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Analysis on the Export Growth of Chinese Aquatic Products in Japanese Market

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Abstract

China is an important aquatic product import and export country. Since China joined WTO in 2001, the import and export volume of China has been increasing continuously, and the fishery economy has achieved rapid development. Based on the United Nations trade statistics data, this paper uses CMS model to analyze the status quo of China's export of aquatic products to the Japanese market, and further puts forward reasonable Suggestions.

Keywords: Chinese aquatic products; Japanese market; export growth.

Overview of China's aquatic products trade

Aquatic products (according to the classification of HS-1996 code commodity, they are classified in chapter 03 products) is one of China's most internationally competitive advantage products. According to the FAO database, China's output of aquatic products was 14719,050 tons, and the world's total output was 3,123,655 tons, accounting for about 47.1 % of the world's output in 2016. Over the past 40 years of reform and opening up, China's fishery productivity has been liberated and its productive capacity significantly enhanced, resulting in a rapid increase in China's supply capacity of aquatic products. China's per capita share of aquatic products is twice the world average. At present, China has become the world's leading exporter of aquatic products. In recent years, especially after joining the WTO, China's aquatic product export trade has entered a new development phase (Liu et al., 2006). In 2002, China's aquatic product export volume was up to $2.87 billion. By 2011, the value of aquatic product export exceeded $10 billion for the first time (see Table 1), with an average annual growth rate of 25.2%.

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China has maintained a favorable trade surplus and enjoyed a favorable competitive advantage in the international market.

Table 1. Import and export of aquatic products in China

Year	exports ($100 million)	The growth rate of (%)	imports ($100 million)	The growth rate of (%)	G - L index
2002	28.7	10.9%	15.6	17.6%	0.705
2003	33.4	16.1%	18.6	19.2%	0.717
2004	40.6	21.6%	23.4	25.5%	0.732
2005	43.5	7.3%	28.8	23.0%	0.797
2006	47.4	9.1%	31.6	9.6%	0.799
2007	47.5	0.2%	34.4	9.1%	0.840
2008	51.8	9.0%	36.5	6.0%	0.826
2009	68.1	31.5%	36.0	- 1.2%	0.692
2010	88.1	29.3%	43.7	21.1%	0.663
2011	109.9	24.8%	55.9	28.0%	0.674
2012	113.2	3.0%	54.9	- 1.8%	0.653
2013	125.3	10.6%	59.9	9.2%	0.647
2014	140.7	12.4%	65.8	9.8%	0.637
2015	133.2	- 5.3%	63.3	- 3.9%	0.644
2016	137.1	2.9%	69.2	9.3%	0.671
Data source: United Nations Trade Database					

Intra-industry trade index (G-L index) is employed to measure the degree of intra-industry trade of an industry. Its basic formula is as follows:

$$T_i = 1 - \frac{|X_i - M_i|}{|X_i + M_i|}$$

T_i is the intra-industry trade index of Sector I, X_{ii}, M_i is the current export volume and import volume of Department i. T_i is between 0 and 1. The larger the T_i is, the higher the level of intra-industry trade.

With the passage of time, the level of intra-industry trade of aquatic products in China is also changing constantly. From the perspective of G-L index, Ti is higher than 0.5 and close to 1 as a whole, which indicates that the trade within aquatic product industry develops well. The highest value was 0.84, and the lowest year was 0.63. It also shows that the trade capacity of the world market is expanding rapidly, China's consumer demand is increasingly diversified, the number and types of aquatic products also presents an increasing trend, and new products are constantly emerging.

Status quo of China's aquatic products export to Japan

The scale of China's aquatic products export to Japan

Owing to the geographical location and cultural origin, the aquatic products trade between China and Japan has a long history. Since China joined the WTO in 2001, on the background of increasingly liberalized trade environment, China's export of aquatic products to Japan has made new progress. At present, Japan has become the largest export market of Chinese aquatic products, and it indispensible for China to maintain the export share of Japanese market so as to facilitate the development of China's aquaculture industry. In general, except for fluctuations in individual years, China's aquatic product exports to Japan have been growing in recent years (see table 2). From 2002 to 2009, China's export of aquatic products to Japan remained around $1 billion. From 2011 to 2016, China's exports of Japanese aquatic products had nearly doubled to about $2 billion. China's total exports of aquatic products rose nearly fourfold from $2.87 billion in 2002 to $13.71 billion in 2016. However, the proportion of China's aquatic product exports to Japan in China's total aquatic product exports has been declining, from 38.1% in 2012 to 14.7% in 2016, indicating the improvement of China's aquatic product export structure and the continuous development of the aquatic product industry (Geng, 2010).

Japanese have a relatively stable demand for aquatic products, fluctuations in the overall market capacity in 90-10 billion dollars or so (see table 3). In recent years, China's export of aquatic products to Japan has been continuously ascending, and its market share has been increasing year by year, from 12.2% in 2002 to 22.1% in 2016. Japanese mainly rely on the Chinese market for its aquatic products supply.

Table 3. Share of Chinese aquatic products in The Japanese market

Year	China's aquatic product exports to Japan ($100 million)	World exports of aquatic products to Japan ($100 million)	MS Market Share (%)
2002	11.0	89.7	12.2%
2003	10.5	84.4	12.5%
2004	12.8	92.3	13.8%
2005	12.4	91.3	13.6%
2006	11.8	82.8	14.2%
2007	10.9	77.3	14.1%
2008	11.6	85.0	13.7%
2009	12.8	79.5	16.1%
2010	15.3	91.6	16.7%
2011	19.5	108.4	17.9%
2012	20.9	108.9	19.2%
2013	20.0	96.3	20.8%
2014	20.0	96.5	20.7%
2015	18.7	87.4	21.4%
2016	20.1	90.9	22.1%

Data source: United Nations Trade Database

Market share index refers to the share of a country's products in the international market, which directly reflects the competitiveness of products. The higher the products

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market share, the greater the competitiveness. The market share index is generally expressed as:

$$MS = X_{it} / Y_t$$

MS refers to market share; X_{it} refers to the export volume of aquatic products of country i to Japan in the period of t; Y_{ti} is the total aquatic product export of the world to Japan in t period.

The export trade of China's aquatic product to Japan grows stably. Aquatic products maintain a traditional competitive edge, and gain a net export trend in the face of rapid growth in both import and export. In Japanese market, China's aquatic products market share has been increasing (Sun and Tan, 2001).

China's export structure of aquatic products to Japan

According to the commodity classification of HS-1996 of the United Nations Trade Statistics database, aquatic products are divided into categories 0301, 0302, 0303, 0304, 0305, 0306 and 0307, showing in Table 4. From 2012 to 2016, China's aquatic products exports to Japan were dominated by categories 0304 and 0307, which accounted for more than 60% of the total aquatic products exports from China to Japan, followed by categories 0306, 0303 and 0301, with the smallest export proportion of category 0302, accounting for less than 1%.

From the perspective of the growth rate of China's aquatic product exports to Japan, from 2012 to 2016, the exports of the 7 categories of aquatic products were all stable at a certain level, and there was no significant change trend.

In general, the aquatic products exported from China to Japan are mainly farmed and processed products, benefiting from China's rich natural resources and low labor cost to a large extent. These products have always maintained a certain competitive price advantage in the Japanese market.

Table 4. Structure of China's aquatic products export to Japan

Year	0301	0302	0303	0304	0305	0306	0307
2012	9.1%	1.0%	11.0%	39.6%	5.0%	13.5%	20.8%
2013	9.8%	0.8%	11.0%	39.1%	4.7%	14.4%	20.1%
2014	8.9%	0.6%	12.4%	40.5%	4.6%	12.9%	20.2%
2015	7.6%	0.6%	12.3%	42.4%	4.9%	12.7%	19.4%
2016	9.5%	0.8%	10.8%	42.0%	4.5%	13.3%	19.1%

Data source: United Nations Trade Database

Analysis of China's export growth of aquatic products to Japan

Model construction

Since Tyszynski (1951) first employed the Constant Market Share model (CMS model) in the analysis of international trade in 1951. CMS model has gradually become a very popular tool of trade analysis, and it has been widely used in the study of national (regional) export strategies and policies. CMS model is also a model used to reflect the impact of factors on a country's or region's export growth. The model assumes that if a country's competitiveness to maintain unchanged, and its market share in the world should remain unchanged over time. Thus the difference of export growth and actual export growth reflects the influence of competitiveness. The model decomposed the export changes of aquatic products into market demand effect, export commodity structure effect, export market structure effect and competitiveness effect. In general, there is multi-market model in a country, and multi-product model in a country. This paper only studies aquatic products and single market, thus the export fluctuation is reduced to market demand effect, export products structure effect and competitiveness effect. The CMS model is as follows:

$$\Delta X = rX(0) + \sum(r_i - r)X_i(0) + \sum\left[X_i(t) - X_0(t) - r_iX_i(0)\right]$$

ΔX is the trade balance of aquatic products in two periods; X(t) shows the export volume of China's aquatic products to Japan in the T period; $X_i(t)$ refers to the export volume of category i aquatic products exported by China to Japan in period T; r refers to the growth rate of Japanese aquatic products import from base period to T period; r_i refers to the growth rate of Japan's import of category i aquatic products from base period to T period; 0 is the base period.

In addition, $rX(0)$ refers to the demand effect, which means the increase of China's aquatic products export owing to the increase of the demand of aquatic products; $\sum(r_i - r)X_i(0)$ refers to the structural effect, which measures whether the export structure of China's aquatic products is compatible with the demand structure of Japan's aquatic products; $\sum\left[X_i(t) - X_0(t) - r_iX_i(0)\right]$ refers to the market competitiveness effect, which means competitiveness of China's changes (mainly reflected in the price) leads to the increase of exports.

Data description and result analysis

The aquatic products trade data (2001-2015) of China and Japan in this paper are mainly from the United Nations Trade Database. According to the commodity item classification stipulated in the coordinated coding system of The Customs Statistical Yearbook (HS-1996), aquatic products include the species with tax number 03 and it is subdivided into categories 0301, 0302, 0303, 0304, 0305, 0306 and 0307.

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Table 5. Structure analysis of China's export of aquatic products to Japan

Growth factor decomposition	2001-2008		2008-2015	
	Contribution value ($100 million)	contribution (%)	Contribution value ($100 million)	contribution (%)
Total growth effect	1.99	100.0%	7.12	100.0%
Demand effect	0.28	13.9%	1.50	- 21.0%
Structure effect	0.28	- 14.3%	0.31	- 4.3%
Competitiveness effect	2.00	100.3%	8.93	125.3%

(1) Demand effect: From 2001 to 2008, the increase of Japan's demand for aquatic products led to an increase of 28 million US dollars in China's export of aquatic products, contributing 13.9% to China's export of aquatic products, and its contribution rate is relatively low. With the passage of time, the demand for aquatic products in the Japanese market declined, and the demand effect shows negative effect from 2008 to 2015, which leads to a decline in the export of China's aquatic products. Owing to the financial crisis in 2008, the import value of Japanese aquatic products fell.

(2) Structural effect: during the period of 2001 to 2008, and 2008 to 2015, the structural effect was negative. Although the poor structure of China's export aquatic products has a relatively weak impact on export growth, it also indicates that the commodity composition of aquatic products exported in China does not match with the demand growth. Thus China should pay more attention to market demand-oriented product structure adjustment so as to better adapt to the changes in the market structure.

(3) Competitiveness effect: It can be seen from Table 5 that the competitiveness effect is quite obvious. Price competitiveness advantage is the key to China's aquatic products export, and it is the decisive factor to maintain the overall export growth. During the period of 2001 to 2008, and 2008 to 2015, the competitiveness effect made China's aquatic product export to increase by $200 million and $893 million respectively, contributing 100.3% and 125.3% to export growth. In recent years, the competitiveness of aquatic products in China has been further improved, and the adverse impact brought by the decrease of demand and the mismatch of commodity structure has been made up. It is also reflects an obvious feature of China's exports that the majority of primary products have low-cost advantage.

Conclusions and Implications

Conclusions

This paper employs the trade data of the United Nations Statistics Database, and uses CMS model to make an empirical study on the export of aquatic products from China to the Japanese market. The results show that from 2001 to 2015, the growth of China's aquatic products export to Japan is mainly driven the competitiveness effect, and the specific performance is that the contribution rate of China's aquatic products export growth to Japan is above 100%. Price competitiveness is the key to China's aquatic

product export, which makes up for the negative impact of reduced demand and structural maladjustment, and it is the decisive factor for China's aquatic product export to Japan for maintaining the overall growth of aquatic products export trade. However, the export structure is not suitable for the market demand of Japanese market for the structural presents negative effect, thus it is necessary to be attracted more attentions. Therefore, China should pay more attention to structure adjustment of market demand-oriented product so as to better adapt to the changes of market structure.

Implications

In order to promote the sustained and stable growth of China's aquatic product export, the following three aspects can be taken into consideration: (1) It is necessary to strengthen inspection and improve the quality of aquatic products. With the improvement of life quality and living standard, people all around the world pay more and more attention to food safety. It is advisable adjust China' quality inspection standard referring to foreign inspection standard. In addition, enterprises should produce quality-required aquatic products, and the government should strengthen inspection and take law enforcement efforts to promote the growth of export volume driven by the export quality improvement of aquatic product.

(2) Paying close attention to trade laws, regulations and technical standards of aquatic products of importing countries, keep abreast of changes in domestic policies of importing countries, accurately master the latest trends of aquatic products import, and make preparations for adjusting the quantity and varieties of aquatic products export in a timely manner.

(3) Establishing brand awareness, creating well-known brands, and making use of brand effect to improve the international market share of aquatic products. At present, China's aquatic products export benefits from China's rich natural resources and lower labor costs to a large extent.The export enterprises of aquatic products should be encouraged and supported to carry out continuous technological innovation for promoting the transformation of export from rough processing to fine processing. Meanwhile, the exporting enterprises of aquatic products should promote new products and explore new international markets so as to realize the diversification of the export market of aquatic products.

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