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Demand and Supply: An Analysis of the Quality of China's Export Products

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Abstract: This article takes "quality" as the starting point, and draws on the latest progress in foreign literature to clarify the importance of upgrading the quality of export products. On the premise of measuring the quality of Chinese export products, objectively assess the quality structure and product quality characteristics of Chinese exports, to further explore and analyze the current development status of enterprise export product quality, and provide a basis for improving the quality of Chinese export products.

Keywords: Export product quality; Industry demand; Corporate supply

1. Introduction

Chinese companies rely on resources and demographic dividends to create "export miracles", and they are often labelled "low quality, low prices, and low profits." But with the aging and the disappearance of the demographic dividend, the old dynamic of China ’s economic development is gradually shrinking, and new ones needs to be developed. The unsustainability of economic growth rate has gradually slowed down, and China ’s economic development has entered a new normal stage. Therefore, it is urgent to change the export growth model. In order to get rid of the current predicament of export trade, Chinese policy makers and scholars have begun to pay attention to the issue of upgrading the quality of Chinese export products, where quality is also the constant theme of production operations and market competition. It has become a social consensus to promote the economic transformation and solve the problem of insufficient economic development dynamicby improving product quality [1].

Export being one of the "troikas" for China's economic development, the quality level of exported products has an important role to play in promoting the high-quality development of China's economy as it relates to the international competitiveness of our products and the development of export companies.

2. Literature Review

2.1. Definition of export product quality

Quality is a new perspective to observe the structure of China's export trade, and it is completely different from the concept of technological sophistication. The technological sophistication focuses on the technical characteristics of the product and emphasizes the difference in the technical content between products. For example, the technical content of shoes is generally considered to be lower than that of mobile phones. Quality emphasizes vertical differences within the product. For example, lower-end shoes in high-end shoes have higher comfort, and lower-end phones in high-end phones have better durability. With the development of the times, the masters of quality management are constantly updating the meaning of "quality". Crosby stated in "Quality Free" that "quality is defined as meeting requirements, not the good itself." Feigenbaum stated in the book "Comprehensive Quality Control" that the quality evaluation standards are based on customers' actual feelings about products or services, and are measured and judged according to customers. No enterprise manager or technical staff is involved. Garvin analyzes the many aspects of quality from eight perspectives (performance, characteristics, reliability, consistency, durability, applicability, aesthetics, and perceived quality), and the content is extremely rich. In 2000, ISO issued the ISO9000: 2000 standard, which updated the definition of quality to "the degree to which a set of inherent characteristics that meets requirements." From the above evolution of the quality concept, it can be seen that customer satisfaction is an important content of "quality" [2].

With regard to research on product quality, Aw & Roberts and Boorsteindefine product quality from the perspective of consumer demand as the weighted average of product utility among consumers [3]. Aiginger believes that the so-called high-quality product refers to the product has one or more characteristics that the consumer considers valuable and willing to pay more. Kuhn proposed that product quality is the attractiveness of products to consumers, and the attractiveness of products comes from the characteristics determined by the product design process. Johnson defines the quality of a product as contained in a physical unit of product that consumers consider valuable. Hallakdefines product quality based

on the tangible or intangible attributes that a product can use to improve consumer evaluation [4].

In summary, product quality refers to the sum of the characteristics of a product that meets regulations or potential requirements, and is a concrete manifestation of product use value. The quality of export products refers to the sum of the characteristics of export products that meet consumer demand, for which consumers are willing to pay. It is different from export technology content or complexity, the former focuses on vertical differences within the same product, and the latter emphasizes the difference in technology content or complexity between different products.

2.2. Factors affecting the quality of export products.

In exploring the influencing factors of the quality of export products, this article mainly focuses on the impact of demand factors such as the economic level and income distribution of importing countries and the supply factors such as the economic level and factor inputs of exporting countries on the quality of export products. Therefore, other factors such as tariffs, foreign investment ethics, etc. have not been described too much [5].

2.2.1. Demand factor

Economic level and income distribution of importing countries: Hallak used bilateral trade data from 203 sectors in 60 countries, and found that high-income countries would choose to import more high-quality products than low-income countries. The study by Bekkers also reached the same conclusion, and the results showed that as the per capita income of importing countries increased by 1%, and the unit price of imported products increased by 1.06%. Based on Portuguese firm-level trade data, Bastos' research has shown that the value of offshore units of products exported by firms increases as the distance between trading partners increases, and the quality of products exported to high-income countries tends to be higher [6]. Based on the trade data of Italian manufacturing companies, Crino found that companies with higher productivity levels produce high-quality products while focusing on exporting high-quality products to high-income countries. Manovainvestigated China's micro-enterprise export data from 2003 to 2005, and found that among different trading partner countries, companies will set higher prices for products exported to richer countries with larger bilateral distances. It can be seen that due to the difference in income, high-income consumers who have a strong preference for high-quality products are usually willing to pay higher prices.

2.2.2. Supply factor

Economic level and income distribution of exporting countries: Hummels found, based on empirical research on trade data of 126 exporting countries, 59 importing countries, and more than 5,000 products, that richer countries tend to export higher quality products to target markets at higher prices. Khandelwal reached the same conclusion. Latzer conducted a study of 25 members of the European Union and found that for countries with high enough income, the inequality of income distribution has widened, which has a dual positive effect on the quality and quantity of exports. But for low-income countries, inequality in income distribution affects only the volume of exports. At the level of technology inputs, Schott and Hallak point out that countries of intensive capital or technology export higher quality products. Verhoogen conducted an empirical research using panel data from the Mexican manufacturing industry and found that companies with higher productivity also produce higher quality products. Johnson verified the relationship between entry barriers and export prices, and also reached the conclusion that high-productivity enterprises choose to produce high-quality products. The results of Bastos show that within a given product, more productive firms tend to export larger quantities to specific markets at higher prices [7].

2.3. Research on the quality of china's export products

Compared with foreign studies, domestic scholars started late in the study of export product quality. The quality of China's export products attracted the attention of scholars at home and abroad in the past 10 years, and the research issues have mainly focused on the basic situation of China's export products and empirical analysis of influencing factors. Among them, there are many studies on the basic situation of export quality. Zhang Lu used Hallak & Schott's method to measure the quality level of Chinese export products from 1990 to 2006. The study found that the quality level of Chinese high-tech products showed an upward trend. XiongJie found that after excluding processing trade, the quality level of Chinese high-tech products showed a downward trend from 1990 to 2009. Shi Bingzhan, based on Khandelwal nested method, measured the quality of products exported from China to the United States from 1995 to 2006.It is found that the quality of China's export products shows a stable and significant decline after 2000, and that the higher intensity of the industry capital and technology intensity in products, the longer the quality ladder and the lower the quality of China's export products are of. Li Kunwang et al. analyzed the quality distribution of Chinese export products from 1995 to 2010 by using the BACI database of French CEPII and the unit value as an indicator. The results show that the quality of China's export products has been rising before joining the WTO, and it reversed after joining the WTO. The proportion of high-quality products has dropped sharply, and the proportion of low-quality products has risen again. There is likely to be a

"quality trap". It can be seen that from 1990 to 2010, the quality of China's export products did not significantly improve, but after the accession to the WTO, there has been a sharp decline in quality. Among them, the improvement of the quality level of high-tech products exported by China is mainly reflected in the processing trade, and there is a lack of self-produced high-quality products [8].

Regarding the impact of the quality of export products, scholar Zhang Junmeibelieves that the improvement of the quality of export products by Chinese enterprises has a positive impact on the maintenance of export relations and the growth rate of enterprises. She believes that the upgrading of the export productquality of enterprises is conducive to the survival of export relationships and can increase the export growth rate. Li Yan believes that the quality of export products promotes economic growth and is conducive to the sustainable and healthy development of the national economy, and that the improvement of product quality in low-quality countries has a more significant impact on export growth than in high-quality countries.

In summary, we find that the innovation in the existing literature is mainly reflected in the measurement methods of export product quality, focusing on analyzing the trend of China's export product quality level. And this article will analyze the evolution trend of the distribution characteristics of high-quality products, medium-quality products and low-quality products in China's export products from the two aspects of overall industry and enterprise supply. This study also further discusses the influence of economic development level, income distribution and trade liberalization of trading partner countries on the upgrading of the quality of China's export products, which is helpful for the government departments to formulate relevant trade policies accordingly, promote the improvement of China's export product quality, and then get rid of the trade dilemma [9-10].

3. Analysis of the Quality Characteristics of China's Export Products

3.1. Measurement of export product quality

As for the methods of measuring the quality of export products, scholars have proposed three types of measurement methods so far, including unit value method, price index method and regression inference method. The unit value method refers to the value per unit obtained by dividing the monetary value of the exported product by the quantity. This method is mainly used to calculate the unit value of products at the micro-enterprise level, such as Bastos and Joana, Baldwin and Harrigan, and Liu Xiaoning. Regarding the price index method, scholars Hummels and Klenow decompose a country's export trade into product breadth and product depth, and further decompose export depth into price index and quantity index. Then Hallak constructed the EKS multilateral price index to measure the quality of export products. In addition to quality differences, prices are also affected by productivity, production costs, etc. Therefore, quality information needs to be stripped from the price. Based on this, scholars began to use regression inference to measure product quality from demand functions, such as Khandelwal, Hallak, and Schott.

This article believes that the quality of export products refers to the sum of the characteristics of export products that meet consumer demand, for which consumers are willing to pay. Therefore, based on the definition of export product quality, and comprehensive consideration of various measurement methods and the availability of data, in describing the characteristic facts of the evolution of Chinese product quality, this article will use the unit price to measure the level of export product quality. And according to the calculation methods proposed by Fontagné and Li Kunwang et al. the unit value UVi of the export product i is calculated at the product level, and the world average export unit value UV (Trade-weighted geometric mean of the unit value of exports of the product in all countries)of the product is used as a reference to calculate the ratio of the two: ki = UVi / UV. According to the size of ki, we divide the quality of export products into high-end products with higher quality than the world average, low-end products with lower quality than the world average, and middle-quality products in the middle.

3.2. Analysis of quality characteristics of export products

This article uses the French CEPII (International Economic Research Institute) World Trade Database BACI to measure and analyze the quality of China's export products from 1995 to 2017. Although the BACI database helps to analyze the relative quality changes of Chinese export products over a longer time span, it does not provide export information at the enterprise level and cannot discuss the impact of market entry on the quality of export products. Since the number of product exports reflects the number of exporting companies to a certain extent, in order to analyze the impact of market entry on the quality of Chinese export products at the enterprise level, this article uses the China Customs Classification Statistics Import and Export Trade Database's export value data to more accurately analyze the evolution characteristics of China's export product quality distribution.

3.2.1. Overall level of the industry

Figures 1 and 2 show the changes in the quality distribution of China's export products during the 20 years from 1998 to 2017. It can be seen that during this period, the export value of China's low-quality products has generally increased stepwise. During the period of 2001-2013, it

showed a rapid growth trend, rising from US $ 267 billion in 2001 to US $ 145 billion in 2013, increasing by more than five times. The proportion of exports of low-quality products has shown a downward trend, from 84% in 1998 to 59% in 2017, but China's exports of low-quality products still occupy an absolute dominant position in terms of proportion. Judging from the changes in the export volume and proportion of medium quality products, China ’s export volume of medium quality products has been growing slowly before 2010, but has shown a continuous upward trend since 2010.From US $ 30.9 billion in 1998 to US $ 945 billion in 2017− the export volume of medium-quality products has increased by 30 times. In terms of the proportion of exports, the proportion of China's exports of medium-quality products is on the rise, from 12% in 1998 to 37% in 2017, which has more than tripled. The export value of China's high-quality products has also shown an upward trend in general, but its proportion of the total exports has shown a steady decline, basically remaining at about 4% during 1998-2017.It can be seen that China's exports are still dominated by low-quality products, while the proportion of exports of medium-quality products is on the rise, and the share of high-quality exports is relatively small, which means that the quality of Chinese exports needs to be improved in general.

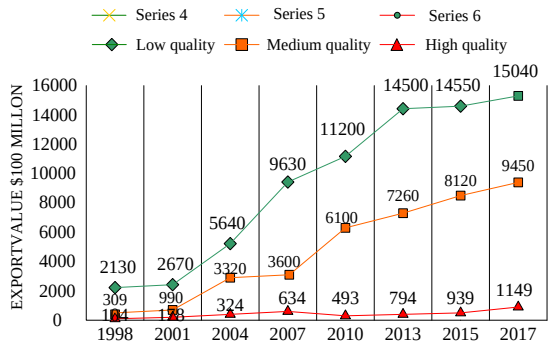

Figure 1. China's export product value by quality level

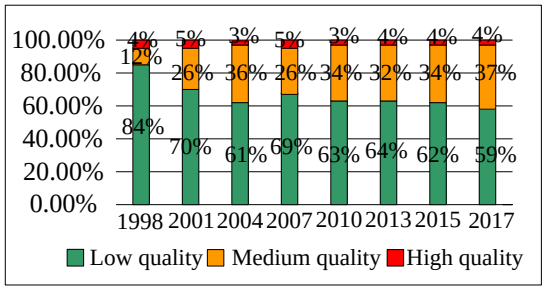

Figure 2. Proportion of China's export products by quality level

According to the above analysis, since the accession to the WTO in 2001, China's export products of various quality levels have increased in varying degrees. On the one hand, compared with the gradual increase in the number of export products before joining the WTO, China's exports have developed rapidly after joining the WTO. The degree of international trade is more open, and the number of countries that we export is large, and these countries are widespread, which has caused a rapid increase in the type and amount of China's export products. The different economic levels and income levels among countries have caused China's exports of different quality products and their growth rates to differ. High-income countries prefer to import high-quality products, while countries with poor economic development are more likely to choose to import low-quality products. On the other hand, countries with better economic development tend to export higher quality products to target markets at higher prices. Due to the pursuit of "high-speed growth" in the early stage of the Chinese economy, the rapid economic development model has led to a relatively large proportion of middle and low-quality products in China's exports. With the transformation and development of "high-quality growth" in China's economy, the proportion of low and medium-quality products exported has been decreasing year by year, and the share of medium- and high-quality products has been increasing year by year. However, the proportion of exports of low-quality products is still very large, and the growth rate of high-quality products is too slow.

3.2.2. Supply level ofenterprise

According to the enterprise-level data provided by the China Customs Database, it was found that the growth of China's total exports before entering the WTO was relatively stable, and the total exports grew rapidly after joining the WTO. Especially from 2001 to 2007, the growth rate once reached 100%.

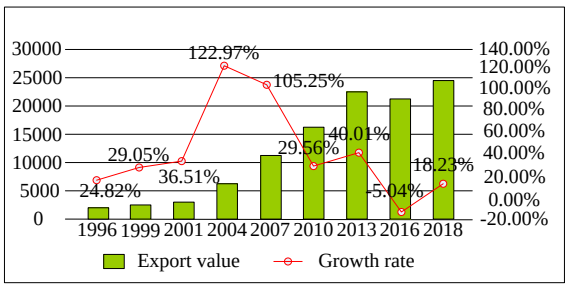

Figure 3. Changes in export value of Chinese companies

With the rapid growth of China's total exports, if new entrants enter the export market in a price-competitive manner dominated by low-price strategies, instead of entering the export market with non-price-competitive methods based on quality, it will inevitably cause the

quality of China's export products to decline. The reason why price competition has become the main competitive strategy of Chinese export companies in the international market is, on the one hand, related to the existence of a large number of cheap labor endowments in China. On the other hand, it is also related to some government export incentives, especially export tax rebate policies. This has led many companies with low production quality to choose exports in search of a policy premium. The low production quality has led many companies to export to the low-end market as their main goal, which has led to an overall decline in the quality of Chinese exports. In short, after joining the WTO, some enterprises that did not have export competitiveness also joined the WTO to join export enterprises. These enterprises that produce low-quality products have entered the international market through low-price competition, which has led to a general decline in the quality of China's export products.

4. Measures to Improve the Quality of Export Products

We should further strengthen high-quality product trade cooperation between China and developed countries. The research shows that the higher the level of economic development of the trading partner country is, the better the export product quality of the exporting country will be. The quality level of China's export products needs to be improved, mainly due to the relatively low proportion of exports of high-quality products. In the global trade network of high-quality products, the United States, Germany, France, Italy and Japan are at the core of control. It can be seen from this that China should further strengthen high-quality product trade cooperation with developed countries such as the United States, Germany, France, Italy, and Japan, promote the upgrading of export product quality through the market forced mechanism, and finally realize the transformation and upgrading of foreign trade.

Improve industrial policies and give priority to promoting the quality upgrade of China's high-tech industries. Studies show that compared with low and medium technology products, the increase in per capita income of trading partner countries and the widening income gap have a higher impact on high-tech products. In recent years, under the background of low per capita income and low level of domestic production technology, China has been able to quickly gain a strong international competitiveness in high-tech industries such as the mobile communication equipment industry and the photovoltaic new energy industry, and emerged Huawei, ZTE and other internationally renowned enterprises. This is related to the adoption of more open industrial policies in these industries, which has promoted the quality upgrade of high-tech industries by actively expanding international markets, especially in developed countries.

Take proactive and effective measures to promote enterprise R&D investment. Research shows that increasing R&D investment can effectively improve the quality level of China's export products. Then, under the general trend of economic globalization, if China's export trade wants to achieve the transformation from "quantity" to "quality", it should still pay attention to the use of global resources, especially the high-quality resources of developed economies. By effectively reducing import tariffs, introducing more high-quality products that are conducive to independent innovation, and promoting enterprise product innovation or production process innovation. The government should also use financial support, technical support and other measures to cultivate enterprises' ability to absorb and learn advanced technologies and further improve their ability to independently innovate. In addition, laws, regulations and policies on intellectual property protection should be further improved to create an institutional environment that encourages independent innovation by enterprises.

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