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Trade Competitiveness of Palm Oil Export from ASEAN Countries

B. Teena Lakshmi [a*], K. M. Shivakumar [a], D. Suresh Kumar [a], K. Mahendran [b] and J. Suresh [c]

[a] Department of Agricultural Economics, CARDS, Tamil Nadu Agricultural University, Coimbatore, India.
[b] Department of Agricultural and Rural Management, CARDS, Tamil Nadu Agricultural University, Coimbatore, India.
[c] Department of Medicinal and Aromatic Crops, Horticulture College and Research Institute, Coimbatore, India.

Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Aims: To study the competitiveness, import intensity and structural break of palm oil exports from ASEAN member countries to the Indian market for the period 2000 to 2020.
Data and Methodology: The relevant data was collected from UNCOMTRADE for the period of 21 years (2000 to 2020). The tools used for the analysis were Revealed Symmetric Comparative Advantage (RSCA), Import Intensity Index (III) and Chow test.
Results: The study revealed that Indonesia had lost its comparative advantage due to differential tariff rates imposed by India between Indonesia and its close competitor Malaysia. After 2011, the import intensity index clarifies that there was a gradual decrease in imports from Indonesia. However, Malaysia and Thailand showed an upward trend in import intensity index till the year 2018. After 2018, Singapore had an upward trend in import intensity. From chow test, there was a significant difference in importing palm oil from ASEAN countries to India before and after signing AIFTA (ASEAN- India Free Trade Agreement).

**Corresponding author: E-mail: 240teena@gmail.com;*

Conclusion: Considering India's demand for palm oil which is expected to double by 2030, so sustainable palm oil cultivation is recommended and a balanced approach should be taken to fix the tariff rate to protect domestic producers and refineries without compromising consumer demand.

Keywords: AIFTA; chow test; comparative advantage; import intensity index.

1. INTRODUCTION

A worldwide trend toward regionalism evolved in the early 1990s and India recognised ASEAN's importance in terms of politics, economy and diplomacy, so as a result, it proposed "Look East" policy, with a focus on how to get more actively involved in South East Asian affairs [1]. India has been pursuing greater economic and strategic connections with the countries of Southeast Asia as part of "Look East" policy and India became an ASEAN sectoral dialogue partner in 1991, a full dialogue partner in 1995, and a member of the ASEAN Regional Forum (ARF) in 1996. On October 8, 2003, India and ASEAN signed the Comprehensive Economic Cooperation Agreement (CECA), to establish an institutional framework that would allow economic cooperation to take place. In March 2004, India and ASEAN began negotiations on trade in products agreement. Regional/bilateral FTAs are seen as a supplement to the global trading system by India and ASEAN, as they ensure that Free Trade Agreement (FTAs) are consistent with WTO norms. After six years of discussion, the India-ASEAN Free Trade Agreement (AIFTA) was signed on August 13, 2009, in Bangkok, during a meeting of ASEAN Economic Ministers and the agreement took effect on January 1, 2010.

Korinek and Melatoes [2] made a study on ASEAN Free Trade Agreement (AFTA), MERCOSUR, and Common Market for Eastern and Southern Africa (COMESA) and found that all Regional Trade Agreements (RTAs) had a net trade effect in agriculture, which was primarily fueled by deeper economic integration. India's agriculture import from ASEAN member countries in 2020 was 0.83 billion USD (11.48% of world share) (APEDA, 2022). Vegetable oil (HS 15) was the dominant item in 2014 with a share of 77 per cent of total agricultural imports of India from ASEAN member countries [3]. In 2020, the share of vegetable oil in India's total agricultural imports from ASEAN countries was 87.36 per cent. In which palm oil (HS code 1511) was majorly imported with a share of 98.48 per cent.

India was the world's largest consumer of vegetable oil (25.29 million MT) in which palm oil constituted 9.21 million MT out of that 8.41 million MT was imported during 2020. Sagar et al. [4] found that 94.10 per cent of palm oil used in Indian food products, especially as cooking oil. Indonesia (57%) and Malaysia (32%) were the main exporters of palm oil to the world in 2020 were among the countries that formed the ASEAN organization.

Pal and Dasgupta [5] pointed out that, India will not gain significantly from ASEAN, as most of them have lower MFN tariff rates, whereas Francis [6] argued that, ASEAN countries will gain Indian market share in several semi-processed or processed agricultural products due to the drastic tariff liberalization under the AIFTA. With this background and the tariff cut in 2019 on crude palm oil from Malaysia, Indonesia and other members of ASEAN from 44 per cent to 40 per cent; an attempt was made with the objective of analysing the competitiveness, import intensities and chow test of palm oil trade between ASEAN member countries with India.

2. DATA AND METHODOLOGY

2.1 Data Collection

The study relied upon secondary data of palm oil the exports (HSC-1511) of ASEAN member countries and India which was collected from the UN COMTRADE database for the period from 2000 to 2020. The analyses of palm oil exports were carried out for the following countries in the Association of South East Asian Nations (ASEAN) - Indonesia (65%), Malaysia (32%), Thailand (2%) and Singapore (2%) because they had a major share in exporting palm oil to India (Table 1).

2.2 Methodology

2.2.1 Revealed Comparative Advantage (RCA)

RCA examines whether India and ASEAN member countries have a comparative

advantage to palm oil (HSC-1511) exports in the world market and ASEAN countries' competitiveness with Indian markets. The original index of RCA was first formulated by Balassa [7]:

$$B = \frac{X_{ij}/X_{ik}}{X_{nj}/X_{nk}}$$

where,

Xij - Value of exports of country 'i' of commodity 'j'

Xik - Value of exports of country 'i' of a set of commodities 'k'

Xnj - Value of exports of a set of countries 'n' of commodity 'j', and

Xnk - Value of exports of a set of countries 'n' of a set of commodities 'k'

When the RCA value is greater than one, it indicates the competitiveness of the commodity. However, RCA suffers from the problem of asymmetry as 'pure' RCA cannot be compared. The index is made symmetric, following the methodology suggested by Dalum et al. [8] and the new index is called 'Revealed Symmetric Comparative Advantage' (RSCA). It can be represented by the equation;

$$RSCA = \frac{(RCA - 1)}{(RCA + 1)}$$

This measure ranges between -1 and +1 and is free from the problem of skewness. If the RSCA value is positive for a commodity's exports, that commodity is said to have a competitive advantage, and vice versa.

Table 1. Share of ASEAN countries export to India (triennium average: 2016-2020)

ASEAN member countries	Volume (%)	Value (%)
Cambodia	0.01	0.01
Indonesia	64.10	64.60
Malaysia	31.52	31.14
Philippines	0.25	0.26
Singapore	1.95	1.77
Thailand	2.18	2.23

Source: Computed based on UN COMTRADE database

2.2.2 Import Intensity Index (III)

Import intensity indices reflect the ratio of India's preference for trade with ASEAN in comparison with the world. An index of greater (less) than unity has been interpreted as an indication of a larger (smaller) than expected trade flow between two parties.

$$EII = \frac{M_{IA}/M_I}{X_A/(X_W - X_I)}$$

Where,

MIA - Value of India's agricultural imports to ASEAN countries

MI - Value of India's total agricultural import

XA - Value of total exports by ASEAN countries

Xw - Value of total world's export of agricultural product

XI - Value of India's total agriculture export

2.2.3 Structural break analysis

In the analysis of time series, the problem of structural break was quite significant. The Chow test was employed to determine the significance of the variance in the group regression coefficients by using F-test. It occurs over time for a variety of reasons, including economic crises, modifications to institutional design, changes in policy, and regime changes. Since the ASEAN-India Free Trade Agreement was signed in 2010, the same year was considered as a break in this analysis.

Null Hypothesis: No significant difference between the coefficients of the two groups.

Alternate Hypothesis: There is a significant difference between the coefficients of the two groups.

$$F = \frac{(RSS - (RSS_1 + RSS_2))/k}{(RSS_1 + RSS_2)/(n_1 + n_2 - 2k)} \sim F[_{k,(n_1+n_2-2k)}]$$

Where,

RSS - Residual sum of square of the pooled OLS

RSS_1 - Residual sum of square of group 1

RSS_2 - Residual sum of square of group 2

k – Number of parameters

n_1 - Number of observations in group 1

n_2 - Number of observations in group 2

The following empirical model is used to analyse the structural break; the model is in linear log form and free from the problems of heteroscedasticity, autocorrelation and multicollinearity.

$$IMP = \beta_1 + \beta_2 \ln(PP) + \beta_3 \ln(CONS)$$

Where,

IMP - Import volume of palm oil from ASEAN (billion MT) to India

PP - Import price of palm oil from ASEAN ($/kg) to India

CONS - Palm oil consumption in India (billion MT)

3. RESULTS AND DISCUSSION

The overall growth of palm oil exports from ASEAN member countries to the World and India was 10.64 and 11.92 per cent per annum for the period of 21 years (2000 to 2020) respectively. The major share of palm oil exports in ASEAN countries was Indonesia and Malaysia. The growth rate of Indonesia and Malaysia exports to global were 14.75 and 6.97 per cent per annum respectively. The palm oil imports to the Indian market have grown at a rate of 12.60 and 11.23 per cent per annum from Indonesia and Malaysia respectively.

3.1 Trade Competitiveness of Palm Oil

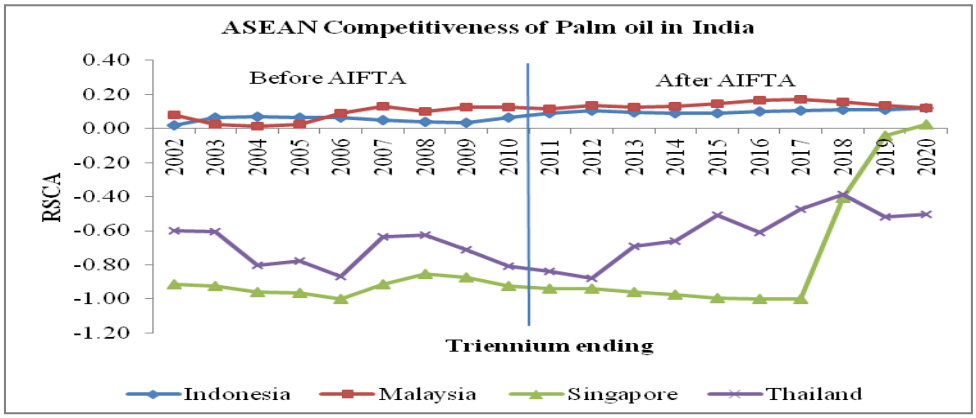
The export of palm oil to India had a comparative advantage over Indonesia and Malaysia for the last 21 years, as indicated in Table 2.

From the triennium year 2012, Malaysia had higher competitiveness than Indonesia, mainly due to the Malaysia-India Close Economic Cooperation Agreement (CECA), which retains 37.5 per cent of the import duty for refined palm oil and crude palm oil [9]. There was a constant decrease in the competitiveness of palm oil imports from Indonesia in the Indian market for the period of 2013 to 2015 [10]. AIFTA had opened a trading platform for Singapore i.e., RSCA had a positive sign and the RCA index value was greater than one in the triennium year of 2020. From 2000 to 2020, the trade competitiveness of Indonesian and Malaysian palm oil exports fluctuated over time and Singapore's RSCA had an upward trend (Fig. 1).

Table 2. Comparative advantages of ASEAN member countries exporting Palm Oil to India

Triennium year	RCA			
	Indonesia	**Malaysia**	**Singapore**	**Thailand**
2010	1.14	1.24	0.04	0.11
2011	1.20	1.26	0.03	0.09
2012	1.23	1.31	0.03	0.07
2013	1.21	1.28	0.02	0.18
2014	1.20	1.30	0.01	0.20
2015	1.19	1.33	0.00	0.32
2016	1.23	1.40	0.00	0.24
2017	1.24	1.41	0.00	0.36
2018	1.24	1.37	0.42	0.44
2019	1.25	1.32	0.92	0.32
2020	1.27	1.27	1.05	0.33
Triennium year	**RSCA**			
	Indonesia	**Malaysia**	**Singapore**	**Thailand**
2010	0.06	0.11	-0.92	-0.81
2011	0.09	0.12	-0.94	-0.84
2012	0.10	0.13	-0.94	-0.88
2013	0.09	0.12	-0.96	-0.69
2014	0.09	0.13	-0.97	-0.66
2015	0.09	0.14	-0.99	-0.51
2016	0.10	0.17	-1.00	-0.61
2017	0.11	0.17	-1.00	-0.48
2018	0.11	0.15	-0.41	-0.39
2019	0.11	0.14	-0.04	-0.52
2020	0.12	0.12	0.02	-0.50

Source: Authors calculation based on UNCOMTRADE database



Note: Before ASEAN-India Free Trade Agreement (AIFTA): 2002 to 2010
After AIFTA: 2011 to 2020

Fig. 1. RSCA export of palm oil from ASEAN to India

Table 3. Import Intensity Index of ASEAN countries Palm Oil export to India

Triennium year	Import Intensity Index			
	Indonesia	Malaysia	Singapore	Thailand
2010	1.83	0.41	0.12	1.10
2011	1.73	0.47	0.15	0.94
2012	1.60	0.59	0.18	0.52
2013	1.52	0.67	0.14	1.04
2014	1.35	0.85	0.09	1.35
2015	1.25	0.97	0.03	2.72
2016	1.17	1.11	0.00	3.96
2017	1.25	1.01	0.00	5.55
2018	1.29	0.88	10.59	5.49
2019	1.19	0.96	27.06	3.82
2020	1.08	1.03	29.16	4.50

Source: Authors calculation based on UN COMTRADE database

3.2 Import Intensity Index (III)

It was apparent from Table 3 that the import intensity index of Malaysia and Thailand had a positive trend of palm oil exports to India after 2011 i.e., AIFTA had opened the way for the export of palm oil to India. Imports from Singapore increased over the period of 2018 to 2020. In 2020, Singapore was the 8th largest exporter of palm oil and the main destination was India (OCED, 2021). The import from Indonesia decreased after the triennium ending of 2014, and the III value was 1.08 in the triennium ending year 2020 due to the tariff gap between Indonesia and Malaysia in 2019 [11]. The results of the study by Pujiati et al. [12] were similar and they concluded that Malaysia has a higher impact on the Regional Trade Agreement than Indonesia due to their dissimilar government policies.

3.3 Chow Test

Table 4 presents the regression results of the model, it can be concluded that there was a positive and significant relationship between consumption of palm oil in India and import of palm oil to India from ASEAN countries. Similar results were seen in the study by Tandra et al. [13] of determinants of competitiveness in the palm oil trade.

Table 4. Regression result

Variables	Coefficients	Standard error
PP	-1.22^{NS}	0.86
CONS	5.70***	0.66
Intercept	-43.99***	6.10
R^2 = 0.89		
Adjusted R^2 = 0.88		

*Note: Significance is based on p-value; ^{NS} = Non significant; *** = significant at one per cent level*

Table 5. Chow test result

	RSS	Observations	k
Pooled regression	14.30	21	2
1st set (2000 -2009)	3.20	10	2
2nd set (2009 - 2020)	0.74	11	2
F_{cal}	22.33		
F_{tab}	3.59		

From Table 5 we can conclude that the null hypothesis of no significant difference between the groups at break 2010 was rejected, since $F_{cal} > F_{tab}$. Imports of palm oil from ASEAN countries were affected by AIFTA. As a result of the agreement, trade had opened for Singapore with a growth rate of 86.35 per cent per annum (before AIFTA growth rate was negative) and Thailand with a growth rate of 77.86 per cent per annum (before AFITA growth rate was 10.10% yearly). Similarly, Jha and Batla (2021) highlighted the fact that trade in crude palm oil and refined palm oil had flourished after signing the Free Trade Agreement. India has been the most significant importer of palm oil for decades as the consumption of palm oil in India increased at the rate of 7.74 per cent per year from 2000 to 2020.

4. CONCLUSION

In 2020, Indonesia and Malaysia were the two leading palm oil exporters with the highest share of 18.56 and 15.56 per cent of imports to India. There was the absolute advantage of competitiveness to Indonesia and Malaysia in the export of palm oil to the world and India, but Singapore loses its advantage to the world trade as years go i.e., in the triennium ending of 2002 and 2020, RSCAs were 0.63 and -0.53 respectively. In 2020, Singapore had an advantage in exporting palm oil to India, with a positive RSCA and RCA of greater than one. The growth rate of palm oil import from ASEAN member countries to India had decreased after signing the AIFTA i.e., the growth rate before (2000-2009) and after AIFTA (2010-2020) was 6.34 and 3.8 per cent per annum respectively but Malaysia, Singapore and Thailand had a positive impact of AIFTA due to decrease in tariff rate i.e., the growth rate after AIFTA for Malaysia was 3.80 per cent per annum (-10.55% per year before AIFTA); Singapore was 88.97 per cent per annum (-25.03% per year before AIFTA) and for Thailand, the growth was 26.37 per cent per annum after AIFTA (10.10% per year before AIFTA). Based on the import intensity index, Malaysia and Thailand had upward trends in palm oil exports to India. Since 2014, Indonesia's imports had been declined and this drop was largely due to the tariff gap between Indonesia and Malaysia. From the Chow test, it was concluded that there was a significant difference between imports of palm oil from ASEAN countries to India after signing the Free Trade Agreement. Considering Malaysia and Indonesia, India's demand for palm oil is expected to double by 2030, so sustainable palm oil cultivation is recommended; Sagar et al. [4] mention it as an option. A balanced approach should be taken to fix the tariff rate to protect domestic producers and refineries without compromising consumer demand [14].

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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