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Dynamism of Revealed Comparative Advantage in Footwear Industry: A Comparison of BRICS Economies

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Abstract

Revealed Comparative advantage is an imperative determinant of bilateral trade. In the context of footwear export, this paper examines the dynamism of revealed comparative advantage in footwear of BRICS economies. The study empirically investigates to identify those countries which exhibit comparative advantage among BRICS economies using Balassa's index (1965). The paper also employs the statistical technique to test the significant difference between the Revealed Comparative Advantage of BRICS economics by Analysis of Variance. The study covers the period from 2003 to 2013 utilizing the 2-digit HS code 64. The result of the study reveals that China and India both have the comparative advantage in footwear sector throughout the period of study in contrast to Russia and South Africa. The result also shows the most significant changes in the pattern of comparative revealed advantage of Brazil during the period of the study. The result further indicates the significant difference between the Revealed Comparative Advantage in footwear among BRICS economies. The study suggests that these international emerging economies need to follow the proactive strategies for that product in which country has the revealed comparative advantage. The government of these economies must ensure the implementation of technical and financial support to promote the export of comparative advantageous product to strengthen the economy.

Keywords:

Revealed Comparative Advantage, BRICS, Balassa index, Footwear industry

JEL classification: F1, F14.

Introduction

The changing patterns of world export leads to reduction in trade barriers resultant a shift in a pattern of comparative advantage. The technological advancements also gave a pace to gain productivity in the global economies (Akhtar, Zakir, & Ghani, 2008). The acronym BRICS is associated with the Brazil, Russia, India, China, and South Africa. The group was originally known as BRIC before the inclusion of South Africa in 2010. Over the years it has been argued and pointed out the potential of future growth of BRIC countries. Goldman Sachs

forecasted BRIC as emerging markets. These countries are growing faster in economic as well as, geopolitical power especially after the world economic recession, in view of the fact that the rate of recovery is much faster than developed world. The rapid economic growth of BRICS were based on their specialization and enhanced by a large endowment of factors of production with a comparative advantage. Therefore, the specialization and endowment of factor of production could push their mutual cooperation and development (De Castro, 2012). Thus, reduction of trade barriers among the countries creates competitive pressures and the potential for technology transfer resultant to productivity gains and restructuring of an economy toward its comparative advantage (Batra & Khan, 2005). The geographic and demographic dimensions of BRICS economies laid foundation for global development, especially in Low Income Countries. (Directorate - General for External Policies, 2012).

The objective of the paper is to empirically examine the comparative revealed advantage of BRICS economies. The methodology used to compute the revealed comparative advantage is Balassa index (1965) utilizing the 2-digit HS code 64. The paper also tests the significance difference between the Revealed Comparative Advantage of BRICS economics by Analysis of Variance (ANOVA).The paper is organized as follows: Second section covers the theoretical background, third section review of literature, section four describes the data and methodology, section five covers the statistical technique, section six measures and explains empirical results and last section concludes the study.

Theoretical foundation

Theoretical foundation and empirical measures of comparative advantage have long been analyzed by trade economists. In particular, Ricardian comparative advantage has long been perceived as a useful pedagogical tool as what a country should produce and therefore exports comparatively more from the industries in which it is relatively more productive. The Balassa Index, indeed, being computed directly on observed export flows, does not distinguish between exporter, importer and sector specific factors affecting export flows.(Leromain & Orefice, 2014).

International trade thrives on the comparative advantage that economies offer, as proactive players in the world market. While Ricardo laid down the basic tenets of comparative advantage, Balassa (1965) developed the concept of revealed comparative advantage (RCA). Thus, the revealed comparative advantage connotes the idea, that countries specialize and export those items, which could be produced at a lower cost in comparison to the world. In Balassa's view, the comparative advantage that a country enjoys primarily depends on its physical and human capital endowments. Moreover, trade orientation also impacts an economies advantage with the other countries. Hence, as a country pass through the road to development, its comparative advantage is expected to 'shift'. Accumulation of human and physical capital along with the trade policies alters the comparative advantage of the various sectors of the economy**.** **(**Burange & Chaddha, 2008**).**

Comparative revealed advantage is created and sustained through a highly localized process. Differences in national values, culture, economic structures, institutions, and histories all contributes to the competitive success. Further, Porter pointed the factor conditions, demand conditions, related and supporting industries and the firm strategy, structure, and rivalry as the four determinants to create the national comparative advantage. (Porter,1990**).**The concept of "revealed comparative advantage" " as defined by Bela Balassa is widely used in practice to determine a country's weak and strong sectors. Michael Porter, for example, uses a Balassa index exceeding 1, in some cases; Balassa index exceeding 2 is consider to identify a country's strong sectors in his influential book "The Competitive Advantage of Nations" (Hinloopen & Marrewijk, 2001).

The principle of comparative advantage, which arises from differences in technology and in factor proportions, was originally developed to explain the underlying reasons for international trade and to predict the trade pattern resulting from changes in factor endowments. According to this principle, a country should export the products that use its relatively abundant factor intensively and import the goods that use its relatively scarce factor intensively. The rationale underlying the comparative advantage principle is to determine export performance under the assumption of uniformity of tastes within the region (Yue & Hua, 2002).

Literature Review

The economic literature on Revealed Comparative Advantage is date back to Adam Smith's theory of absolute advantage. Much of the literature sketched on Ricardian comparative advantage theory and the Heckscher-Ohlin theory of factor proportions to demonstrate that both factor productivity and relative factor endowments as important determinants of specialization. These theories are not a complete explanation of specialization patterns. Rather, differences arise from the influence of a complex combination of economic, technological, social and political factors, including country specific idiosyncrasies and data accuracy problems (Kilduff & chi, 2007).

Porter (1990) pointed out the factor conditions, demand conditions, related and supporting industries and the firm strategy, structure & rivalry as the four determinants to create the National competitive advantage. Panchamukhi (1973) identified the pattern of revealed comparative

advantage and discussed the factors contributing to the relatively poor export performance of India compared to that of some other developing ECAFE countries. Widodo (2009) also found a comparative advantage pattern of the ASEAN was similar with that of Japan, although there was no stationary level of similarity in the patterns of comparative advantage. Similarly, Carolan et al. (1997) while analyzing the time series found the significant change in the pattern of trade, reflecting changing comparative advantage based on changing factor proportions, technology transfer and product cycles.

Le (2010) indicated that Vietnam's comparative advantage was largely based on the country's endowments of labour and natural resource . Analyzing the trade specialization in the leather products Shahab & Mahmood (2013) study showed that Pakistan had a high comparative advantage in leather products over all the selected economies during the period of the study. Yue and Hua (2002) used econometric results to show the China's shift from a heavy industry-oriented development strategy to a comparative advantage. Kilduff & Chi (2007) in an exploratory investigation noted that income group does not independently affect comparative advantage; however, the nature of products is the significant factor influencing national comparative advantage.

Some researchers examined the trade pattern based on agriculture product and on the same pattern Liyas et al. (2009) analyzed competitiveness among Asian exports in the world rice market and conclude that India, Pakistan, Thailand and Vietnam all have both comparative and competitive advantage over china in rice exports. Thornton (1987) pointed that revealed comparative advantage based on a broad commodity classification is insufficient as an explanation of the intensity of trade. Instead, the intensity of trade would seem to be related to geographic proximity, market familiarity and, in some cases, direct foreign investment. Maule (1996) mentioned that although Thailand's trade with ASEAN is characterized largely by competition yet ASEAN nations have similar patterns of comparative advantage. Further, suggested that there are limited possibilities for trade creation from the formation of AFTA.

Crafts & Thomas (1986) also showed that British comparative advantage in unskilled-labour-intensive, capital-neutral, and human- capital-scarce commodities. Further, Hutchinson & Schumacher (1994) pointed out two important finding, Firstly the major exports from the Caribbean Basin countries to the United States have significant competitive advantages over Mexico's exports of the same products. Secondly, the products in which CB exports to the US are least threatened by exports from Mexico are primarily resource-based. Karaalp & Yilmaz (2013) by using Balassa's index (1965) revealed that Bangladesh, China and Turkey have a strong comparative advantage in both the textile and clothing markets of the world, the US and the EU-15, while Germany has no significant comparative advantage in any of these markets. Balassa & Noland (1989) indicated that Japans pattern of specialization is shifted from unskilled labor intensive goods to human capital intensive products whereas the United states maintained its specialization in physical capital and human capital intensive goods. The study also provides that both countries increased their comparative advantage in high technology products.

Data and Methodology

The data is obtained on footwear export of BRICS economies published by International Trade Centre (ITC). BRICS consists of Brazil, Russia, India, China and South Africa. The paper utilize the 2-digit HS code 64 which focus on footwear, gaiters and the like; parts of such articles. The reason to choose only HS code 64 is primarily to accelerate the export of footwear from the country which has the revealed comparative advantage among BRICS economies. In order to know the tendency of BRICS economies in export of footwear, the study covers the period from 2003 to 2013 irrespective of its emergence as an economic bloc. An empirical investigation has carried by Balassa's (1965) theory of revealed comparative advantage using the formula

$$RCAij = (Xij/Xwj)/(Xi/Xw) \quad \text{.....(a)}$$

Where

RCAij = Revealed comparative advantage of country i of commodity j

Xij = Country i's export of commodity j;

Xwj = World exports of commodity j;

Xi = Country i's total export;

Xw = World's total exports

The country has revealed comparative advantage if Balassa index exceeds 1. However, to identify a country's strong sectors the revealed comparative advantage of Balassa index exceeds 2 (Hinloopen & Marrewijk, 2001). The empirical investigation is carried by One-way analysis of variance (ANOVA) to examine the significance difference between the revealed comparative advantages of BRICS economies. Further, Scheffe Post Hoc multiple comparisons is also applied in order to analyze the multiple comparisons of Revealed Comparative Advantage (RCA) among BRICS economies. The statistical Package for the Social Sciences (SPSS) was used in analysis of data.

Statistical Technique

The value of Revealed comparative advantage (RCA) for

export of footwear is obtained by formula of Balassa's revealed comparative advantage given in equation a. A summary of descriptive statistics of Revealed Comparative Advantage (RCA) of BRICS economies is reported in Table I. The value of Revealed Comparative Advantage (RCA) for data in sample is tabulated in Table II. To examine the significance difference between the Revealed Comparative Advantage (RCA) of BRICS economies the following hypothesis is formulated.

H_0. There exists no significance difference among the revealed comparative advantage of BRICS economies.

To test the hypothesis, One-way analysis of variance (ANOVA) is applied and reported in Table III. For insight of the result Revealed Comparative Advantage (RCA) Matrix of multiple comparisons among BRICS economies are also tabulated in table IV

Empirical results

Descriptive Statistics

Revealed Comparative Advantage has distinct characteristics to know the nations comparative advantages in any sector. Table I offers the descriptive statistics about the revealed comparative advantage of BRICS economies. The mean and standard deviation of Brazil, India, and China are 1.8289 and 0.84763, 1.3946 and 0.25260, 3.6350 and 0.22835 respectively. The mean value of Brazil, India, and China is more than 1 emphasizing the comparative advantage of footwear sector among BRICS economies. Contrary to this Russia and South Africa has mean values of 0.0190 with Standard deviation of 0.00932 and 0.0701 with Standard deviation of 0.07672 respectively with mean value less than 1 revealing the least dedication of Russia and South Africa toward the footwear sector. From the table I, it is also evident that china has the highest and South Africa has the lowest RCA of 3.6350 and 0.0701 respectively among the BRICS economies.

Table 1: Descriptive Statistics

Country	Mean	SD	Minimum	Maximum
Brazil	1.8289	0.84763	0.75	3.06
Russia	0.0190	0 .00932	0.01	0.04
India	1.3946	0.25260	1.06	1.69
China	3.6350	0.22835	3.28	4.08
South Africa	0.0701	0.07672	0.00	0.29

Revealed Comparative Advantage

In order to determine the comparative advantage of export in footwear, the values are computed using the Balassa's formula (equation a). Table II reports the computed values of Revealed Comparative Advantage (RCA) from 2003 to 2013. A country is said to have revealed comparative advantage if Balassa index exceeds 1 and the sector is said to be strongest if it exceeds 2. The value of Revealed Comparative Advantage (RCA) of Brazil showed the much variation during the period of the study. The value of RCA index of Brazil is more than 2 between 2003 to 2007 which indicates, footwear as strongest sector during the period of the study. Later the value of Brazil's RCA starts declining which implies the changing pattern of footwear export of Brazil.

China has the strongest footwear sector with the RCA index greater than 2 along with the consistency in the revealed comparative advantage during the period of the study. Among the BRICS economies Russia and South Africa both reports for RCA index lower than 1 emphasizes that the Russia and South Africa do not have the revealed comparative advantage in footwear sectors. India also exhibited consistency in revealed comparative advantage from 2003 to 2013 showing the RCA index greater than 1. After the profound analysis of Revealed Comparative Advantage (RCA) it has been observed that, in case of footwear sector Russia and South Africa do not stand at competitive level among the BRICS nations. In fact, Brazil also showed a downtrend in footwear sector moving from the strongest sector to a comparative disadvantageous sector. Among the BRICS countries only India and China showed a consistency in footwear sector with a very meager change in Revealed Comparative Advantage. India in future could gain more share for footwear export as in the 12th five year plan China has shifted its priority to export of high-end product and would gradually eliminate the export of low-value products which includes leather and textile. According to China's new policy the average salary is intended to rise 13% which ultimately will lead to the rise in cost of production which pressurize china to discouraging the low-value product. All these factors will provide an

opportunity for India to grab more orders from major importers such as Europe and U.S.A. The export scenario also looks much brighter with the prospect of new emerging markets like Latin America, Africa, CIS Countries, Japan and Australia. (Indian Leather Product association, 2012)

Table II: Revealed Comparative Advantage from 2003 to 2013

Year	Brazil	Russia	India	China	South Africa
2003	3.06209	0.02513	1.605555	4.076655	0.0006771
2004	2.978487	0.022357	1.692258	3.875439	0.0005246
2005	2.608628	0.017424	1.621474	3.895985	0.0579091
2006	2.32283	0.014575	1.599231	3.664387	0.0559834
2007	2.118239	0.015063	1.615971	3.469332	0.0521484
2008	1.775822	0.011156	1.509118	3.605656	0.0523957
2009	1.451205	0.014108	1.259536	3.504559	0.0683900
2010	1.291475	0.010054	1.164468	3.528310	0.0659123
2011	0.93525	0.009938	1.107882	3.511417	0.0588181
2012	0.828483	0.030726	1.056498	3.569372	0.0693273
2013	0.745861	0.038949	1.108614	3.283832	0.289336

Source: Authors' calculations based on UN Comtrade

One Way Analysis of Variance

One way analysis of variance is used to test the significance of the differences among more than two sample mean (Levin & Rubin, 1998). Table III shows the one way analysis of variance (ANOVA) on the RCA of BRICS economies. The analysis is highly significant as the p-value (0.000) is below 0.05 with the F statistics of 144.868; therefore, the null hypothesis that, there exists no significance difference among the revealed comparative advantage of BRICS economies is rejected. The result thus reveals that there is significance difference among the revealed comparative advantage of BRICS economies

Table III:

ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	97.397	4	24.349	144.868	0.000
Within Groups	8.404	50	0.168		
Total	105.801	54			

For getting more insight, RCA matrix of multiple comparisons in BRICS economies has been done with the Post Hoc Scheffe method. Table IV reports the Multiple Comparisons of RCA among BRICS economies .Comparing the RCA of India with other BRICS economies all the values differ significantly except the RCA of Brazil.

While comparing the Russia with other BRICS economies only RCA of South Africa does not show the significant difference. When comparing RCA of Brazil with the other BRICS economies all the value is significant except the RCA of India with Brazil. Further, South Africa and Russia do not differ significantly in RCA among the BRICS nations. Moreover, it is evident from the table that China has significant difference in RCA with all the BRICS economies.

Table IV: Multiple Comparisons of Revealed Comparative Advantage

(I)Country	(J)Country	Mean Difference (I-J)	Std. Error	Sig.
India	Russia	1.37556*	.17481	.000
	Brazil	-.43434	.17481	.204
	China	-2.24039*	.17481	.000
	South Africa	1.32447*	.17481	.000
Russia	India	-1.37556*	.17481	.000
	Brazil	-1.80990*	.17481	.000
	China	-3.61595*	.17481	.000
	South Africa	-.05109	.17481	.999
Brazil	India	.43434	.17481	.204
	Russia	1.80990*	.17481	.000
	China	-1.80605*	.17481	.000
	South Africa	1.75881*	.17481	.000
China	India	2.24039*	.17481	.000
	Russia	3.61595*	.17481	.000
	Brazil	1.80605*	.17481	.000
	South Africa	3.56487*	.17481	.000
South Africa	India	-1.32447*	.17481	.000
	Russia	.05109	.17481	.999
	Brazil	-1.75881*	.17481	.000
	China	-3.56487*	.17481	.000

*The mean difference is Significant at the 0.05 level.

Conclusion

The paper has examined dynamism of revealed comparative advantage of footwear export in BRICS economies by Balassa's index (1965). This has been done by computing and comparing the revealed comparing advantage along with tracing the changes over the time. Among the BRICS economies Brazil has exhibited the most significant changes in the patterns of comparative advantage. However, the rate of changes has decreased showing the shifting pattern of export in Brazil. India has the revealed comparative advantage in footwear sector with a very little change in the value of RCA from one period to another. The pattern of RCA of Russia is almost similar as South Africa revealing that country does not have the comparative advantage in export of footwear. Among the BRICS economies China has the strongest revealed comparative advantage in footwear sector as the value of Balassa's index in more than 2. The result of the one way analysis suggests that there is

significance difference between the RCA of BRICS economies. Further, results of Post hoc Scheffe suggests that there is no significant difference in RCA among India and Brazil similar with that of Russia and South Africa. BRICS are the leading emerging economies and political powers at the regional and international level. Thus, these economies need to follow the proactive strategy for the products which has the comparative revealed advantage. Moreover, Government of these economies ensures the implementation of technical and financial support to promote the export of comparative advantageous product to strengthen the economy.

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