Comparative Analysis of China and Korea's Competitive Strength of Electronic Information Industry Trade

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***Abstract*—The paper is mainly about the compare of China and Korea's advantages of electronic information industry trade. The methodology used in this paper relates to Trade Competitiveness and Revealed Comparative Advantage Index based on the data of China and Korea's value of import and export from 2010 to 2013. As a result, the article figures out that china and Korea all have advantages in electronic information industry trade, but Korea has more competitive strength than China. In order to improve the two countries' competitiveness in the international trade, this paper provides a strong basis for the theory and data.**

***Index Terms*—China and Korea, competitive strength, electronic information industry, trade competitiveness, revealed comparative advantage index**

I. Introduction

With the expansion of globalization and international economic exchanges, with the rapid growth of China and Korea's trade scale which has closer geographical location and culture, at the same time as a result of a certain degree of similarity of their economic development and production exports between the two countries, the international competition in the market has become more intense. Comparison of China and Korea's main export production, we can find that, China's top five categories of goods for exports are electronic information production, machinery production, textiles and garments, primary production, chemical production. And Korean's top five categories of goods for exports are electronic information production, motor vehicles and parts production, chemical production, ship machinery production. This shows that the electronic information production is the largest export production of the two countries.

China's electronic information industry started in the 1990s, but has developed rapidly. Since 2010, China's foreign trade of electronic information production overcomes the complicated domestic and international economic situation, to keep a rapid growth. China's the value of import and export in 2013 first breakthrough 4 trillion dollars, up to 4.16 trillion dollars. Among them, the value of import and export of electronic information production reached up to 974.14 billion dollars, 32.0 percent of the total value of import and export, an increase of 12.1%, higher than the national growth rate of foreign trade import and export levels over the same period total 4.5 percentage. Among this, exports 545.31 billion dollars, an increase of 11.9%, higher than the national export growth rate of 4.0 percent, the proportion of the country's total foreign trade exports reached 35.3%. Imports 428.83 billion dollars, an increase of 12.4%, higher than the national foreign trade import growth rate 5.1 percentage points, the proportion of the country's total imports of foreign trade reached 28.2%. Electronic information industry trade has become an important engine for the country's exports and the dominant force, and its trade structure has been further optimized.

Korea began to develop electronic information industry from the 1960s, and rapidly rose in the early 1980s. The main reason is that Korea has a good foundation for the development of industry, after the Asian's financial crisis, Korea gradually abandoned low value-added industries, and has taken measures to promote the development of high-tech industries, even on a par with the national policy. In recent years, affected by the widespread use of smart phones, electronic information industry's scale almost reach to the peak. Korea's value of import and export trade reached 110 million dollars in 2013, of which exports of electronic information production 124.1 billion dollars, accounting for the Korean national foreign trade export share of 22.2%. [1]

TABLE I. Trade Value of Electronic Information Production

Year	China		Korea	
	Export	Import	Export	Import
2010	3887.6	3143.1	1107.9	630.7
2011	4457.6	3509.5	1185.7	697.3
2012	4873.2	3815.2	1191.0	668.6
2013	5453.1	4288.3	1355.0	722.7

Hundred million dollars

Data sources: the Ministry of Commerce of the People's Republic of China

Manuscript received April 20, 2015; revised August 5, 2015.

doi: 10.18178/joams.4.6.479-481

II. Competitive Strength Comparisons

As international competitiveness is a very complex area of research involving multiple disciplines, analyze international competitiveness of industry is a complex and difficult task. Many scholars from different perspective, made a variety of index calculation method and measurement models. There are mainly two types of indicators: one is the display indicators, it shows the results of international competitiveness; the other is the analysis of the index, which explains the presence of international competitiveness. We selected the two display indicators for analysis.

A. Trade Competitiveness Index

Trade Competitiveness index, also known as net exports index. It is one of the more commonly used measure when analyzing the international competitiveness index, represents the difference between a country's value of imports and exports accounted for the proportion of total value of import and export. This indicator, as a relative value of total trade, it excludes the impact of economic expansion, inflation and other macroeconomic factors' aspects. The formula is:

$$TC = \frac{Ei - Ii}{Ei + Ii} \quad (1)$$

In this formula we should explain that: Ei represents for the export trade of the product, and Li represents for the import trade of the product. No matter how much the absolute amount of imports and exports, the index is between -1-1. Its index is closer to 0, closer to the average level of competitiveness. Its index is closer to -1, weaker to have competitiveness. Its index is closer to 1, stronger to have competitiveness.

According to trade competitiveness formula and the data in Chart 1, we can get the data of the trade competitiveness of two countries.

TABLE II. Trade Competitiveness

Country	2010	2011	2012	2013
China	0.106	0.119	0.122	0.120
Korea	0.274	0.413	0.281	0.304

Data sources: according to the data in Table I

As can be seen from the results in Table II, two countries' trade competitiveness are greater than 0, so they are both export advantage country.

But with respect to China, Korea's index is closer to 1, so more has a comparative advantage. Carefully compared the data of nearly four years, we can see that China's trade competitiveness has been less than Korea's. But the overall value continues to rise, only decreased when it run into the financial crisis and the rapidly raised of Smartphone in 2013. As for Korea, its trade competitiveness has been at a relatively high value, but suddenly dropped from 2011 to 2012. It only had a small range of pick-up in 2013, but still less than the index in 2011. It has been affected Korea's electronic information industry's export, because of China's rapidly development. [2]

B. Revealed Comparative Advantage Index

Revealed Comparative Advantage Index, was proposed by Balassa (US) in 1965. It is the most convincing measure of a country's production or industry in the international market. RCA index can be determined by what the industry is more of export competitiveness, which reveals a country's comparative advantage in international trade. The formula is:

$$RAC = \frac{Xi/X}{Wi/W} \quad (2)$$

In this formula we should explain that: Xi represents for the export trade of the product in the country, and X represents for the export trade of the country. Wi represents for the export trade of the product in the world, and X represents for the export trade of the world. To simplify the calculations, we can define a new concept of R to compare the trade competitiveness between the two countries. The formula is:

$$R = \frac{Xi/X}{Yi/Y} \quad (3)$$

In this formula we should explain that: Xi represents for the export trade of the product in China, and X represents for the total export trade of China. Yi represents for the export trade of the product in Korea, and Y represents for the total export trade of Korea. If R is greater than 1, indicating that the proportion of China's exports of electronic information products in total exports is greater than the Korean exports of electronic information in the proportion of total exports. Meanwhile, China has more comparative advantage. In contrast, if R is less than 1, indicating that China's exports of electronic information products in total exports is less than the proportion of Korean exports of electronic information in the proportion of total exports. Meanwhile, Korea has more comparative advantage. [3]

TABLE III. Trade Value of Export and Import

year	China		Korea	
	Export	Import	Export	Import
2010	15777.5	13962.4	4663.8	4252.1
2011	18983.8	17434.8	5554.1	5243.7
2012	20487.1	18184.1	5478.7	5195.8
2013	22093.7	19503.2	5596.3	5155.9

Hundred million dollars

Data sources: the Ministry of Commerce of the People's Republic of China, China Statistical Yearbook

TABLE IV. Index of R

Year	2010	2011	2012	2013
R	1.03	1.10	1.10	1,02

Data sources: According to the data in Table I and III

As can be seen from the results in Table IV, the index of R is always greater than 1. So the proportion of China's exports of electronic information industry has been higher than in Korea. The index of R reaches a maximum value

of 1.10 from 2011 to 2012. It only had a small range of drop in 2013, but Korea still has more comparative advantage. We can see that, the proportion of exports and export of electronic information production in Korea is increasing when we mix the final data in Chart 4 with the intermediate data in Chart 3. But the overall trend is relatively flat. Because of continuous optimization technology in China, the two countries' competition in the international market is more and more tense.

III. Conclusion

Electronic information products are China and Korea's largest export products, and electronic information industry of both two countries is currently in the stage of rapid development. It can be seen in the above data analysis that, in the competition of the two countries, Korea has more comparative advantage. Chinese comparative advantages of electronic information products is increasing year by year, while the comparative advantages of electronic information products in Korea has seen a downward trend. Nowadays, Chinese electronic information products export competitiveness is close to Korea with a rapid speed. [4]

With the rapidly increase in the international competitiveness of China's electronic information industry, it has a tendency of surpassing Korea. China has a relatively strong comparative advantage, while Korea is still better than China at the level of specialization. With the development of China's electronic information industry, the trade structure of electronic information industry of China and Korea has changed radically, while China's electronic information industry trade competitiveness has improved, there still having a great complementing between China and Korea. Overall, there is more complementary than competitive, and it will be a huge potential of trade. So we believe that open trade of electronic information industry are conducive to further enhance both China and Korea's electronics information industry structure and industrial competitiveness. [5]

So based on the above analysis of competitiveness index, we give the following recommendations to achieve leapfrog development goals of China's electronic information industry:

First, China should follow the trend of economic globalization, and further deepen the reform of industry management system, transformation the government role in the industrial development. Give full play to China's electronic information industry competitive advantage, and change the disadvantage to advantage.

Second, China should improve the productivity of electronic information industry. Make the use of market mechanism and macro-policy, and promote the rational flow of resources factors. Especially for science and technology, advanced human resources, and other advanced production management concept of industry.

Third, Enterprises should to improve their quality of management, what's the key of improving the productivity of information industry. It must first establish the appropriate R & D incentives, then constantly improve their own capabilities, to enhance the core competitiveness of enterprises. At the same time, learning the advanced management experience of Western countries, to improve the industry's production and business management level.

Last, Establish the quality management system of electronic information products. Set up the industry standard of electronic information products and strengthen the management of production process, which is an indispensable factor to improve the quality of China's electronic information products and international competitiveness of the electronic information industry.

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