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Analysis of Export Competitiveness of Indian Agricultural Products with ASEAN Countries

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ANALYSIS OF EXPORT COMPETITIVENESS OF INDIAN AGRICULTURAL PRODUCTS WITH ASEAN COUNTRIES

Subhash Jagdambe∗

Abstract

The paper attempts to assess India's trade intensity as well as the Revealed Comparative Advantage (RCA) of the agricultural sector with respect to trade with ASEAN (Association of South-East Asian Nations) at the aggregate and disaggregate levels. The study assesses the structure of the comparative advantage from 2001 to 2013. ITC (International Trade Centre) data available in the public domain are used to accomplish the study. HS (Harmonized System) classification is used to calculate the Trade Intensity (TI) index and RCA index. The study found that India's export intensity in total agricultural trade was increasing with respect to ASEAN rather than with the rest of the world. Import Intensity, it was observed, that declining over the study period. It was also notice that the comparative advantage was decreasing gradually throughout the study period although the pattern of India's comparative advantage in export of agricultural products with ASEAN varied from one commodity to another. The study suggests direct policy initiate to promote products that have comparative advantage in exports. It will also help producers and exporters to select appropriate commodities that have comparative advantage for trading. The efforts of Indian exporters should be focused on promotion of export of meat, vegetables and fruits, tea, rice and cereal products to the ASEAN markets.

Key words: Trade Intensity, Revealed Comparative Advantage, Export competitiveness

Introduction

International trade changed rapidly across the world after the establishment of World Trade Organization (WTO) and subsequent liberalization of trade barriers. The economic reforms in the 1990s and the ratification of the Agreement on Agriculture (AoA) with WTO had a major impact and redefined agricultural trade on the international platform as well as in India. In the recent past, Indian agricultural trade in various commodities has occupied an important place in world agricultural trade. Today, India is a major supplier of several agricultural commodities such as rice tea, coffee, spices, fresh fruits and vegetables, meat and marine products to the international market. However, India faces major challenges and competition from the Asian countries for various agricultural products in the international market even though there are international trade policies to make it somewhat easier to compete on the international platform and with Asian countries.

On the basis of the prevailing reality, the comparative advantage of a country or region facilitates economic integration in world trade. The trade policy of a nation or region is based on output value that is drawn on the theory of comparative advantage. However, to explain the current circumstances of international trade, the relevance of the theory of comparative advantage is being questioned even though the theory has been of great importance within the domain of international trade after World War II. This theory is based on available domestic natural resources. At present, a significant improvement in information and communication technology is affecting the mobilization of

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factors of production and productivity across countries and the pattern of world trade as well (Kowalski, 2011). Ricardo (1817) emphasized on physical and natural resources but many post-Ricardo economists have put more emphasis on the technological and human factors of production.

Within the domain of international trade, the proliferation of regionalization is getting intensified due to limited progress of multilateral trade negotiations under the WTO. In the recent past, India has been attempting integration with the world economy through regional engagement. One such attempt was the signing of the Regional Trade Agreement (RTA) with ASEAN on August 13, 2009. In the policy circle, the ASEAN-India Free Trade Agreement (AIFTA) generated intense discussion on the economic impact of India's trade in goods. Amongst the several commodities moving across India-ASEAN borders, agricultural commodities claim irrefutable importance because a large number of people in India still depend upon agriculture for a livelihood. Agricultural trade with Southeast Asia is a major pillar of India's external trade policy. To understand the comparative advantage of India in agricultural products, it is important to provide a better picture of the ASEAN-India trade framework. Therefore, the present study is designed to make a modest attempt to analyse the competitiveness of India's agricultural trade with ASEAN member-countries in the last decade.

This paper is organised in six sections. The next section gives a brief review, theoretical as well as empirical, of related literature. Section Three presents the two-way trade flows between India and ASEAN nations and Section Four discusses the data and methodology used for analyses of the comparative advantage. Section Five presents the results of the study and Section Six brings together the summary and conclusions of this study.

Review of Literature

This section is divided into two parts. First is a theoretical review of literature and second is an empirical review of literature.

Theoretical Studies

In international trade literature, two prominent theories exist and are based on comparative advantage – the Ricardian Theory and the Heckscher and Ohlin (H-O) Theory. Ricardo (1817) stated that absolute production cost difference rather than comparative cost difference is the reason for international trade. Instead, the H-O theory stated that the difference in factor price across the countries is the reason for international trade.

The validity of the H-O theory has been examined and presented as the Leontief paradox. Leontief (1951) used the US data of 1947 for his study. The US was then the most capital abundant nation in the world and Leontief expected that it exported capital intensive commodities and imported labour intensive commodities. In fact, he found the contrary of what he expected.

In brief, the comparative advantage of classical trade theories is determined by pre-trade relative prices. In a closed economy, a country has comparative advantage in a particular commodity if relative price of domestic goods is below its relative price in the world market. These pre-trade relative prices depend on relative cost of production. Traditional measures of comparative advantage are based on the comparison of pre-trade relative costs. However, due to the absence of observable data on

relative prices and/or costs, to fill this gap, Balassa (1965), introduced an alternative to calculate comparative advantage, called Revealed Comparative Advantage (RCA) index.

Empirical Studies

Among the empirical studies, Balassa's (1965) study was the first to arrive at the RCA index. It has undergone changes several times (Balassa 1977, 1979 and 1986). He used post-trade data to calculate the RCA index. The Balassa index did not determine the sources of comparative advantage but tried to identify a country has revealed comparative advantage or not. The formula he defined as a commodity share in total national export divided by its share in total world export. The RCA value of a commodity that is greater than one indicates that a particular commodity has comparative advantage in exporting it to the world. If the value is less than one, it indicates comparative disadvantage in exporting that commodity to the world. RCA has been widely used to analyse the changes in trading patterns (Ferto and Hubbard 2003, Batra and Khan 2005, Kannan 2010).

Ferto and Hubbard's (2002) study used modifications of the RCA index developed by Vollrath (1991) namely, the *Relative Trade Advantage*, the *Logarithm of the Relative Export Advantage* and *Revealed Competitiveness*. They used data at 4-digit level of Standard International Trade Classification (SITC) for the period of 1992 to 1998 for agro-based products. In fact, they explored the competitiveness of Hungarian agriculture with the EU as its competitor. They found that in spite of changes in the agricultural scene in Hungary, the pattern of revealed comparative advantage remained stable.

Another study was by Widgren (2005) on the comparative advantage of a sample of Asian, American and European countries from 1996 to 2002. His study mainly used the data of HS classification at the 4-digit level. He studied the source of comparative advantage and came to the following conclusion. In the context of the Asian continent, the factor content of comparative advantage had some similarity. In the case of the US, it was based on highly skilled labour and for the EU, it moved towards use of human as well as physical capital.

A study by Batra and Khan (2005) assessed the RCA index at the 2 as well as 6-digit level of HS classification to compare the comparative advantage of India and China. The study mainly focused on the changes in the structure of comparative advantage in the latter period (2002-2003). The authors also examined the comparative advantage of the two countries according to factor intensity using the SITC. The study does not find any structural changes in the comparative advantage of both the countries, except for some manufacturing sectors. Further, Burange and Chaddha (2008) evaluated the structure of comparative advantage in India and the change in the scene from 1996 to 2005. They used the data as per HS classification to compute the RCA index. The index is constructed at various levels of aggregation for exports and imports. Their study found that India has comparative advantage in the export of labour intensive items like textiles and scale intensive items like chemicals and iron industries.

A similar study by Shoufeng et.al (2011) analyses the export competitiveness of agricultural products between China and Central Asian countries by using the RCA index and trade competitiveness index, came to the following conclusions: (1) China's total agriculture products do not have comparative advantage while Central Asian countries have changed from comparative advantage into comparative

disadvantage, (2)The total agri-products of both China and Central Asian countries have changed from trade competitive advantage to trade competitive disadvantage, (3) China and Central Asian countries have different advantage structures on specific categories of agricultural products, which presents vast bilateral trade potential on the basis of comparative advantage.

A study by Sarath Chandran (2010) used the Trade Intensity Index (TII) and RCA Index to see the trade complementarities and similarities between India and ASEAN countries. His study revealed that complementarities are available for both trading partners to enhance trade cooperation in some sectors and products. This study showed that India has advantages in exporting of food grains to small and less-developing ASEAN countries and importing edible oils and other agriculture products from other ASEAN countries. India enjoys comparative advantages in minerals, chemicals, iron and steel, gems and jewellery etc., while ASEAN countries have comparative advantage in electrical and electronic components that India can import. In brief, with the spread of regionalization all over the globe, the emerging economies warrant greater cooperation from India and vice-versa.

Further, a study by Shinoj and Mathur (2008) used the Revealed Symmetric Comparative Advantage (RSCA) to find India's comparative advantage in agricultural export vis-a-vis Asia. They found that India's comparative advantage in most of the important agricultural exports has been eroding and losing out to other Asian competitors during the post reform period.

Andrew Maule (1996) studied the trade complementarity of Thailand with other ASEAN countries. He used the data of 1991 and 1992 at the four digit SITC level and calculated the RCAX (Export) and RCAM (Import) to find trade complementarity between trade partners. The study found that trade complementarity was high between Thailand and other developed nations than between Thailand and ASEAN neighbours. Further study shows that the difference in trade complementarity, a real danger of AFTA (ASEAN Free Trade Agreement), lies in the possibility of trade diversions resulting from its formation.

Andhale and Kannan (2015) estimated India's RCA in agro-processed products with rest of the world. The study followed commodity aggregation by WITS (World Integration Trade Solution) from 2003 to 2013. The authors found that India has comparative advantage to export 7 out of 44 processed animal products, 12 out of 40 processed vegetable products and seven out of 44 processed food products. Further they used the consistency test for four indices of RCA. It was reported that the ordinal measures are relatively more consistent than cardinal measures.

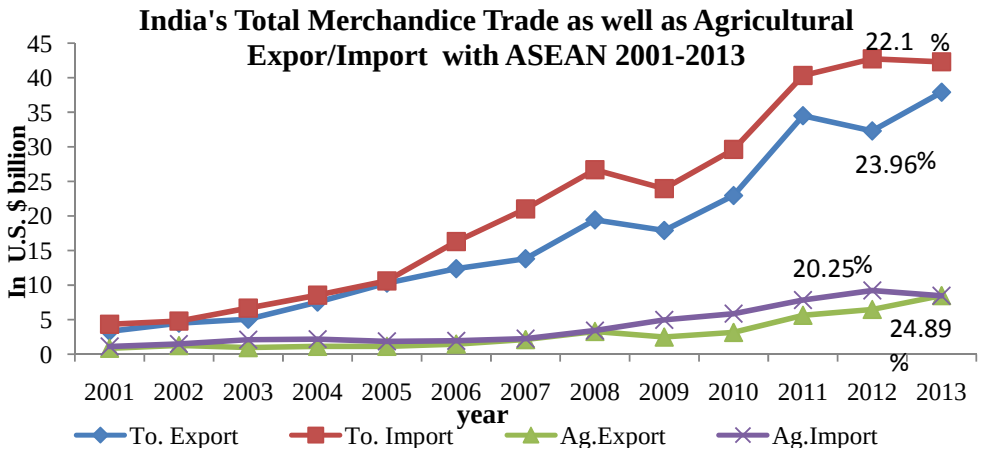
In a nutshell, we did not come across any important study that focuses on agricultural trade competitiveness using Trade Intensity Index and Revealed Symmetric Comparative Advantage Index to find out if the Indian agricultural sector is competitive or not under the ASEAN-India FTA. Hence, in the said context this study is one step forward.

India's Trade Profile with ASEAN *Vis-a-Vis* ASEAN with India

Theoretically, the value of exports between two countries should be the same as the value of their imports. However, this may not be true in reality because there is often mismatch between the two due to the fact that the exports are recorded FOB (free on board) while imports are recorded under CIF (cost insurance and freight) (Joshi,2012). Hence, we have given India's exports and imports to and

from ASEAN separately. The trade profile gives a clear picture of how India and ASEAN countries have been integrating over the last decade. The broad picture of total merchandise and agricultural trade between India and ASEAN during 2001-2013 is given in Figures 1 and 2.

Figure 1: India's Trade with ASEAN

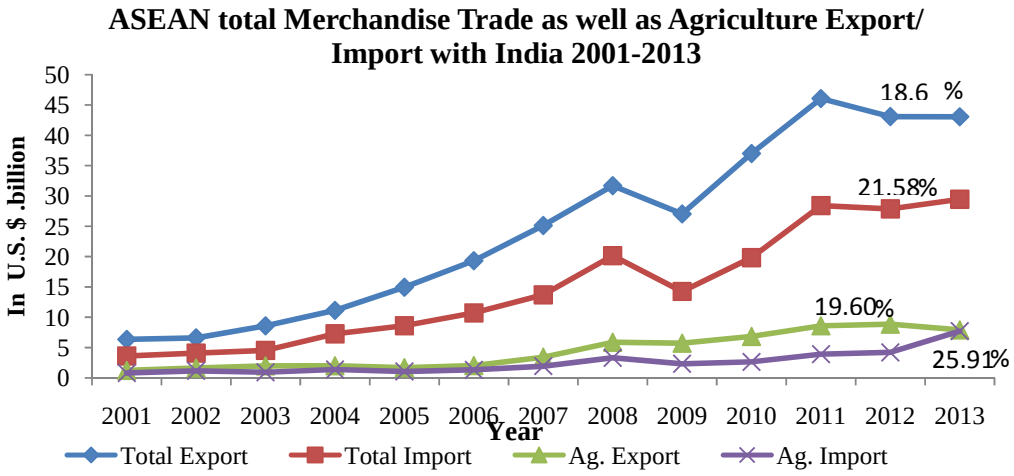


Source: International Trade Centre (ITC).

Figure 1 reveals India's total merchandise as well as agricultural trade with ASEAN countries. The total merchandise trade grew at an annual rate of 23 per cent from US $7.66 billion in 2001 to US $80.19 billion in 2013. Exports (23.96 %) and imports (22.13 %) grew in double digit percentage during 2001 to 2013 (Figure 1). These represented about 11 per cent of total Indian exports and nearly 9 per cent of total imports in 2013. However, India's imports from ASEAN have been growing faster than its exports to ASEAN in absolute terms. The trade gap was always negative and volatile in nature during the study period. It was US $ -1.03 billion in 2001, it reached to US $ -10.44 billion in 2010 and again fell to US $ -4.42 billion in 2013. Imports out-valued exports throughout this period and hence the trade balance has been in favour of the ASEAN.

On the other hand, it has been found that the total agricultural trade has been increasing at an annual rate of 21 per cent and increased from US$ 1.95 billion to US$ 16.94 billion during 2001-2013. India's agricultural exports to ASEAN have been increasing at an annual rate of 24.89 per cent, from US$ 0.85 billion to US$ 8.49 billion during 2001-2013. Imports grew at an annual rate of 20.25 per cent, from US$ 1.11 billion to US$ 8.45 billion (Figure 1). It represented about 20 per cent of total Indian agricultural exports and nearly 49 per cent of total agricultural imports in 2013. Agricultural exports are growing faster than agricultural imports to and from ASEAN in terms of percentage. The agricultural trade balance has also been in favour of ASEAN over the study period except in 2013. One important aspect is that agricultural trade balance was negative and increased in 2010 and declined thereafter but turned positive in 2013. In sum, India's total trade, including agriculture, with ASEAN countries was increasing over the last decade. So, India has a potential to increase its agricultural and other trade with ASEAN countries.

Figure 2: ASEAN's Trade with India



Source: International Trade Centre (ITC).

Further, it can be observed very clearly that the total merchandise trade of ASEAN countries with India increased at an annual rate of 20 per cent, from US$ 9.98 billion to US$ 72.53 billion during the study period. Both exports (18.63 %) and imports (21.58 %) increased in double digit percentages from 2001 to 2013 (Figure 2). It represented about 3.37 per cent of total ASEAN exports and 2.33 per cent of total ASEAN imports in 2013. Hence, ASEAN's exports to India are more than its imports from India. The total trade balance is in favour of ASEAN over this period.

On the other hand, the total agricultural trade of ASEAN with India increased at an annual rate of 21 per cent per annum – from US$ 2.05 billion in 2001 to US$ 15.66 billion in 2013. The ASEAN's agricultural exports increased at an annual rate of 19.60 per cent, from US$ 1.23 billion in 2001 to US$ 7.93 billion in 2013. Imports increased at an annual rate of 25.91 per cent, from US$ 0.82 billion in 2001 to US$ 7.73 billion in 2013 (Figure 2). It represented 8.72 per cent of total ASEAN agricultural exports and 7.50 per cent of total agricultural imports in 2013. However, agricultural trade balance has also been in favour of ASEAN over the period. It was US$ 0.40 billion in 2001, touched US$ 4.67 billion in 2011 and fell to US$ 0.20 billion in 2013. Overall we can say, over the last decade India's trade balance of total merchandise as well as agriculture trade has been in favour of ASEAN. Despite of this fact, India's total merchandise trade, including agriculture, with ASEAN countries is growing faster than ASEAN trade with India in terms of annual growth rate over the reference period of 2001 to 2013.

Method & Materials

Data Sources

The study is based on export and import data as per the Harmonized System (HS 2007) classification. The entire data is sourced from the International Trade Centre (ITC) and covers a 13-year period from 2001 to 2013.

Methodology

For any RTA to be successful, it is important to have a complementary trade structure between partners for mutual benefit. Countries having a complementary trade structure are likely to trade more whereas countries with similar trade structure will often struggle to improve trade share unless there is substantial intra-industry trade (Chandran, 2010). Despite its limitation, we used the Trade Intensity (TI) Index and modified RCA index to assess the competitiveness of agricultural products between India and ASEAN countries. These are the important tools in international trade to study the competitiveness of participating countries and hence reveal the possibility of increased trade cooperation between them. For this analysis we defined the agriculture sector based on the Uruguay Round of Agreement on Agriculture (URAoA) and Chapters 01-24 of the HS classification. The Trade Intensity index is used to see how intensely India and ASEAN countries trade in agricultural goods compared to the rest of the world (ROW).

The bilateral trade intensity index for total trade is as follows:

$$\mathbf{Tij = [(Xij+Mij)/(Xi+Mi)]/\{[Xwj+Mwj)-(Xij+Mij)]/[(Xw+Mw)-(Xi+Mi)]\}} \quad \mathbf{(1)}$$

Where,

Tij = Total trade intensity index of country i (India) with country j (ASEAN);

Xij = Exports of country i to j;

Mij = Imports of country i from j;

Xi =Total exports of country i;

Mi= Total imports of country i;

Xwj= Total world exports to country j;

Mwj = Total world imports from country j; and

Xw = Total world exports; Mw = Total world imports.

This index is interpreted as a relative measure of the two basic ratios. If the value of Tij > 1, it implies that the bilateral trade intensity for country i with country j is greater in comparison to country i's trade with the rest of the world (ROW). For instance, if India is considered as country i and country j is represented by its trading partners, viz, ASEAN, then a value of Tij > 1 implies that India prefers to trade more intensely with ASEAN than with the ROW. Trade Intensity Index is further divided into Export Intensity Index (EII) and Import Intensity Index (III) for looking the pattern of intensity in agricultural exports and imports.

$$\mathbf{EII \text{ between India and ASEAN}} = [Xij / Xi] / \{[Mj - Mji] /[Mw - Mi]\} \quad \mathbf{(2)}$$

EII= Export Intensity Index

M_j = Total imports of country j and

M_{ji} = Imports of country j from country i.

A value of this index above unity implies that country i's relative share of exports to country j exceeds country j's share of imports from the ROW.

III between India and ASEAN = [Mij / Mi] / {[Xj-Xji] / [Xw- Xi]} **(3)**

III = Import Intensity Index

Xj= Total export of country j and

Xji = Export of country j to country i.

A value of this index above unity implies that country i's relative share of imports to country 'j' exceeds country j's share of exports from the ROW (Asher and Sen, 2005).

Moving further, the RCA index is calculated at the aggregate level as well as disaggregates level. First we calculated RCA index for total agriculture sector and clubbed under the four major categories on basis of Harmonized System (HS 2007) to understand the sectoral competitiveness over the study period.

Table 1: Details of the Sectors Included Under the Analysis

Sl. No.	Details	Code
1.	Live Animal	HS 01-05
2.	Vegetable products	HS 06-14
3.	Animal or vegetable fats products	HS 15
4.	Prepared foodstuffs products	HS 16-24

Source: Author's aggregation based on HS classification.

For the disaggregated level analysis, ten major agricultural commodities/commodity groups were selected based on their respective shares in India's total agricultural exports. They are marine products, milk products, meat products, vegetables and fruits, rice, cereals, coffee, tea and spices. During the period under study (2001-2013), these commodities together accounted for more than 65 per cent of India's total agricultural export earnings from the world.

To examine the export competitiveness of agricultural products between India and ASEAN countries, we used the RCA index. To capture the degree of trade specialization of one country, Balassa (1965) introduced the RCA index. It shows how a product is competitive in country's exports compared to the product's share in another country or group of countries. A product with high RCA is competitive and can be exported to countries with low RCA. Countries with similar RCA profile are likely to have high bilateral trade intensities unless intra-industry trade is involved (Chandran, 2010). 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 (Shinoj & Mathur, 2008). The advantage of using the RCA 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 endowments and productivity. The disadvantage, however, is that it cannot distinguish improvements in factor endowments and pursuit of appropriate trade policies by a country (Batra & Khan, 2005).The original index of RCA was first formulated by Balassa (1965) and can be written as follows.

$$RCA_1 = (X_{ij} / X_{it}) / (X_{nj} / X_{nt}) \quad (4)$$

Where,

X_{ij} = i^{th} country's exports of commodity j

X_{it} = i^{th} country's total exports (all merchandise).

X_{nj} = n^{th} set of countries export of commodity j.

X_{nt} = n^{th} set of countries total exports (all merchandise)

In the present study, country 'i' refers to India , commodity 'j' refers to any of the selected agriculture commodity and set of countries 'n' refers to the members of ASEAN .

We have slightly modified the above said formula as follows,

$$RCA_2 = (X_{ij} / X_{iAg}) / (X_{nj} / X_{nAg}) \quad (5)$$

Where,

X_{ij} = 'i' (India's) exports of agricultural products (Ag) j.

X_{iAg} = 'i' (India's) exports of total agricultural products (Ag).

X_{nj} = 'n^{th}' (ASEAN) exports of agricultural products j.

X_{nAg} = n^{th} (ASEAN) exports of total agricultural products (Ag).

The RCA index value ranges between zero (0) and positive infinitive (+∞). If the RCA index value of a country is greater than one, the country has comparative advantage in those products and vice -versa. However, RCA suffers from the problem of asymmetry as 'pure' RCA is basically not comparable on both sides of unity because the index ranges from zero to one if a country is said not to be specialized in a given commodity. The value of the index ranges from one to infinity, if a country is said to be specialized.

Some procedure has been proposed to alleviate the problem of asymmetry, such as the logarithmic transformation of the Balassa measure (Vollarth 1991). But the methodological problem arises when, for example, ln(RCA) is used as the basis for statistical test – small RCA values are transformed to high negative ln(RCA) values (Dalum *et al.* 1998). 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 as follows,

$$RSCA = (RCA - 1) / (RCA + 1) \quad (6)$$

The value of RSCA 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

Agricultural Trade Intensity between India and ASEAN

It is evident from Table 2 that India's total agricultural export as well as import intensity with ASEAN is above unity for all the years. It is revealed from the overall estimate of EII and III that India's

agricultural trade is more intense with ASEAN countries compared with ROW. According to the natural trading partner theory countries trade more with neighbours and countries in close proximity rather than distant countries. However, these indices support the natural trading partner theory that the intensity of India's trade with its neighbours is higher than with the ROW. The ASEAN countries are natural trade partners of India in agricultural trade. India's Agricultural EII marginally increased and III declined during the study period. India's III with ASEAN is higher than EII; it means that imports of agricultural goods from ASEAN are more intense than export of agriculture goods to ASEAN.

Table 2: India' Agricultural Exports and Imports Intensity Index with Respect ASEAN; 2001 to 2013:

Years	India's EII with ASEAN	India's III with ASEAN
2001	3.60	6.59
2004	3.74	7.73
2008	4.28	6.00
2013	3.69	6.30

Source: Author's calculations based on ITC Database.

Note: EII- Export Intensity Index. III - Import Intensity Index.

The agricultural export and import intensity of India with ASEAN countries is presented in Table 3. India's EII is above one with Malaysia, Indonesia, Philippines, Singapore Thailand, and Vietnam and has declined for Thailand and Vietnam during the study period. For Brunei and Cambodia it is below one till 2008, after which it turns above one. Lao PDR is one country where the EII is below one for all the years due to the lower exports from India. It shows that after singing of AIFTA, India's agriculture export intensity increased with less developed countries. India will consider Thailand and Vietnam as the best partner for export of agricultural commodities in comparison to other ASEAN members (the value of EII has increased over the study period for both the countries).

On the other side, India is importing smaller volumes of agricultural commodities from the less developed ASEAN countries, which is reflected in the low III with Brunei, Cambodia, and Lao PDR. India had very high import intensity with Indonesia (16.97) and Malaysia (7.28) in 2013. Interestingly, India's agriculture trade with ASEAN is heavily tilted towards Indonesia – around 38 per cent India's agriculture trade to ASEAN headed to that country in 2013. India's import intensity was below one with the Philippines, Singapore and Thailand for all the years. The import intensity with Vietnam was below one till 2008 but it turned above one after that. India will consider Indonesia, Malaysia and Vietnam to other ASEAN members (all the countries the value of III above one) as the best partners of its import source of agricultural commodities.

Table 3: India's Agricultural Export and Import Intensity Index with ASEAN Countries.

Year		BRU[1]	CAM	LAO	MAL	INDO	PHI	SING	THAI	VIET
2001	EII	0.25	0.14	0.41	4.24	5.81	3.29	2.53	2.71	4.26
	III	0.00	0.00	0.00	15.60	14.71	0.28	1.03	0.33	0.47
2004	EII	0.51	0.12	0.01	5.24	4.79	2.50	2.04	2.09	8.12
	III	0.00	0.00	0.19	7.12	28.41	0.25	0.45	0.24	0.89
2008	EII	NA	1.21	0.00	5.51	3.53	2.42	1.48	2.57	14.27
	III	NA	11.51	0.01	2.91	18.48	0.56	0.65	0.51	0.46
2013	EII	1.09	1.48	0.92	3.18	2.63	1.96	1.00	3.08	7.90
	III	0.00	0.02	0.02	7.28	16.97	0.31	0.58	0.79	1.08

Source: Author's calculations based on ITC Database.

Note: Data is not available for Myanmar

The volume of agricultural trade between India and ASEAN is less because of the strict Rules of Origin and the exclusion of most of the agriculture commodities from the tariff concession committed to in the AIFT agreement.

Revealed Comparative Advantage between India and ASEAN

We can see from Table 4 that the Revealed Symmetric Comparative Advantage (RSCA) for the entire agricultural sector of India with respect to ASEAN countries from 2001 to 2013 is fluctuating. India's agricultural sector enjoyed comparative advantage with gradual decreasing trend from 2001 to 2008. It shows that India is losing its comparative advantage in export of agricultural goods to ASEAN markets. The world witnessed a very difficult global financial crisis in 2009 as reflected in RSCA results and it was also a bad experience for the Indian agricultural sector. The values of RSCA were negative from 2009 to 2011; it means that India had a comparative disadvantage in these years. The inception of AIFTA in 2010 had some positive impact on India's comparative advantage for agricultural exports to ASEAN markets. Hence, the position changed from comparative disadvantage to comparative advantage later.

Table 4: RSCA Index of Total Agricultural products.

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
RSCA	0.30	0.25	0.19	0.19	0.15	0.14	0.09	0.04	**-0.10**	**-0.05**	**-0.03**	0.12	0.15

Source: Author's calculations based on ITC Database.

To understand the sector wise comparative advantage of agricultural goods, we divided the agricultural sector into four parts – Live Animal (HS 01-05), Vegetables Products (HS 06- 14), Animal or Vegetables Fats Products (HS 15) and Prepared Foodstuff Products (HS 16-24) and calculated the RSCA index. The results are presented in Table 5.

[1] Abbreviations are given in appendix 1 at last.

Table 5: Sector wise RSCA Index for India with Respect to ASEAN

Year	01-05	06-14	15	16-24
2001	0.00	0.39	-0.71	-0.25
2002	0.06	0.46	-0.83	-0.30
2003	0.08	0.46	-0.83	-0.22
2004	0.08	0.43	-0.77	-0.22
2005	0.15	0.42	-0.78	-0.28
2006	0.11	0.37	-0.81	-0.09
2007	0.12	0.41	-0.84	-0.05
2008	0.11	0.39	-0.85	0.07
2009	0.19	0.39	-0.79	-0.12
2010	0.28	0.37	-0.80	-0.07
2011	0.30	0.40	-0.82	-0.11
2012	0.22	0.46	-0.86	-0.24
2013	0.37	0.43	-0.86	-0.31

Source: Author's calculations based on ITC Database.

Note: 01-05: Live Animal. 06-14: Vegetable Products. 15: Animal 0r Vegetable Products. 16-24: Prepared Foodstuff products.

The value of RSCA index was positive for Live Animal (01-05) sector for all the years. India has 'revealed' comparative advantage with an increasing trend in ASEAN markets. Hence, India has some potential to capture the ASEAN markets for the export of Live Animal products from ROW to ASEAN. In case of Vegetable Products (06-14), the value was also positive with a stagnant trend for all the years. It means that India has comparative advantage in ASEAN markets for Vegetable exports. Hence, India can focus on ASEAN rather than ROW, to increase the export of Live Animal and Vegetable products.
On the other hand, the values for 'Animal or Vegetable Fats' (15) products and 'Prepared Foodstuff' (16-24) products were negative for all the reference years. Hence, India has comparative disadvantage in these two sectors. Basically, these two sectors are known as value-added industries and have the potential to acquire international markets to earn foreign currency. Hence, India should use AIFTA to convert its position from comparative disadvantage to comparative advantage. The commodity wise details of the RSCA index results are presented in the next section.

Marine Products

The values of RSCA index for marine products for India with respect to ASEAN are depicted in Figure 3. The index value was negative throughout the period under consideration and volatile in nature due to factors such as slowdown in global consumer demand, shift in demand towards less expensive species and implementation of stringent sanitary and phyto-sanitary (SPS) measures. Further, low MFN (Most Favoured Nation) base rate in most of the ASEAN countries have included most of the prominent items of India's marine products in the exclusion list (Parvathy and Rajasenan, 2012). Based on the latest FAO (Food and Agriculture Organization) Fish Index, the price of fish and fish products weakened in late 2008 and early 2009, reaching the lowest in March 2009. Thailand, China, Indonesia, Vietnam and The

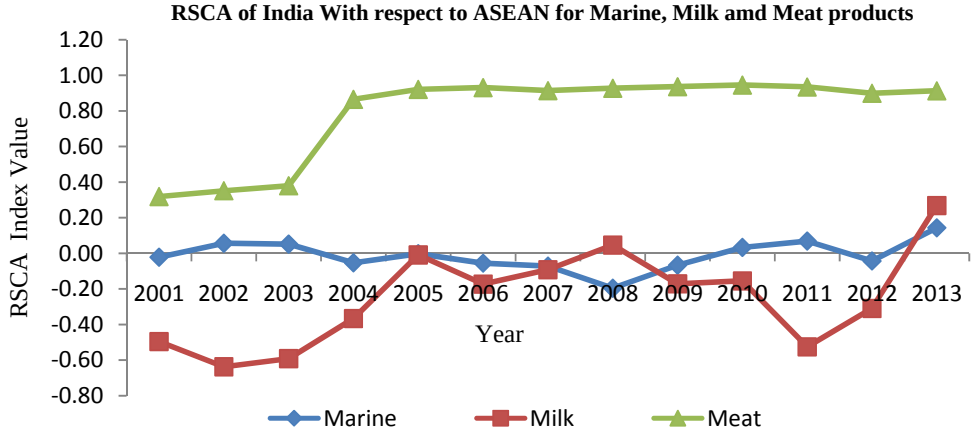
Philippines are the major competitors to Indian marine products because these countries are producing and supplying large quantities of farmed shrimp to the international market.

Even though, India had comparative disadvantage in the initial period, it turned to comparative advantage for short period and again had a comparative disadvantage position for a long time. The results have wide-reaching implications for India; India may have comparative advantage for marine products in global markets but not in ASEAN. Hence, the other markets are more suitable for marine products than ASEAN.

Milk Products

India is currently in first place in milk production in the world but does not enjoy any comparative advantage in ASEAN markets. Hence, the ASEAN markets may not be suitable for export of Milk products. So, India has to look for other markets for export of milk products. The computed RSCA values for milk for India with respect to ASEAN were negative throughout the study period except in 2013 and indicated 'revealed' comparative disadvantage in Milk products exports (Figure 3). India's milk products are facing many challenges in ASEAN markets such as high tariff rates and SPS norms. For instance, import has been banned in Indonesia due to Foot and Mouth Disease (FMD) prevalent in India. The Philippines, Thailand, Indonesia and Malaysia have kept most of Indian milk products under the Exclusion List[2] (AIFTA Text.)

Figure 3: The trend in RSCA index on Marine, Milk and Meat Products



Source: Author's calculations based on ITC Database.

Meat Products

Meat has become an essential food all over the world because of its high protein content. In meat exports, China and the US are the major competitors to India. The estimated RSCA values for India were positive for all the years and indicated comparative advantage in meat exports. The RSCA value

[2] Under the exclusion list (EL) members are allowed to retain their base rate, i.e. the MFN applied rates as of 1 July 2007. In other words there is no commitment regarding tariff reduction under the EL.

increased till 2004. However, it was stagnant for the remaining period (Figure 3) due to the prevalence of stringent Non-tariff barriers (NTB) in ASEAN markets like barriers related to process standards. For example, slaughterhouses should be certified under HACCP[3] policy in The Philippines and Malaysia. Singapore and Indonesia banned Indian meat imports due to the FMD prevalent in India. In 2014 the outgoing government passed a legislation to open the Indonesian market to meat imports from FMD affected countries on certain conditions. However, despite this fact India has the potential to increase its market share in ASEAN markets by using the AIFT Agreement.

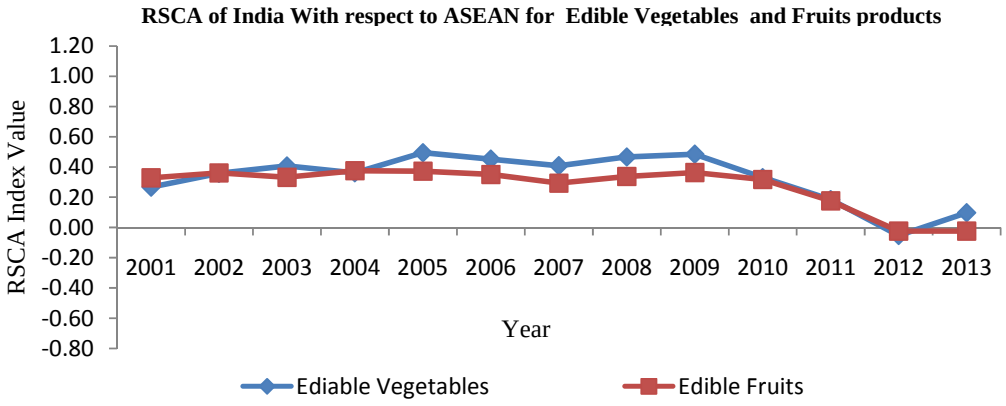
Edible Vegetable Products

In vegetable exports also China is a major competitor to India. India is second largest producer after China, of fresh vegetables in the world. India lacks high-quality storage facilities required to store fresh vegetables. Efforts are required to create adequate storage facilities. The values of RSCA were positive for all the years except 2012 (Figure 4). For fresh vegetable exports India can explore its market opportunity with ASEAN countries.

Edible Fruit Products

Fruit products also require good storage facilities. In mango and orange production India is placed first and third, respectively, in the world. Hence, India has the potential to feed fruits to the world. In the recent past India has been losing its comparative advantage position in ASEAN markets. The values of RSCA were positive up to 2011 and India had a comparative advantage in fruit exports to ASEAN but it turned negative in 2012 and 2013 (Figure 4). It shows that the singing of AIFTA (2010) has no impact on fruit exports from India to ASEAN countries.

Figure 4: The Trend in RSCA Index on Edible Vegetables and Edible Fruits Products



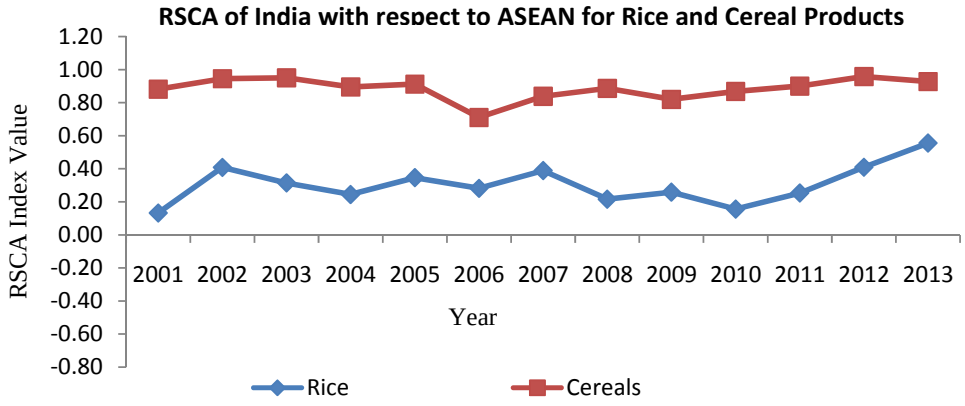
Source: Author's calculations based on ITC Database.

[3] The Hazard Analysis and Critical Control points (HACCP) system is a logical, scientific approach to controlling hazards in meat production.

Rice

The values of RSCA indices for rice are presented in Figure 5. It reveals that India had comparative advantage to export rice to ASEAN for the period under consideration. In 2001, the RSCA value was 0.13 which improved to 0.56 in 2013. It implies that India's competitiveness in rice exports to ASEAN has been increasing over the period. In the recent past rice export has shown a remarkable growth due to factors such as the adjustment in the exchange rate, attractive premium on exim-scrips[4] policy and inclusion of certain varieties of rice in the open general license that made the export of rice more competitive in the international market (Sahini 2014). Despite the facts, Indian rice varieties are facing the severe problem of Non-Tariff Barriers (NTB) in ASEAN – barriers related to product standard. For ex., Indonesia imports 25 per cent broken non-Basmati rice, unlike other ASEAN countries such as Malaysia and Singapore that import 20 per cent broken non-Basmati rice (Saqib and Taneja 2005). It implies that it is very difficult for exporters to meet individual country's demands.

Figure 5: The Trend in RSCA Index on Rice and Cereals Products



Source: Author's calculations based on ITC Database.

Cereals

We excluded rice from cereals for this analysis. The values of RSCA indices for cereals for India with respect ASEAN is presented in Figure 5. The values of RSCA indices were positive for the reference period of the study. India is enjoying comparative advantage in cereals exports to ASEAN. Hence, ASEAN is an important destination for Indian cereals exports in future also.

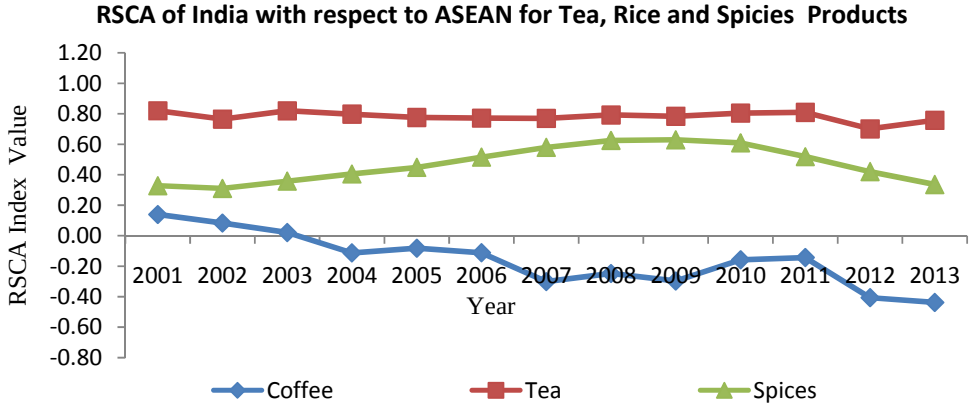
Coffee

In coffee exports, Indonesia, Thailand and Vietnam are the major competitors to India. The computed RSCA values for India at the initial period were positive up to 2003 and for the remaining period it was negative (Figure 6). It indicated that for coffee exports, India has comparative disadvantage in ASEAN

[4] Exim-scrips were to be the means of obtaining access to certain categories of imports of raw materials, component and spares. They were issued on the basis of value of exports of foreign exchange earnings from exports.

markets. The serious concern is that Vietnam and Indonesia are improving at a rapid pace and posing a serious threat to Indian coffee in the international markets. The major coffee producing countries like Thailand, The Philippines and Vietnam have put Indian coffee either on the Exclusion list or Sensitive list[5] (AIFTA Text).

Figure 6: The Trend in RSCA Index on Coffee, Tea and Spices Products



Source: Author's calculations based on ITC Database.

Tea

The values of RSCA indices for tea for India are depicted in Figure 6. It was positive with a comparative advantage in tea export to ASEAN throughout the study period. But, India's comparative advantage was stagnant around the value 0.80 for all the years. In 2001, the value of RSCA was 0.82 and it fell to 0.76 in 2013. Sri Lanka's dominance in the global market is poising a serious threat to Indian tea exports in international markets (Shinoj and Mathur, 2008). The increase in domestic demand for tea and decrease in exports to USSR are the major reasons for declining comparative advantage. Nevertheless, India can increase its tea export market share to ASEAN countries because it had a comparative advantage for the entire study period.

Spices

The value of RSCA indices for spices for India with respect to ASEAN is presented in Figure 6. India had comparative advantage in spices exports to ASEAN throughout the study period. It can be noted from Figure 6, that India's comparative advantage in spices exports to ASEAN has been increasing from 2001 to 2009 but thereafter started to decline.

[5] Under the Sensitive List member countries are bound to reduce the tariff rate but not fully eliminate.

Summary and Conclusion

In this study we found that India's export intensity in total agricultural trade has been increasing with respect to ASEAN rather than the ROW. In terms of Import Intensity it was declining over the study period. The study also noted that India's trade intensity in agricultural trade was varying from country to country. India's export intensity increased with the Vietnam, Thailand, Brunei, Cambodia and Lao PDR over the period. On the other hand, it decreased with the rest of the ASEAN countries such as Indonesia, The Philippines, Malaysia, and Singapore. Further, import intensity was very low with Brunei, Cambodia and Lao PDR. In contrast, it was very high with Indonesia (16.97) and Malaysia (7.28) particularly in 2013**.** The findings of the study are consistent with the argument posed in other studies, like those by Kalirajan and Bhattacharya (2007). It is notable that both export and import indices with Brunei, Cambodia and Lao PDR are very low. It reveals the future potential for trade with these countries.

India's comparative advantage in export mainly for agricultural products with ASEAN had been gradually decreasing throughout the period under study. In addition, the comparative advantage from 2001 to 2008 turned into comparative disadvantage in 2009 to 2011 and comparative advantage was regained in 2012 and 2013 within the ASEAN markets. Sector wise analysis of comparative advantages revealed that India enjoyed comparative advantage in export of Live Animals and Vegetables products with ASEAN countries rather than the ROW. In case of Animal or Vegetable fats and Prepared food products, India had comparative disadvantage for all the years of the study.

The pattern of India's comparative advantage with ASEAN has strong variations across commodities. It is notable that India has enjoyed advantages at a comparative scale in the export of meat, tea, rice, cereal and spices and was consistent over the study period. A similar kind of pattern has been observed in export of vegetables and fruits but India has been losing its comparative advantage to other exporters like China and The Philippines in recent years. However, for first 10 years the Indian market enjoyed comparative advantages on those commodities. The study found some issues requiring urgent attention. India is a big producer of those products but India is facing high comparative disadvantages on marine products, milk products and coffee. This suggests that India has to seek new markets other than ASEAN to export these products.

Overall, it is concluded that there is further scope for increasing the destinations of Indian agriculture goods in ASEAN markets particularly in Vietnam, Thailand, Brunei, Cambodia and Lao PDR. The sources of agricultural goods will be Indonesia and Malaysia in future. Moreover, the volume of agriculture trade between India and ASEAN members is very low because India's average tariff for agriculture products is higher than that of the ASEAN countries. Hence, the study suggests direct the policy initiatives to promote the products that have comparative advantage in exports. It will also help producers and exporters to select appropriate commodities with comparative advantage for trading. Efforts should be focused on promotion of exports like meat, vegetables and fruits, tea, rice and cereal products for Indian exporters in ASEAN markets.

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Appendix

Table A1. Country list

Sl. No.	Country
1	BRU- Brunei
2	CAM - Cambodia
3	LAO -Lao PDR
4	MYA - Myanmar
5	MAL - Malaysia
6	INDO - Indonesia
7	PHI - Philippines
8	SING - Singapore
9	THAI - Thailand
10	VIET - Vietnam

Table A2: The RSCA Index Value for India With Respect to ASEAN for Ten Major Agricultural Products

Year	Marine products	Milk Products	Meat products	Vegetable Products	Edible Fruit Products	Coffee	Tea	Rice	Cereals	Spices
2001	-0.02	-0.50	0.32	0.27	0.33	0.14	0.82	0.13	0.88	0.33
2002	0.06	-0.64	0.35	0.36	0.36	0.08	0.76	0.41	0.95	0.31
2003	0.05	-0.59	0.38	0.41	0.33	0.02	0.82	0.31	0.95	0.36
2004	-0.05	-0.37	0.87	0.36	0.38	-0.11	0.80	0.24	0.90	0.41
2005	0.00	-0.01	0.92	0.49	0.37	-0.08	0.78	0.35	0.91	0.45
2006	-0.06	-0.17	0.93	0.45	0.35	-0.11	0.77	0.28	0.71	0.52
2007	-0.07	-0.09	0.91	0.41	0.29	-0.30	0.77	0.39	0.84	0.58
2008	-0.20	0.05	0.93	0.47	0.34	-0.25	0.79	0.22	0.89	0.62
2009	-0.07	-0.17	0.94	0.48	0.36	-0.30	0.78	0.26	0.82	0.63
2010	0.03	-0.15	0.95	0.33	0.32	-0.16	0.80	0.16	0.87	0.61
2011	0.07	-0.53	0.94	0.19	0.18	-0.14	0.81	0.25	0.90	0.52
2012	-0.04	-0.31	0.90	-0.05	-0.02	-0.41	0.70	0.41	0.96	0.42
2013	0.14	0.27	0.91	0.10	-0.02	-0.44	0.76	0.56	0.93	0.34

Source: Author's calculations based on ITC Database.

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