

AN EMPIRICAL ANALYSIS OF EXPORT COMPETITIVENESS AND COMPARATIVE ADVANTAGE OF PAKISTAN'S FRUIT PRODUCTS

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Abstract: *This study evaluates the global competitiveness of Pakistan's fruit exports for the period 2003-2019. The comparative advantage and competitiveness of fruit exports of Pakistan are examined by employing revealed comparative advantage (RCA), revealed symmetric comparative advantage (RSCA), relative import advantage (RMA), relative trade advantage (RTA), Trade Balance Index (TBI) and Revealed Competitiveness Index (RC). The data were collected from the International Trade Center (ITC) UN-COMTRADE Statistics for the Pakistani fruit exports from 2003-19. The empirical findings illustrate that Pakistan had a comparative and competitive advantage in fruit exports during the period under consideration. The empirical analysis of Pakistan's global competitiveness in the fruit exports indicates that there exists much potential for the growth of the horticulture sector. With government patronage and proper facilities, the fruit products can be a source of valuable foreign exchange earnings for the economy. The country needs to move from labour-intensive subsistence farming to capitalintensive commercial farming.*

Key words: *Comparative Advantage, Empirical Analysis, Exports*

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Introduction

The concept of comparative advantage is used to evaluate the trade patterns and the commodity of specialization of a country (Prasad, 2004 & Maqbool et al., 2020). The labor specialization and opportunity cost are the main concepts behind the idea of comparative advantages (Zhao et al., 2019). Every nation aims at producing and exporting the commodities having a higher comparative advantage, while preferring to import only those commodities having a lower comparative and higher comparative disadvantage (Ricardo, 1817). Pakistan has a comparative advantage in the production of many horticultural crops (Riaz and Jonson, 2012 & Akhtaret al., 2013). The agro-climatic conditions of the country encourage the fruit yield. The environment of Pakistan is quite suitable for the growth of many fruits like orange (kinnow), mango, dates and pine nuts. Pakistan is famous for the production of kinnow which is a hybrid variety of orange. Due to favorable climatic conditions mainly in the Punjab province, Pakistan grows the world's best Kinnow. Pakistan is the sixth largest producer of Kinnow which is exported

to the Middle East, the Philippines, Indonesia, Sri Lanka and Europe. In general, Pakistan is ranked 10th in the production of citrus fruits but nearly 88% is consumed domestically and only 12% is exported. The other major competitors of Pakistan in the citrus production are Brazil, USA, Mexico, China and India. Mangoes the second-largest fruit export item of Pakistan which is mainly grown in Punjab and Sindh. As Pakistani mango is famous for its unique taste, Chaunsa Mango is the highly demanded fruit product which is exported to Europe, Middle East, Afghanistan, Malaysia and Singapore. The other top competitors of Pakistan in the mango production are China, India, Thailand and Mexico. The country is the fifth-largest producer of mango globally. In the production of dates, Pakistan is the seventh-largest producer and the third-largest exporter in the world economy. Many types of dates including Begam Jangi, Dhakki and Aseel are produced in Pakistan. Although the total annual yield of date is 535,000 tones in the country, only 86,500 tones are exported. So, there is much capacity to enhance the export volume if proper government policy and incentives are provided. The other major

competitors of Pakistan in the dates exports are Egypt, Iran, Saudi Arabia, Algeria, and UAE. The climatic conditions of Pakistan are also suitable for the growth of a variety of pine trees. The country produces delicious Peanuts and stands second in the pine nut exports. The share of pine nuts is approximately 23% of Pakistan's total fruit exports. China, Korea, Afghanistan and Russia are other competitors of Pakistan in the pine nuts production.

The other fruits like grapes, melon, banana and Guava are also produced in Pakistan which is sufficient to meet the domestic requirements. However, the production of these fruits is undertaken under subsistence farming while the yield can be increased by moving towards commercial farming. Despite the absence of any horticulture policy and government incentives, the fruit production is experiencing rapid growth in Pakistan. However, the perishability of horticultural commodities is a major problem for the sector. Proper provision of incentives and infrastructure facilities can significantly raise Pakistan's foreign exchange earnings through fruit exports. The present study aims at measuring the competitive and comparative advantage in the fruit sector of Pakistan from 2003-2019 by employing a set of

revealed comparative advantage indices. There is a lack of any prominent research in Pakistan under this topic utilizing these indices of revealed comparative advantage to measure the competitiveness. This study will be helpful to extend the future research on horticulture by incorporating the unique measures of revealed comparative advantage.

The study is organized in such a way that the section 1 and 2 deal with the introduction and literature review respectively. The empirical methodology along with different indices is presented in section 3. The discussion of empirical results is provided in section 4 while the conclusion is presented in section 5.

Review of Literature

Since the establishment of Revealed Comparative Advantage by Balassa in 1965, a number of studies have been conducted by researchers and policymakers to measure comparative advantage (Mahmood, 2004). The RCA index is explained as the ratio of two shares (Soyyigit and Yavuzaslan, 2020). The trade theories indices regarding comparative advantage have a privileged background beginning with absolute advantage (Smith, 1776).

The method of RCA utilized by Akhtar *et al.*, (2009) for the competitiveness of Pakistani fruit exports in the world market from 1995- 2005. The results highlight that fruit exports in Pakistan had a higher comparative advantage as compared to its competitors. Yousef (2009) investigated past inclination and future vision of comparative advantage and trade liberalization reforms in the manufacturing sector for Pakistan's by applying RCA index. Erkan and Sariçoban (2014) studied export competitiveness by using ITO, ESI, RCA, lnRCA, RSCA and CEP in Turkey and EU+13 countries for science-based goods. The findings revealed that there was an increasing pattern for export competitiveness as well as Turkey's export competitiveness was lower compared to the EU for the period 1993-2012. Similarly, the RCA index was employed in EU-27 member states to investigate the export competitiveness by Bojneci and Ferto (2016) for fruit and vegetable in the global markets from 2000-2011, and the results exposed competitive deterioration of export of EU-27 member states. Abbas and Waheed (2017) also scrutinized Pakistan's trade competitiveness in the global world by

applying the RCA index during 2003-2014. The results expressed that there was a higher comparative advantage in fruits, cereals, and raw cotton in Pakistan. The comparative advantage and competitiveness were measured by Kousar *et al.*, (2019) in the fruit sector of Pakistan. Munir and Sultan (2019) examined Pakistan's export competitiveness with selected countries by employing RCA for the year 2014 and concluded that the highest CA was seen in this sector of Pakistan. The method of NPC, RCA and RSCA was utilized by Sardaret *al.*, (2019) to examine the competitiveness in the meat exports over the period 2002-2016. The competitiveness of Indians textile was examined by Kim (2019) by employing RCA and concluded that a higher comparative advantage was observed for the period 1991-2017.

Competitiveness in the automotive segment examined by Soyuyigit and Yavuzaslan (2020) by using RCA for the time period from 1989-2016 and findings of the study indicated that comparative advantage was seen in Turkey's automotive sector. RCA was employed by Soetriono (2020) for snake fruit Pronojiwo and found out a higher comparative advantage in Pronojiwo

snake fruit. Mamadjanova (2020) formulated ways for market strategies regarding Uzbekistan's export of vegetables and fruits based on RCA during 2010-2017. The comparative advantage of different states of Brazil in Soyabean was examined by Halisiki (2020) by employing RCA and RSCA indices during 2006-16. The study concluded that Brazil had a comparative advantage in the selected period. An investigation was conducted via RCA by Thein (2020) for Myanmar's Fishery exports and concluded that a higher CA was seen in Fishery's exports over the period 1990-2000. Hossain and Nath (2020) also utilized RCA to examine the trade pattern in Bangladesh, and the results of the analysis illustrated a higher CA in jute, garments, leather and textile-based articles. Similarly, the Indians competitiveness for industrial exports was overlooked through Fetscherin et al., (2012) over the period 2001-2005 by using RCA and highlighted that the industrial exports of India were competitive in the global market.

As far as Pakistan is concerned, many a study applied RCA indices to measure the competitiveness and comparative advantage in different sectors of the economy. Kamal *et al.*, (2020) examined

trade potential and competitiveness in Pakistan by employing RCA from 2003-17. The findings of the study show that comparative advantage was observed in pharmaceutical merchandise over ASEAN during the selected period. Competitiveness in cotton's export of Pakistan, China, India, Vietnam and USA was inquired by Maqboole *et al.*, (2020) by employing RCA, RSCA and RCA#. The results indicated the existence of comparative advantage in these countries over 2003-2017 except Vietnam. The exports of Pakistan for Halal meat was analyzed by Magsi *et al.*, (2020) using RCA from 1994-2016. The results of the analysis indicated Pakistan had a high potential in halal meat export. The key purpose of the current study is to measure the competitiveness in the export sector of fruits by utilizing several indices of revealed comparative advantage. There is no valuable study available which employed these indices to examine the competitiveness in fruit sector. The present study is expected to be a good addition in the field of competitiveness of fruit exports as global markets have become far more competitive than ever before.

Materials and Method

The present study aims at analyzing of the competitiveness of the fruit products of Pakistan to measure CA of exports and to point out the position of this sector in the global market. The data were collected from the International Trade Center (ITC) UNCOMTRADE Statistics for the Pakistani fruit exports from 2003-19.

Revealed comparative advantage index

Liesner (1958) was the first who initiated the RCA index which was utilized by Balassa (1965) to examine the competitiveness of an economy in the global market (Balassa, 1965). The concept of CA set by Balassa (1965) is explained as follows;

$$RCA = \frac{F_i^t / \Sigma F_i^t}{F_i^w / \Sigma F_i^w}$$

F_i^t = Fruit exports of Pakistan

ΣF_i^t = Pakistan's total exports

F_i^w = Global fruit exports

ΣF_i^w = Total exports of the world

(Source: Erkan and Kazim, 2014)

The RCA index greater than 1 shows comparative advantage or in the terminology of Balassa, a revealed

comparative advantage (Rivlin, 2000).

The current study employs logarithms to the RCA index and $\text{LnRCA} > 0$ indicates CA, while $\text{LnRCA} < 0$ highlights the comparative disadvantage of the economy (Faustino, 2008).

Revealed Symmetric Comparative Advantage

To contain the problem of skewness, the index of revealed symmetric comparative advantage is employed.

The RSCA index is defined as

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

(Source: Erkan and Kazim, 2014)

Vollrath index

Vollrath (1991) commenced the index for comparative advantage, and this index is believed to be a good measure of measuring competitiveness because this index eliminates the dilemma of double-counting in the global market (Gnidchenko and Salnikov, 2015). The Vollrath index is explained as

$RCA\# =$

$$\frac{\left\{ \frac{F_{ij}}{(\Sigma_i F_{ij})} \right\}}{\left\{ \frac{(\Sigma_i F_{ij}) - F_{ij}}{[(\Sigma_j \Sigma_i F_{ij}) - (\Sigma_j F_{ij})] - [(\Sigma_i F_{ij}) - F_{ij}]} \right\}}$$

Where

F_i^t = Pakistan's fruit exports

ΣF_i^t = Pakistan's total exports

F_i^w = World's fruit exports

ΣF_i^w = World's total exports

(Source: Topcu and Sarigul, 2015)

Relative import advantage index

The relative import advantage index is explained as the RCA index of exports.

$$RMA = \frac{M_i^F / \Sigma M_i^F}{M_i^w / \Sigma M_i^w}$$

(Source; Akhtar *et al.*, 2013)

Where, M_i^F = Imports of fruit of Pakistan, ΣM_i^F = Total imports of Pakistan, M_i^w = Fruit imports of the World, ΣM_i^w = Total imports of the world

Relative trade advantage index

The present also employed a relative trade advantage (RTA) that is an alternative of comparative advantage. The RTA index is measured as the difference between the relative export advantage(RCA) and relative import advantage index (RMA).

$$RTA = RCA - RMA$$

$$= \frac{F_i^t / \Sigma F_i^t}{F_i^w / \Sigma F_i^w} - \frac{M_i^F / \Sigma M_i^F}{M_i^w / \Sigma M_i^w}$$

(Source; Akhtar *et al.*, 2013)

Revealed competitiveness

Vollrath (1991) has developed another index named revealed competitiveness (RC) which is explained as the logarithm of relative export advantage index (InRCA) and relative import advantage index (LnRMA).

$$RC = \text{LnRCA} - \text{LnRMA}$$

(Source; Ignjatijevic *et al.*, 2013)

Trade balance index

Besides, the study also utilized trade balance index (TBI) to analyze whether an economy has specialization in the exports (as netexporter) or in the imports (as net-importer) for a specific group of commodities. Lafay (1992) employed TBI to examine the review of comparative advantage. This index is explained as follows; $TBI = X-M/X+M$ (Source; Sachithr *et al.*, 2014)

Results and Discussion

Figure 1 Export and import growth of Pakistan's fruit sector in the global market

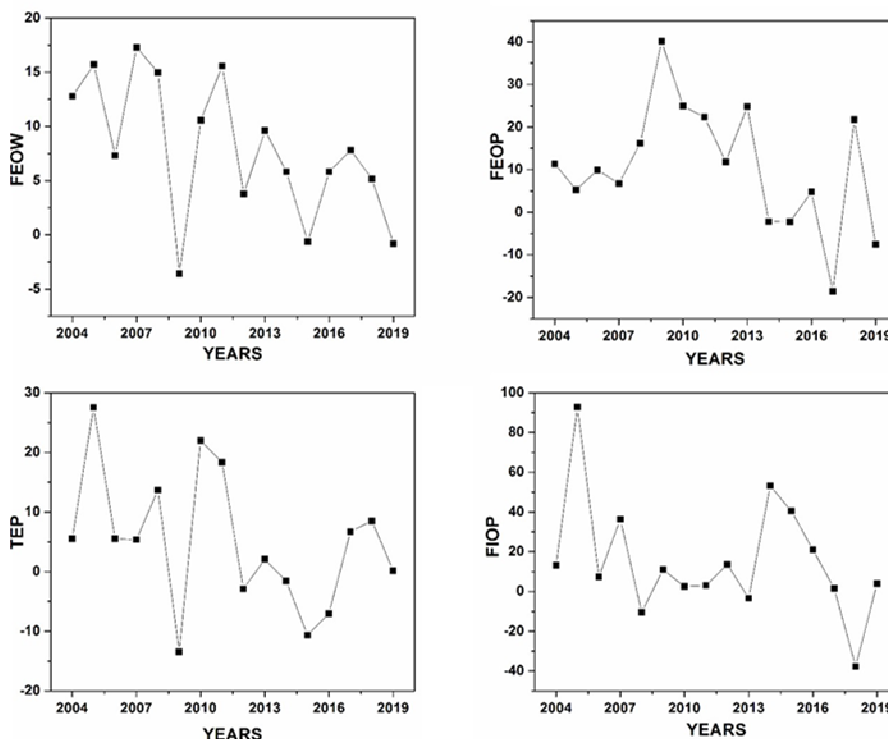


Figure 1 highlights the export growth of the world, fruit export of Pakistan, total exports of Pakistan and Pakistan's import of fruits from the world. An increasing and decreasing trend of growth was observed in the selected period.

The central objective of this study is to measure the export competitiveness and comparative advantage in the Pakistan's fruit sector by utilizing several indices of revealed comparative advantage during 2003-19. The findings of table 1

highlight that Pakistan enjoyed a CA in the concerned sector during the above mentioned period (Akhtar *et al.*, 2009). The positive values of RSCA and LnRCA describe the comparative advantage in the fruit sector from 2003-19. In addition, the competitive advantage of fruit sector was also obtained by applying the Vollrath index (Munir and Sultan, 2019). Vollrath index of revealed competitiveness (RC) highlights that Pakistan experienced competitiveness in the exports of

fruit(Irshad and Xin, 2017). RMA index shows that Pakistan had a competitive advantage in the import of fruit sector. It means that Pakistan not only exports but also imports these fruit products during 2003-19. RTA index illustrates that

Pakistan had a net comparative advantage in the fruit products. The positive values of Trade balance index (TBI)depict that Pakistan is the net-exporter of the fruit products in the global market.

Table 1: The Revealed Comparative Advantage of fruit products of Pakistan in the world scale

Years	RCA	RSCA	LNRC	RCA#	RMA	RTA	TBI	RC
2003	1.513	0.204	0.414	1.518	0.4756	1.0372	0.432	1.157
2004	1.721	0.265	0.543	1.728	0.4906	1.2303	0.425	1.255
2005	1.396	0.165	0.333	1.399	0.5904	0.8052	0.15	0.86
2006	1.566	0.221	0.449	1.572	0.5632	1.0031	0.161	1.023
2007	1.56	0.219	0.445	1.566	0.7027	0.8578	0.04	0.798
2008	1.607	0.233	0.474	1.613	0.4811	1.1259	0.169	1.206
2009	2.086	0.352	0.735	2.102	0.5833	1.5024	0.28	1.274
2010	2.362	0.405	0.86	2.383	0.5646	1.7974	0.368	1.431
2011	2.534	0.434	0.93	2.558	0.5279	2.0057	0.439	1.568
2012	2.858	0.482	1.05	2.891	0.5888	2.2688	0.433	1.58
2013	3.271	0.532	1.185	3.321	0.5369	2.7345	0.531	1.807
2014	3.068	0.508	1.121	3.113	0.7233	2.3449	0.352	1.445
2015	2.964	0.495	1.086	3.009	0.9337	2.03	0.184	1.155
2016	3.062	0.508	1.119	3.115	0.993	2.0693	0.114	1.126
2017	2.392	0.41	0.872	2.42	0.8294	1.563	0.004	1.059
2018	2.805	0.474	1.032	2.845	0.5147	2.2908	0.327	1.696
2019	2.515	0.431	0.922	2.546	0.6247	1.8905	0.274	1.393

Source: Author's own calculations

Conclusion

This paper examines the comparative advantage and competitiveness of fruit exports of Pakistan to the world from 2003-2019. The study employed RCA,

RSCA, RCA#, MA, RTA, TBI and RC index to measure competitive and comparative advantage and data was collected from ITC UNCOMTRADE statistics. The empirical findings suggest that Pakistan experienced a comparative

and competitive advantage in this sector during 2003-2019. The RTA index illustrates that Pakistan had a net comparative advantage in the fruit exports. The positive values of Trade balance index (TBI) indicate that Pakistan is the net-exporter of the fruit products in the global market.

The global competitiveness of Pakistan in the fruit products indicates that there exists much potential for the growth of this sector. The country needs to move from labour-intensive subsistence farming to capital-intensive commercial farming. The government should incentivize the farmers by providing subsidies and cheaper loans to encourage the horticulture sector. The utilization of high yield variety and hybrid seeds can improve the taste and quality of fruit which will entice the importers. Proper transportation infrastructure and storage facilities can minimize the perish ability problem of fruit products and increase Pakistan's foreign exchange earnings.

Harvesting and post-harvesting losses are major issues which can be improved through proper mechanization and awareness in farmer side. Fruits processing units and SME's can perform their respective roles in enhancing the quality of exports.

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