Revealed Comparative Advantage, Competitiveness and Growth Performance: Evidences from India's Foreign Trade of Agricultural Commodities

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ABSTRACT

Agricultural sector has played an important role in economic development of the country by earning sizable amount of foreign exchange by exporting agricultural commodities. The export of agricultural commodities can reduce the current account deficit of the country because the values of exports of agricultural commodities are more than the import value of agricultural produces. After agreement under world trade organisation, agricultural commodities are moving from one country to another country realising the benefits of comparative advantage in the international economy. The present study is an attempt to study the growth trend, variability and trade specification coefficient index for various agricultural commodities and to study the comparative advantage of spices export from India using revealed comparative advantage, trade specification coefficient, revealed symmetric comparative advantages and revealed competitive advantage indices. For the purpose secondary data was collected from various government published sources and websites. The compound growth trend, coefficient of variation, Revealed comparative advantage (RCA), Revealed symmetric comparative advantage (RSCA), Revealed competitive advantage (RC) and trade specification coefficient (TSC) was used to achieve the objectives. Growth trend analysis for value of export and import suggests that all the agricultural commodities showed positive trend with high inter-annual variability during the study period except for import value of jute hessian and guar gum meal import. The TSC analysis suggests that value of export was more than the value of import for all the crops except pulses, vegetable oils, fresh fruits, cashew, cocoa products and raw jute during the study period. The analysis of competitiveness of spices export showed a favourable competitive scenario, whereas the export-import balance was found slight decrease from high dominance of export over import.

Key Words: Spices, Revealed comparative advantage, Trade specification coefficient, Revealed symmetric comparative advantages, Revealed competitive advantage

JEL.: F31, F40, P59, Q17

I

INTRODUCTION

Indian agricultural sector has played an important role in the economic development of the country. The gross value added from agricultural sector at current prices was Rs.27559.92 billion accounting for 14.46 per cent of the gross domestic product at market price (Government of India, 2019). The total exports of agricultural commodities from India was Rs.2515.64 billion and agricultural imports was Rs.1520.95 billion during 2017-18 with a net trade balance of Rs.994.69 billion during the same period (Government of India, 2019).The exports of agricultural

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commodities may be considered as gainful in improving the health of economic and financial scenario balance of the country (Singh and Vasisht 1996; Coote *et al*., 2000; Ghosh 2005; Johnson 2009). India's current account deficit is US$ 1.2 billion, accounting for about 0.9 per cent of the gross domestic product in 2019-20.Augmentation in agricultural commodities exports may be helpful in mitigating the current account deficit. The agreement under World Trade Organisation (WTO) allows all countries to take the benefits from realising the comparative advantage in the international economy and augmentation of competition would trigger the efficient use of available and allocated resources. The trade policies of the country have influenced its comparative advantage (Mirzaei *et al*., 2012).

Trade competitiveness of commodities holds a unique role in policy making. The classical trade models says that a country has an ability to produce a commodity at lower cost in which the country has comparative advantage and export that commodity, while other country import that particular commodity, because the importing country has the comparative disadvantage in producing that commodity (Ahmed *et al*., 2017). Many economists tried to define and measure comparative advantage- like Revealed Comparative Advantage (RCA) measurement by Balassa (1965) to recent development of Normalised Revealed Comparative Advantage (NRCA) by Yu *et al*., (2009). The comparative advantage theory of Balassa's (1995) identify trade pattern of any country with its limitation. Other new indices have been introduced on the basis of trade-cum-production such as Lafey index (Lafey, 1992) that cover export, Dalum *et al*., (1998) index and weighted RCA index by Proudman and Reading (1998), additive index developed by Hoen and Oosterhaven (2000) and normalised index NRCA by Yu *et al*., (2009) covers comparison among countries, products over time with neutral point.

India exports a large number of agricultural commodities to a number of overseas countries. These export products include processed foods, frozen or dried food, fresh foods, prompt foods and ready to eat food. This has empowered the Indian food industries to occupy a significant position in the world market. The agro-based products are broadly classified into two groups, viz., plant based and animal based products. Some of the important plant based commodities which are exported from India to overseas market include tea, coffee, basmati rice, tobacco, spices, cashew, sesame seed, niger seed, groundnut, oil meal, guargum, castor oil, molasse, fresh and processed vegetables, processed juice, milled products, jute, cotton, floricultural products etc. The animal-based products are animal casings, buffalo meat, sheep and goat meat, processed meat, dairy and poultry products and marine products. To promote the agro-based products, various measures have been adopted by the government to provide financial enticements to endorse the exporting agro-food products (Barik and Anand, 2017). India also imports lot of the food items from the overseas countries and sold in the domestic market and this has benefited many Indian consumers who prefer to eat frozen foods instead of spending hours in the kitchen by the imported ones at affordable price. Looking into the importance of

exports, the present study attempts to analyse and understand the revealed comparative advantage, competitiveness and growth performance in trade of Indian agricultural commodities. The objectives of the present study are: (1) to estimate the trade specification coefficient index, trend analysis and variability of agricultural commodities; and (2) to study the comparative advantage of spices exports from India using revealed comparative advantage, trade specification coefficient, revealed symmetric comparative advantages and revealed comparative advantage indices.

II

METHODOLOGY

The study is based on secondary data collected from the various published sources of government publications like *Agricultural Statistics at a Glance*, *Handbook of Horticulture*, data from *Spices Board of India*, etc.

The exponential function ($Y = a*b^t$) was used to study the temporal growth in agricultural import and export. Where, Y is the dependent variable (it may be export or import data), t is the independent variable (it is rank given to the year concerned). Ranking of the year was done in ascending order, a is the functional coefficient used in exponential function and b is the compounding coefficient (Singh and Singh, 1997).

The coefficient of variation [$CV = (\sigma/\mu) \times 100$] was used to measure the variability in agricultural import and export. Here, σ is the standard deviation and μ is the mean (Singh and Singh, 1997).

To measure the Revealed Comparative Advantage (RCA) of a country's trade pattern for any spices, Balassa (1965) method was used. The mathematical expression is denoted as:

$$RCA_{ij} = \{(X_{ij} / \Sigma X_{ij}) / (\Sigma j \Sigma i X_{ij})\}$$

where, X_{ij} denotes the exports of commodity i in country j; $\Sigma i X_{ij}$ is the total agri-exports of country j; $\Sigma j\ X_{ij}$ is the Asia's exports of commodity i; and $\Sigma j\ \Sigma I\ X_{ij}$ is the total agri exports of Asia. If RCA index < 1, it indicates that the share of Indian exports in the country's overall export trade is lower than its share in Asia's trade. If RCA >1 it means the share of imports, export in different products is more than Asia's shares hence it has a comparative advantage in that particular commodity.

Vollrath (1991) and Dalum *et al*. (1998) suggested another alternative method to measure the competitiveness of a particular country to avoid the problem of double counting like Revealed Symmetric Comparative Advantages (RSCA). The RSCA can be expressed as:

$$RSCA_{ij} = [\{(X_{ij} / \Sigma X_{ij}) / (\Sigma j\ X_{ij} / \Sigma j\ \Sigma i X_{ij})\}\text{-}1] / [\{(X_{ij} / \Sigma X_{ij}) / (\Sigma j\ X_{ij} / \Sigma j\ \Sigma i X_{ij})\}+1]$$

where, Xij is the exports of commodity iin country j; $\Sigma i X_{ij}$ is total agri-export of country j; $\Sigma j\ X_{ij}$ denotes the Asia's export of commodity i and $\Sigma j\ \Sigma i X_{ij}$ signifies

Asia's total agri export. The value of RSCA index ranges between -1 to +1 to avoid the problem of zero. Positive values of the index indicate the stability as well as the competitiveness of a particular country. Hence, RSCA also measures the permanency of the particular product.

Revealed Competitive Advantage (RC) index measures the balances in supply and trade by using the values of export and it was developed by Vollrath (1991). It also used to know the distinctions between specific commodity and all other commodity as well as among specific country with rest of the world/ a set of countries. The RC index can be expressed as:

$$RC_{ij} = \{(X_{ij} / \Sigma X_{ij}) / (\Sigma j\ X_{ij} / \Sigma j\ \Sigma i X_{ij})\} - \{(M_{ij} / \Sigma M_{ij}) / (\Sigma j\ M_{ij} / \Sigma j\ \Sigma i M_{ij})\}$$

where, X_{ij} represents the exports of commodity i in country j; $\Sigma i X_{ij}$ is total agri-exports of country j; $\Sigma j\ X_{ij}$ implies Asia's exports of commodity i and $\Sigma j\ \Sigma i X_{ij}$ is total agri-exports of Asia; M_{ij} represent the imports of commodity i in country j; $\Sigma i M_{ij}$ is the total agri-import of country j; $\Sigma j\ M_{ij}$ implies Asia's imports of commodity i and $\Sigma j \Sigma i M_{ij}$ is the total agri imports of Asia. The values of index must be either positive or negative. If the values depicts positive, the commodity of the country is competitive and if the index value is negative means it will not competitive internationally in that commodity trade. Therefore, value of RC is a perfect measure to show the balances in supply and demand as well as competitiveness and edges in comparative advantages.

Trade specification coefficient index (TSC Index) also known as Lafay's (1992) Index has been employed to understand the export competitiveness of Indian exports during the study periods. The mathematical model of the TSC index is represented as follows:

$$TSC = \frac{(X_{ij} - M_{ij})}{(X_{ij} + M_{ij})}$$

This index represents the ratio of the trade balance (changes between exports and imports) of a particular commodity in a country to the total value of the trade (cumulative value of exports and imports) for that particular commodity. In the above equation, X_{ij} represents the total exports of the commodity while M_{ij} represents the total imports of the commodity. The value of the index ranges between -1 and +1. The value of this index equals 'zero' when a commodity's exports are equal to its imports. A positive index indicates that the country's exports of a particular commodity are higher than the imports of the commodity. Hence this measure indicates the degree of equilibrium between exports and imports of a particular commodity and is a suitable method for comparing the trends over a longer period of time.

<center>III</center>

<center>RESULTS AND DISCUSSION</center>

3.1 *Growth Performance of Agricultural Import and Export*

Total value of India's imports was 431.71 billion in 1990-91 and it increased to the level of Rs.30010.33 billion by the year 2017-18. The contribution of agricultural import to India's total imports was 2.79 per cent during 1990-91 and the share of agricultural imports increased to the level of 5.07 per cent by the year 2017-18. In case of national export, it was Rs.325.27 billion during 1990-91 and it was reached to the level of Rs.19565.15 billion by the year 2017-18. The contribution of agricultural exports indicated a declining trend, i.e., 18.49 per cent in 1990-91 to 12.86 per cent during 2017-18. But in absolute terms, value of agricultural exports was found to have increased.

Total agricultural imports in India was Rs.12.06 billion in 1990-91and it was increased to the level of Rs.1520.95 billion by the year 2017-18 (Figure 1). The growth trend analysis of agricultural import showed a compound growth rate of 16.50 per cent per annum during same period of time. Total value of agricultural export from India was Rs.60.13 billion and it increased to the level of Rs.2515.64 billion by the year 2018-19 and registered a compound growth rate of 13.74 per cent per annum during the same period. The inter-annual variability of the value of agricultural import during 1990-91 to 2017-18 was estimated to be 117.34 and 103.57 per cent.
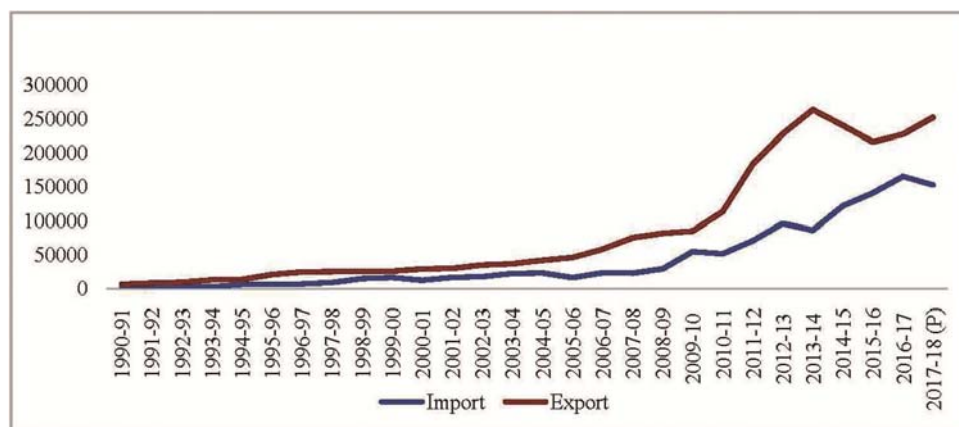

Figure 1. Growth of Agricultural Imports and Exports.

3.2 *Export Performance of Agricultural Commodities*

The export performance of agricultural commodities in terms of growth, instability and trade specialisation coefficient for all the crops/agricultural products was carried out and the results are presented in Table 1 and Table 2 respectively.

TABLE 1. GROWTH AND INSTABILITY OF CROP/PRODUCTS

Groups of commodities (1)	Crops/Product (2)	Growth		Instability	
		Export (3)	Import (4)	Export (5)	Import (6)
A. Cereals and Pulses	1. Rice Basmati	20.25*	-	76.26	-
	2. Rice (other than Basmati)	15.25**	38.28*	86.65	120.02
	3. Wheat	13.17	-	154.36	191.28
	4. Other cereals	16.72*	35.35*	86.29	139.95
	5. Pulses	9.45*	17.81*	49.19	79.88
	6. Cereal preparations	15.88*	15.47*	38.30	38.89
B. Oil seeds	1. Sesame seeds	14.03*	33.43	60.06	96.57
	2. Niger seeds	4.03**	-	37.59	142.36
	3. Other oilseeds	30.88*	19.47*	66.03	61.79
	4. Vegetable oils	19.69*	24.14*	50.86	104.67
	5. Oil meals	7.08*	31.25*	58.54	91.48
	6. Castor oil	16.18*	13.31*	65.47	43.94
	7. Groundnut	22.31*	-	78.97	208.16
C. Sugar products	1. Sugar	17.94*	35.97*	69.65	102.53
	2. Molasses	18.05*	11.15	98.26	110.07
D. Fruits and vegetables	1. Fruits and vegetable seeds	16.33*	13.15*	74.25	34.87
	2. Fresh vegetables	15.14*	14.45	61.87	205.16
	3. Processed vegetables	13.24*	2.97	57.57	21.93
	4. Fresh fruits	14.16*	19.27*	64.89	46.62
	5. Processed fruits and juices	17.96*	15.43*	70.62	41.49
E. Plantation crops	1. Cashew	8.13*	14.19*	40.19	67.66
	2. Cashew nut shell liquid	13.52*	19.36	58.52	112.53
	3. Cocoa products	35.54*	15.95*	75.75	38.37
	4. Spices	19.32*	18.42*	72.86	84.26
	5. Tea	9.15*	10.09*	42.05	46.29
	6. Coffee	13.21*	15.83*	56.69	39.21
F. Fibre products	1. Cotton raw incld. Waste	27.04*	11.28*	75.01	84.76
	2. Jute raw	2.67	11.85*	24.34	78.72
	3. Jute hessian	7.14*	-8.39	38.36	40.84
G. Narcotics products	1. Tobacco unmanufactured	13.28*	16.16	53.62	52.67
	2. Tobacco manufactured	16.03*	13.18*	72.78	34.55
H. Other products	3. Guar gam meal	2.18	-0.21	86.37	101.95

*: Significant at 5 per cent level of significance, **: Significant at 10 per cent level of significance.

3.2.1 *Cereals and Pulses*

The export of basmati rice was Rs.20.59 billion in 2002-03 and it increased to the level of Rs.268.77 billion by the year 2017-18 registering a compound growth rate of 20.25 per cent per annum during the same period. There was no import of basmati rice during the study period. The inter-annual variation in export of basmati rice was 76.26 per cent during same period of time. Trade Specialisation Coefficient (TSC) which represents the ratio balance between exports and imports indicate positive trend. It was observed that the value of TSC index for basmati rice during the entire period of study was one, indicating that the India's exports of basmati rice was higher than the value of imports.

TABLE 2. TRADE SPECIALISATION CO-EFFICIENT (TSC) FOR CEREALS, PULSES, OILSEEDS AND SUGAR

Crop groups (1)	Name of the crops (2)	2002-03 (3)	2003-04 (4)	2004-05 (5)	2005-06 (6)	2006-07 (7)	2007-08 (8)	2008-09 (9)	2009-10 (10)	2010-11 (11)	2011-12 (12)	2012-13 (13)	2013-14 (14)	2014-15 (15)	2015-16 (16)	2006-17 (17)	2017-18 (18)
A. Cereals and Pulses	1. Rice Basmati	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	2. Rice (other than Basmati)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	3. Wheat	1.00	1.00	1.00	1.00	0.03	-0.16	-0.16	-0.17	-0.18	-0.11	0.33	0.50	0.56	0.54	0.29	0.24
	4. Other cereals	0.99	0.99	0.99	0.96	0.96	0.97	0.98	0.97	0.97	0.97	0.97	0.97	0.97	0.96	0.94	0.92
	5. Pulses	-0.78	-0.76	-0.68	-0.59	-0.61	-0.67	-0.71	-0.77	-0.77	-0.78	-0.79	-0.78	-0.79	-0.81	-0.83	-0.83
	6. Cereal preparations								0.69	0.68	0.70	0.71	0.72	0.71	0.71	0.71	0.71
B. Oil seeds	1. Sesame seeds								0.99	0.98	0.99	0.95	0.88	0.88	0.88	0.86	0.87
	2. Niger seeds								0.95	0.95	0.96	0.96	0.96	0.96	0.89	0.78	0.76
	3. Other oilseeds								0.08	0.13	0.23	0.38	0.53	0.61	0.61	0.56	0.55
	4. Vegetable oils								-0.98	-0.99	-0.99	-0.99	-0.99	-0.98	-0.98	-0.98	-0.99
	5. Oil meals								1.00	0.99	0.99	0.99	0.99	0.98	1.00	0.96	0.95
	6. Castor oil								1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	7. Groundnut	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
C. Sugar Products	1. Sugar	0.96	0.94	0.49	0.37	0.60	0.75	0.76	0.34	0.34	0.46	0.46	0.47	0.44	0.43	0.39	0.34
	2. Molasses								0.90	0.91	0.92	0.92	0.92	0.89	0.92	0.92	0.88
A. Fruits and Vegetables	1. Fruits and vegetable seeds								0.49	0.28	0.16	0.08	0.05	0.00	-0.03	-0.04	-0.04
	2. Fresh vegetables								1.00	0.99	0.99	0.99	0.99	0.99	0.97	0.98	0.98
	3. Processed vegetables								0.96	0.92	0.90	0.88	0.86	0.86	0.86	0.86	0.86
	4. Fresh fruits								0.54	0.26	0.08	-0.05	-0.13	-0.21	-0.26	-0.29	-0.31
	5. Processed fruits and juices								0.94	0.90	0.87	0.83	0.82	0.81	0.80	0.79	0.78
B. Plantation Crops	1. Cashew	0.25	0.18	0.17	0.15	0.14	0.14	0.12	0.09	0.09	0.05	0.02	0.02	0.01	-0.03	-0.06	-0.08
	2. Cashew nut shell liquid								1.00	1.00	1.00	0.99	0.98	0.93	0.91	0.91	0.89
	3. Cocoa products								-0.59	-0.62	-0.65	-0.62	-0.52	-0.45	-0.35	-0.31	-0.28
	4. Spices	0.48	0.47	0.49	0.49	0.53	0.56	0.60	0.60	0.62	0.64	0.65	0.65	0.63	0.61	0.60	0.59
	5. Tea	0.86	0.89	0.88	0.88	0.88	0.88	0.88	0.87	0.87	0.88	0.88	0.87	0.87	0.87	0.87	0.87
	6. Coffee								0.96	0.93	0.90	0.86	0.84	0.82	0.81	0.79	0.79
A. Fibre products	1. Cotton raw incld. waste	-0.92	-0.48	-0.47	-0.04	0.33	0.51	0.47	0.55	0.64	0.73	0.73	0.75	0.73	0.72	0.68	0.64
	2. Jute, raw								-0.88	-0.72	-0.72	-0.69	-0.63	-0.58	-0.57	-0.62	-0.61
	3. Jute hessian								0.87	0.82	0.79	0.79	0.80	0.78	0.76	0.78	0.77
B. Narcotics products	1. Tobacco unmanufactured								0.99	0.99	0.99	0.98	0.98	0.98	0.97	0.97	0.97
	2. Tobacco manufactured								0.95	0.92	0.90	0.87	0.86	0.84	0.84	0.84	0.84
C. Others	3. Guar gam meal								1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

The rice (other than basmati) exports from India was Rs.37.73 billion during 2002-03 and it was augmented to the level of Rs.234.37 billion by the year 2017-18 showing a compound annual growth of 15.25 per cent per annum. The import value of rice (other than basmati) was Rs.0.001 billion during 2002-03 and it reached up to 0.12 billion by the year 2017-18. But the import of other rice was not a common phenomenon in the country and import value was expanding with compound growth rate of 38.28 per cent per annum. The coefficient of variation for import and export of rice (other than basmati) was estimated to be 86.65 and 120.02 per cent respectively. The value of Trade Specialisation Coefficient (TSC) index for rice (other than basmati) during entire period of study was one, which indicates that the India's value of exports of rice was higher than the value of imports.

In 2002-03, the value of wheat exports was Rs.17.60 billion and it was augmenting with compound growth rate of 13.17 per cent per annum, it reached to Rs.105.29 billion in 2012-13 and again it was found declined to Rs.6.25 during 2017-18. The export of wheat was not a common phenomenon and some year it was zero and another year it was Rs.23.58 billion. Very high fluctuation was observed for value of export and import of wheat with 154.36 and 191.28 per cent respectively. The results of TSC index for wheat shows positive value throughout the study period except during 2007-08 to 2011-12. It implies that during 2007-08 to 2011-12, value of wheat export was less than import, whereas during the rest of the period, value of wheat export was more than the value of import.

The export and import value of other cereals was Rs.0.91 and Rs.0.007 billion respectively in 2002-03 and it was increased to Rs.16.04 and 4.34 billion respectively during 2017-18. Growth trend analysis for value of other cereals export and import suggest that it was growing with compound growth rate of 16.72 and 35.35 per cent respectively. The inter-annual variability of value of exports and imports were found to be 49.19 and 79.88 per cent respectively. The positive results of Lafay's (1992) Trade Specialisation Coefficient index value for other cereals was positive and ranged between 0.92 to 0.99. India's exports value of other cereals was higher than the value of imports.

The value of export and import of pulses in India was Rs.3.45 and Rs.27.37 billion respectively in 2002-03 and it accelerated to Rs.14.70 and Rs.187.49 billion respectively by the year 2017-18. The value of import and exports of pulses in the country was expanding with compound growth rate of 9.45 and 17.81 per cent per annum respectively during the study period. Instability for export and import of pulses was found to be 49.19 and 79.88 per cent respectively. Trade Specialisation Coefficient (TSC) showed negative value during the study period for pulses, indicating that the country's export of pulses was less than the imports.

The value of exports and imports of cereal preparation was Rs.10.30 billion and Rs.1.89 billion respectively during 2009-10 and it was augmented to Rs.35.62 billion and Rs.6.60 billion respectively by 2017-18. The growth trend analysis for value of export and import of cereal preparation was found to be 15.88 and 15.47 per cent per

annum respectively during same period of time. The coefficient of variation in value of export and import of cereal preparation was estimated to be 38.30 and 38.89 per cent respectively. The results of Lafay's Trade Specialisation Coefficient (TSC) shows positive and highest TSC index for cereal preparation was 0.72 in 2013-14 and did not display negative values indicating that India's export value of cereal preparation was higher than the import value during the study period.

3.2.2 *Oil Seeds*

The export value of sesame seed was Rs.3.73 billion in 2002-03 and it increased to Rs.29.91 billion by the year 2017-18 and registered compound growth rate of 14.03 per cent per annum during the same period. The value of import of sesame seed was Rs.0.53 billion in 2009-10 which increased to Rs.1.77 billion during 2017-18 registering a compound growth rate of 33.43 per cent per annum. The very high fluctuation of instability for value was observed for sesame seed import and export, i.e., 60.06 and 96.57 per cent respectively. Trade Specialisation Coefficient index shows positive trend throughout the study period for sesame seed. The highest TSC index value 0.99 was observed during 2009-10 and 2011-12 and no negative index value was observed. This shows India's export value of sesame seed was higher than the value of import during the study period.

In case of nigerseed, the value of export was Rs.0.78 billion in 2002-03 and it increased to Rs.1.17 billion in 2016-17 and again declined to Rs.0.70 billion. The value of exports indicated with compound growth rate of 4.03 per cent per annum during the same period. Niger seed import in the country was not prominent. The nigerseed was imported in certain years while in some years there were no imports at all. The inter-annual variability in value of export and import was estimated to be 37.59 and 142.36 per cent during the study period. The results of Lafay's Trade Specialisation Coefficient index show positive value for Nigerseed during the study period. The highest positive index value was 0.96. The positive index value indicating that the India's value of exports of Niger seed was higher than the value of imports.

The value of export and import of other oilseeds in the country was Rs.1.39 and Rs.1.18 billion respectively in 2009-10 and it was expanded to Rs.11.26 and 3.65 billion respectively by the year 2017-18. The value of export and import of other oilseeds was expanding with compound growth rate of 30.88 and 19.47 per cent per annum respectively. The coefficient of variation of export and import value of other oilseeds was found to be 66.03 and 61.79 per cent respectively. The results of Lafay's TSC index for other oilseeds depict positive value during the study period. The highest positive TSC index value was 0.61. The positive index value indicated that the India's value of exports of other oilseeds was higher than the value of imports.

The value of export and import of vegetable oils in the country was Rs.1.83 and Rs.223.17 billion respectively in 2009-10 and it was augmented to Rs.5.66 and

2749.96 billion respectively by 2017-18. The value of export and import of vegetable oils was growing with compound growth rate of 19.69 and 24.14 per cent per annum respectively. The instability of value of export and import of vegetable oils was found to be 50.86 and 104.67 per cent respectively. The results of Trade Specialisation Coefficient (TSC) indicate negative value throughout the study period for vegetable oils and no positive value was observed. This implies that the value of vegetable oil export was lower than value of import during the study period.

Export value of oil meals in India was Rs.14.87 billion in 2002-03 and it was increased to Rs.70.43 billion by 2017-18 registering a compound growth rate of 7.08 per cent per annum. Whereas import value of oil meals was Rs.1.05 billion in 2009-10 and it was increased to Rs.7.47 billion by 2017-18 augmenting with compound growth rate of 31.25 per cent per annum. Inter-annual variation in oil meal export and import was found to be 58.54 and 91.48 per cent respectively. Trade Specialisation Coefficient (TSC) index depicts positive value for oil meals during entire period of study and it was highest (1.0) during 2009-10, which represents the ratio balance between exports and imports. It reflects that the value of export for oil meals was higher than the value of import.

Value of castor oil export was Rs.6.10 billion in 2002-03 and it was increased to Rs.67.30 billion by 2017-18 recording a compound growth rate of 16.18 per cent per annum during same period of time. Whereas, import was Rs.0.004 billion in 2009-10 and it expanded to 0.03 billion by 2017-18 registering a compound growth rate of 13.31 per cent per annum. The variability in value of export and import was 65.47 and 43.94 per cent respectively. The highest value of Lafay's (1992) Trade Specialisation Coefficient for castor oil was 1.0 throughout the study period. The positive index value represents that the India's exports value of castor oil was higher than the value of imports.

The growth trend analysis for groundnut export was found to be 22.31 per cent per annum, the value of export was increased from Rs.1.78 billion in 2002-03 to Rs.33.86 billion by 2017-18 while, import of groundnut remain very small and irregular. The instability of export and import was found to be 78.97 and 208.16 per cent respectively. Trade Specialisation Coefficient index for groundnut were found positive 1.0 during the study period. It implies that the India's exports value for groundnut was higher than the value of groundnut import during the study period.

3.2.3 *Sugar Products*

The value of export and import of sugar was Rs.17.70 billion and 0.33 billion respectively in 2002-03 and it was augmented to the level of Rs.52.26 billion and Rs.60.36 billion respectively, depicting compound growth rate of 17.94 and 35.97 per cent per annum respectively. The inter-annual variability in value of sugar export and import was 69.65 and 102.53 per cent respectively. The Lafay's (1992) Trade Specialisation Coefficient (TSC) was carried out to find the trade balance for sugar.

The highest TSC index value for sugar was found to be 0.96 in 2002-03, indicating that the India's exports value of sugar was higher than the value of imports.

The value of molasses export was Rs.0.45 billion in 2002-03 and it was increased to Rs.0.98 billion by 2017-18 recording a compound growth rate of 18.05 per cent per annum during same period of study. Whereas import value of molasses was Rs.0.32 billion in 2009-10 and it expanded to Rs.0.69 billion by 2017-18 registering a compound growth rate of 11.15 per cent per annum. The variability in value of export and import was 98.26 and 110.07 per cent respectively. The highest value of TSC index for molasses was found to be 0.92 and no negative value was observed. This indicates that the India's value of exports of molasses was higher than the value of imports.

3.2.4 *Fruits and Vegetables*

In 2002-03, export value of fruits and vegetables seed was 0.98 billion and it was growing with compound growth rate of 16.33 per cent per annum, it reached to Rs.6.71 billion by 2017-18, while value of import for fruits and vegetable seeds was Rs.2.84 billion and it was increasing with compound growth rate of 13.15 per cent per annum reached to Rs.7.68 billion by 2017-18. The value of export and import instability was found to be 74.25 and 34.87 per cent respectively. The results of Lafay's (1992) TSC index indicate both positive and negative values for fruits and vegetables seed during the study period. These results suggest that during 2009-10 to 2013-14, the value of export was higher than the import value. The export value was equal to import value was observed in 2015-16. During 2015-16 to 2017-18, the TSC index value was negative suggesting the value of export of fruits and vegetable seed export from India was lower than the value of import.

Fresh vegetable export value was 6.43 billion in 2003-04 and it was growing with compound growth rate of 15.14 per cent per annum. It reached to Rs.52.98 billion by 2017-18, while value of imports for fresh vegetable was Rs.0.08 billion in 2009-10 and it was increasing with compound growth rate of 14.45 per cent per annum reached to Rs.0.26 billion by 2017-18. The coefficient of variation in the value of export and import was estimated to be 61.87 and 205.16 per cent respectively. The value of Lafay's (1992) Trade Specialisation Coefficient (TSC) index for fresh vegetables shows positive during study period. The highest value of index was found to be 1.0 with positive sign in 2009-10, suggests that India's exports value for fresh vegetables were higher than the value of imports.

Value of export of processed vegetables was Rs.2.57 billion in 2002-03 and it increased to Rs.18.23 billion by the year 2017-18. The value of export was growing with compound growth rate of 13.24 per cent per annum. Import value of processed vegetables was Rs.0.78 billion in 2009-10 and it augmented to Rs.1.35 billion with compound growth rate of 2.97 per cent per annum. The analysis of inter-annual variability in value of exports and imports was found to be 57.57 and 21.93 per cent

respectively. In case of fresh fruits, the Lafay's (1992) TSC index value shows positive throughout the study period and it was highest (0.96) during 2009-10, which represents the ratio balance between exports and imports. The analysis suggests that India's value of exports of processed vegetables was higher than the value of imports.

In 2002-03, export value of fresh fruits was 4.47 billion and it was growing with compound growth rate of 14.16 per cent per annum. It reached to Rs.49.13 billion by 2017-18, while value of import for fresh fruits was Rs.28.43 billion and it was increasing with compound growth rate of 19.27 per cent per annum reached to Rs.125.25 billion by 2017-18. The instability in value of export and import was found to be 64.89 and 46.62 per cent respectively. The Lafay's (1992) Trade Specialisation Coefficient (TSC) for fresh fruits was estimated and it was found both positive and negative values. The results suggests that value of export was lower than the value of import of fresh fruits during 2012-13 to 2017-18, whereas value of import of fresh vegetable was lower than the export value during 2009-10 to 2011-12.

Processed fruits and juices export value was 2.57 billion in 2003-04 and it was growing with compound growth rate of 17.96 per cent per annum. It reached to Rs.41.69 billion by 2017-18, while the value of export for processed fruits and juices was Rs.1.91 billion in 2009-10 and it was increasing with compound growth rate of 15.43 per cent per annum reached to Rs.8.04 billion by 2017-18. The coefficient of variation in the value of export and import was estimated to be 70.62 and 41.49 per cent respectively. Trade Specialisation Coefficient (TSC) showed positive values for processed fruits and juices. The highest TSC index value for processed fruits and juices was observed 0.94 in 2009-10. It indicates that, India's exports value of processed fruits and juices was higher than the value of imports.

3.2.5 *Plantation Crops*

In 2002-03, total value of export and import of cashew was Rs.20.53 and Rs.12.36 billion respectively and it increased to the level of Rs.59.45 and Rs.91.34 billion respectively by 2017-18. The growth trend analysis suggests that value of cashew export and import was expanding with a compound growth rate of 8.13 and 14.19 per cent respectively during the same period of time. The coefficient of variation in value of export and import of cashew was 40.19 and 67.66 per cent respectively. The results of Lafay's Trade Specialisation Coefficient (TSC) indicated both positive and negative sign for cashew. The results suggest that, India's export value for cashew was higher than the import value during 2002-03 to 2014-15. During 2015-16 to 2017-18, the country's export value of cashew was lower than the import value.

In case of cashew nut shell liquid, value of export was 0.09 billion in 2002-03 and it was augmenting with compound growth rate of 13.52 per cent per annum. Its value increased to Rs.0.33 billion during 2017-18. The import of cashew nut shell liquid was very erratic in the country. The value of imports was 0.001 billion in 2010-

11 and it increased to 0.06 billion by the year 2017-18 showing a compound growth rate of 19.36 per cent per annum. The inter-annual variability in value of export and import was found to be 58.52 and 112.53 per cent respectively. The results of TSC shows positive values for cashew nut shell liquid for the study period and highest value was observed for 1.0 during 2009-10. The results indicate that the India's exports of cashew nut shell liquid were higher than its value of import.

In 2009-10, value of export and import of cocoa products was Rs.0.97 and Rs.3.76 billion respectively and it was augmenting with compound growth rate of 35.54 and 15.95 per cent per annum respectively, it reached to the level of Rs.11.44 and Rs.14.73 billion respectively by 2017-18. The instability in value of export and import of cashew was 75.75 and 38.37 per cent respectively. The trade balance analysis for cocoa products was carried out using Lafay's Trade Specialisation Coefficient (TSC) and negative values were obtained for the entire period of study. The results suggest that India's value of exports of cocoa products was lower than the value of imports.

Value of export and import of spices in the country was Rs.16.55 and Rs.5.86 billion in 2002-03 respectively and it was increased to Rs.200.85 and Rs.63.85 billion respectively by 2017-18. The growth trend analysis for spices export and import found that it accelerated with a compound growth rate of 19.32 and 18.42 per cent per annum. The high variability in value of export and import of spices was observed. The Lafay's Trade Specialisation Coefficient was implied to find out the trade balance between export and import for spices and highest TSC value was 0.65. The results of TSC suggest that export value of Indian spices was higher than the import value during the study period.

India's export and import value of tea was Rs.16.52 and Rs.1.25 billion in 2002-03 and it was expanded to Rs.53.97 and 3.57 billion during 2017-18. The compound growth trend for value of export and import of tea was estimated and it expanding with 9.15 and 10.09 per cent respectively. The variability of tea export and import was estimated and it was found to be 42.05 and 46.29 per cent respectively. The results of Lafay's (1992) Trade Specialisation Coefficient (TSC) for tea shows positive and highest TSC index for tea was observed to be 0.89 in 2003-04 and did not display any negative values. The results of TSC suggest that India's export value of tea was more than the import value during the study period.

During 2003-04, the total value of coffee export from India was Rs.9.94 billion and it was increased to the level of Rs.62.45 billion by the year 2017-18 registering a compound growth rate of 13.21 per cent per annum. In 2009-10, total value of coffee import was 2.97 billion and it was enlarging with compound growth rate of 15.83 per cent per annum it reached to the level of Rs.9.97 billion. The instability analysis found that variability in value of export and import was 56.67 and 39.21 per cent respectively. The Lafay's (1992) Trade Specialisation Coefficient (TSC) was used to find out the ratio balance between exports and imports for coffee. The highest TSC

index value was found to be 0.96 in 2009-10. It implies that export value of coffee was more than the import value of the coffee during the study period.

3.2.6 *Fibre Products*

In 2002-03, total value of export and import of cotton raw including waste was Rs.0.50 and Rs.12.38 billion respectively and increased to the level of Rs.122.00 and Rs.63.07 billion respectively by 2017-18. The growth trend analysis suggest that value of cotton raw including waste export and import expanded with a compound growth rate of 27.04 and 11.28 per cent respectively during the same period.. The coefficient of variation in value of export and import was 75.01 and 84.76 per cent respectively. The value of TSC for cotton raw including waste was found to be both positive and negative values. The results suggest that, the value of export of cotton raw including waste was lower than the import value during 2002-03 to 2005-06, whereas rest of the study period India's value of export was more than the import value.

In case of jute raw, value of export was 0.54 billion in 2009-10 and it was augmenting with compound growth rate of 2.67 per cent per annum, its value increased to Rs.0.95 billion during 2017-18. The value of import was 1.35 billion in 2002-03 and it was increased to 2.80 billion by the year 2017-18 showing a compound growth rate of 11.85 per cent per annum. The inter-annual variability in value of export and import was found to be 24.34 and 78.72 per cent respectively. The Trade Specialisation Coefficient for jute raw was found negative values for entire period of study. The results suggest that value of raw jute export from India was lower than the import value during the study period.

In 2002-03, value of export of jute hessian was Rs.3.49 and it was augmenting with compound growth rate of 7.14 per cent per annum, it reached to the level of Rs.9.10 billion by 2017-18. Whereas in case of value of jute hessian export was Rs.2.31 billion in 2009-10 and it reached a level of Rs.1.22 billion by 2017-18 registering a compound growth rate of -8.39 per cent per annum. The instability in value of export and import of jute hessian was 38.36 and 40.84 per cent respectively. The TSC results for jute hessian depict positive sign throughout the study period and highest value was observed to be 0.87 during 2009-10. The TSC value indicates that the India's export value of jute hessian was higher than the value of imports.

3.2.7 *Narcotics Products*

Value of export of tobacco unmanufactured in the country was Rs.7.34 and it was increased to Rs.38.28 billion by 2017-18. The growth trend analysis for tobacco unmanufactured value of export was accelerating with a compound growth rate of 13.28 per cent per annum. While, the value of import of tobacco unmanufactured was Rs.0.38 billion in 2009-10 and it was increased to level of Rs.0.69 billion in 2017-18

with compound growth rate of 16.16 per cent per year during same period of time. The variability in value of export and import was found to be 53.62 and 52.67 per cent. The result of TSC value shows positive sign ranging between 0.99 to 0.97 and no negative value was observed during the study period. The results implied that value of export of tobacco unmanufactured was higher than the value of import during the study period.

India's export value of tobacco manufactured was Rs.2.89 and it was increased to the level of Rs.21.94 billion in 2017-18 recording a compound growth rate of 16.03 per cent per annum. India's value of import of tobacco manufactured in 2009-10 was Rs.0.79 billion and it was augmented to Rs.1.86 billion by the year 2017-18 with compound growth rate of 13.18 per cent per annum. The variability of tobacco manufactured export and import was estimated and it was found to be 72.78 and 34.55 per cent respectively. The value of all TSC index was found positive during the study period. The value of TSC ranging between 0.95 to 0.84, reflects that export value of tobacco manufacture was more than the value of import during the study period.

3.2.8 *Other Products*

During 2003-04, total value of guar gam meal export and import was Rs.11.33 and Rs.0.02 billion, respectively and it was increased to the level of Rs.41.70 and 0.03 billion respectively by the year 2017-18 registering a compound growth rate of 2.18 and -0.21 per cent per annum respectively. The instability analysis indicated variability in value of export and import to be 86.37 and 101.95 per cent respectively. The Lafay's (1992) Trade Specialisation Coefficient (TSC) was estimated for the guar gum meal. The value of TSC was found to be 1.0 with positive sign during the study period. The results suggests that the value of export of guar gum meal from India was more than its import value.

3.3 *India's Spices Export and Its Competitiveness over Time*

India is the world's largest spice producer, exporter and consumer. India is often called as the home of spices, and the glory of Indian spice products is well known across the globe from ancient times onwards. Being the leader in production and export, India accounts for almost half of the global trading in spices. The value of spices export from India during 2019-20 was Rs.21000 crore, with a record growth of 10 per cent. The major export destinations of Indian spices are China, USA, Bangladesh, UAE and Thailand. The major spices that contribute maximum to the total export of spices from India are chilli, mint products, cumin, spice oils and oleoresins and turmeric. Vietnam, China, Indonesia, Netherlands and Madagascar are the major competitors for India in the global market for spice export.

Though India is the leader, competition from other major producing countries can't be ruled out. It is important to have proper understanding on the competitiveness of India's spice export over time so as to take proper policy measures. Trade competitiveness of export of spices from India was analysed using various indices like Revealed Comparative Advantage (RCA), Trade Specialisation Co-efficient (TSC), Revealed Symmetric Comparative Advantage (RSCA) and Revealed Competitive Advantage (RC). From the results (Table 3) it can be seen that throughout the years spices remained as an efficient export commodity with better competitiveness. RCA values were found to be more than one throughout the years, which indicates that the share of spice export to total agricultural export in India is more than that of Asia's combined data. This clearly shows the high competitiveness of India's spice export. Throughout the years the index values did not see much fluctuation except in few years like 2013 (1.61). It slightly increased in the beginning of the study period, but found slow decline in the later stages. In the most recent year (2018) the value was found to have improved over the previous years' values.

TABLE 3. REVEALED COMPARATIVE ADVANTAGES AND COMPETITIVENESS INDICES OF SPICES

Year (1)	Revealed comparative advantage (RCA) (2)	Trade specification coefficient (TSC) (3)_	Revealed symmetric comparative advantages (RSCA) (4)	Revealed comparative advantage (RC) (5)
1990	2.977700	0.999020	0.497197	2.969313
1991	4.766695	0.999857	0.653181	4.764222
1992	3.738148	0.998358	0.577894	3.724307
1993	4.756691	0.983209	0.652578	4.522405
1994	4.379714	0.997986	0.628233	4.367806
1995	3.417904	0.992061	0.547297	3.364741
1996	2.868971	0.976026	0.483067	2.677072
1997	4.066022	0.994958	0.605213	4.009277
1998	4.647628	0.994460	0.645869	4.599809
1999	4.672405	0.960496	0.647416	4.298509
2000	4.670416	0.987952	0.647292	4.525974
2001	3.905363	0.984400	0.592283	3.788857
2002	4.011184	0.976684	0.600893	3.818757
2003	3.590821	0.936546	0.564348	3.079341
2004	3.172826	0.903434	0.520709	2.559748
2005	3.250592	0.836886	0.529477	1.746039
2006	3.270015	0.843710	0.531618	2.195328
2007	3.431525	0.881358	0.548688	2.222279
2008	4.079266	0.911473	0.606242	2.912708
2009	3.908667	0.848594	0.592557	2.429830
2010	3.680599	0.907589	0.572704	2.350034
2011	3.648641	0.902680	0.569767	2.498573
2012	2.168865	0.917707	0.368859	1.405987
2013	1.610958	0.882137	0.233998	0.381494
2014	2.568403	0.818477	0.439525	1.206500
2015	3.084981	0.789613	0.510402	1.620514
2016	3.452104	0.754435	0.550774	1.736292
2017	3.116034	0.750233	0.514095	1.552994
2018	4.356384	0.685249	0.626614	1.534839

Data source: http://www.fao.org.

Similar results were found from the values of other indices also. TSC values were positive in all the years in the entire study period. Values did not show much fluctuation over the years. But in the most recent years – from 2013 onwards the TSC values were found to be continuously decreasing. RSCA values also were positive throughout the period. Trend in the values were found almost similar to that in the RCA values, indicating favourable competitive scenario for India's spice export. RC values also were found positive for all the years. But, compared to the values in 990s, RC values were found decreasing from 2000 onwards. Value became even less than one in 2013. Slight unfavourable movement in the balance between export and import of spices in the recent years can be seen from these values. Similar inference can be made from the TSC values also. Policy interventions are therefore needed to better utilise the competitiveness of spice export from India and to improve the export-import balance.

IV

CONCLUSION

The Government of India has been giving several export incentives to promote the agricultural exports, despite the restrictions imposed by the WTO regime and other trade agreements. This includes price measures and non-price measures. The price measures are directed towards enhancing competitiveness at the price front while non-price measures provide competitive edge in areas other than price (Gupta, 2010). These export promotion measures are being directed to the exporters through several institutions and under various Acts (Ahuja, 2001). The export incentives are basically provided by the Ministry of Commerce and Industry through its Directorate General of Foreign Trade and through Ministry of Finance. Growth trend analysis for value of export and import suggests that all the agricultural commodities showed positive growth trend with high inter-annual variability during the study period except for import value of jute hessian and guar gum meal import. The TSC analysis for the analysis suggests that value of export was more than the value of import for all the crops except pulses, vegetable oils, fresh fruits, cashew, cocoa products and raw jute during the study period. In case of pulses, vegetable oils, fresh fruits, cashew, cocoa products and raw jute, value of export is less than value of import during the study period. The values of RCA, TSC, RSCA and RC showed the competitive scenario of India's spice exports; throughout the study period it was found to maintain its competitive position. However in terms of the balance between export and import of spices there has been a slight deterioration in the recent years. Proper policy interventions are utmost necessary to address this issue.

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