

Research Article

India's trade potential and export opportunities for spices

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Abstract

Economic growth and development of a country rely on trade as it serves as a driving force with efficient utilization of factor of endowments. Several commodities are traded world-wide, among them spices which has a long history of being one of the highly traded commodity. Developing countries including India are the leading producer and exporter of spices in the world. The demand for Indian spices has gone up in the United States of America, Vietnam, United Arab Emirates, United Kingdom, etc. The study assess the comparative advantage of major spices exporting countries for pepper, cardamom and turmeric-based on data available in International Trade Centre. To analyse the effect of trade liberalisation, a simulation model (SMART) developed by UNCTAD was used to estimate trade creation, diversion and revenue effect on importing and exporting countries. The result shows that India has a comparative advantage in the export of Turmeric, Guatemala in Cardamom and Vietnam in Pepper. The impact of tariff relief on India has greater advantage, which has trade creation in the export of cardamom and turmeric. Whereas in pepper, comparatively, trade diversion is higher than trade creation, indicating that less efficient countries are given a chance to export to the top importing countries due to a reduction in tariff. Indian spice exporters should focus on promoting or exporting spices to countries like Netherlands, United States, United Kingdom, and Germany.

Keywords: Comparative advantage, Spice, Trade, Tariff

INTRODUCTION

Trade is considered the important factor for economic development at the global level (Riedel 1984). India is known as "The Origin and Land of Spices". Spices which include black pepper, turmeric and cardamom have been produced and traded for thousands of years and have a long history of being highly traded commodities both in India and at the global level. India is the largest producer and exporter of spices in the world. Exports of spices from India continued to increase, and during 2016-17, the total quantity of spices exported was 9,47,790 tons, valued 2655.29 Million US dollars. The values of spice exports gradually increased from

2655.29 in 2016-17 to 3110.63 Million US dollars in 2019-20. Indian spices are exported to 185 countries, and the major importers of spices from India are the United States, China, Bangladesh, Thailand, and the United Kingdom. However, there is fierce competition in the global market, where countries such as Vietnam, Germany, the United Arab Emirates, Indonesia and China are the major competitors in the export of spices. Recent developments followed by the establishment of the World Trade Organization (WTO) and trade liberalization transformed the demand and supply of agricultural products in South Asian countries. Agreements such as the ASEAN Free Trade Area (AFTA) and South Asia Free Trade Agreement (SAFTA) have

paved the way for better bargaining power in global markets (Shinoj and Mathur 2008).

Even India has increased its involvement in regional trade agreements (RTAs). However, this is no different from the global trend, as the world has witnessed an unprecedented proliferation of RTAs (Feasel, 2018). As India had been involved in new trade policy, the country should know where its comparative advantage lies and against which country. The concept of comparative advantage is theoretically appealing following the Ricardian theory of comparative advantage. Balassa (1965) developed the revealed comparative advantage (RCA). There is also a need to examine the impact of various trade agreements on import, export and welfare gains between trading countries. A partial equilibrium model such as SMART can provide information on the impact of trade agreements on individual commodities (Economic Commission for Africa, 2005). Many empirical studies have been done on the export performance of spices and their trade competitiveness (Beyene, 2014; Laursen, 2015 and Singla, 2015). The general welfare gains from free trade have been well established (Holmes et al., 2014), and specific issues related to spices have not been exhaustively studied. The present study was undertaken to determine India's comparative advantage in exports of major spices and the impact of tariff relief by importing countries on trade creation, diversion and welfare effects.

MATERIALS AND METHODS

Methodology

This study is based on secondary data consisting of panel data from 2000 to 2019. To estimate the revealed comparative advantage data regarding exports, imports of major exporting countries of pepper, cardamom and turmeric were collected from World Integrated Trade Solutions (WITS). To estimate the effect of preferential trade agreement (PTA), WITS software developed by the World Bank and the United Nations Conference on Trade and Development (UNCTAD) was used by employing tariff and export data collected from the World Trade Organization (WTO), USDA and Trade Analysis and Information System (TRAINS).

Comparative advantage cannot be measured after trade; hence, it is defined in terms of relative autarky prices and poses formidable challenges in measuring the comparative advantage among countries. Nevertheless, the empirical literature typically uses relative export performance as a proxy for comparative advantage. The revealed comparative advantage (RCA) index was proposed by Balassa (1965) and has been widely used in many empirical studies (Irshad et al., 2015 and Rahmaddi and Ichihashi, 2012). The RCA index expresses the ratio of a given commodity in total countries exported to the world.

$$RCA_{ij} = \left(\frac{X_{ij}}{X_{it}}\right) / \left(\frac{X_{nj}}{X_{nt}}\right) \dots Eq.1$$

X_{ij} = ith country's export of commodity j

X_{it} = ith country's total exports

X_{nj} = nth countries export of commodity j

X_{nt} = nth countries total exports

The value of this index ranges from 0 to infinity. A value greater than 1 indicates that the country has a comparative advantage in that commodity. However, the criticism of RCA was that i) the measure is asymmetric; the value on one side of unity cannot be compared with those on the other side and ii) RCA focuses exclusively on relative export performance and neglects the net trade flow and interindustry trade. To overcome these limitations, Dalum et al. (1998) framed the symmetric index, and the new index is called the revealed symmetric comparative advantage (RSCA). It can be expressed as follows,

$$RSCA_{ij} = (RCA - 1)/(RCA + 1) \dots Eq.2$$

The country is said to have a comparative advantage in a commodity if the index value is 1 and vice versa if not a comparative advantage. The value of RSCA ranges between -1 and 1.

Partial equilibrium SMART model

Laird and Yates (1986) carried out tariff relief simulations for importing country simulations, and their welfare impacts were studied using the WITS/SMART model. Trade agreements allow us to reduce the cost of trade between the trading country, as there may be a larger gap in price between the importing country and export price. Trade agreements can reduce the trade cost by reducing the tariff rate among the countries. WITS is a partial equilibrium model that fails to represent the intersectoral links and the behavioural response of the market. It calculates the impact of tariff cuts on trade creation, trade diversion, revenue and welfare effects. Supply elasticity, import substitution elasticity, and import demand elasticity were used to find consumer surplus whose values were taken from the model and kept constant. Trade creation is the increase in demand for commodities in the world market due to a change in the tariff rate in the importing country. Thus, decreasing the price of commodities in the importing country increases the demand in the exporting country for the commodity.

$$C_{ijk} = M_{ijk} \cdot E_m \cdot T_{ijk} / (1 + T_{ijk}) \left(1 - \left(\frac{E_m}{E_x}\right)\right) \dots Eq.3$$

where C is trade creation, i is product, k is importing country, k is exporting country, M is imports, E_m is elasticity of import demand with respect to domestic

price, T is tariff and Ex is elasticity of export supply with respect to export price.

Trade diversion is the change in the country that supplies the commodity due to a change in import prices. It is considered negative for global welfare, as a more efficient producer is being replaced by a less efficient producer. This can happen when countries have preferential measures or prices fall in a specific country.

RESULTS AND DISCUSSION

Area, production and export performance of spices

The area under spices in India has increased slightly over a period of time, and exports from India have an increasing trend, as shown in Fig. 1. Even with an increase in area and production, crops such as pepper declined in the area from 181350 hectares in 2008 to 138929 hectares in 2018, and production fluctuated over the periods, as shown in Fig 2. The decline in pepper production may be due to the reduction of price for pepper in the domestic market. The price of pepper in Cochin market was Rs. 687 in 2015 and declined to Rs. 383 in 2018-19 (Cariappa, 2020). Turmeric and cardamom showed an increasing trend in area and production from 2008 to 2018, as shown in Fig 3 and 4.

Comparative advantage

Pepper

The revealed comparative advantages of pepper for the top five exporting countries are presented in Table 1. The results indicated that Vietnam has a comparative advantage over other countries in the export of pepper, followed by Brazil. Even though Vietnam's contribution to global pepper production was approximately 36 percent, there was a decline in the RCA values because factors other than prices are export quality. In addition to Vietnam, Brazil has a comparative advantage, and there is an increasing trend in RCA values from 8.20 to 9.37. India ranks third in terms of comparative advantage, but the values are reduced from 5.16 to 2.90 (RCA) due to a fall in pepper production. Countries such as Germany and China are not comparatively advantageous in pepper exports.

The comparative advantage of pepper was also measured using revealed symmetric comparative advantage, and the results were similar to those of RCA. The results indicated that Vietnam and India have a comparative advantage but a gradual decreasing trend, indicating that both countries are losing their comparative advantage in exporting pepper. There is shift in the direction of trade due to the emergence of south-east

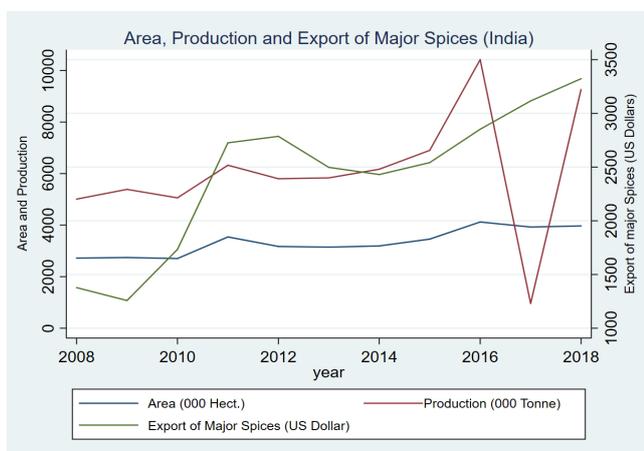


Fig. 1. Area, production and export of spices in India

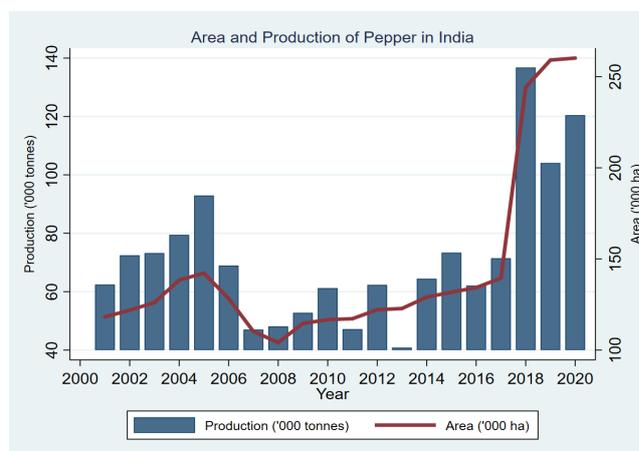


Fig. 2. Area and production of pepper in India

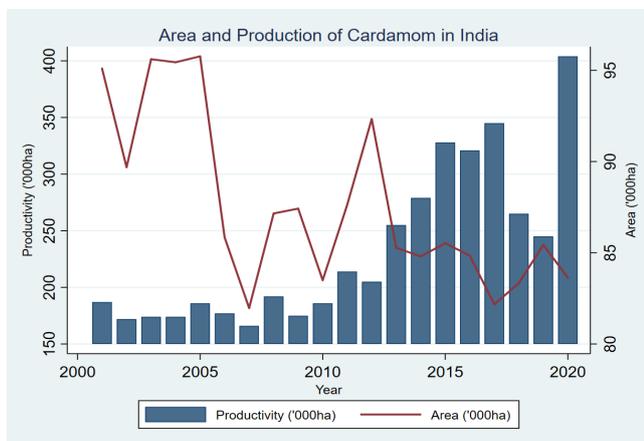


Fig 3. Area and production of cardamom in India

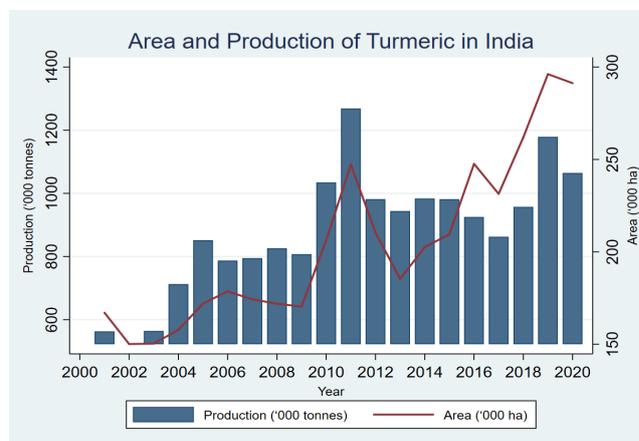


Fig 4. Area and production of turmeric in India

Table 1. Revealed comparative advantage (RCA) and revealed symmetric comparative advantage (RSCA) index (Pepper)

Year		India	Vietnam	Germany	China	Brazil
2015	RCA	5.16	35.08	0.47	0.03	8.20
	RSCA	0.67	0.94	-0.35	-0.93	0.78
2016	RCA	3.53	39.60	0.53	0.03	6.52
	RSCA	0.55	0.95	-0.29	-0.92	0.73
2017	RCA	3.06	35.01	0.57	0.04	8.49
	RSCA	0.50	0.94	-0.26	-0.91	0.78
2018	RCA	2.91	31.22	0.60	0.08	8.54
	RSCA	0.48	0.93	-0.24	-0.84	0.79
2019	RCA	2.90	29.63	0.52	0.07	9.37
	RSCA	0.48	0.93	-0.31	-0.86	0.80

Source: Author's calculation from World integrated trade solutions (WITS) data

Asian producing countries and the decline in price at domestic and international markets due to illegal import of pepper across the border (Cariappa, 2020 and Sanjeev Kumar, 2019). China and Germany have negative values, which indicates a comparative disadvantage in the export of pepper.

Cardamom

The RCA and RSCA values show that Guatemala has a comparative advantage but a declining trend, whereas the United Arab Emirates has a comparative advantage that increases from 7.91 to 12.48 (RCA) and 0.77 to 0.85 (RSCA). An RSCA close to one indicates that the country has a higher comparative advantage. India is drastically losing its comparative advantage from 11.09 to 3.73 (RCA). In the case of Indonesia, there is a gradual increase in value, which is gaining a comparative advantage in the global market. Globally,

there has been a steady growth in production of cardamom. Though India and Guatemala have a similar share in total cardamom production, Guatemala exports were higher than India since there is a huge domestic demand in India, affecting the exportable surplus. Thus, Guatemala has a greater comparative advantage than other countries, particularly India (Thomas et al., 2019). The details of RCA and RSCA are presented in Table 2.

Turmeric

India is the major exporter of turmeric in the global market. From the results, India has a comparative advantage in exports when compared to other countries with a gradual increase in RCA and RSCA. The RSCA is close to one, indicating a higher comparative advantage than other countries. Countries such as Indonesia and Vietnam have comparative advantages but

Table 2. Revealed comparative advantage (RCA) and revealed symmetric comparative advantage (RSCA) index (Cardamom)

Year		India	Guatemala	United Arab Emirates	Indonesia
2015	RCA	11.09	52.63	7.91	1.81
	RSCA	0.83	0.96	0.77	0.29
2016	RCA	10.65	50.65	4.83	1.67
	RSCA	0.82	0.96	0.65	0.25
2017	RCA	10.11	10.11	49.56	1.89
	RSCA	0.82	0.96	0.55	0.30
2018	RCA	6.73	49.72	8.32	2.55
	RSCA	0.74	0.96	0.78	0.43
2019	RCA	3.73	46.81	12.48	2.42
	RSCA	0.57	0.95	0.85	0.41

Source: Author's calculation from World integrated trade solutions (WITS) data

Table 3. Revealed comparative advantage (RCA) and revealed symmetric comparative advantage (RSCA) index (Turmeric)

Year		India	Indonesia	Vietnam
2015	RCA	44.10	6.05	1.55
	RSCA	0.95	0.71	0.21
2016	RCA	43.13	5.08	0.85
	RSCA	0.95	0.67	-0.07
2017	RCA	39.40	4.27	1.33
	RSCA	0.95	0.62	0.14
2018	RCA	40.69	3.98	5.17
	RSCA	0.95	0.59	0.67
2019	RCA	37.00	2.84	3.63
	RSCA	0.94	0.48	0.56

Source: Author's calculation from World integrated trade solutions (WITS) data

at a lower level than India. In 2015, the value of RSCA was 0.21, and it increased to 0.56 in 2019; the results are presented in Table 3.

Impact of tariff in exporting of pepper

The trade effect is the impact of the flow of imports, which includes trade creation and trade diversion by reducing tariffs by importing countries. The trade effect also includes the welfare effect and revenue effect. The increase in quantities of goods consumed by consumers is the welfare effect, and the reduction in revenue due to import tariffs is the revenue effect. The prevailing tariffs imposed by the top spices importing countries are presented in Table 4. There are no tariffs imposed by the United States, Germany and the United Kingdom on pepper (neither crushed), but Pepper (crushed) Germany and the United Kingdom have four percent tariffs on exporting countries. In the case of Turmeric, five percent tariffs are imposed by the United Kingdom and United Arab Emirates. In Cardamom, Pakistan imposed three percent as import tariffs and five percent as tariffs by Afghanistan.

The impact of tariff relief in Germany on imports would generate an increase in pepper exports from India equivalent to 43.66 thousand US dollars, given the creation of 9.52 thousand US dollars and 34.14 thousand dollars of trade diversion. The trade effect in Indonesia has 1.86 thousand US dollars of trade creation and 6.71 thousand US dollars of trade diversion. The revenue loss for Germany due to a reduction in tariffs would be 112.33 thousand US dollars, and the welfare of consumers would increase by a surplus of 0.21 thousand US dollars. The impact of the reduction in tariffs by importing countries is presented in Table 5.

The tariff impact on Indonesia, India and the United States imposed by the United Kingdom can increase the trade creation and diversion of pepper imports. Among these countries, India would have higher trade

creation than the rest of the importing countries by 97.08 thousand US dollars. The net revenue loss for the country would be 177.99 thousand US dollars. However, trade diversion from India is larger than trade creation, as the total trade diversion from India is 141.78 thousand US dollars, which indicates that less efficient countries can gain and export to countries. The liberalization has an important impact on the export and trade creation happens for many developing countries due to tariff cut to most favoured nations reduction in prices occurs, which makes the countries compete with global market (Sunil 2018, Veeramani 2010).

Cardamom

The impact of tariffs would generate an increase in imports equivalent to 264.61 thousand US dollars, fol-

Table 4. Tariff rate imposed by importing country

Commodity	Importing Country	Tariff rate
Pepper (Neither Crushed)	United States of America	0 %
	Germany	0 %
	United Kingdom	0 %
Pepper (Crushed)	United States of America	0 %
	Germany	4 %
	United Kingdom	4 %
Turmeric	United States of America	0 %
	United Kingdom	5 %
Cardamom	United Arab Emirates	5 %
	United Arab Emirates	0 %
	Pakistan	3 %
	Afghanistan	5 %

Source: World integrated trade solutions (WITS)

Table 5. Impact of tariff relief on export of commodities

Importing country	Exporting country	Trade creation (000 USD)	Trade diversion (000 USD)	Revenue effect (000 USD)	Consumer Surplus (000 USD)	Export Before and after tariff (000 USD)
Germany (Pepper)	Indonesia	1.86	6.71			183.26 (191.84)
	India	9.52	34.14	-112.33	0.219	935.92 (979.59)
	Brazil	8.58	30.78			843.51 (882.88)
United Kingdom (Pepper)	Indonesia	10.82	15.93			349.99 (376.76)
	India	97.08	141.78	-177.99	0.65	3138.26 (3377.13)
	United states	20.49	30.15			662.55 (713.19)
Pakistan (Cardamom)	Guatemala	264.61	4.75			12779.42 (13048.78)
	India	26.58	0.47	-476.98	4.897	1283.99 (1311.05)
	China	31.16	-5.36			1637.46 (1663.26)
Afghanistan (Cardamom)	Guatemala	12.12	-			358.03 (370.16)
	India	10.00	-	-32.87	0.556	295.53 (305.54)
	United States	0.13	-			3.90 (4.03)
United Arab Emirates (Turmeric)	Ethiopia	11.60	0.07			252.30 (263.99)
	India	369.29	2.48	-441.52	10.11	8027.06 (8393.83)
	Myanmar	15.37	0.10			334.14 (349.62)

Note: Figure in parentheses indicates exports after tariff relief

lowed by China (31.16 thousand US dollars) and India (26.58 thousand US dollars) from Guatemala due to a reduction in the tariff rate. Trade diversion had not impacted due to tariff relief, but China had a setback in export of 5.36 thousand US dollars. The revenue effect would reduce the Pakistan income from tariffs by 476.98 thousand US dollars. Afghanistan's leading importer next to Pakistan, does not have a greater impact on trade creation, as it has increases of 12.12, 10 and 0.13 thousand US dollars in Guatemala, India and the United States, respectively.

Turmeric

The trade effect due to tariff relief could increase imports from India by 369.29 thousand US dollars, followed by Myanmar and Ethiopia, which can slightly increase trade creation. The welfare gain by consumers in United Arab Emirates was 10.11 thousand US dollars, and the net loss as revenue to United Arab Emirates was 441.52 thousand US dollars.

Conclusion

In this study, we found that the revealed comparative advantage and revealed symmetric comparative advantage both indicate that India is losing its comparative advantage in the export of pepper, whereas Brazil has an increasing trend and comparatively advantage. The area and production of pepper in India are decreasing gradually, which may cause its decline in the

global market and is becoming a net importer. There is a need to scale up production and incentivise farmers to encourage pepper export to the global market. Strong investments in research for enhancing the efficacy of production (Press Information Bureau, 2019). In the case of cardamom, India has a declining trend and loses its comparative advantage, and the top exporter United Arab Emirates has a comparative advantage over other cardamom exporting countries. In turmeric, as India is leading in exports, it still maintains its comparative advantage over other countries. The impact of tariff relief on India has a greater advantage and has created a trade in exporting cardamom and turmeric. In peppers, trade diversion is higher than trade creation, indicating that less efficient countries are given a chance to export to importing countries due to a reduction in tariffs.

Conflict of interest

The authors declare that they have no conflict of interest.

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