Pakistan Journal of Social Sciences (PJSS)
Vol. 40, No. 1 (2020), pp. 123-131

A Comparative Analysis of Export Competitiveness of Top Five Cotton Exporting Countries

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Abstract:
The current study has examined the cotton export competitiveness of China, USA, India, Pakistan and Vietnam by using a set of Revealed comparative advantage (RCA) indices namely Balassa index(RCA), Revealed symmetric comparative advantage index(RSCA) and Vollrath index (RCA#) vis-a-vis global trade. Further, the study also aims at assessing export competitiveness of these countries and determining its dynamics in global trade with the world. The data were collected from the International Trade Center (ITC) UN-COMTRADE Statistics for the selected economies from 2003-17.The findings of the current study illustrate that China, USA, India and Pakistan had a comparative and competitive advantage from 2003-17, while Vietnam had a comparative disadvantage from 2003-07 and comparative advantage from 2008-17 in the cotton sector. Moreover, the results also indicate that Pakistan had a strong comparative advantage in the cotton sector as compared to other four economies.Likewise, these results highlight that Pakistan should lay emphasis on quality of cotton, Infrastructure, reduction in the cost of production, use of modern technology, investment in agricultural sector and marketing in the global market to enhance the export volume of cotton for foreign exchange earnings.

Keywords: Comparative advantage, Competitiveness, Cotton exports, RCA, Agricultural sector

I. Introduction

The competitiveness of a country's exports is studied by examining the structure, volume and trend of its exports. Export competitiveness means the ability of an economy to sell its goods in international markets at the quality and price that is indispensable to compete the other economies and to gain balance of foreign trade as well (Halilbasic and Brkic, 2015). Cotton being a cash crop and the most important fiber provides livelihood to more than 250 million people including small-holders farmers across the globe (Moseley and Gray, 2008 and Grose, 2009). The textile industry of any economy of the world for its raw material heavily depends upon its cotton sector (Hornborg, 2006 and Ahmad et al., 2018). In the global cotton export market, China ranked first with a share of 28.2 % of the total exported value during 2017, while United States and India ranked second and third with 14.2% and 8% share respectively. Pakistan and Vietnam ranked fourth and fifth having 6.5% and 4.9% shared in the world market respectively (Javed and Atif, 2017). Moreover, among more than 80 cotton producing economies of the world, China, United States, Pakistan, Uzbekistan and India produce near 74 % of the global cotton supply. Cotton growing industry of China generated revenue about $14.3 billion in the year 2018 with an increase of 1.1% as compared to 2017. The cotton industry declined 0.8% annually from 2013-18 due to different factors such as competition from synthetic fiber manufacturing, lower price level and imported cotton. The United States play a pivot role in the world cotton market, performing as a major producer and exporter of cotton. Moreover, the United States is the leading exporter of the cotton, providing more than a third of the global cotton exports and facilitate the domestic farmers for marketing their cotton to the world. The cotton sector of India also plays a key role in the development of the economy and its exports were expected to jump 43% in the year 2018 due to the strong overseas demand from China. Cotton is considered a cash crop having much importance as it provides raw material for textile manufacturing industries in Pakistan; however, its share to GDP is 1.4%. The share of cotton and cotton made products in GDP is about 10% and contributes 55% to the foreign exchange earnings for the country. Vietnam is another significant cotton exporter which plays a significant role in his development through the cotton exports worth $2.6 billion to the global market and its share is 4.9% in the world market (ITC,2018 and http;//www.worldatlas.com).

Table 1: Export growth of Cotton from top five exporting countries in the world

Years	China	USA	India	Pakistan	Vietnam
2004	5.903	22.208	14.34	13.92	-9.957
2005	12.91	-7.417	5.237	18.84	-1.299
2006	19.35	9.514	34.38	5.018	52.752
2007	5.436	-1.459	25.59	-4.48	25.967
2008	14.22	4.2799	3.174	4.536	162.56
2009	-10.2	-25.880	-29.8	-10.9	42.817
2010	36.1	53.205	115.7	25.27	83.805
2011	18.6	46.697	13.15	27.00	15.85
2012	-4.25	-25.14	9.92	2.522	5.9271
2013	18.25	-7.817	31.8	2.068	39.37
2014	-7.08	-14.600	-21.3	-11.30	34.337
2015	-3.1	-9.941	-15.9	-14.60	9.8755
2016	-5.27	-3.049	-16.2	-13.40	22.815
2017	1.079	34.096	10.15	0.009	25.346

Sources; Authors' calculations by using ITC data

Table 1 illustrates the export growth of cotton from selected economies of the rest of the world from 2003-17. A trend both increasing and decreasing was observed in the export growth of these economies, but the growth rate of Vietnam remained high among the selected economies. The aim of present study is to measure the competitiveness of top five export economies of the cotton product in the global market by using a set of revealed comparative advantage indices namely Balassa index(RCA), Revealed Symmetric Comparative Advantage index(RSCA) and Vollrath index(RCA#). The current study is expected to be a good addition in the competitiveness of cotton as international markets have become far more competitive than ever before. Throughout the world, it can be perceived that the leading determinant of prosperity is economic growth which in return depends upon exports and imports as well. As no valuable research utilizing a number of indices has been carried out yet to examine the competitiveness of top five exporting countries of the world in the cotton sector, and it will be highly dynamic and valuable for the future research also. The limitations of the study are that the researchers will examine the competitiveness in cotton sector by employing more indices of revealed comparative advantage such as Revealed import advantage, Revealed trade advantage and Net export index.

II. Review of Literature

The Revealed Comparative Advantage Index (RCA) has so far been utilized by a number of studies to examine the competitiveness and comparative advantage of an economy. This method was also been employed by Balassa and Marcus (1989) to measure the CA between the two economies, the USA and Japan, during 1967 to 1983. The results of the study indicated that Japan shifted its specialization from labour intensive products to human capital intensive goods. In addition, it was also seen that the USA had CA in the production of natural resources intensive goods. Jin (2003) measured the competitiveness of the top ten exporters of the cotton production to the USA by employing Austin's Environmental Analysis Framework during 1974-2000. The findings of this study illustrate that exchange rate, gross national product and the roads had a significant positive impact, while tariff rates had a negative significant impact on USA cotton import. Javed et al (2006) measured the CA of cotton production by employing nominal protection coefficient, effective protection coefficient and domestic resource cost analysis for the harvesting years, 1998-2003 in Pakistan. The study concluded that the Punjab had a lower CA as compared to Sindh in seed cotton. The economic relationship of India and China with Pakistan was scrutinized by Sahoo (2012) to check the competitiveness by utilizing RCA index during 1992-2007. The findings of the study highlight that India had lost out to China in many important manufacturing Industries, while China scored over India in price competitiveness, scale economies and trade complementarity. The export performance of China and India was investigated by Sadequl Islam (2014) to measure the competitiveness from 1992-2012. The study utilized Hirschman-Herfindahl Index and export similarity index for empirical analysis and concluded that the share of China in the USA market was higher as compared to India, and Chinese products were diversified than Indian.

Gatto et al (2011) and Gruber et al (2012) determined the competitiveness of US exports to the world and investigated the factors behind the decline in the export share in the world respectively. The study conducted by Sachithra et al (2012) to measure the comparative advantage of Sri Lankan exports utilized RSCA and Trade balance index (TBI) and concluded that Sri Lanka had a significant comparative advantage. Offei and Oduro (2014) measured Ghana's competitiveness by employing four indices of RCA and found out that Ghana's had a comparative advantage in nine agro-processed product groups. The competitiveness of Danube countries was investigated by Lgnjatijevic et al (2014) by employing RXA, InRXA, RTA, RCA and RCA during 2005-2011. The results of the analysis illustrate that Hungary, Czech Republic, Germany, Ukraine and Serbia had a competitive advantage in the food sector. Sharma and Bugalya (2014) measured the competitiveness and comparative advantage of cotton crop between USA and India from

1996-2010 by employing different indicators. The findings indicate that India and USA had a CA in the cotton sector. Different indices of RCA were employed by Erkan and Sarıçoban (2014) to measure the export competitiveness of Turkey and EU+13 economies in science based goods from 1993-2012. The results of the analysis illustrate that the export share of selected countries did not increase in science-based goods. The method of RCA and RSCA were employed by Javed et al (2017) to examine the CA of agricultural products of Pakistan to UAE and concluded that Pakistan had a CA in these products during selected time period. Irshad and Xin (2017) also measured the competitiveness of Pakistan's export by employing RCA method during 2003-15 and the findings of the analysis indicate that Pakistan had a CA in textile, hides and skin and vegetables. The competitiveness and CA were examined by Alidou et al (2017) by utilizing three revealed comparative advantage indices for major export crops of Benin Republic during 1964-2014. The results of the study show that Benin had a CA in cashew, while comparative disadvantage in the cotton sector. Xu et al (2018) employed competition index to investigate the role of India and China in textile competition in the market of USA under green trade barriers during 2000-16. The results show that both India and China had CA in the import trade of clothing and textile raw materials in the USA. Pflüger and Tabuchi (2019) examined a simple integrated Ricardo–Marshall framework to deal with the relationship between increasing returns and comparative advantage. The export competitiveness of Indian textile and clothing sector in USA was measured by Kim (2019) by employing different revealed comparative advantage indices. The findings of the analysis illustrated that India had a comparative advantage in this sector from 1991-2017.

III. Methods and Materials

The data of cotton exports of China, USA, India, Pakistan and Vietnam have been taken from the International Trade Center (ITC) for the time period of 2003-17. The current study has employed three indices namely Balassa index (1965), Revealed Symmetric Comparative advantage index (RSCA) (Larsen, 1998) and Vollrath index (RCA#) (1991) for measuring competitiveness of the sector concerned.

A. Revealed comparative advantage index (RCA)

The Revealed Comparative Advantage index was first introduced by *Liesner*(1958) and utilized by Balassa (1965) to measure the competitiveness of the economy (Balassa, 1965). The RCA index of exports is expressed as the ratio of exports of an economy to its share in total merchandise exports (Balassa and Noland, 1989).

$$\mathrm{RCA}(BalassaIndex) \quad = \frac{X_i^B / \sum X_i^B}{X_i^w / \sum X_i^w}$$

Source; Erkan and Sarıçoban, 2014

Where, X_i^B=Cotton exports of the country, $\sum X_i^B$=Country's total exports, X_i^w = World's cotton exports, $\sum X_i^w$ =Total exports of world. The power of comparative advantage has been illustrated in a more comprehensive way; the RCA index has been classified into four classifications.

Table 2: RCA Classifications

Sr. No	Classifications	Interpretations
1	0 < RCA ≤ 1	Shows no CA
2	1 < RCA ≤ 2	Indicates weak CA
3	2 < RCA ≤ 4	Highlights moderate CA
4	RCA > 4	Reveals strong CA

Source; Hinloopen, 2001

B. Vollrath index (RCA#)

The Vollrath index (1991) is considered a better measurement for measuring competitiveness of a country and eliminates the problem of double counting in world trade. The Vollrath index is expressed as;

$$RCA\# = \frac{\left\{\frac{Y_{ij}}{\left(\sum_i Y_{ij}\right)-Y_{ij}}\right\}}{\left\{\frac{\left(\sum_j Y_{ij}\right)-Y_{ij}}{\left[\left(\sum_j \sum_i Y_{ij}\right)-\left(\sum_j Y_{ij}\right)\right]-\left[\left(\sum_i Y_{ij}\right)-Y_{ij}\right]}\right\}}$$

Source; Khai et al., 2016

Where, $Y_{ij=}$ Cotton exports of the country, $\sum_i Y_{ij}$=Total exports of the country, $\sum_j Y_{ij}$= World's Cotton exports, $\sum_j \sum_i Y_{ij}$=Total exports of world

C. Revealed symmetric comparative advantage index (RSCA)

The current study aims at resolving the issue of upward biased values of RCA by utilizing Larsen (1998) index which has adjusted the values of RCA index in a symmetric way. The position of these adjusted values of RCA lies between +1 and -1. The RSCA index described by Larsen (1998) is illustrated as;

$$RSCA = \frac{RCA-1}{RCA+1}$$

Source; Erkan and Sarıcoban, 2014

IV. Results and Discussion

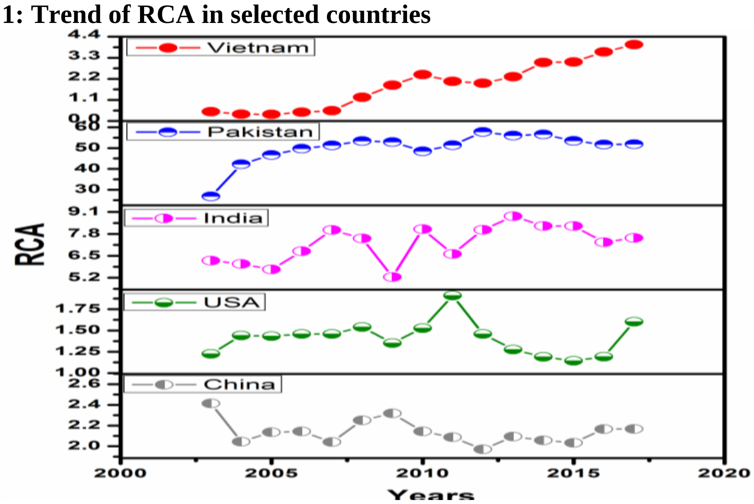
In table 3 and figure 1, the results reveal that China had a CA in the cotton sector exports having the RCA values greater than 1 during 2003-17. The trend of RSCA illustrates that China paid much attention on the specialization in this sector and the positive values of RSCA indicated comparative advantage (Xu et al, 2018 and Karlaalp and Yilmaz, 2013). In addition, the competitive advantage was observed by employing Vollrath index during a selected time span (Xu et al., 2018). Similarly, the study employed RCA and (RCA#) index and noted that USA also had comparative and competitive advantage from 2003-17 (Gatto et al., 2011, Gruber et al., 2012 and Siudek, T. and Zawojska, A. 2014). Moreover, the RSCA positive values illustrate the comparative advantage in this sector. The findings indicate that India having RCA index values greater than 4 succeeded in gaining and maintaining the high level CA in cotton sector as compared to China and USA up to 2017. The trend of RSCA index highlights that India focused on the specialization in cotton exports. The findings of RSCA index also illustrate that India had a CA from 2003-17 in this sector. Hence, the competitive advantage of India was also observed by using an alternative index that introduced by Vollrath (1991). The Vollrath index indicates a high competitive advantage in selected sector (Sharma and Bugalya, 2014).

Table 3: Various Revealed Comparative Advantage Indices Related to the cotton sector from 2003-17

Years	China	USA	India	Pakistan	Vietnam
	RCA/RSCA/RCA#	RCA/RSCA/RCA#	RCA/RSCA/RCA#	RCA/RSCA/RCA#	RCA/RSCA/RCA#
2003	2.4 2.413/0.414/2.670	1.224/0.100/1.256	6.219/0.722/6.698	26.835/0.928/33.549	0.484/-0.347/0.481
2004	2.044/0.343/2.218	1.441/0.180/1.510	6.021/0.715/6.466	42.220/0.953/57.798	0.359/-0.471/0.357
2005	2.135/0.362/2.360	1.433/0.178/1.498	5.693/0.701/6.100	46.731/0.958/63.703	0.343/-0.488/0.341
2006	2.142/0.363/2.395	1.457/0.186/1.527	6.772/0.742/7.382	49.729/0.960/67.581	0.457/-0.372/0.455
2007	2.040/0.342/2.278	1.457/0.186/1.524	8.037/0.778/8.929	51.290/0.961/67.716	0.537/-.300/0.535
2008	2.251/0.342/2.578	1.539/0.212/1.620	7.535/0.765/8.331	53.417/0.963/69.348	1.237/0.106/1.239
2009	2.317/0.397/2.715	1.351/0.149/1.399	5.242/0.679/5.671	52.941/0.962/69.708	1.868/0.302/1.88
2010	2.142/0.363/2.484	1.526/0.208/1.608	8.086/0.779/9.295	48.486/0.959/63.757	2.421/0.415/2.451
2011	2.086/0.352/2.403	1.909/0.312/2.086	6.609/0.737/7.472	51.411/0.961/69.003	2.066/0.347/2.086
2012	1.969/0.326/2.251	1.458/0.186/1.525	8.047/0.778/9.316	57.737/0.965/79.064	1.969/0.326/1.989
2013	2.094/0.353/2.458	1.276/0.121/1.310	8.846/0.796/10.628	55.980/0.964/76.384	2.308/0.395/2.342
2014	2.056/0.345/2.426	1.189/0.086/1.212	8.267/0.784/9.676	56.552/0.965/0.965	3.055/0.506/3.128
2015	2.032/0.340/2.444	1.144/0.067/1.161	8.265/0.784/9.618	53.507/0.963/70.218	3.081/0.50/3.169
2016	2.165/0.368/2.639	1.191/0.087/1.215	7.302/0.759/8.327	51.702/0.962/66.449	3.603/0.565/3.743
2017	2.167/0.368/2.636	1.601/0.231/1.705	7.563/0.766/8.710	51.859/0.962/65.755	3.983/0.598/4.176

Sources; Author's calculations by using ITC data

Figure 1: Trend of RCA in selected countries



Sources; Authors own calculations

Pakistan had high comparative advantage in this sector because the values of RCA are greater than 4 from 2003-2017. The above findings illustrate that Pakistanhaving RCA values greater than 4 successfully maintained and gained the high CA up to 2017 (Shahzad, 2015). Moreover, the results of RCA indicate that the cotton sector had a revealed comparative advantage having both decreasing and increasing trends. The RSCA index also describes that Pakistan gave much attention to this sector during above selected time span. The results of RSCA index highlight that Pakistan had a CA from 2003-2017 in the cotton sector. The competitive advantage of cotton sector was also noted by using an alternative index initiated by Vollrath (1991). The values of Vollrath index reveal a high competitive advantage in the concerned sector (Irshad and Xin, 2017). In addition, the results of RCA, RSCA and Vollrath depict that Vietnam had a comparative disadvantage from 2003-07, while had a CA from 2008-17 in the cotton sector (Kathuria, L. M. 2018).

The international financial crises had a strong impact on world trade in 2008-09 as 12% decrease was observed by the world trade organization in global trade volume in

2009. This turn down in the trade channels caused by financial collapse diminished the demand of trading commodities and formed shortage in trade financing (WTO, 2010). The decreasing trend of these indices were due to inconsistency in the production of cotton, regional devaluation in the currency, decline in the cotton prices, high energy cost, low wages, high tax rate,energy crises, bad government policies, shortage of raw material, low productivity of labour, law and order situation in economy, global financial crises and low level of technology (Syed, 2009 and Malik et al., 2017).

V. Conclusion

The purpose of present study is to measure the competitiveness of cotton sector among the top five exporters of the world by employing different indices of revealed comparative advantage such as, RCA, RSCA and RCA#. The data have been gained from ITC UN-COMTRADE Statistics for these countries from 2003-17. The findings of the analysis illustrate that China, USA, India and Pakistan had a competitive and comparative advantage in the exports of cotton, whereas Vietnam had a comparative disadvantage from 2003-07 but had a competitive and comparative advantage from 2008-17 in the selected sector. Furthermore, the results also indicate that China, USA, India and Pakistan had net competitive advantage in the cotton sector. The study also suggested that these economies should lay emphasis on infrastructure of the economy, decrease in the cost of production,consistency in yield of cotton crop, utilities and cost of finance, human resource, use of the modern technology, marketing in international market and investment in the agricultural sector to enhance the exports of cotton.

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