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Comparative Advantage of India in Agricultural Exports vis-á-vis Asia: A Post-reforms Analysis

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Abstract

Recent developments in the international trade scenario and corresponding alterations in India's foreign trade policies have depicted far reaching implications for India's agricultural sector in general and agricultural exports in particular. The present study has ascertained the changes in comparative advantage status of India's major agricultural exports vis-a-vis other Asian players during the post-reforms period (1991-2004). It has been found that in exports of certain commodities like cashew and oil meals, India has been able to maintain its comparative advantage, but several others like tea, coffee, spices, marine products, etc. have been negatively affected. India has been found losing out its comparative advantage in export of some of the agricultural commodities to other Asian competitors during the period after economic reforms.

Introduction

Indian agricultural commodities have come to occupy a supreme position in the global market over the years. Today, India is a major supplier of several agricultural commodities like tea, coffee, rice, spices, cashew, oil meals, fresh fruits, fresh vegetables, meat and its preparations and marine products to the international market. However, the country faces fierce competition from other major players in the field, both the existing and new entrants in the fray. Ironically, the major challenge is from within Asia itself where countries like China, Malaysia, Philippines, Thailand, Singapore and Indonesia among others pose a big threat to Indian agricultural products.

The demand and supply situations in the Asian continent have undergone a rapid transformation due to the growth of the world economy and lowering of trade barriers (Aksoy and Beghin, 2005). An economic upheaval which took place in most of the South-East Asian countries has resulted in the creation of a huge supply potential in these economies along with an increase in their per capita income and a simultaneous increase in their trade potential. Moreover, some recent developments in the international trade scenario, followed by the establishment of World Trade Organisation (WTO) and subsequent liberalization of trade have resulted in the emergence of new powers like Vietnam and Turkey with substantial potential in agricultural trade. The formation of regional trading blocks like ASEAN Free Trade Area (AFTA), Bangkok Agreement, South Asia Free Trade Agreement (SAFTA), etc. has given rise to powerful associations with strong bargaining power and these can significantly influence the demand and supply factors in the global markets. Above all, the Indian economy in itself has undergone a rapid transformation after the inception of economic reforms in 1991. India's ratification of the Agreement on Agriculture (AoA)

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with WTO also had a major impact leading to redefining of its agricultural trade. During this time span, various agricultural commodities exported from India have responded differently and their levels of comparative advantage in the global markets have altered significantly. Hence, it is imperative to have a systematic and well-structured analysis to find alterations in the comparative advantage of India vis-a-vis Asian continent. The present study was undertaken with the specific objective of determining India's comparative advantage in exports of major agricultural commodities with respect to Asia and to compare it with that of other major Asian exporters.

Data and Methodology

Ten major agricultural commodities/commodity groups were selected for the analysis, based on their respective shares in India's total agricultural exports. They were tea, coffee, rice, spices, cashew, oil meals, fresh fruits, fresh vegetables, meat and meat preparations, and marine products. During the period under study (1991-2004), these commodities together accounted for more than 65 per cent of India's total agricultural export earnings from the world. The data on exports of selected agricultural commodities for India and other major exporting countries were culled from various issues of *FAO Trade Yearbook*, published by the statistics division of Food and Agriculture Organisation (FAO), Rome. The official website of FAO [*www.faostat.fao.org*] was also used for the purpose. The selected commodities corresponded to the various codes of Standard International Trade Classification (SITC) and their export values were provided in the US Dollars.

'Revealed comparative advantage'(RCA) (Balassa, 1965) is a measure of international trade specialisation. It identifies the comparative advantage or disadvantage a country has for a commodity with respect to another country or group of countries. It provides a ranking of commodities by degree of comparative advantage and identifies a binary type demarcation of commodities based on the comparative advantage (Balance *et al.,* 1987). Under the assumption that the commodity pattern of trade reflects the inter-country differences in relative costs as well as non-price factors, the index is assumed to "reveal" the comparative advantage of the trading countries. The factors that contribute to movements in RCA are economic, structural, world demand and trade specialization. The advantage of using the comparative advantage index is that it considers the intrinsic advantage of a particular export commodity and is consistent with the changes in an economy's relative factor endowment and productivity. The disadvantage, however, is that it cannot distinguish improvements in factor endowments and pursuit of appropriate trade policies by a country (Batra and Khan, 2005).

The original index of RCA was first formulated by Balassa (1965) and can be written as per Equation (1):

$$B = \frac{(X_{ij} / X_{ik})}{(X_{nj} / X_{nk})} \qquad \ldots(1)$$

where,

X_{ij} = Exports of country 'i' of commodity 'j'

X_{ik} = Exports of country 'i' of a set of commodities 'k'

X_{nj} = Exports of a set of countries 'n' of commodity 'j', and

X_{nk} = Exports of a set of countries 'n' of a set of commodities 'k'

In the present study, country 'i' refers to India, commodity 'j' refers to any of the selected agricultural commodities, set of commodities 'k' refers to the total agricultural commodities and set of countries 'n' refers to Asia. When RCA assumes the value greater than unity for a given country in a given commodity, the country is said to have a revealed comparative advantage in that commodity.

However, RCA suffers from the problem of asymmetry as 'pure' RCA is basically not comparable on both sides of unity, as the index ranges from zero to one, if a country is said not to be specialized in a given sector, while the value of the index ranges from one to infinity, if a country is said to be specialized. The index is made symmetric, following the methodology suggested by Dalum *et al*. (1998) and the new index is called 'revealed symmetric comparative advantage' (RSCA).

Mathematically, it can be expressed by Equation (2):

$$RSCA = (RCA-1) / (RCA+1) \quad \ldots(2)$$

This measure ranges between -1 and +1 and is free from the problem of skewness. A commodity is said to have comparative advantage in its exports if the corresponding RSCA value is positive and vice-versa. In the present study, the RSCA was used to look into the comparative advantage of the selected commodities.

Results and Discussion

Commodity-wise details of the results are presented in the following section.

1. Tea

The estimated RSCA indices for tea for India and other major Asian competitors have been presented in Figure 1. For the period 1991-2004, India was found to have a comparative advantage in tea exports in all the years under consideration, as was obvious from the positive values of RSCA. But over the years, India's comparative advantage seemed to be deteriorating gradually. In 1991, the value of RSCA was 0.68 which fell to 0.43 by the year 2004, depicting a clear downward trend. Among other major tea exporters in Asia, China and Indonesia were less competitive to India, while Sri Lanka was far ahead with substantially higher values of the RSCA index. The dominance of Sri Lanka was more obvious in the later years of economic liberalization. In 2004, the estimated RSCA value for Sri Lankan tea exports was 0.94, which was marginally higher than the initial value of 0.92 in 1991. The results have significant and wide-reaching implications for India as Sri Lanka's dominance in the global market remains unchallenged and has direct impact on the Indian tea industry.

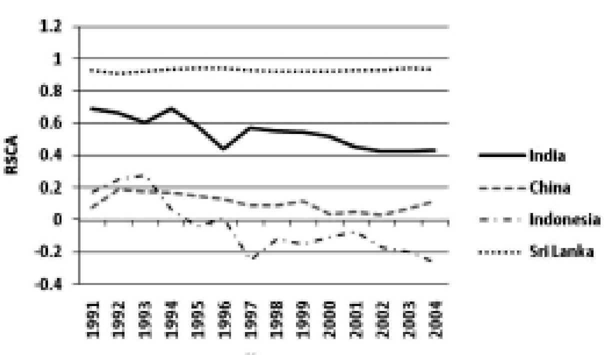

Fig. 1. Trends in RSCA estimates of tea exports from India and other Asian countries

2. Coffee

In coffee exports, Indonesia, Thailand and Vietnam are the major competitors to India. The computed RSCA values for India were positive for all the years and indicated its comparative advantage in coffee exports. But, Indonesia and Vietnam were found to have outsmarted India during the study period. Moreover, the comparative edge which India exhibited during the initial years of liberalization, deteriorated over the years, with the index gradually eroding from 0.52 in 1991 to 0.25 in 2004 (Figure 2). Another serious concern was that Vietnam was improving its position at a much rapid pace posing a serious threat to Indian coffee in the international markets. While the RSCA value for Vietnam coffee during 1991 was 0.78, it increased considerably to 0.87 by the year 2004. Along with Vietnam, Indonesia also challenges India's coffee exports, though to a lesser extent. However, the Thailand coffee did not enjoy a comparative advantage throughout the study period and its position rather worsened gradually over the years.

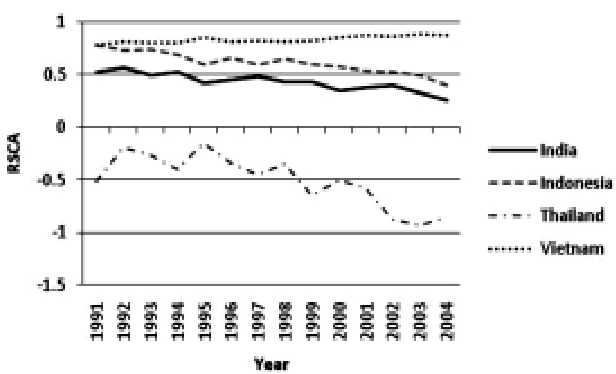

Fig. 2. Trends in RSCA estimates of coffee exports from India and other Asian countries

3. Rice

A brief perusal of the RSCA estimates presented in Figure 3 reveals the comparative advantage of India and other major rice exporting countries in Asia. Indian rice exports showed varying levels of

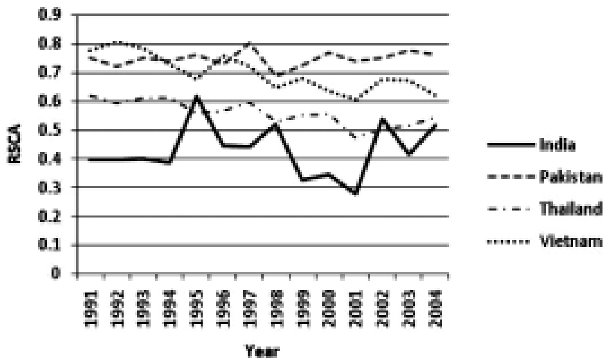

Fig. 3. Trends in RSCA estimates of rice exports from India and other Asian countries

comparative advantage in different years of the study period. In 1991, the estimated value of RSCA was 0.39 which improved to 0.61 in 1995 but dropped to the lowest value of 0.27 in 2001. By the year 2004, it recovered to reach 0.51. However, India's status remained inferior to its major Asian competitors in almost all the years. For Pakistan, the index ranged from 0.74 to 0.76 between 1991 and 2004, while for Thailand, it varied between 0.61 and 0.54 during this period. For Vietnam, it was a little higher at 0.77 during 1991 but dropped to 0.62 by the year 2004. Therefore, it can be concluded that India along with other major players are enjoying a comparative advantage for their rice exports, though at varying levels.

4. Spices

Several developments that have taken place after economic liberalization, i.e. post-1991 seemed to have a detrimental effect on the spices exports from India. There was a noted decline in the RSCA estimates corresponding to India's spice exports from 0.47 in 1991 to 0.26 in 2004 (Figure 4). Indonesia also followed a similar trajectory with erosion in its comparative advantage. A mixed trend was observed in China's position of comparative advantage with occasional ups and downs. However, India had a distinct advantage over China during the entire period under study. Vietnam's position as a spice exporter was not one to be emulated, the consistent negative RSCA estimates suggested comparative disadvantage in its spice exports throughout the study period and it did not show any signs of recovery.

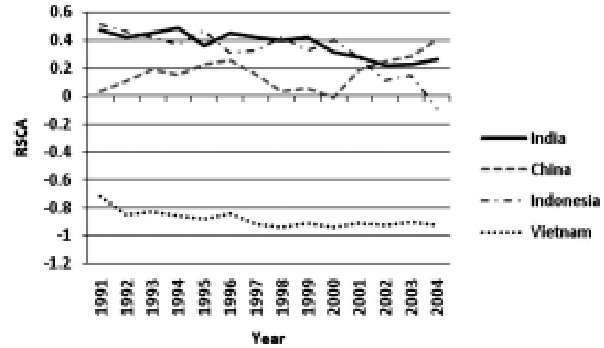

Fig. 4. Trends in RSCA estimates of spices exports from India and other Asian countries

5. Cashew

India maintained its prime status as the largest exporter of cashew in the world throughout the study period, particularly through its comparative advantage in the international markets. The RSCA estimates of Indian cashew exports were as high as 0.86 in the year 1991 (Figure 5) and till 1999, India did not face any notable external challenges. The RSCA estimates of other Asian cashew exporters like Indonesia, China and Vietnam were much low, underlining India's supremacy. However after 1999, Vietnam improved its comparative advantage steadily, as a result of which cashew exports from Vietnam shot up phenomenally. It was coupled with a gradual reduction in India's comparative advantage and by the year 2003, Vietnam outsmarted India. In this backdrop, it is imperative for the Indian cashew farmers and exporters to stay vigilant and undertake all possible steps to counter the stiff competition offered by Vietnam. At the same time, the government should also take appropriate initiatives

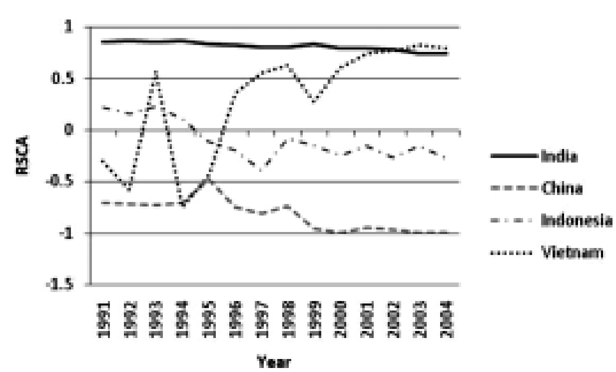

Fig. 5. Trends in RSCA estimates of cashew exports from India and other Asian countries

to make Indian cashew exports more attractive in the global markets.

6. Oil Meals

India's status as a leading exporter of oil meals in Asia remained unabated throughout the period under study and it could be attributed to the high comparative advantage enjoyed by India in relation to other Asian players. Throughout the study period, India has revealed its comparative advantage in this sector with notably higher values of RSCA. Unlike in other commodities as discussed before, India did not suffer any setbacks in this commodity, as is clear from Figure 6. The RSCA for Indian oil meals exports was 0.70 during 1991 and was more or less stable in the succeeding years and stood at 0.74 during 2004. China, Indonesia and Malaysia were the immediate competitors for India in the field, but did not maintain a consistent level of comparative advantage as is evident from occasional dipping of their RSCA to negative values.

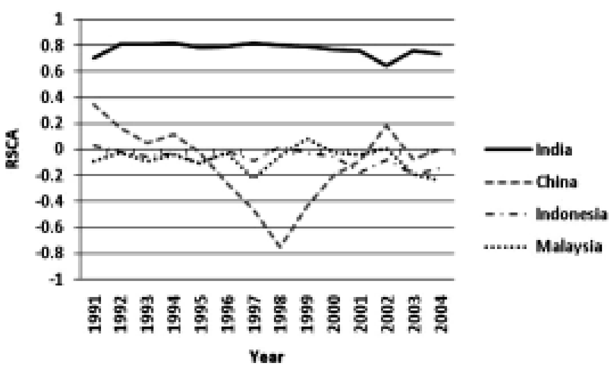

Fig. 6. Trends in RSCA estimates of oil meals exports from India and other Asian countries

7. Fresh Fruits

The results presented in Figure 7 clearly depict that India experienced a comparative disadvantage in export of fresh fruits in all the years under consideration and had negative and RSCA values. The RSCA estimate for the year 1991 was -0.46 which points towards a quite unfavourable status of Indian fresh fruits exports in the global market. The situation has hardly improved over the years, and RSCA value was below zero (-0.23) even during 2004. China also had to pass through a similar condition with all its RSCA values well below null

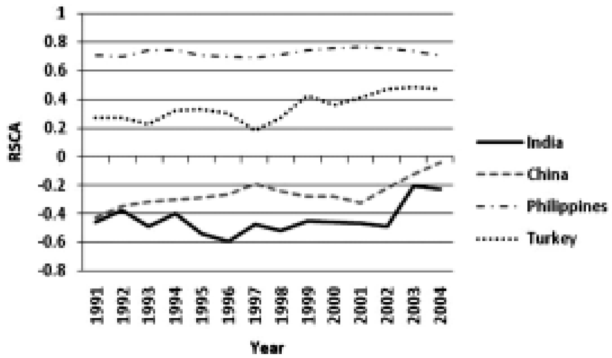

Fig. 7. Trends in RSCA estimates of fresh fruits exports from India and other Asian countries

for all the years under consideration. Fresh fruits exports from Philippines exhibited a distinct advantage over that of all other Asian countries, even though its comparative advantage has slightly eroded over the years. Turkey was found to have improved its status with RSCA values increasing from 0.26 in 1991 to 0.48 in 2004. Given the current status, considerable efforts are needed to make India a competitive exporter of fresh fruits in the future.

8. Fresh Vegetables

India's comparative advantage in export of fresh vegetables seemed to dwindle during various years after economic liberalization. In 1991, when the reforms were at the budding stage, India was found to have a marginal comparative advantage with an RSCA value of 0.12 (Figure 8). But the period which followed witnessed India losing its advantage with other countries like China and Israel bypassing it. However, a reversal of role was observed in 2003, when the RSCA values turned positive (0.04) for

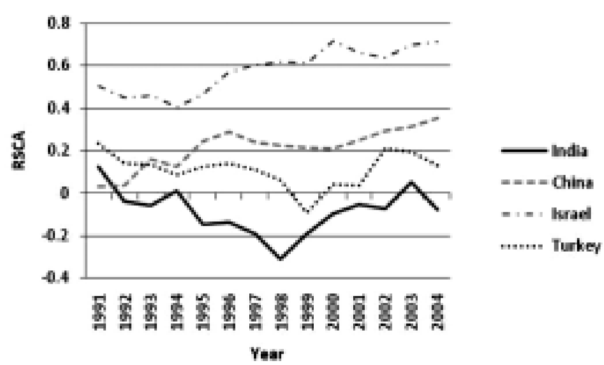

Fig. 8. Trends in RSCA estimates of fresh vegetables exports from India and other Asian countries

India. Among various Asian exporters of fresh fruits, Israel was at comfortable levels of comparative advantage. China had significantly improved its status since 1991 and was still progressing. Turkey also maintained its comparative advantage status, though with occasional fluctuations.

9. Meat and Meat Preparations

The exports of meat and meat preparations from India did not enjoy any comparative advantage till the year 1999. However, by the year 2004, India was at a better position with a positive RSCA value of 0.18 (Figure 9). The countries like China and Thailand were better than India with higher RSCA in almost all the years under study. During 2004, the RSCA corresponding to China's export of meat and its preparations was 0.42 and that of Thailand was 0.22. However, the performance of Vietnam seemed to be far off the mark. The RSCA estimates of Vietnam meat exports were not only negative in most of the years but also faced high inter-year fluctuations. Even though the present trend seems to move in favour of India, it should not be forgotten that the competitors were constantly trying to improve their positions and India should aggressively pursue to maintain the pace.

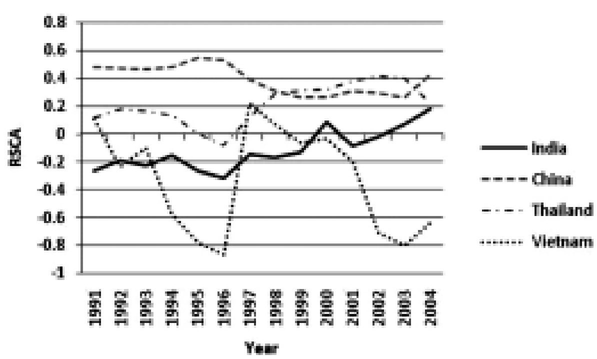

Fig. 9. Trends in RSCA estimates of meat and meat preparations exports from India and other Asian countries

10. Marine Products

Marine products contribute significantly to India's exchequer through a considerable share of export earnings every year. But, there is no reason to believe that it is due to a dominant position of Indian marine products in the global markets. It can

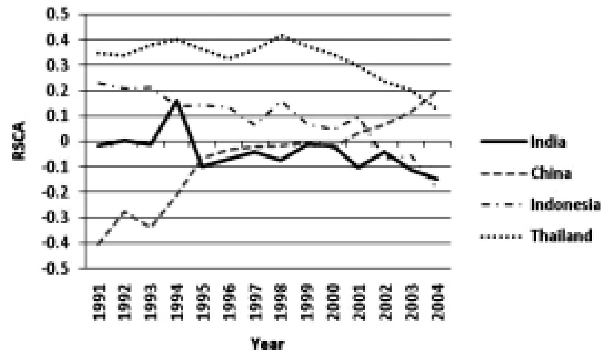

Fig. 10. Trends in RSCA estimates of marine products exports from India and other Asian countries

be attributed more to an ever-enlarging international demand base for these products year after year (Dehadrai and Yadava, 2004). This fact can be corroborated from the results presented in Figure 10. In all the years under study, except for 1994, the RSCA values were found to be less than zero and suggested a comparative disadvantage for the Indian marine products abroad. The RSCA estimates varied from -0.014 to -0.15 during 1991 to 2004 and never showed signs of notable improvement. The export from China was also not very comfortably placed during early 1990s, but showed substantial recovery in the later years. By the year 2004, China's exports turned out to be at a higher advantage in comparison to that of India. Indonesian exports were found to loose the advantage gradually over the years. In contrast to others, Thailand was at comfortable levels of comparative advantage, though there was a downward movement during the past few years.

Conclusions

The study has shown that exports of various agricultural commodities from India has responded differently in terms of comparative advantage during the post-reforms period. India has enjoyed a comparative advantage in tea exports but has depicted a declining trend over the years. However, Sri Lanka has shown a far better advantage in comparison to India and other countries like China and Indonesia. A similar pattern has been observed in coffee exports also, where India has been found losing its comparative advantage to other coffee exporters like Vietnam and Indonesia. An unstable pattern of comparative advantage has been observed in case of rice exports with intermittent ups and downs in the status. A gradual decline in India's comparative advantage has been depicted for exports of spices and cashew also. Vietnam has bypassed India in the later years in terms of comparative advantage in cashew exports. As opposed to other commodities, India has strengthened its position in the global markets in exports of oil meals. But as far as the exports of fresh fruits and fresh vegetables are concerned, India cannot boast to have a comparative advantage. While Philippines and Turkey have dominated in fresh fruits exports, Israel has been dominant in the exports of fresh vegetables. India's status in exports of meat and its preparations and marine products has not been very comfortable. Although marine products dominate India's agricultural exports, it cannot be attributed to India's comparative advantage in the global markets. It is assumed to be more due to a growing demand for these products among the international consumers. In nut shell, India's comparative advantage in most of the important agricultural exports has been found to be eroding and losing out to other Asian competitors in certain commodities during the period after economic reforms.

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