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Study of Evaluation on China's Electronic Equipment Manufacturing Industry Competitiveness

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Abstract: Giving the fact that hi-tech products as a trade product have become quite crucial and critical in the growth of economies in many nations, the paper took electronic equipment manufacturing industry as an example. The aim of this study is to investigate the competitiveness of the selected electronic equipment manufacturing sectors in China in comparison with selected 19 countries in the world based on the comparative advantage index. In this context, Revealed Comparative Advantage index was utilized using trade figures of four electronic equipment manufacturing sectors for the years 2005, 2007 and 2009. The results indicate that strong comparative advantage exists for China in electronic equipment manufacturing industry, and there is a positive tendency of Revealed Comparative Advantage.

Keywords: Revealed Comparative Advantage, electronic equipment manufacturing industry, trade

1. INTRODUCTION

Due to the gradually opening door from 1984, China has become one of the world's most important manufacturing centers. However, the development of China's economy requires not only the processing and assembly of products, but also the development and growth of China's high-tech industries. ^[1]According to China's Statistical Classification of high-tech industry, Electronic equipment manufacturing industry belongs to the statistics of high-tech industry. Information technology (IT) and innovation play an important role in electronic equipment manufacturing industry. ^[2] And the export of electronic equipments increases steadily. ^[3] ^[4] The amount of the export of electronic equipments is 94.86 billion USD in 2005, 146.28 billion USD in 2007 and 148.8 billion USD in 2009(from the author's calculation). Does this mean China's electronic equipment manufacturing industry has an international competitive advantage in the world? Giving the fact that electronic equipment manufacturing industry has become quite crucial and critical in the growth of economies in China and many nations in the world, this paper aims at investigating the competitiveness of electronic equipment manufacturing industry in China compared to selected 19 countries. Through the investigation the focus was given on four particular electronic equipment manufacturing sectors as the comparable data were available in those sectors for conducting the research.

The rest of the study is organized as follows: section 2 describes the methodology while in Section 3 empirical findings are provided. Section 4 concludes the articles with recommendations for policy makers.

2. METHODOLOGY

Although different approaches are available to use in explaining competitiveness of a nation, such as Diamond model (Porter,1991,1997) ^[5], RCA index(Balassa,1965) ^[6],Trade Specialization Coefficient index(TSC), Relative Export Performance index(REP) and so on, within the scope this study, in order to measure the comparative advantages Revealed Comparative Advantage (RCA) index was utilized.

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The concept of comparative advantage was originated from David Ricardo's insight that free trade allows countries to gain from increasing specialization in activities where they have (strong) comparative advantage under autarky. Empirically, comparative advantage is often measured by Balassa's revealed comparative advantage (RCA) index. Balassa's RCA index is based on the general RCA approach, which in essence, is to use export specialization patterns to infer comparative advantage patterns, i.e. a country's actual high specialization in an activity can be viewed as an evidential indication that it has strong comparative advantage in that activity (Balassa, 1965). There are a variety of RCA indices have been suggested and disputed. See from Baldwin, 1971^[7]; Donges and Riedel, 1977^[8]; Wolter, 1977^[9]; Bowen, 1983^[10] and so on. But Balassa's RCA index remains to be the most widely used measure by applied economists. ^[11]

Balassa's RCA index can be defined as:

$$RCA_{ia} = \left(\frac{X_{ia}}{X_{it}} \right) \left(\frac{X_{wa}}{X_{wt}} \right)$$

Where X_{ia} denotes country i 's export of product a ; $X_{wa} = \sum_{j=1}^n X_{ja}$ represents the world export of product a ; X_{it} denotes country i 's total export at year t ; $X_{wt} = \sum_{j=1}^n X_{jt}$ represents the total world export of all products at year t .

According to the above Equation, $RCA_{ia} > 1$ implies that country i has strong international comparative advantage in product a . According to the above Equation, $RCA_{ia} > 2.5$ reveals that country i has very strong international comparative advantage in product a . $1.25 < RCA_{ia} < 2.5$ implies that country i has stronger international comparative advantage in product a . Conversely, $RCA_{ia} < 1$ implies that country i has weak international comparative advantage in product a .

Table 1. The electronic equipment manufacturing industry investigated

NO.	Industry Name	SITC Rev.4
1	Monitors and projectors, not incorporating television reception apparatus; reception apparatus for television, whether or not incorporating radio-broadcast receivers or sound or video recording or reproducing apparatus	761
2	Reception apparatus for radio-broadcasting, whether or not combined, in the same housing, with sound recording or reproducing apparatus or a clock	762
3	Sound recording or reproducing apparatus; video recording or reproducing apparatus; whether or not incorporating a video tuner	763
4	Telecommunications equipment, n.e.s., and parts, n.e.s., and accessories of apparatus falling within division 76	764

In this study, the electronic equipment manufacturing industry is classified based on Standard International Commodity Classification Reversion 3(SITC Rev.3). Table above shows the industry group numbers for related

industries that were taken into account for analysis. The index mentioned above was used to compare China's competitive potential in the electronic equipment manufacturing industry shown in table and figure below with 19 countries, which are China's main trade partners. To evaluate the competitiveness of the electronic equipment manufacturing industry the import and the export figures for years 2005, 2007 and 2009 were acquired. The data was obtained from World Bank and United Nations Commodity Trade Statistics Database (UN COMTRADE).

3. EMPIRICAL FINDINGS

The values for years 2005, 2007 and 2009 comparative advantage index of China in comparison with the selected 19 countries are considered. Since the aim was to investigate competitiveness of China against the main export partners, the analyses were done by investigating average RCA values and RCA values for years 2005, 2007 and 2009. The most significant findings of the analyses were summarized as follows:

Table 2. The average value of RCA

Countries	RCA Value	Rank	Countries	RCA Value	Rank
Mexico	2.685	1	Romania	0.561	11
China	2.467	2	Germany	0.468	12
Korea	2.330	3	France	0.406	13
Singapore	1.091	4	Canada	0.397	14
Japan	0.968	5	Brazil	0.345	15
Netherlands	0.865	6	Ireland	0.289	16
United Kingdom	0.815	7	India	0.226	17
United States	0.665	8	Australia	0.131	18
Denmark	0.621	9	South Africa	0.127	19
Indonesia	0.604	10	Russia	0.046	20

The average values indicate that China has comparative advantage over almost all of the countries except Mexico, based on RCA index. In addition to that, Mexico, China, Korea and Singapore are the only 4 countries that have strong international comparative advantage in the electronic equipment manufacturing industry as their average values were found to be greater than one. All the other 16 countries have no comparative advantage based on the export trade index. Country to the first impression, some developed countries like Germany, France, Canada, Ireland and Australia rank behind in all 20 countries, whose average values were found to be less than 0.5.

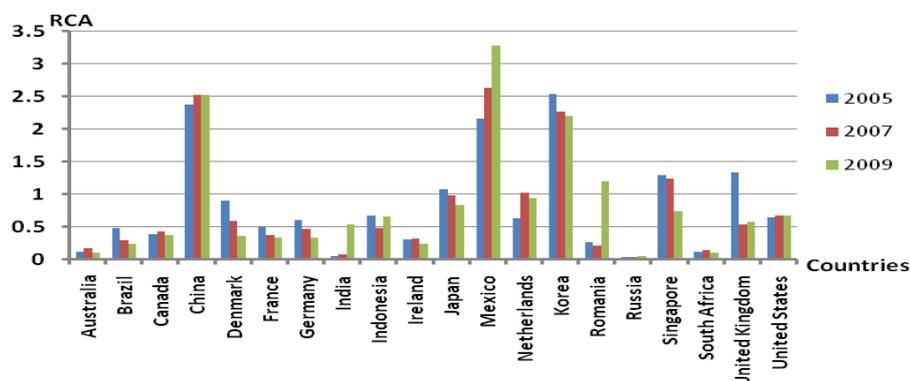


Figure 1. RCA index values (2005, 2007 and 2009)

With regards to the RCA index values of electronic equipment manufacturing industry for years 2005, 2007 and 2009, the outlooks of 20 countries appear to undergo significant changes in comparison with each other. The advantageous status of China against other countries except Mexico has increased. The RCA index value of China was from 2.37 in 2005 to 2.51 in 2007 and to 2.52 in 2009. Besides China, the RCA index values of Mexico, India, Romania and Russia were also increased while the values of Germany, France, Denmark, Japan, Korea and Singapore were decreased. When the changes are scrutinized, it can be found that in 2005 UK had strong international comparative advantage ($RCA_{2005}=1.33$), but in 2007 and 2009 UK lost comparative advantage ($RCA_{2007}=0.53$, $RCA_{2009}=0.58$). On the contrary, in 2005 and 2007 Romania had weak international comparative advantage with RCA value less than 0.5, but in 2009 Romania acquired strong international comparative advantage ($RCA_{2009}=1.2$). As far as tendency is concerned, China together with Mexico and Korea's competitiveness shows a positive tendency in comparison with the rest 17 countries.

4. CONCLUSIONS

This study was conducted by focusing on competitiveness of the selected electronic equipment manufacturing sectors in China in comparison with 19 main trade partners in the world. Import and export figures of selected countries in four electronic equipment manufacturing sectors were taken into consideration in 2005, 2007 and 2009. When the results were examined the following discussions can be made.

First, China has increased its export performance and relative competitiveness status in electronic equipment manufacturing industry for the years from 2005 to 2009, it could conclude that China process a strong competitive advantage over selected countries except Mexico. Second, the average revealed comparative advantages of China together with Mexico, Korea and Singapore against all the rest countries were found to be greater than one. Third, as far as tendency is concerned, the export figures of China look promising and current competitiveness status based on trade appear to be well.

Although this study sheds a light on the competitiveness of China's electronic equipment manufacturing industry in comparison with selected countries in the world it also has limitations which could be considered as areas for future work. First, the RCA can indicate the export scale, but it can't show the quality and technology of electronic equipment manufacturing products. Though electronic equipment manufacturing industry belongs to hi-tech industry, there is still technology gap between different countries. Therefore a future work may conducted through new analytical methods such as International Fragmentation of Production model. Second, as more data becomes available a future work may perform the examination for latest comparative advantage.

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