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Impact of State Trading Enterprises on Indian Agriculture Trade Potential via Gravity Model Approach

TARUN GEHLOT[1]

ABSTRACT

State Trading Enterprises (STEs) have influence in a variety of sectors throughout the world. These institutions confront two problems as a result of their importance in international business: recognizing and conquering the difficulties in international business management that are specific to state-owned enterprises, and predicting changes in existing international business practices. The study looked at the feasibility and capacity of agricultural trade between India and a set of nations from 2009 to 2019. India's agricultural commodities exports were compared to those of a few other countries using the Revealed Comparative Advantage Index. According to the survey, Indian exporters are more competitive than other countries in cotton, rice, oilcake meals, and tea. The gravity model was used to calculate the overall value of agricultural commerce between India and other countries. The model predicts that the income of partners and free trade agreements have a positive influence on bilateral trade. Considering the importance in bilateral trade, border trade between India and Myanmar has been neglected due to a lack of infrastructure. According to estimates of India's trade potential with Cambodia, Indonesia, Malaysia, Myanmar, and Vietnam, India has already surpassed that potential, but Brunei, Lao, the Philippines, Singapore, and Thailand still have potential. The research emphasizes the importance of trade facilitation measures in boosting trade with certain countries. The empirical data demonstrate that output, the shared border, and the GDP of allied nations all have a positive impact on India's exports. The data show that distance has a negative influence on exports as well as gross domestic product. The data also shows that the country that shares a border with India has more trade flows.

***Keywords**: STE, GATTS ,gravity model, FTA, trade potential ,WTO*

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I. INTRODUCTION

Since many large agricultural importers and exporters, for example, Canada, China, India, Indonesia, Japan, and South Korea, employ state trading enterprises (STEs), the practice is extensively utilized globally. STEs are viewed as an impediment to market access when they are introduced in foreign markets, but they are seen as an unfair benefit when they are introduced within exporting countries. The alleged issues might be valid, and therefore tariffs can be considered hurdles to attaining undistorted commerce. And, in principle, the impact of these tariffs or export subsidies could be evaluated in the form of tariffs or export subsidies. The approach of treating STEs in this background is unsatisfactory, as the categorization of a STE as anti-competitive relies on it being defined as a "monopoly position." This characterization is simple since it fails to reflect the STEs' impact on commerce if they are actually doing so. Because of this, it is preferable to define STEs in the importing nation context as non-tariff measures. Even so, estimating their distortive impacts is complicated, and this study looks at how to best go about it.

For a long time, the agricultural commodities trade has been reliant on STEs. A recent surge in the importation of pulses, for example, is an illustration of this. Metals & Minerals Trading Corporation of Canada has raised its pricing .India has agreed to the government's request. Such STE actions are beneficial to keep the cost of goods in control At the moment, every three years Out of the four STEs that have been notified under Article XVII of the GATT, Involved in the agro-products trade. Trade, like India, is booming. Other countries' ambitions in this area have been (or at least are being) met. With the aid of STEs, we attempted to) meet. The purpose of these is to countries is to have a domestic price support system in place for their products. When it comes to quality, and it results in a loss for both; STE as well as domestic buyers There is no denying the fact that STE 's businesses are relevant in specific industries, but they must be in the right sequence .Certain conditions must be met in order to get the most out of them. When it comes to STEs exporting goods, they should only be permitted to do so if there is a clear need due to a drop in exports and the government is confidence in their ability to do so.

(A) State Trading Enterprises in the perspective of the WTO

State trading enterprises were acknowledged in the General Agreement on Tariffs and Trades (GATT 1947) as having the ability to distort international trade due to government participation in their activities. Thus, the goal of Article XVII of the GATT was to force STEs to operate in line with "ordinary economic reasons" by setting regulations that limited how they may lawfully behave (WTO, 2012b). It's crucial to remember that "commercial considerations" is not the same as "maximizing profits." 2 This distinction is important because, as described further below, STEs have a variety of goals, one of which is maximizing profits. STEs could never operate like private businesses without this separation between commercial concerns and profit maximization, and hence the Article's goal would be impossible to achieve. Nonetheless, the definition of commercial concerns is ambiguous.

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"The WTO does not seek to prohibit or prohibit the implementation or management of state trading enterprises, but solely to guarantee that they are not operated in a manner that is incompatible with WTO principles and rules," says Article XVII, which was drafted to ensure that STEs acted in the same way as private firms with reference to their effects on international trade. (WTO, 2012). Governments who do not utilize STEs are nonetheless concerned about the behavior of STEs involved in international commerce in agricultural goods, since they believe that the actions of STEs have the potential to restrict imports or increase exported products as a result of their activities. The hypothetical, on the other hand, must be specified in order for these claimed distortions to make any sense. While the requirements for STEs were clearly established in GATT 1947, notably in Article XVII, the type of business that qualified as a STE was not. This was corrected in GATT 1994

Trade is vital to a nation's economic prosperity. It does have a part in the provision of consumable commodities, since there are two methods for a country to provide food, either through production or commerce. Globally, the second technique has gained popularity and utility. The international agricultural export has risen dramatically in the previous two decades to meet the needs of nations with limited domestic food production. The average annual growth rate of global exports is 7%, but global agricultural output growth has slowed. This condition prompted concern for the future population. The world may not be able to meet demand for food and other products. This slowdown in agriculture is due to a lack of demand for agricultural products as well as a scarcity of land. One of the primary causes is that most of the world's population lives in abject poverty Agriculture is a major contributor to rural GDP and labor employment. It also acts as a catalyst for the business by supplying raw materials. In 2019-20, the agricultural industry expanded by 3.9%, driven by nominal growth in agriculture-related sub-sectors.

Agriculturists need early development and higher returns which provide them high benefit and ample time for sowing following harvests. Brokers and mill operators require high product quality in terms of form, size, and whiteness. India is an agricultural country with a strong agricultural industry. Agriculture offers food, raw materials, foreign exchange, and work opportunities. Natural catastrophes, population growth, and financial crises have reduced our primary agricultural exports. The decrease in exports of these crops hurts Indian economy. From 2009 to 2019, this study examines the factors affecting agriculture exports. Our research will assist policymakers and the government sustain and expand agriculture exports. This research may also benefit Indian agricultural prosperity.

Since long, India and ASEAN nations have had a vibrant cultural and business relationship. India's "Look East Policy" encouraged economic integration with its eastern neighbors in the 1990s. Since then, bilateral trade has risen tenfold, from $6.8 billion in 2009 to $81.3 billion in 2019, encompassing agricultural (ASEAN Secretariat, 2019). India is now the tenth largest export destination for ASEAN, accounting for 6.5% of total exports and 3.2% of total imports. Between 2009 and 2019, bilateral agricultural trade increased by $2.2 billion, from 17% to 28% of India's overall agricultural trade. India's processed foods, drinks, tobacco, and other value-added products are in high demand throughout

ASEAN. Animal and vegetable fats and oils are the most common ASEAN agricultural goods imported. Also, approximately three-quarters of Asian agricultural imports come from ASEAN (Shinoj, 2009).In 2009, India and ASEAN signed a 'Free Trade Agreement' to enhance trade, investment, and services relations. The ASEAN-India Free Trade Agreement (AIFTA) covers a market of over 1.39 billion people with a combined GDP of $2.8 trillion. However, there are concerns that India would not benefit substantially from ASEAN because most member nations have lower tariff rates (Pal and Dasgupta, 2008).

II. METHODOLOGY AND DATA SOURCES

(A) Revealed Comparative Advantage (RCA) Index

An indicator of international commercial competitiveness, the RCA Index established by Balassa (1965), That product's proportion of global commerce vs a country's export competitiveness. It is competitive and may be sold to low-RCA nations. This metric shows how India compares to other nations in a certain product. Equation calculates the RCA index.

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

where,

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

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

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

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

Any product for which the RCA index above one indicates a country's apparent comparative advantage in export. An analysis of 9 commodity/commodity groupings that collectively accounted for over 60% of India's largest exporters from 2009 to 2019 has been carried out in this study.

(B) GRAVITY MODEL

To compute agricultural commodity export factors over STE , we use the Gravity Model, which is based on Newton's Law of Gravity. This states that two substances attract each other in proportion to their mass (kg) divided by the distance between their respective centers of gravity (meters). Tinbergen used this law in international trade in 1962. The basic trading model is as follows:

$$F_{ij} = G\frac{M_i M_j}{D_{ij}}$$

Where, F shows the flow of trade, M is mass of economy of country i and country and D is the distance between countries. In econometric form we can write this model as follow

$$F_{ij} = G\left(\frac{{M_i}^{\beta 1}\ {M_j}^{\beta 2}}{{D_{ij}}^{\beta 3}}\right) * \eta_{ij}$$

$\ln(F_{ij}) = \beta_0 + \beta_1 \ln(M_i) + \beta_2 \ln(M_j) - \beta_3 \ln(D_{ij}) + c_{ij}$

The basic form of the gravity model is given by Equation :

$T_{ij} = Yi*Y_j / D_{ij}$ where,

T_{ij} = Bilateral trade flows between country 'i' and 'j',

Y_i &Y_j = National income of country 'i' and 'j', respectively measured in terms of GDP, and

D_{ij} = Distance between the capital cities of country 'i' and country j (in km).

The GDP indicates the trading partners' market size and purchasing power, implying that larger economies will trade more. Distance is associated with higher transportation expenses and wider cultural differences, which can slow information flow and trust building. Thus, distance is inversely related to bilateral trade. It is not widely recognized to use distance alone to estimate trade barriers.. Given the multiplicative structure of the model, the linear connection may be obtained using natural logarithms, and the Equation was increased as Equation :

$\ln T_{ijt} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln Dist_{ij} + \beta_4$ comborder + β_5 landlock + β_6 comlang+ β_7 comcol + β_8 FTA + u_{it}

where,

$\ln T_{ij}$ = Natural logarithm of bilateral trade flows between countries 'i' and 'j' in time't',

$\ln GDP_{it}$ and $\ln GDP_{jt}$ = Natural logarithm of GDP of countries 'i' and 'j' in time't',

$\ln Dist_{ij}$ = Natural logarithm of bilateral distance between countries 'i' and 'j',

Com border = Binary variables that take the value 1 if both countries share border, and 0 otherwise,

Landlock = Binary variables that take the value 1 if country is landlocked, and 0 otherwise,

Com lang = Binary variables that take the value 1 if countries have common official language, and 0 otherwise,

Com col = Binary variables that take the value 1 if both countries were under same colonizer, and 0 otherwise,

FTA = Binary variables that take the value 1 if countries have common membership in ASEAN FTA, and 0 otherwise,

u_{it}= Error-term, which is assumed to be normally distributed with zero mean and constant variance for all observations and to be uncorrelated.

(C) DATA

Data is often examined on a single dimension of cross section data or time series data . This can particularly help to enhance the study of a policy choice, such as the influence of STEs over time. Panel data offers appealing characteristics for econometric analysis. Individual cross sectional units have an incomparable individuality that can be controlled. This is significant because it uncovers cross-sectional variability that would not have been detected in single dimension data analysis, which would have resulted in absolute co linearity. Panel data captures greater variability within variables and avoids difficulties with multi variate linearity. Panel data can concurrently evaluate the influence of time variable elements such as agricultural productivity and cross sectional characteristics such as the usage of STE to offer adequate scientific conclusions (Wooldridge, 2000; Kennedy, 2003)

A panel data pertaining to the bilateral agricultural trade between India and ASEAN countries for 10 years (2009-2019) was prepared for the analysis.

The result of the gravity model from Equation (1) was then used to calculate the trade potential between India and ASEAN countries following Batra (2004). These estimated values essentially depict the trade potential with each of the partner countries, given theconstraints of distance, GDP, openness, closeness, land lock, common language, common colony and free trade agreement.

$$\text{TRADE POTENTIAL} = \frac{\text{ESTIMATED VALUE OF TRADE}}{\text{ACTUAL VALUE OF TRADE}} \text{----------1}$$

If the counter reaches one in relation to a partner nation, it indicates the potential for increased trade with that country as a result of model projected values, while values less than one indicate that India has already surpassed its trading capacity with the state in terms of model forecast values

(D) ASSESSMENT OF PANEL DATA

There are numerous means of obtaining estimates for panel data. Each method of estimation is a variation to the traditional estimating technique Ordinary Least Squares (OLS). They have been developed to deal with an array of statistical issues. The analysis of panel data can be more problematic than pure cross sectional because observations are usually not independent when analyzed over time. There are several reasons for violation of the standard OLS assumptions. (Wooldridge, 2002). The following sections describe the estimation methodologies used in this study.

- **Pooled Ordinary Least Squares (POLS)**

The POLS estimate is traditional OLS procedure on the panel data set. The model in equation represents the POLS model.

$$y_{it} = \alpha + x_{it}\beta + v_{it}$$

Where *i* denotes the particular country, firm or transaction relationship and *t* indentifies the time period. Equation depicts the composite error term as v_{it} . The composite error can be described in the following manner,

$$v_{it} = a_i + u_{it} \text{----------2}$$

where a_i are all those unobserved time invariant factors and u_{it} is the idiosyncratic error that represents the unobserved factors that affect the dependent variable and are time variant. If the model is completely specified, heterogeneity bias from omitted time constant variables is not an issue and one can assume $a_i = 0$

In this research it is difficult to control for some feature like land characteristics that are constant over time but are an important component of production. For this intuitive rational, this is an unrealistic assumption. For this reason, it is most likely to require some correction to these significant effects and for this the fixed effects addition is included.

- **Fixed Effects (FE)**

The fixed effects model allows for estimation in the presence of unobserved effects that are common with panel data. Another technique to remove the constant fixed effect from the process is to take differences each observation from its unit specific mean. By applying the fixed effects transformation to equation one derives

$$(y_{it} - \bar{y}_i) = \beta_i (x_{it} - \bar{x}_i) + (u_{it} - \bar{u}_i)\text{----------}3$$

This removes the time invariant a_i from equation (2). The fixed effect estimation is robust with an unbalanced panel

III. DATA INTERPRETATION & RESULTS

Table 1 shows statistics on agricultural trade with India and specific countries as a percentage of total world and ASEAN trade for the triennium ending in 2019. It can be observed that Indonesia, Vietnam, and Malaysia were India's most favoured partners, accounting for more than 5% of its overall commerce with the rest of the globe. Their proportion among ASEAN nations is 37.32 percent, 25.66 percent, and 21.44 percent, respectively. Thailand and Myanmar came in fourth and fifth place, with global shares of 2.56 percent and 1.58 percent, and ASEAN shares of 8.88 percent and 4.98 percent, respectively. At the ASEAN level, the Philippines and Singapore have also recorded strong trade shares of 2.56 percent and 2.45 percent, respectively. During this time, trade with ASEAN's relatively less-developed countries, Brunei, Cambodia, and Lao, was quite low. It is also clear that India had a trade imbalance with Indonesia, Malaysia, and Myanmar since their import share was more than their export share when compared to other nations.

Table 1: agricultural trade among India and ASEAN nations as a percentage of overall ASEAN and global trade in 2019.

	ASEAN trade			World trade		
Country	Export	Import	Total	Export	Import	Total
Brunei	0.21	0.00	0.09	0.03	0.00	0.02
Cambodia	0.57	0.04	0.30	0.10	0.02	0.07
Indonesia	14.44	54.80	37.32	2.36	25.43	9.44
Lao	0.25	0.00	0.11	0.04	0.00	0.03
Malaysia	15.45	25.43	21.44	2.60	11.33	5.18
Myanmar	1.62	7.33	4.98	0.28	3.22	1.58
Philippines	4.55	0.29	2.56	0.76	0.13	0.57
Singapore	4.26	0.67	2.45	0.71	0.36	0.61
Thailand	12.33	4.44	8.88	2.02	2.03	2.56
Vietnam	46.41	4.21	25.66	7.87	2.34	6.14

figure 1 : Agricultural trade between India and ASEAN countries as a per cent share with that of total ASEAN TRADE

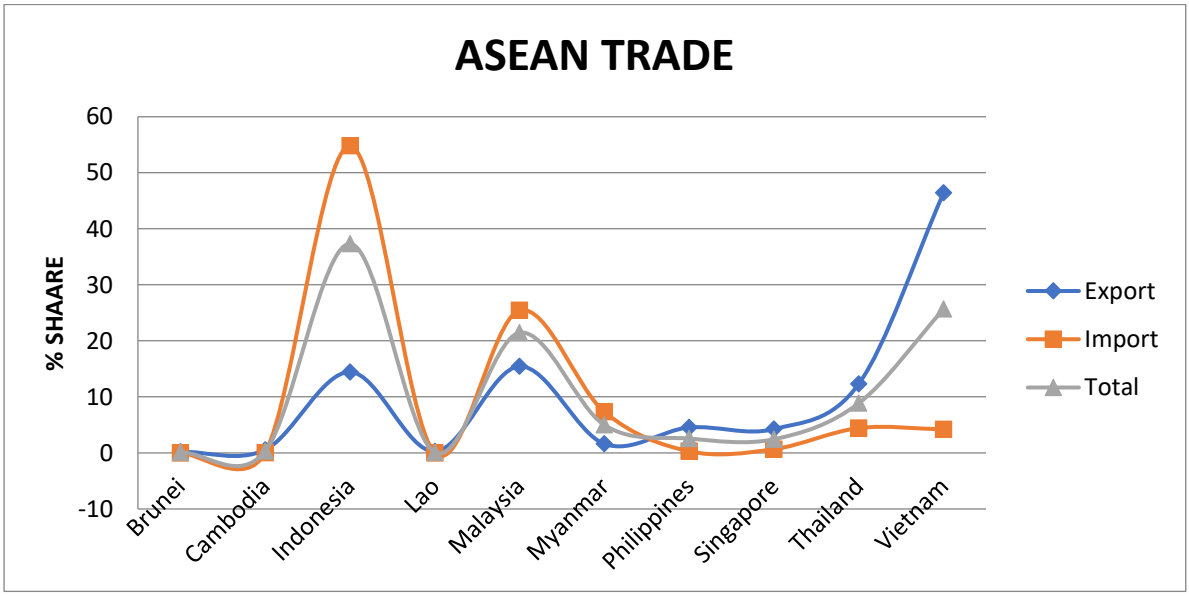


figure 2 : Agricultural trade between India and ASEAN countries as a per cent share with that of total world TRADE

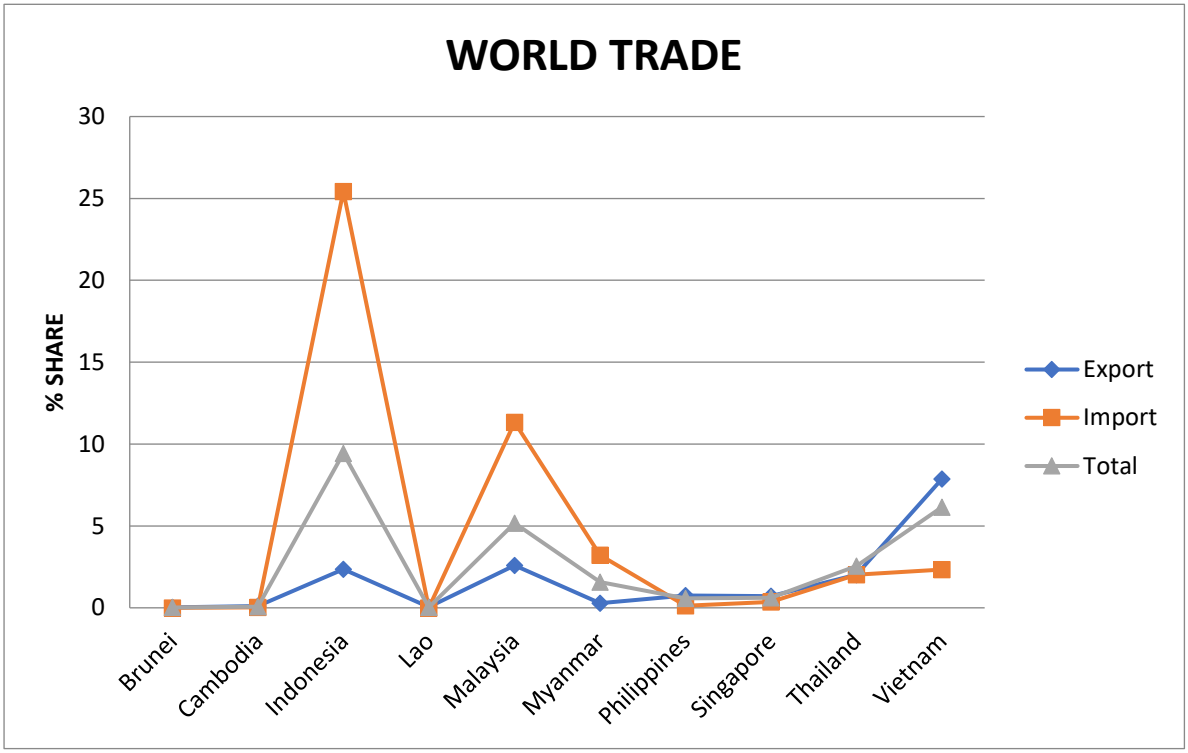
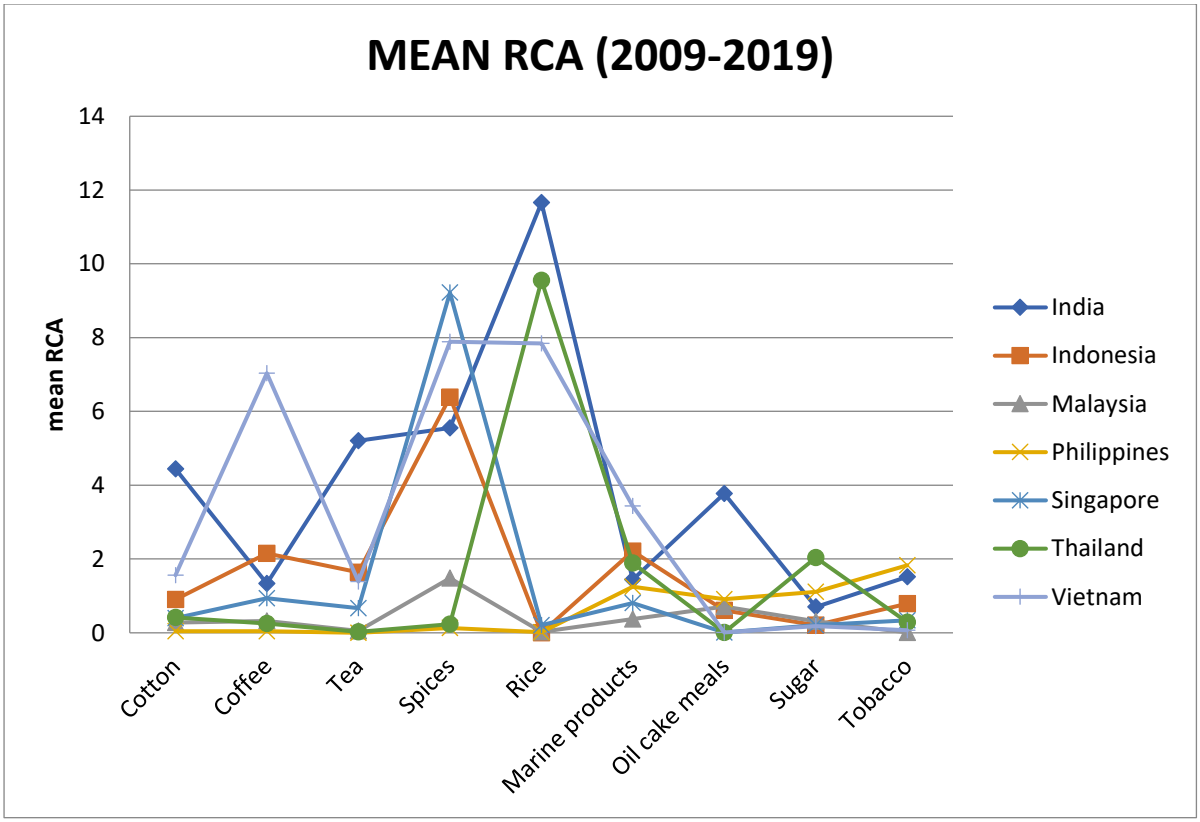


Table 2. Revealed comparative advantage (RCA) in chosen agricultural goods (2009-2019)

Commodities	India	Indonesia	Malaysia	Philippines	Singapore	Thailand	Vietnam
Cotton	4.44	0.90	0.28	0.04	0.40	0.42	1.56
Coffee	1.34	2.15	0.32	0.04	0.94	0.25	7.04
Tea	5.21	1.64	0.05	0.00	0.67	0.03	1.39
Spices	5.55	6.39	1.48	0.13	9.22	0.23	7.89
Rice	11.66	0.00	0.03	0.02	0.21	9.55	7.84
Marine products	1.44	2.21	0.37	1.25	0.81	1.89	3.44
Oil cake meals	3.77	0.61	0.71	0.91	0.01	0.01	0.01
Sugar	0.70	0.21	0.31	1.11	0.21	2.04	0.18
Tobacco	1.52	0.79	0.01	1.83	0.34	0.29	0.07

Figure 3: Mean RCA for agricultural commodities



In light of India's increasing agricultural export contribution to ASEAN nations, we shifted our attention to the study of commodity-level export potential to ASEAN countries (Table 2). The selected agricultural goods made for around 60% of India's total export basket. With a mean RCA index value of 4.44, India may become the world's greatest producer and exporter of cotton, with only Vietnam standing as a rival with a value of 1.56. This is due to technologies such as Bt cotton, increased quality, hybrid varieties, and better management. Growing demand for Indian cotton in the ASEAN market, particularly in Vietnam and Indonesia's textile industry, would undoubtedly benefit Indian exporters. Despite carving out a space for itself in the worldwide coffee industry, India's competitiveness (1.34) is found to be poor when compared to the leading coffee producers of the world, Indonesia (2.15) and Vietnam (7.04). Aside from that, both nations are major exporters of unroasted coffee to India, which is primarily re-exported. India has a superior position in tea export (5.21), despite being the second largest producer, whilst Indonesia (1.64) and Vietnam (1.39) are on the other side. Special kinds of tea, such as Darjeeling tea, give value to the product and help India gain a significant market share. In comparison to Indonesia (6.39), Singapore (9.22), and Vietnam (5.55), India has a lower RCA in spices (5.55). (7.89). With a value of 1.48 billion dollars in spice exports, Malaysia has emerged as a rival. The biggest impediments to India's spice export prospects are food safety concerns and rising domestic demand. Indian rice, being the world's second-largest producer and exporter, has a higher RCA value of 11.66 than Thailand's (9.55) and Vietnam's (7.84). When compared to its ASEAN counterparts, India

exports more non-basmati rice, which is cheaper. Except in Malaysia and Singapore, the popularity of basmati rice has not grown much in ASEAN markets.

Indonesia, Thailand, and Vietnam are India's main rivals when it comes to exporting marine items, but curiously, the ASEAN is the greatest customer of Indian marine products that have export potential. With an RCA index score of 3.77, Indian oil cake meal is one of the most sought-after commodities on the global market. Sugar exports from India have not been constant as a result of strong domestic consumption, whereas Thailand and the Philippines have demonstrated competitiveness with respective index values of 2.04 and 1.11. Currently, India's raw sugar production is not cost-competitive, and the country's export policy is restricted. India, which exports unprocessed tobacco, has just the Philippines to contend with (1.83). A strong demand for Indian tobacco among ASEAN countries further increases its export potential. As a result, it looks that India's prospects in the ASEAN market are bright.

(A) Determinants of India's Agricultural Trade with ASEAN

ASEAN and India share a strong economic relationship as Asian neighbors, as well as a commitment to regional peace and security. Many factors that may be analyzed using the gravity model may have contributed to the growth in trade during the previous 10 years (Table 3). As a result, a 1% rise in the GDP of India and ASEAN countries will boost bilateral trade by 1.45 and 1.38 percent, respectively. When the bilateral distance increases, commerce decreases by 1.78 percent. Bilateral trade was unaffected by shared border factors. As Gul and Yasin (2011) found, it is not required to have a shared border to enhance commerce between the nations. Burma and India share a 1643 km border in the country's north-eastern region. The border commerce between Myanmar and India, despite Myanmar being India's fourth trading partner, is dismal due to inadequate infrastructure and difficult terrain, as well as an insecure commercial climate, as was also highlighted in an earlier study.

TABLE 3. RESULTS OF GRAVITY MODEL EVALUATION

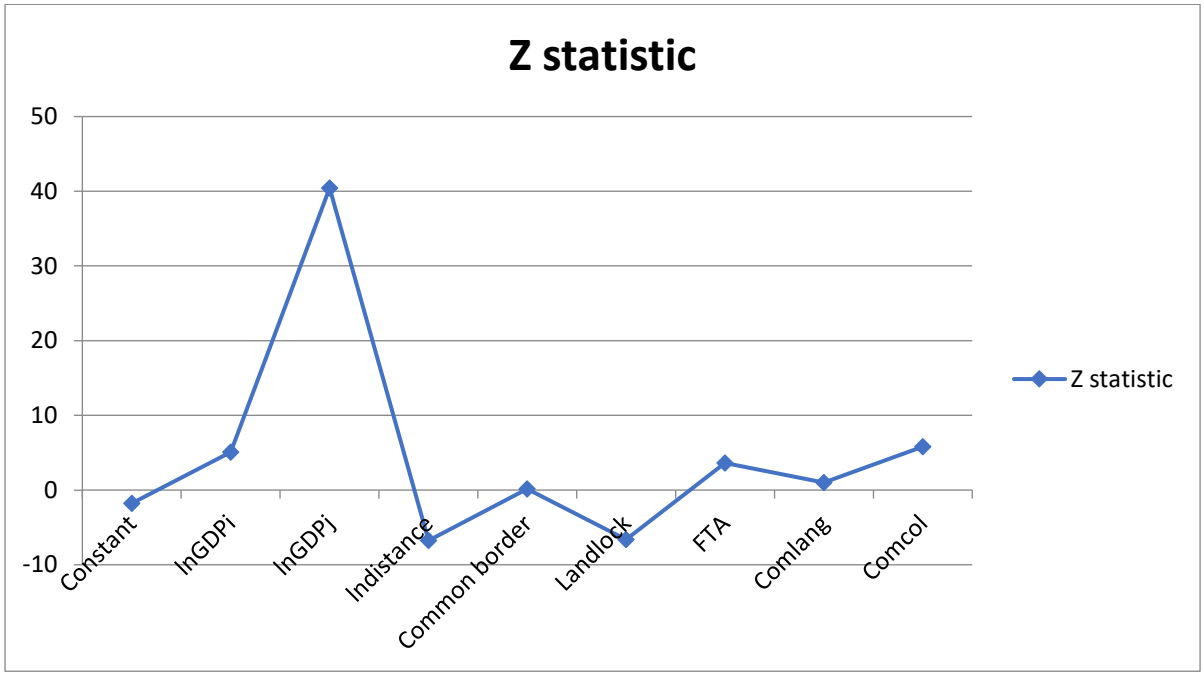
Dependent variable: ln(total agricultural trade)

Variable	Coefficient	Z statistic
Constant	-7.85	-1.79
	(4.40)	
lnGDPi	1.45*** (0.27)	5.09
lnGDPj	1.38*** (0.32)	40.44
lndistance	-1.78*** (0.24)	-6.76
Common border	0.04	0.13
	(0.35)	

Landlock	-2.76*** (0.44)	-6.63
FTA	0.44*** (0.11)	3.62
Comlang	0.17	1.01
	(0.15)	
Comcol	0.97*** (0.16)	5.81
Wald chi2(8)	3960.34	
Prob > chi^2	0.0000	

Notes: *** p<0.01 & The figures within the parentheses are standard errors

FIGURE 4: Z STATISTIC VALUE FOR INDEPENDENT VARIABLES OF PROPOSED GRAVITY MODEL



According to Dey and Majumdar, the real commerce between India and Myanmar is difficult to measure due to trading via a third nation like Singapore and the lack of trade statistics . Due to Myanmar's vital position as a gateway to other areas of the region, it is important to keep an eye on the operations and development of commercial infrastructure. A landlocked country's only commerce with India is quite low, therefore it's clear that landlocked has a negative but considerable impact on trade. There was a beneficial impact on bilateral trade from the colonial connection with the ASEAN countries, whereas the shared language had little effect. For both economies, it is a good indicator that the FTA variable has a statistically significant effect on the bilateral trade of 0.44 per cent**.**

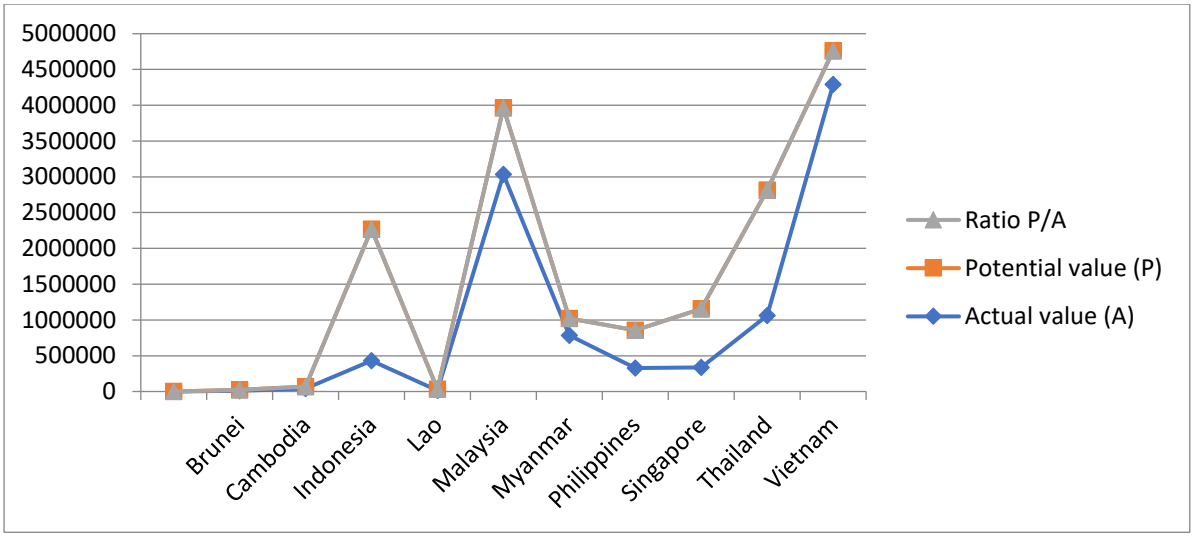
(B) India's Agricultural Trade Potential with ASEAN Countries

After estimating the gravity model, we calculated the trade potential by dividing the projected trade potential (P) by the actual trade (A) for the year 2019. (Table 4). If the value of P/ A is greater than one, the inference is that commerce with the relevant country may expand. The results reveal that Cambodia, Indonesia, Malaysia, Myanmar, and Vietnam have already surpassed their trading potential. This is also a signal to build strong commercial relations with these nations in order to gain foreign money, which will aid India's attempts to integrate the Eastern region's economy. Brunei and Laos, which are low-income economies in the ASEAN area and are in the process of transformation, have untapped trade potential. As seen in Table 1, Brunei and Laos have the lowest agricultural trade shares with India when compared to other nations; their geographic characteristics, as well as their economic backwardness, may constitute trade barriers. Because they already have a strong business climate with India, India still has chances to develop agricultural trade with the Philippines, Singapore, and Thailand.

Table 4. India's trade potential with ASEAN countriesfor the year 2019

Country	Actual value (A) ('000 $)	Potential value (P) ('000 $)	Ratio P/A
Brunei	10794.38	13011.44	1.21
Cambodia	42584.02	24405.33	0.54
Indonesia	431101.95	1838114.22	0.45
Lao	15151.77	19138.44	1.43
Malaysia	3034576.44	931704.04	0.36
Myanmar	785345.55	234233.05	0.36
Philippines	326587.34	527777.44	1.69
Singapore	337444.33	816345.55	2.98
Thailand	1062678.05	1752594.57	1.59
Vietnam	4292567.55	468595.89	0.19

Figure 5: India's trade potential with ASEAN countriesfor the year 2019



IV. CONCLUSIONS

Through bilateral trade, India and ASEAN nations have maintained a long-term economic connection that will continue after the signing of the free trade agreement. In comparison to global commerce, agricultural trade between the two sides is growing, with ASEAN serving as a key supplier of agricultural goods to India in Asia. As seen by the considerably greater comparative advantage score in cotton, rice, tea, and oil cake meals, India has significant export potential in the area. Bilateral commerce has been determined to be promising, according to gravity model estimations, but inefficiency in border trade with Myanmar is the primary problem that has to be addressed. Myanmar is the gateway to other ASEAN countries, thus India should speed up the infrastructure development process to encourage border commerce. Export development measures should be adopted to promote trade with ASEAN's less-developed nations, such as Brunei and Laos, because these countries have untapped potential. India can continue to increase its commerce with the Philippines, Singapore, and Thailand while keeping up with the rest of the ASEAN countries. Because the promise under the free trade agreement has yet to be fulfilled by 2020, there is still room for both partners to explore their possibilities. To boost trade and deeper integration within the area, initiatives such as trade facilitation, improved manufacturing and export competitiveness, and speedier conclusion of bilateral discussions are required.

It is essential for policymakers to have a solid understanding of market phenomena in order to make the STE model more efficient and profitable. The country as a whole would benefit. It has benefitted a large number of private actors. The STEs are a team of individuals that collaborate to solve issues. They are now impeding international trade.

The study's empirical goal was to see if using a STE exporter had a beneficial influence on farm trade from 2009 to 2019 and if using a STE importer had a negative impact. Furthermore, the marginal impact of the STE's monopolistic position was investigated. The classification of STEs and their dominant status are based on WTO notification documents in all circumstances. A modified conventional gravity model was employed to ensure econometrically robust results. This model was built using a

combination of pooled OLS and fixed effects, the latter of which included both time and country pair fixed effects. The data used was a large panel data set of bilateral agricultural trade that spanned the years 2009 to 2019. To identify possible variations in STEs aims and outcomes, the model was tested on a variety of subsamples representing nations at various levels of development and in various income groups.

The existence of a STE exporter had a substantial and favourable influence on the value and volume of agro commodity exports from the nation with the STE exporter in almost all scenarios. The notion that a STE was granted monopoly status has little impact on agricultural commodity trading. Importers of STEs had a negligible influence.

There are two concerns expressed by this research investigation. First, do state trading firms that export agricultural commodities have an impact on the value or volume of such exports? The solution to this issue will be determined by determining if any gains or declines in exports are due to the existence of STEs or are due to a variety of other variables that encourage trade. Second, do state-trading importers have an impact on other importers or restrict market access for agricultural commodities trade exports?

As it has been established in the literature, the gravity model employed in this study works well for assessing policy consequences over time. The gravity model has been demonstrated to have solid theoretical foundations and to be an effective tool for policy analysis. While the gravity model has been most commonly used to represent aggregate commerce, it was modified to model agricultural commodity trading across numerous nations. The link between STEs and agro commodity trading was established using econometric estimate and testing. The findings refer to the average impact of STEs during the chosen time period. When making conclusions regarding the effect of individual organizations, it is important to examine the analysis of specific STEs.

The use of STE imports would have been expected to have a detrimental impact on commerce in theory. STE importers are frequently accused of having a protectionist mandate for the home market and therefore obstructing imports. The model shows that when the two importing STE variables are combined, the influence is positive, but only the usage of monopoly STE importers has a meaningful influence. By adding the monopoly factors in a combined F test with an estimated F stat of 0.378, no extra explanatory power is discovered.

One reason for the little impact of STE imports might be because some of the nations that use them are developing countries. In this circumstance, these organisations are more akin to trade facilitators. The findings show that when a STE importer has monopoly status, they have a positive and substantial impact, possibly indicating that the good impact of certain monopoly STE importers outweighs the negative impact (if any) of others. However, endogeneity is shown when the estimations are very important and have the inverse relation than predicted. Because of the massive imports, it's possible that the importer has established a STE monopoly.

If a number of variables in the regression are very significant yet the R-square is low, the model may be missing information. It's worth noting that aggregate trade gravity models are known for having high R^2 values. With a single commodity as the trade variable, this is not always the case. The standard gravity model variables may not be as efficient in describing the variance around agricultural commodity trade observations as aggregate trade, despite considerable modification in terms of variable choice. One clear limitation of the POLS for our current study topic is that it is unlikely to completely capture some of the distinctiveness of trading pair interactions. If that's the case, the POLS specification isn't always the best estimate. The presence of missing country pair effects can be used to determine whether the POLS has a flaw. If this is discovered to be an issue, a fixed effect will be applied.

If this is true then the expected outcome ($E(X_{ijt})$) would be the same from both the POLS estimates ($ß_{POLS}$) and the fixed effects estimates ($ß_{FE}$).

Consider that $E(Xijt) = (ß_{POLS} + \partial) = (ßFE)$ where δ is the fixed effect

Ho: δ is =0 (pooled model – i.e. the restricted model)

Ha: δ is ≠0 (fixed effects – i.e. the unrestricted model)

Reject H_0 if F (Calculated)>F (Critical)

Because F (Calculated) > F (Critical), the outcome of this test indicates that we do not accept the null and that the POLS standard is not the best option. This indicates that the limited model's coefficient estimates differ from the unconstrained model's coefficient estimations. As a result, the presence of fixed effects must be factored into the calculation. This is frequently necessary in the examination of huge panels of data. Rose (2004) used a two-way fixed effect model, although this was not the right specification. The gravity model, as a result, necessitates a country specification that is calculated with even more rigorous estimations than the preceding POLS result. impact that cannot be changed

Although the following findings are intriguing for the initial idea, it is unclear how broadly the findings apply to all trading pairs. The nations in the sample are quite diverse, ranging from extremely low-income or emerging economies to extremely wealthy and prosperous ones. As previously stated, it is partly in this context that the dispute about the different aims of STEs and the relevance of exclusive rights conferred by monopoly status has erupted. The fear of having a STE monopolist in a developed export economy has been attributed to the protection it may give for domestic manufacturers. The similar issue arises when a monopolist STE importer dominates the developed country import market. The STE concern or goal in the case of a developing nation is centred on the local customer. As a result, the entire sample for the above study was divided into sub samples based on economic circumstances in the import nation, export country, or both.

Regional trade agreements appear to be more effective in OECD countries, and the WTO has had a positive impact in general, if insignificant in some situations. Because the STE has a monopoly, adding a STE exporter boosts export volume while requiring no extra quantities to be delivered. STE imports

have no effect on the volume of exports. As a consequence, the same conclusion concerning the influence of STEs on the volume of agricultural commodity trading has been reached.

- To examine policy variables further, a balanced panel was created and a particular estimate technique was used.
- To examine policy variables further, a balanced panel was created and a particular estimate technique was used.
- To evaluate specific cross sections of the data, several estimate techniques are used.
- Other alternative policy variable specifications are being tested. Incorporating and estimating the influence of time-invariant variables using a method.

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