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COMPETITIVENESS & STABILITY OF EXPORT SPECIALIZATION OF AGRICULTURAL TRADE

Averyl Pires
Research Student, Department of Economics, Goa Business School & Assistant Professor, St. Xavier's College, Mapusa-Goa.

B. P. Sarath Chandran
Professor & Guide, Department of Economics, Goa Business School, Goa University, Taleigao-Goa.

Abstract:
Trade and specialization brings nations closer as they become intertwined in their economic activities. Specialization leads to comparative advantage. The export competitiveness of a nation indicates the nation's ability in terms of natural endowments, product development, marketing and profit making ability in the global market. The export competitiveness of a nation for various commodities can be measured by using the Revealed Comparative Advantage (RCA) index. The main aim of the paper is to analyse India's export competitiveness of agricultural goods and to examine the pattern of stability of specialization of agricultural exports. Secondary data is collected from the WITS data base for a time period from 1991 to 2020. The methodology of Dalum et. al. is used to test the stability of agricultural trade. The OLS Glatonian Regression is applied. The findings indicate that India's comparative advantage has weakened with a fall in the India's agricultural exports to the world over a thirty year time period.
Keywords: Export, Competitiveness, Agriculture, Stability and Specialization.

I) Introduction:

International trade strongly influences every emerging market and country's economy in terms of global competition. The export competitiveness of a nation indicates the nation's ability in terms of natural endowments, product development, marketing and profit making ability in the global market. Export competitiveness can also be used to assess the competitiveness of domestic product in terms of specialization and diversification of its export potential.

Indian agricultural products have strong export competitiveness in the world agriculture market. India is the main export market for many agricultural commodities such as rice, sugar, spices, pulses and buffalo meat. India has emerged as the top tenth exporter of agricultural products in the world. India's export competitiveness of agricultural products has increased over the years by crossing $50 billion for the financial year FY22 which is the highest level of agricultural exports.

II) Literature review:

- Bushra Riaz (2016) examined the convergence and divergence pattern of specialisation over two decades between China and European Union (EU). It was found that China has an advantage and is diverging towards high technology sectors

- Kerobim Lakra et al., (2014) assessed the export performance of major agricultural products such as rice, tea, tobacco, spices, groundnuts and castor oil having a comparative advantage over a twenty year period.
- Nguyen K.D. (2011) made an attempt to analyse the trade specialization of Vietnam's exports. It was found that Vietnam's exports patterns have converged and are moving towards diversification.

III) Objectives:

a) To study the comparative advantage of India's agricultural commodities using the Revealed Comparative Advantage (RCA) index and Revealed Symmetric Comparative Advantage (RSCA) index for HS-2 classification of agricultural goods.

b) To analyse the stability of export specialization of agricultural trade.

IV) Methodology:

Secondary sources of data were obtained from WITS data base. The Revealed Comparative Advantage (RCA) index and Revealed Symmetric Comparative Advantage (RSCA) index are used to measure the comparative advantage of India's agricultural exports. RCA and RSCA for HS-2 digit classification have been computed. The time period of the study is 1991-2020.

V) RCA index of India's Agricultural Products:

Revealed Comparative Advantage (RCA) index indicates a country's export potential. A high RCA product is competitive and can be exported to countries with low RCA.

The RCA index of county 'i' for a particular commodity 'j' is assessed by the products share in the country's exports in relation to its share in world trade.

$$RCA_{ij} = \frac{(X_{ij}/X_{it})}{(X_{wj}/X_{wt})} \quad (1)$$

Where Xij and Xwj are the values of country's 'i' exports of product 'j' and world exports of product 'j'. While, Xit and Xwt refer to the country's total exports and world total exports.

The mean RCA was calculated for HS-2 classification of 24 agricultural products for a time period from 1991-2020. From the mean RCA, ranks are classified into four categories-

Weak, Low, High and Strong RCA based on their export performance. The categories are RCA less than 0.5 is weak comparative advantage; RCA >0.5 to 1 is low comparative advantage; RCA >1 to 2 is high comparative advantage and RCA above 2 is strong comparative advantage.

Ranks based on Mean RCA for HS-2 Classification:

Table 1: India's RCA Ranks for HS-2 Classification

Commodity Classification	Weak RCA RCA<0.5	Low RCA RCA >0.5 to 1	High RCA RCA >1 to 2	Strong RCA RCA Above 2
1.Live Animals	0.04			

2.Meat			1.11	
3.Fish				3.25
4.Dairy Products	0.23			
5.Products of Animal Origin			1.32	
6.Live Tree	0.32			
7.Edible Vegetable			1.19	
8.Edible Fruit			1.89	
9. Coffee, tea, mati & spices				6.41
10. Cereals				3.55
11. Prod. Mill.		0.73		
12. Oil seed			1.44	
13. Lac; gums, resins & other Vegetable saps				12.68
14. Vegetable Plaiting materials & Vegetable Product				4.96
15. Animal/Veg fat oils		0.88		
16. Prep of Meat/Fish	0.27			
17. Sugar			1.70	
18. Cocoa	0.08			
19. Prep Cereal/Flour	0.36			
20. Prep Vegetable Fruit Nut	0.39			
21. Miscellaneous Edible		0.66		
22. Beverages	0.14			
23. Residues				3.17
24. Tobacco			1.39	

Source: Author's Compilation

Table 1 represents the ranks for HS-2 Classification based on mean RCA. It is observed that India has strong RCA (above 2) for Fish; Coffee, tea, mati & spices; Cereals; Lac, gums, resins & other vegetable saps; Vegetable Plaiting materials & vegetable Product and Residues. In this Strong RCA, Lac; gums, resins & other vegetable saps recorded the highest mean RCA index of 12.68. India has a high RCA (1 to 2) in Meat; Products of Animal Origin; Edible Vegetable; Edible Fruit; Oil seed; Sugar and Tobacco. In this category, edible fruit recorded the highest mean RCA index of 1.89. India has a low RCA (>0.5 to <1) in Production mill; Animal/Veg fat oils and Miscellaneous Edible with Animal/Veg fat oils recording the highest mean of 0.88. India has a weak RCA (<0.5) in Live Animals; Dairy Farming; Live Tree; Prep of Meat/Fish; Cocoa; Prep Cereal/Flour; Prep Vegetable Fruit Nut and Beverages with Live animal recording the lowest of 0.04 RCA index.

VI) RSCA index of Export Competitiveness of India's Agricultural Products:

Dalum et al. (1998), in order to normalise the RCA index, it has to be made symmetric by using the Revealed Symmetric Comparative Advantage index which is computed from

RSCA= (RCA-1) / (RCA+1) (2)

This RSCA index is comparable. The RSCA ranges from -1 to +1. The values between 0 to 1 indicate that the nation has a comparative export advantage in the product. Likewise, if the index is -1, the country has a comparative export disadvantage in the product. Positive values of the index imply stability as well as competitiveness of a particular nation.

Table 2-India's Consolidated Mean RSCA & RCA Ranks for HS-2 Classification of goods:

Section/Category	RCA	RSCA
1.Live Animals	0.0439	-0.9171
2.Meat	1.3429	0.1034
3.Fish	3.0965	0.4871
4.Dairy Products	0.2574	-0.6056
5.Products of Animal Origin	1.0247	-0.0949
6.Live Tree	0.2880	-0.5600
7.Edible Vegetable	1.1809	0.0682
8.Edible Fruit	1.5035	0.1030
9. Coffee, tea, mati & spices	5.4268	0.6534
10. Cereals	3.5771	0.5430
11. Prod. Mill.	0.7903	-0.2132
12. Oil seed	1.2827	0.1024
13. Lac; gums, resins & other Vegetable saps	9.5864	0.7960
14. Vegetable Plaiting materials & Vegetable Product	4.5348	0.6081
15. Animal/Veg fat oils	0.9000	-0.0782
16. Prep of Meat/Fish	0.3959	-0.4792
17. Sugar	1.9838	0.2298
18. Cocoa	0.1301	-0.7808
19. Prep Cereal/Flour	0.3941	-0.4362
20. Prep Vegetable Fruit Nut	0.4530	-0.3831
21. Miscellaneous Edible	0.6010	-0.2626
22. Beverages	0.1452	-0.7502
23. Residues	2.4170	0.2796
24. Tobacco	1.3987	0.1587

Source: Computed from WITS data

The above table and figure gives the mean Revealed Comparative Advantage (RCA) of HS-2 Classification of goods of India for the selected years of 1991, 1995, 2000, 2005, 2008, 2010, 2015 to 2020 for 24 agricultural product categories. With regard to the Revealed Symmetric Comparative Advantage (RSCA), India has a positive index or revealed comparative advantage for Meat, Fish, Edible Vegetable, Edible Fruit, Coffee, tea, mati & spices, Cereals, Oil seed; Lac; gums, resins & other Vegetable saps; Vegetable Plaiting materials & Vegetable Product; Sugar; Residues and Tobacco.

The RCA is highest for Lac; gums, resins & other Vegetable saps, followed by Coffee, tea, mati & spices and Vegetable Plaiting materials & Vegetable Product. The RCA indices indicate that

India has revealed comparative advantages for 13 of the 24 HS-2 product groups: Meat; Fish; Products of Animal Origin; Edible Vegetable; Edible Fruit; Coffee, tea, mati & spices; Cereals; Oil seed; Lac; gums, resins & other Vegetable saps; Vegetable Plaiting materials & Vegetable Product; Sugar; Residues and Tobacco.

VII) Specialization & Comparative Advantage:

When a country focuses on its natural resources, labour and capital on the production of goods and services that they are experts in, it is called specialization. The process of exchange of goods and services among nations is trade. Trade and specialization brings nations closer as they become intertwined in their economic activities. International trade and specialization help in expanding markets and increase economic productivity among nations.

Specialization and comparative advantage are two important factors that have a great influence on international trade. Specialization leads to comparative advantage. Nations can enter into a trade relationship with another nation so that both can benefit. Comparative advantage is a factor of specialization where the nations produce at a lower cost than other nations. When nations specialise, this exchange creates gains from trade which is based on the law of comparative advantage, in which both nations are better off if they specialise and trade. Both economies will gain and become more productive.

VIII) Stability of Export Specialization of Agricultural Exports:

One of the contributions made by Dalum et al. (1998) was the distinction between specialisation or de-specialisation in trade patterns, on the one hand, and divergence or convergence on the other. A specialisation process refers to a process in which specialisation intra-country becomes more dispersed (and conversely for de-specialisation). In other words, the concepts of specialisation/de-specialisation refer to the sectoral distribution of a country. By contrast, a divergence process refers to a process in which countries become more different in terms of specialisation in a particular sector (and conversely for convergence).

The stability in the export specialization outline of countries is determined by:

1. Differentiated technology- Trade will be beneficial among countries if there is a difference in the technological capabilities to produce goods. This can be done by improving the existing technology base. When a firm expands its technology base into a wide range of other methods it will result in diversification and provide a wide platform for trade and specialisation.
2. Economies of scale- Another reason for promoting specialization in international trade is through economies of scale. By producing at a large scale more output can be achieved at a lower cost. The presence of economies of scale can generate trade gains because of the improvement in the productive efficiency through reallocation of resources.
3. Comparative Advantage- Countries having comparative advantage in a product can produce at a lower cost than that of its trade partners. This would involve an efficient interaction of the nation's abundant resources and its technology. Comparative advantage will determine which county will specialize in which good.

The stability of the RSCA index can be assessed by the Galtonian regression model which is used to check the similarity and dissimilarity in the values of revealed comparative advantage at different time periods relative of each other. The patterns of stability, convergence and divergence and its trade specialization can be explained using the Galtonian regression which compares the RSCA for each country or product at two time periods i.e. t1 and t2 given by the following equation:

$$RSCA_{ij}^{t2} = \alpha i + \beta i\, RSCA_{ij}^{t1} + \varepsilon ij \quad (3)$$

Where α and β are standard regression parameters and ε is a residual term.

- The β values indicate the pattern of revealed comparative advantage whether it has converged or diverged.
- If β =1, it implies an unchanged pattern of the RSCA between periods of t1 and t2 which means no change in the trade specialization.
- If β >1, it implies that the trade specialization is strengthened. A country tends to be more specialised in those sectors in which it is already specialised and less specialized where initial specialization is low. The degree of specialization has grown in the future and is called as β divergence.
- If 0<β <1, it implies that commodity groups with low β indices experience growth over time. The degree of specialization has fallen over time which is called as β convergence.

Table 3: Classification and Growth of Trade Specialization:

β = 1 or β = R	No change	No change
β > 1 or β>R	Specialization	Divergence
0< 1 or 0<β<R	De-specialization	Convergence

Source: Dallum et.al

Table 4: Results of OLS Glatonian Regression:

		β	R^2	**Convergence/Divergence**
RSCA t2	RSCA t1	.821806	0.9148	Trade Despecialization Convergence
RSCA t3	RSCA t1	1.118759	0.9264	Trade Specialization Divergence
	RSCA t2	1.053614		Trade Specialization Divergence
RSCA t4	RSCA t1	1.077506	0.9584	Trade Specialization Divergence
	RSCA t2	.2954118		Trade Despecialization Convergence
	RSCA t3	.9980486		Trade Despecialization Convergence

Source: Computed from WITS data

The results of the OLS Galtonian Regression are represented in table 4. The Mean Revealed Symmetric Advantage is divided into 4 time periods i.e. RSCA t1= 1991-1999, RSCA t2=2000-2008, RSCA t3=2009-2016 and RSCA t4= 2017-2020.

$$RSCA_{ij,\,t^2} = \alpha j + \beta j RSCA_{ij,\,t^1} + \varepsilon ij \quad (4)$$

$$RSCA_{ij,\,t^3} = \alpha j + \beta j RSCA_{ij,\,t^1} + \beta j RSCA_{ij,\,t^2} + \varepsilon ij \quad (5)$$

$$RSCA_{ij,\,t^4} = \alpha j + \beta j RSCA_{ij,\,t^1} + \beta j RSCA_{ij,\,t^2} + \beta j RSCA_{ij,\,t^3} + \varepsilon ij \quad (6)$$

In the first model the $0 < \beta < 1$ so the country tends to change its specialization pattern between periods and there is trade despecialization convergence. In the second model, $\beta > 1$ the country tends to be more specialised in sectors in which it is already specialised and there is trade specialization divergence. In the third model, the $0 < \beta < 1$ so the country tends to change its specialization pattern between periods and there is trade despecialization convergence. The overall finding indicates that there appears to be a deterioration of comparative advantage as indicated by the RSCA index, which is consistent with the relative decline in India's agricultural exports to the rest of the globe.

IX) Conclusion

By using the RCA indices the trade structure specially export competitiveness can be analysed for HS-2 classification of Agricultural Commodities. The values of RCA showed the competitive scenario of India's exports of HS-2 Classification of goods throughout the study period. India enjoys advantage in Meat, Fish, Edible Vegetable, Edible Fruit, Coffee, tea, mati & spices, Cereals, Oil seed; Lac; gums, resins & other Vegetable saps; Vegetable Plaiting materials & Vegetable Product; Sugar; Residues and Tobacco. Lowering of tariffs will aid in facilitating India's exports thereby promoting efficiency in the production.

Trade policy makers should promote those products having strong export comparative advantage. Given India's massive agricultural resources, processed agricultural products is one of the largest in the world and contributes to India's export can be developed even more. The country should focus on specific products having strong export potential through which the country can earn foreign exchange and such trade will have a multiplier outcome on the economy.

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