in the aspect of promoting pig market price stability has a certain requirements, does not apply to all cases, the chase after go up an exodus of inertia in pig breeding strategy instead of price volatility period may increase the price fluctuations. Second, the relatively weak links in the breeding market are the free-range breeding subjects and small-scale breeding subjects. The counter-cyclical breeding strategy adopted by the subjects has a certain impact on the specific breeding income level. Therefore, it is necessary to realize the specific influence on the information disadvantage and psychological deviation degree of free-range breeding subjects and small-scale breeding subjects, to realize rational breeding, especially to constantly improve the proportion of medium breeding subjects in all breeding subjects. The formation mechanism of hog price obtained in this paper is also the specific reason for the delisting of free-range breeding subjects and small-scale breeding subjects. However, in general, the study in this paper has not yet analyzed the deep causes of the differences in the behaviors of different scale breeding subjects. Therefore, it is necessary to continuously strengthen the deep causes for the differences in the behaviors of different breeding subjects in the subsequent studies, and strive to explore the specific effects of this reason on the formation of hog prices.

4.3. Analysis of National Pig Trade

(1) Status Analysis

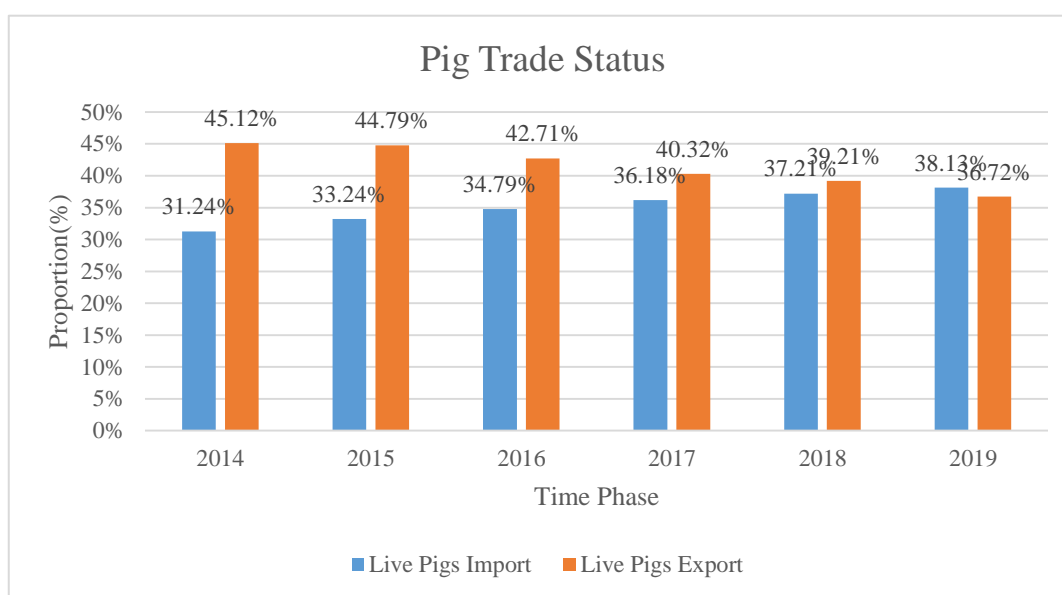


Figure 3. China's pig trade status from 2014 to 2019

From the data in Figure 3, we can see that the import quantity of China's pig trade from 2014 to 2019 keeps rising, gradually rising from 31.24% in 2014 to 36.72%. The proportion of pig exports has been decreasing from 45.12% in 2014 to 38.13% in 2019. The increasing import quantity indicates that the demand for pigs in China is constantly rising. The decreasing export quantity is not only related to the low supply quantity of pigs in China, but also related to the low quality and low competitiveness of pig products in China. In general, the overall situation of China's pig trade is not optimistic. In order to promote the further development of China's pig trade, relevant strategic measures must be formulated. Based on the existing research data and the actual development situation of China's pig trade, the author proposed the following specific strategies to promote the development of China's pig breeding trade.

(2) Strategies to promote the development of China's pig trade

The factors influencing the development of pig trade are diverse and comprehensive. The author puts forward the following development strategies based on the factors and current situation: First, combine with relevant policies to promote the continuous improvement of the pig industrial chain. Since the 11th five-year plan implementation in China, China out of many policies to accelerate the development of the pig constantly improve, the central government has mobilized fiscal spending to boost domestic demand, in order to promote the continuous development of animal husbandry in China, China's agricultural sector to improve the industry chain of pig industry has always maintained a high popularity, and on the basis of the actual proposed the "base + farmer" concreteness sheep farm pig industry chain. For the pig breeding industry dominated by retail investors, it is an important opportunity for its industrial reform. Therefore, each region of China should thoroughly grasp this opportunity to promote the continuous optimization of the pig industrial structure, so as to promote the continuous development of pig industrial processing. Second, promote the deep cooperation between enterprises to promote the continuous increase of the added value of their products. It is understood that at present market in the process of simplification of the problem is that China's pork exports in the face of the main problems, this is mainly because the true value of pigs and its related products in China is not able to fully play out, China related pig can help enterprise cooperation or the introduction of foreign capital, etc all kinds of ways to promote the improving of the specific value added of pigs and pork products, not only make the space of the pig products export in China has been greatly scenery all, also can promote

the pigs and product value maximum full play, promote the benefit maximization. Third, promote the production of high-quality pork to further open the international market. Western developed countries on the basis of trade protectionism in the "green barriers" Settings, to break the trade barriers, need to continuously improve the quality of pig and its products in China, this can promote the adjustment of industrial structure of the industry, establishing high quality pig breeding base and scientific pork processing production line, the live pig breeding and production technology; The most important thing is to pay close attention to the potential sexually transmitted diseases, so as to gradually sort out the brand of high-quality pork in the national market and build a good reputation. Fourth, we need to deepen cooperation between different regions to make the best of our strengths and avoid our weaknesses. With the help of technical exchanges, we will actively learn excellent and advanced pig breeding experience from other regions and combine it with practical application. For example, set up relevant investigation team, the domestic pig-breeding industry development in China relatively early and system more mature areas of acute careful investigation, understand the pig industry and the specific process of internationalization development, absorbing the lessons of the region and actively implement effective to evade the various risks in the process of development, reduce the risk of industry in the development process of probability. For the establishment of the overseas market of China's pig industry, specific industrial selection and landing can be carried out in some relatively specific regions. For example, in some regions where the demand for pigs is relatively large, we should cooperate with local enterprises to set up factories, so as to promote the continuous promotion of China's pig industry brand and promote the continuous expansion of its potential market. For some haven't development to regional and national, in promoting China's brand constantly improve their own pigs at the same time, also want to use the spring and autumn period and the further development of part of the cooperation way, for example, by inviting the other side of the experts and scholars to Ningxiang local inspection, the depth of cooperation, will be China's pig industry brand to more places, so as to promote the all-round development of China's pig industry throughout the world.

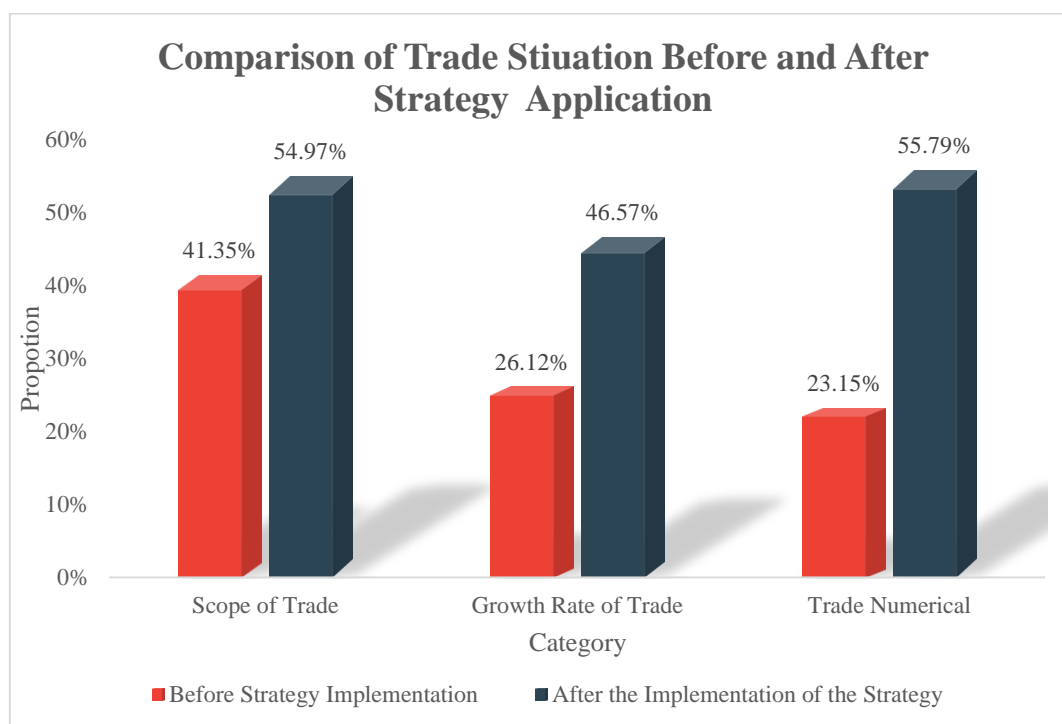


Figure 4. Comparison of trade before and after strategy application

Trade status contrast figure 4 for the different case, we can see from the data in a figure, after implementing the strategy of pigs scope of trade, trade growth and trade value got up, the trade value range increased by 13% or so, the trade growth rate of 20% or so, a total of 32% or so, this suggests that this paper puts forward the concrete policy has a positive role in promoting the expansion of trade pigs.

4.4. Strategies to Stabilize Pork Prices

As mentioned above, the factors affecting the price of pork mainly include supply and demand, money supply and price index. Feed cost as the main representative of the production costs continue to increase the price of pigs in the source of a substantial rise. The continuous increase of the total population and per capita income increases the overall demand of the pig market, and at the same time, promotes the rise of the pig price to some extent. The specific prices of pork substitutes represented by eggs and others can stabilize the fluctuation of pig prices to a certain extent, and avoid the substantial decrease or increase of pork prices to a certain extent, so as to stabilize pig prices. The specific changes in the nominal exchange rate and the quantity of money supply caused by the fluctuation of the hog price show the phenomenon of overshoot, and the fluctuation range of the hog price caused by the fluctuation is about five times that of the industrial products under the same conditions. There are many reasons for the fluctuation of hog price, including not only various external factors such as economic environment, but also subjective factors such as farmers' behavior. Therefore, it is necessary to promote the continuous improvement of hog production regulation policies and the effective implementation of pig price index insurance. Based on the original control measures, the continuous improvement of the pig price index insurance method can effectively protect the price risks of dispersed and large-scale pig farmers and the rights and interests of consumers. In addition, among the specific factors influencing price fluctuations, the fundamental factor that has a fundamental impact on the price of pigs is the supply side. Pig farmers, as an important part of the supply side, need to continuously promote the continuous improvement of pig breeding scale, and relevant departments need to make strict provisions on the specific standards of breeding scale. In addition, the fluctuation of the hog price has overshoot on the specific supply of nominal currency and the change of exchange rate, so the government departments need to promote the continuous strengthening of financial macro-control and strictly control the amount of currency issued and the change of the specific exchange rate of RMB. For relevant leading enterprises, the application of this model can guarantee product sources and promote the continuous reduction of transaction costs, so as to form a win-win situation of sharing benefits and taking risks together, and enhance the overall anti-risk capability of China's pig market.

5. Conclusion

Through relevant investigations and analysis experiments, this paper explores the specific relationship between the behavior of breeding subjects and the formation mechanism of hog price, and analyzes the specific situation of pig trade in China at the present stage. This paper draws the following conclusions through research:

- (1) There are various factors affecting the price of pigs, among which the most important factors include money supply, supply-demand relationship and price index;
- (2) There is an important relationship between the behavior of breeding subjects and the formation mechanism of pork price index, among which different types of breeding subjects have different specific influences on the formation of pork price index;

This paper puts forward specific strategies to promote the development of China's pig trade from the perspectives of industrial chain, pork product quality and enterprise cooperation, providing

positive and beneficial guidance for the expansion of the pig trade market.

Funding

This article is not supported by any foundation.

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.

References

- [1] Karine D, Barbraud C, Pinaud D.(2019). "Individual Consistency in Non-breeding Behavior of a Long-distance Migrant Seabird, the Grey Petrel *Procellaria Cinerea*", *Marine Ornithology*, 47(1),pp.93-103. DOI: 10.2305/IUCN.UK.2017-1.RLTS
- [2] Soung K K, Wook K T, Sik Y K.(2018). "First Observation on the Breeding Behavior of Endangered Species, Chinese Many-tooth Snake, *Sibynophis Chinensis*", *Journal of Asia-Pacific Biodiversity*, 11(2),pp.305-307.
- [3] Crouch C G, Benson R H, Brennan L A.(2018). "American Kestrel Nonbreeding Roost Use and Behavior in South Texas", *Journal of Raptor Research*, 52(3),pp.370-378.
- [4] Gatica A, Denkiewicz N M, Ochoa A C.(2019). "Breeding Behavior of Mara [*Dolichotis patagonum* (Zimmermann, 1780)] in the Monte-Chaco Ecotone of Argentina", *Mammal Study*, 44(4),pp.1. DOI: 10.3106/ms2019-0006
- [5] Ortega-Alvarez R, Benitez E B, Mena I M.(2018). "Notes on the Breeding Behavior of the Bumblebee Hummingbird (*Atthis heloisa*), An Endemic Species of Mexico: Nest, Courtship Displays, and Altitudinal Movements", *The Wilson Journal of Ornithology*, 130(3),pp.800-805.
- [6] Caballero D, María Asensio, Carlos Fernández.(2020). "Effects of Genotypes and Crossbreeding on the Quality Parameters of Dry-cured Shoulders from Different Iberian Genetic Pig Lines", *Journal of Food Measurement and Characterization*, 14(2),pp.818-829.
- [7] Gao Y, Chen Z, Wang Y.(2019). "Design for Pig Breeding Chamber under Multiple Environment Variable Control and Analysis of Internal Flow Field", *Nongye Gongcheng Xuebao/Transactions of the Chinese Society of Agricultural Engineering*, 35(2),pp.203-212.
- [8] Krupa E, Zuzana Krupová, Elika áková.(2017). "Breeding Objectives of Dam Pig Breeds of the Czech National Breeding Program Based on Reproduction Traits", *Agriculturae Conspectus entificus*, 82(3),pp.245-248.
- [9] Ludvík Friebeľ, Jana Friebeľová, Naděžda Kernerová.(2016). "Stochastic Analysis of Profitability of the Pig Breeding Process", *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 64(1),pp.255-264. DOI: 10.11118/actaun201664010255
- [10] Claire Guinat, Ben Wall, Linda Dixon.(2016). "English Pig Farmers' Knowledge and Behaviour towards African Swine Fever Suspicion and Reporting", *Plos One*, 11(9),pp.0161431.