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Trade Costs Between India and ASEAN: A Gravity Framework

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Abstract

International trade is the crux of an economy's growth and development. As much as trade volume plays a significant role in explaining the economic growth, trade costs also play an important role in determining the growth of a country. The study attempts to observe the challenges between India and ASEAN and also determine various factors that contribute to trade costs. The findings show that trade volumes of India with its ASEAN trading partners have increased over the years. Along with this, the trade gap between India with ASEAN countries has also been increasing. The econometric results show that the variable considered for analysis explains that shipping connectivity and distance are the major factors contributing to trade costs.

Keywords: Trade costs, free trade agreement, tariff and non-tariff barriers

Trade Costs Between India and ASEAN: A Gravity Framework

Introduction

Trade costs act as an essential factor for international trade to take place, and determines the trends and pattern of bi and multilateral trade and investment. The difference between the final price paid by the consumer and the cost of the traded commodity or service is referred to as trade costs. In globalized world, there are many factors that influence trade costs - geographical distance, protection policies like import tariffs, poor governance and infrastructure, etc. However, many countries in the recent past have lowered or removed tariffs but still trade costs in terms of non-tariff barrier remains high. The roots of non-tariff barriers come from the geography and history of each country. Shephard (2015) describes that policy frameworks of each country also has a significant contribution in trade costs. He explains these policy measures in three types, namely, (a) policies at the border (tariffs, custom duty) (b) policies between the border (transportation) (c) policies behind the border (product standards, regulations).

Higher trade costs can isolate the country from the global market. Due to these costs the production and trade pattern becomes distorted and countries cannot take full advantage of economic gains derived from specialization. As a result, trade flows are negatively impacted and thereby affecting the economic welfare and development of the country. World Trade Organization (WTO) (2015).

Anderson and Van Wincoop (2004) reviewed the existing literature on trade costs on goods and estimated that in an advanced economy trade cost is as high as 170 per cent. According to these researchers, international trade is affected not only by bilateral trade barriers but also by multilateral trade barriers, namely the multilateral resistance, the resistance or barriers to trade that each country encounters with all its trading partners.

Kee et al. (2009) mentions that developing countries generally have higher trade costs than developed countries in both – tariffs and non-tariff barriers. Therefore, from the aspect of trade policy and global competitiveness, trade costs are a crucial factor in showcasing an economy's ability to participate in global or regional trade. It is also necessary to recognize the sources of these trade costs, and especially the sort of strategies which should be adopted to diminish trade costs, for instance, trade facilitation, governance and bureaucracy systems, etc.

India is a developing economy and has taken several trade facilitation measures to increase its integration with the global economy. Regional studies pertaining to Asia suggests that India's inclusion in trade organizations will prove to be advantageous for Asia in meeting the continent's

challenges and in improving its influence in world dealings. Asher and Sen (2005). Greenaway, McGowan and Milner (2009) mentions that with the decreasing trends in tariffs rates, studies are now concentrating on the impact of non-tariffs barriers across the trading partners. The Indian government is realizing the importance of non-tariffs barriers such as infrastructural facilities, connectivity, institutional framework, etc. on trade. Lack of these facilities have restricted the Indian firms to emerge successfully in exporting the goods and services to other economies.

Thus, it becomes important to study the trade facilitations agreements in the view of trade costs as higher trade costs will lower the trade between the two countries. The current study aims to analyze the trade relation between India and Association of Southeast Asian Nations (ASEAN)[1] by measuring the trade costs. India became a sectoral dialogue partner of ASEAN in the year 1992 after it saw a relative increase in trade with ASEAN countries to the rest of the world. These countries entered into Free Trade Agreement (FTA) under the initial framework of ASEAN-India Free Trade Area (AIFTA) and gradually progressed to signing various other FTAs such as Regional Comprehensive Economic Partnership (RCEP) and then increasing the market accessibility by introducing new FTA partners like China, Japan, South Korea, Australia and New Zealand. A key characteristic of FTA is that they are intended to reduce the trade barriers between the two trading partners and enhancing the trade volume but over the period trade gap between India and ASEAN has been steadily increasing. Economic Times (2018). Hence, this study investigates the factors responsible for the creation these trade gaps by analyzing the trade costs in goods market using gravity framework between India and ASEAN + 3 countries[2].

The paper is bifurcated into two parts – (a) understanding the challenges faced by India and ASEAN in trade and thus contributing to trade costs (b) applying gravity model to measure the factors or variables that contribute to trade costs.

This paper only considers factors affecting the trade costs from the perspective of India. Therefore, the study focuses on total trade and do not provide sectoral analysis. This can be considered for further detailed study in these areas. The scope of this study can also be expanded to ASEAN + 6 region.

[1] ASEAN = Indonesia, Malaysia, Philippines, Singapore, Thailand, Brunei, Vietnam, Laos, Myanmar and Cambodia.
[2] ASEAN+3 = ASEAN + Japan, China and South Korea.

Background

Free Trade Agreement between India and ASEAN is the result of common interests of the both parties to augment their economic growth. They signed the goods FTA in 2009 and the agreement came into effect in 2010. Total trade volume between India and ASEAN in the year 2015-16 was 65 billion US Dollars which was around 10 per cent of India's total trade. Majority of the exports and imports of India are directed towards Singapore, Malaysia, Thailand, Indonesia and Vietnam. ASEAN Trade Statistics (2015).

Currently, India has strong market potential for ASEAN because of India's rapid-growth markets, low-cost of labor, and natural resource reserves. India received FDI inflows majorly in real estate sector, constituting 27.9 per cent of total FDI inflows from ASEAN, followed by coal, oil and natural gas sector. However, India's outward FDI is primarily directed towards coal, oil and natural gas sector and metals sector, followed by services sectors such as software and IT services, financial services as well as business services. ASEAN Trade Statistics (2015)

Correspondingly, India witnessed a surge in trade deficit with ASEAN from USD 0.5 billion in 2005-06 to USD 14.6 billion in 2015-16. With respect to market share, India's aggregate share of imports from ASEAN increased from 7.3 per cent in 2005-06 to 10.5 per cent in 2015-16 and share of aggregate exports to ASEAN tumbled from 10.1 per cent to 9.6 per cent over the same period. ASEAN Trade Statistics (2015).

ASSOCHAM (2016), reports that India has the highest trade deficit with Indonesia - USD 14.6 billion followed by Malaysia - USD 5.4 billion and then Thailand - USD 2.5 billion in 2015 whereas, it enjoys trade surplus with Vietnam - USD 2.7 billion, Philippines - USD 826 million and Singapore - USD 416 million for the year 2015. A recent article published by Economic Times (2018) mentions that India's trade deficit with China and South Korea rose up to USD 63.12 billion and USD 11.96 billion respectively in 2017-18 from USD 51.11 billion and USD 8.34 billion respectively in 2016-17. On the other hand, India's trade deficit with Lao, Brunei and Cambodia dipped in 2017-18.

TABLE 1 : India's Trade Deficit with ASEAN countries ($ Million)

Year	India Export	India Import	India Share of Total Exports	India Share of Total Imports	Trade balance	Total trade
I	II	III	IV	V	(II-III)	(II+III)
2006-07	12.61	18.11	10	9.7	-5.5	30.72
2007-08	16.41	22.67	10.1	9	-6.26	39.08
2008-09	19.14	26.2	10.3	8.6	-7.06	45.34
2009-10	18.11	25.8	10.1	8.9	-7.69	43.91
2010-11	25.63	30.61	10.3	8.3	-4.98	56.24
2011-12	36.74	42.16	12	8.6	-5.42	78.9
2012-13	33	42.87	11	8.7	-9.87	75.87
2013-14	33.13	41.28	10.5	9.2	-8.15	74.41
2014-15	31.81	44.71	10.2	10	-12.9	76.52
2015-16	25.2	39.84	9.6	10.5	-14.64	65.04

Source: Ministry of Commerce (2016)

It is observed that imports have risen from ASEAN countries significantly while exports to ASEAN does not show a similar pattern of increment. Lack of standardization in tariff reduction rules, lack of product standardization, absence of proper governance structure of customs are some of the major factors responsible for increased trade gaps between India and ASEAN. For instance, the tariff reduction structure under the AIFTA agreement mentions that tariffs over 4000 merchandize should be removed by 2016 and tariffs on sensitive products will be reduced to 50 per cent and 25 per cent according to their respective category by 2019. Major resistance for lowering tariffs comes from Indonesia in ASEAN. Indonesia has committed to reduce tariffs only on 50 per cent of its items. EXIM Bank (2018). Therefore, these differences cause hurdles to the growth and development for all the trading partners.

Trade Cost between India and ASEAN: Literature Review

a) Tariff Barrier:

India and ASEAN's trade and economic relation have huge potential however, it requires more effort in terms of building connectivity and institutional linkages with the ASEAN counterpart. Francis (2011) found that India's international trade is shifting towards developing countries from developed countries of Asia. He observed that the difference in the composition of export baskets, in which labor intensive and natural resource based sectors are losing. The author also mentions about significant growth in bilateral trade in several sectors, owing to rapid increase in regional as well as global integration, particularly with ASEAN. India's aggregate trade balance with ASEAN is significantly negative. Tariff elimination/reduction structure in goods proposed under AIFTA framework involves high tariff reductions way beyond the levels of Most Favored Nations (MFN). As a consequence, farmers in India will face tremendous competition due to increased imports. Increase in agricultural production and distribution can be attributed to growing dominance of Multinational Corporation. The factors responsible for this are technological change, trade liberalization and foreign investment. The author argues that the Small and Medium Enterprises (SMEs) of India will not benefit much from this FTA but countries like Thailand, Indonesia and Malaysia will gain from the AIFTA.

Tariff levels in India is higher as compared to ASEAN member nations. India's average agricultural tariff rate is above 34 per cent as compared to 13 per cent for that of ASEAN. Similarly, MFN tariffs for manufacturing products is also greater than 10 per cent as against 7.5 per cent for ASEAN. Though, India and ASEAN countries focus on liberalizing tariffs in order to increase trade between two partners, it is also important to highlight that tariff liberalization is necessary but not sufficient for boosting trade and economic integration. Helble et al. (2007).

Although, many researchers were in the favor of trade liberalization through tariff reduction, Joseph (2009) opposed the view of tariff reduction brought in by the FTAs as this will increment imports, especially in plantation sector, resulting in decline of prices and henceforth, diminishing the security of domestic manufacturers. In his analysis, it was found that the imports are affected not only by the reduction in tariff but also by exchange rate, productivity and market structures. The author observed the relation between the tariff rate and import from one perspective and import and domestic price on the other. It was found that, for former, the bulk part of import of plantation sector was through duty free route for processing and export and latter is driven by world demand and supply conditions and not by quantity of imports. Thus, the import is the basic

raw material required for planation processing industry in India and hence, can be the foreign exchange earner. There is a need to bridge the efficiency gap in this sector and growing prominence of FTA will enable to achieve this.

Investigating the tariff structure, Pal and Dasgupta (2009) concluded that India has very little to gain in market share from India-ASEAN FTA. Given the fact that, ASEAN have higher export to GDP ratio and also India's commitment for major tariff reduction, shows that this FTA will provide ASEAN better access to Indian markets and not vice versa. Therefore, this might trigger trade deficit of India with ASEAN. This agreement would also lead to increase in competition for domestic players since ASEAN countries are strong exporters of products like light manufacturing and agricultural items. However, India can gain through this FTAs by way economies scale achieved through increased market access. Singapore and Thailand are the two major countries, among ASEAN countries, where India accounts for 60 per cent of its export. Since, India has a bilateral trade agreement with Myanmar, India-ASEAN FTA will provide access to remaining countries, like, Indonesia, Philippines, Malaysia and Vietnam. The area where the Indian industry is likely to gain from the ASEAN-India FTA is cheaper availability of intermediate goods from the ASEAN region. For some companies operating in India and ASEAN countries, this agreement will lead to improvement in their intra-firm production networks.

The scope of negative list was the main dispute in the Trade In Goods (TIG) understanding. After the initial hesitation, India included only five items in the sensitive list, that is, tea, coffee, pepper, crude palm oil and refined palm oil, Pal and Dasgupta (2008) recognized that India has maintained a defensive stance during the negotiations because India faces a substantially large trade deficit with ASEAN and further decline in tariff will elevate the deficit unless there is boost in export.

The major drawback faced by India in trading with ASEAN countries is that different sets of countries have different timeline and percentages for reduction in tariffs. Least developed countries such as Vietnam, Myanmar, Cambodia, Indonesia and Lao impose high import tariffs and restriction measures which makes trade costlier to India. For instance, in the case of coffee, tea, spices, vegetable fats and natural rubber, the number of tariff lines under the exclusion/sensitive lists was higher than the number of tariff lines that were offered full duty concessions; implying a limited reduction in tariffs from already existing levels. Therefore, and despite India's increasing trade deficit with ASEAN, tariff reductions under AIFTA have not had a significant effect on import trends.

According to the multi country survey report presented by Asian Development Bank, there are various reasons which restricts economies to participate in FTAs, one of the major reason is that the businesses consider Rules of Origin (RoO) as restrictive, followed by lack of information, administrative costs, non-tariff measures and small preference margins. Kawai (2011). The rationale behind (RoO) was to prevent trade deflection but due to its complexity it increases the costs of doing business along with placing high burden on origin certifying institutions. Rajan and Sen (2004).

There are few drawbacks regarding the Rules of Origin (RoO) under the AIFTA framework, such as India is relatively flexible in applying the RoO which encourages the entry of non-member country products into India through preferential route. With respect to the Rules of Origin, India has customarily determined these in two categories, they are - change in tariff heading and value addition. Although, only 35 per cent of value addition is limited in the Rules of Origin criteria, but this dilution is crucial with respect to the above mentioned two criteria's and also the 40 per cent value addition rule which is currently existing for India-Singapore and India-Thailand Free Trade Agreements is also significant. Furthermore, revision of tariff classification norm shows that rules under 6-digit classification in the ASEAN is less restrictive as compared to 4-digit level tariff classification. ASSOCHAM (2016)

b) Non-Tariff Barrier:

Analyzing the non- tariff measures, through the survey based on exporters perception Saqib and Taneja (2005) identified that 32.6 per cent faced some kind of barrier for the firms trading with less than 20 million of exports. Their case study further indicated that exporters face difficulties to meet multiple product standards of each country of ASEAN. Further, packaging, labelling, language, mark-up and environmental considerations create even more barriers. Other barriers are also faced by the exporters like lack of subsidies by domestic government and under invoicing demand by Sri Lankan importers.

One of the major barriers for movement of skilled professionals is lack of recognition of qualifications among nations. To avoid this problem, Pal and Dasgupta (2008) suggests having Mutual Recognition Agreements among trading partners. Thus the Indo-ASEAN trade in goods agreement may not be beneficial for India in the short run but it can be thought of as a part of a long-term strategy to improve India's economic and strategic presence in the neighborhood. Negotiations between India and ASEAN on services trade liberalization have just started and it

will be up to the Indian negotiators to ensure that the lack of tangible benefits accruing to India in the goods sector is offset through an agreement on trade in services.

The United Nations Conference on Trade and Development **(UNCTAD)** created an Integrated Trade Intelligence Portal (I-TIP) that focuses on database which provides information on non-tariff barriers in the ASEAN region. According to I-TIP records, there are approximately 6000 non-tariff barrier. The results of I-TIP suggest majority of the existing non-tariff barrier are classified into two group:

1) Sanitary and Phytosanitary (SPS)

2) Technical Barriers to Trade (TBT)

Majority of the 'Sanitary and Phytosanitary' measure are applied on food and drink items and 'Technical Barriers to Trade' measures are applied on chemical products and allied industries. The rationale behind the prohibition on import on some of these products may be valid, for instance, public safety or national security. But these restrictive measures can also be misused, particularly for protecting the domestic players.

Integrated Trade Intelligence Portal's results suggest that the country which has the maximum number of SPS and TBT measures among ASEAN countries is Thailand. For instance, SPS measures in Thailand is 20 times SPS measures adopted by Cambodia and Lao PDR and approximately 15 times TBT measures as Myanmar. Thus, the differences cause hurdles to the growth of CLMV countries, who are least developed ASEAN member nations. Furthermore, Thailand, on global level also imposes about 40 per cent of worlds existing measure and 20 per cent of TBT measures. Rapid increase of non-tariff barriers has negative effect on inter as well as intra – ASEAN trade (ATC, 2016).

Mohanty (2007) analyzed the then on-going negotiations between India and ASEAN to establish a Free Trade Agreement in merchandize and gradually removing barriers, both tariff and non-tariff. He recognized that primary reason for hindrance is the list of items covered under sensitive track. However, India's approach to these restrictions are more flexible as compared to ASEAN. India maintains a uniform list of 489 products as negative items, which constitute less than 5 per cent of the ASEAN exports to India. However, each country of ASEAN maintains a separate list of negative items. Further India has offered to reduce customs duty on crude palm oil and refined palm oil by 2018, but Malaysia (largest producer of Palm Oil in the world) and Indonesia are pressurizing to further reduce it. Similar is the case for pepper and black tea. These

are highly sensitive items and if India will reduce the tariffs further, on the items, then internally lot of political issues will pop up. The author noted that India has been comparatively more flexible and more receptive as compared to ASEAN. ASEAN must also show more appreciation and flexibility so as to close the deal soon (which has now been done).

Another aspect of trade cost explains that a country's cross-membership in multiple FTAs can lead to contradictions in obligations and can also create confusion for investors about rules, obligations and incentives corresponding to the partners. Thus, wider gaps in trade and investment may be observed between rich and less well-off economies because of power asymmetry. Rajan and Sen (2004).

The tariffs in India is comparatively higher than tariffs in ASEAN countries, there is less scope of gains from trade for India in the goods agreement. Tariff rate in India for agricultural sector is in excess of 34 per cent as compared to 13 per cent for ASEAN. Similarly, ASEAN has 7.5 per cent MFN tariffs rates for manufacturing which is lower as compared to MFN tariffs prevalent in India' manufacturing goods, which is in excess of 10 per cent. Currently, around 75 per cent of Indian goods are available to the ASEAN market at duty-free tariff rates. On the contrary, tariffs imposed by ASEAN countries remained low for quite a while and the modifications made to generate benefits from Free Trade Agreements will not be so significant to India. The scope of gain for India from the FTA is smaller for merchandise trade as compared to trade in services and investment. Undoubtedly, the scope for trade in services and investment opportunities is huge and globally, India ranks in top ten exporting services to all the countries and ASEAN constitutes a great share in importing services from India. ASSOCHAM (2016).

Karmakar (2005) explained the potential in service market in ASEAN. ASEAN being a net importer of services has service imports of 2.8 times more than India's total service exports. Also, the demand for services in ASEAN region is rising due to the shortage of skilled labor at cheaper cost in service sector, resulting in ASEAN countries rise in trade deficits in international services trades (unlike favorable net merchandise trade balance). Author analysis therefore suggested that given that ASEAN countries and India are relatively closed to Foreign Service providers (even the member countries) and that they have limited commitments under GATS, they can make use of the service market potential in the region. Negotiations should be based on market access and other consular cooperation. The countries can make use of India's low cost skilled professionals, especially focusing the areas like education, IT, telecommunications, etc. to maintain aggregate

economic growth in the Free Trade Area. India will benefit from CECA agreement as this will provide opportunities to access ASEAN markets.

Theoretical Framework for Trade Cost: Gravity Model

Trade costs constitutes a significant part in describing the trends of bilateral trade and investment between two trading partners along with the distribution of production on the basis of geography. The main focus of empirical literature on theory of international trade has been on utilizing the gravity model to distinguish specific components, for example, distance between geographies.

An attempt to estimate the trade flows empirically in international trade was originated by Tinbergen (1962) by employing gravity equation. The reference of this equation has been taken from Newton's Law of Gravity, stating that, trade between two countries is directly proportional to their economic sizes and inversely proportional to the distance between them. Here, distance between the two trading partners acts as a proxy variable for measuring trade costs.

Anderson (1979), underpins the gravity literature with the estimation of bilateral trade flows by applying expenditure systems of the countries. Assuming, distance and borders as proxy variables for trade costs, McCallum (1995) developed a gravity equation demonstrating the trade patterns between U.S and Canada, and found the resulting Border Puzzle which showed that trade between Canadian provinces is factor 22 times the trade between U.S and Canada. Results of the border puzzle were proved incorrect by Anderson and Van Wincoop (2003) by establishing trade costs, exogenously to the model. They opined that multilateral trade barrier along with bilateral trade barrier affects the trade flows between the trading partners.

Anderson and Van Wincoop (2004), attempted to bring together the literature on different factors affecting trade costs. Their approach included review of various papers and adding the trade costs, such as tariffs, transportation costs, and domestic distribution costs. Their results showed 170 per cent of trade costs for developed nations, comprising of 55 per cent wholesale and retail distribution costs, 44 per cent cross-border trade barriers, 21 per cent transportation costs.

Typically, academic literature pertaining to trade costs focusses on the fundamental factors which affects these costs and then estimate the overall measure of the said trade costs, by summing them together (Arvis, Yann, Ben, Chorthip and Anasuya, 2015).

Arvis et al. (2015) argues that the development in existing literature is rather weak, with each paper, managing best case scenario a subset of variables assumes to impact trade costs. This approach has two disadvantages:

1. It does not help in providing overall estimate of the trade costs level between the trading partners, which frequently used in theoretical models of trade.
2. Incorporation of few variables and not others gives rise to omitted variable bias, to the extent that the variables included in the model have a correlation with trade costs.

To cope with these challenges Novy (2013) used "top-down" approach to estimate trade costs by analyzing the trends of trade across economies. Similar to Head and Ries (2001), Novy (2013) expressed his views differently for measuring the trade costs, he determines comprehensive way to compute the trade costs which has been constructed by observing the trade pattern, which eliminates the singular approach ways as done in his previous work. This approach was straightforward, and depends on traditional gravity model similar to the applied theory of trade. His analysis shows that factors contributing to the trade costs along with the traditional trade costs sources, for example, tariffs, majorly external factors, for instance, geographical distance and digital connectivity and an array of trade policy components are impacting the pattern of trade and trade costs.

This study focuses on the Novy (2008) "Gravity Redux" approach. The model is not fully derived in the paper because its derivation and structure is explained in detail in Novy (2008). Novy's derivation of trade costs is derived from Anderson and van Wincoop (2003) model, where each country produces different goods, consumers enjoy vast assortment of products – utility maximization, identical preferences across countries and have constant elasticity of substitution.

The principal component in this analysis was that Anderson and van Wincoop (2003) present bilateral trade costs exogenously. When the good is delivered from country i to j, transportation costs and other various trade costs between the trading partners add up the trade cost of each unit of good delivered. Therefore, prices of good differs in each country, that is, if pi = net supply price of the good originating from country i, then $p_{ij} = p_i t_{ij}$ is the cost of the good in country j, where $t_{ij} \geq 1$ is the gross bilateral trade cost factor, that is one plus tariff equivalent. According to this framework, Anderson and van Wincoop (2003) determined a micro-founded gravity equation with trade costs:

$$X_{ij} = \frac{y_i y_j}{y^W} \left(\frac{t_{ij}}{\pi_i P_j}\right)^{(1-\sigma)} \quad (1)$$

Here, X_{ij} represents nominal exports from country i to j, y_i is nominal income of country i and y^W is world income defined as $y^W = \sum_j y_j$. σ > 1 is the elasticity of substitution across goods. π_i and P_j are country i's and country j's price indices. The gravity equation infers that all things being constant, rich countries trade with each other. Bilateral trade declines in the presence of bilateral trade costs t_{ij} since they have to be calculated against π_i and P_j. These indices are referred as multilateral resistance variable since it involves trade costs with all other trading partners and can be referred as average trade costs. π_i is outward multilateral resistance and P_j is inward multilateral resistance variable.

Anderson and van Wincoop (2003) assume that bilateral trade costs are a function of:

(a) border barrier
(b) Geographical distance.

The above mentioned is represented as "$tij = bijd\mathrm{K}ij$" , where b_{ij} is a border-related indicator variable, d_{ij} is bilateral distance and K is the distance elasticity.

Novy specifies that bilateral trade barrier not only affect inter-national but also affect intra-national trade. This can be seen formally by using gravity equation (1):

$$\pi_i P_i = \left(\frac{\frac{x_{ii}}{y_i}}{\frac{y_i}{y^W}}\right)^{\frac{1}{1-\sigma}} t_{ii} \quad (2)$$

The above equation explains that for a given trade cost (t_{ii}), the change in the multilateral resistance over time is easy to measure as it does not depend on time-invariant trade cost proxies such as distance.

Equation (1) contains the product of outward multilateral resistance of one country and inward multilateral resistance of another country. If equation (1) is multiplied for the trade flows in the opposite direction, i.e.X_{ji}, bidirectional gravity equation is obtained containing both countries outward and inward multilateral resistance variable.

$$X_{ij}X_{ji} = \left(\frac{y_i y_j}{y^W}\right)^2 \left(\frac{t_{ij}t_{ji}}{\pi_i P_i \pi_j P_j}\right)^{(1-\sigma)} \quad (3)$$

Substituting the values of $\pi_i P_i$ from eq (2) and rearranging yields, we get

$$\left(\frac{t_{ij}t_{ji}}{t_{ii}t_{jj}}\right) = \left(\frac{x_{ii}x_{jj}}{x_{ij}x_{ji}}\right)^{\left(\frac{1}{\sigma-1}\right)} \quad (4)$$

As shipping costs between i and j can be asymmetric, i.e. $(t_{ij}) \neq (t_{ji})$ and as domestic trade costs can differ across countries, i.e. $(t_{ii}) \neq (t_{jj})$, it is useful to take the geometric mean of the barriers in both directions.

Therefore, resulting trade cost measure (T_{ij}):

$$T_{ij} = \left(\frac{t_{ij}t_{ji}}{t_{ii}t_{jj}}\right)^{\frac{1}{2}} - 1 = \left(\frac{x_{ii}x_{jj}}{x_{ij}x_{ji}}\right)^{\frac{1}{2}(\sigma-1)} - 1 \quad (5)$$

By deducting one we get an expression for tariff equivalent. T_{ij} is the trade cost relative to domestic trade cost $t_{ii}t_{jj}$. The rationale behind T_{ij} is straightforward. If bilateral trade flows $x_{ij}x_{ji}$ increase relative to domestic trade flows$x_{ii}x_{jj}$, it must have become easier for the two countries to trade with each other relative to trading domestically. This is captured by a decrease in T_{ij}, and vice versa. The measure thus captures trade costs in an indirect way by inferring them from observable trade flows. Since these trade flows vary over time, trade costs T_{ij} can be computed not only for cross-sectional data but also for time series and panel data. This is an advantage over the procedure adopted by Anderson and van Wincoop (2003) who only use cross-sectional data. It is important to stress that bilateral barriers might be asymmetric $(t_{ij}) \neq (t_{ji})$ and that bilateral trade flows might be unbalanced $x_{ij} \neq x_{ji}$. T_{ij} indicates the geometric average of relative bilateral trade barriers. Arvis et al. (2015)

The Novy (2013) methodology has been applied in a number of published papers, though none has the geographical, sectoral, or temporal scope of the present one. Jacks et al. (2008) use it to track trade costs in the first wave of globalization (1870-1914) using data on GDP and total trade flows for major economies. More recently, the same authors have applied the same technique to examine the role of changes in trade costs as drivers of trade booms and busts in major economies over the long term Jacks et al. (2011).

Similarly, Chen and Novy (2011) analyze trade costs among European countries using detailed trade and production data that distinguish between sectors, and in addition provide an

econometric decomposition of trade costs that highlights the role played by factors such as distance, non-tariff measures, and membership in particular European initiatives, such as the Schengen Agreement.

Although we deal only with merchandise trade, Miroudot et al. (2013) apply the same methodology to services trade; however, their sample is much more restricted than ours, due to the general lack of availability of high quality data on services trade.

The technique portrayed above gives inferred estimates of bilateral trade costs, t_{ij}. With respect to policy decision-making, it will be useful to sum up trade costs across partner countries in order to create a sole reliable approach to calculate trade costs for each country. To construct such a measure, Arvis et al. (2015), augments the Novy (2013) approach by aggregating equation (5) which gives us a symmetric gravity equation considering trade in both directions set to be equal to the geometric average of actual trade.

Data Treatment and Methodology:

This section provides insights about dataset undertaken and methodology to examine the determinants of trade costs. The study uses panel data and the data are obtained for 12 countries in total – India, being the reporter country and following are the partner countries - Brunei Darussalam, China, Indonesia, Japan, Cambodia, South Korea (Korea, Rep.), Lao PDR, Malaysia, Singapore, Thailand and Vietnam.

Limitations:

ASEAN is an amalgamation of developed, developing and less developed countries, the paper faces data constraints especially for less developed countries. Countries like Myanmar and Philippines have been dropped due to lack data availability for majority of the variables considered for analysis. Similarly, the study is limited to 10 years. This study considers only total goods traded for the analysis and thus, do not provide any detailed sectoral analysis.

Based on the above discussion, the following table provides information about the data, definition of the variable, time period and source taken for analysis in this study.

TABLE 2: Variable: Source, Definition and Time

VARIABLE	DEFINITION	YEAR	SOURCE
TRADE COSTS	Geometric average trade costs in country i and j	2006-2015	UNESCAP
LINER SHIPPING CONNECTIVITY INDEX (LSCI)	Geometric average of country i's and j's score on Liner Shipping Connectivity Index	2006-2015	UNCTAD
ENTRY COSTS	Geometric average of the cost of starting a business in country i and j	2006-2015	World Bank - World Development Indicators
TARIFFS	Weighted mean based on applied rated weighted by the product import shares corresponding to each partner country. Data are classified using the HS codes at the six- or eight-digit level.	2006-2015	World Bank - World Development Indicators
NOMINAL EXCHANGE RATE	Geometric average of the nominal exchange rate of country i and j	2006-2015	World Bank - World Development Indicators
GDP per capita	Geometric average of Gross Domestic Product per capita (PPP basis, constant terms) in country i and j	2006-2015	World Bank - World Development Indicators
DISTANCE	Weighted average distance between the country i and j	2006-2015	CEPII

Hypothesis

The ASEAN - India Free Trade Agreement is expected to reduce the trade costs and thus support in increasing the trade flow between the two trading partners. Therefore, on the basis of this the hypothesis for this study is presented as:

Set I:

H_0 = The Free Trade Agreement between India and ASEAN has helped in reducing trade costs.

Set II:

H_0 = Distance between India and ASEAN affect trade costs

H_0 = Entry Costs affect trade costs

H_0 = Liner Shipping Connectivity Index affect trade costs

H_0 = Tariffs affect trade costs.

H_0 = Nominal Exchange Rate affect trade costs

H_0 = GDP per capita affect trade costs

Gravity Model Specification:

The following equation is used to determine the determinants of trade costs level between India and ASEAN. This section follow the approach proposed by Chen and Novy (2011) by the way of regression analysis to investigate the factors contributing to bilateral trade costs. The focus here is on the factors that are principally the sources of international, contrary to domestic trade costs. It is important to note that the interpretation of the dependent variable – trade costs, in the regression analysis is the ratio of international to domestic trade costs and also as is the case in Chen and Novy (2011), the interpretation of the independent variables is in terms of their effect on dependent variable – trade costs.

Following is the gravity equation:

$$logt_{ij} = \beta_0 + \beta_1 \log(entrycosts_{ij}) + \beta_2 \log(LSCI_{ij}) + \beta_3 \log(tariffs_{ij}) + \beta_4 \log(ner_{ij}) + \beta_5 \log(gdppc_{ij}) + \beta_6 \log(dist_{ij}) + \varepsilon_{ij}$$

where, t_{ij} is the geometric trade costs between the two trading partners and also acting as dependent variable, $\log(entrycosts_{ij})$ are the cost of doing business taken from World Bank's

Doing Business project, acting as a proxy variable for the cost of market entry, $\log(LSCI_{ij})$ represents as a proxy for international transport connectivity, $\log(tariffs_{ij})$ are the weighted mean applied rates between the exporting and importing countries explaining that higher the tariffs higher the trade costs, $\log(ner_{ij})$ are the nominal exchange rates of two countries involved in bilateral trade representing the country's competitiveness, $\log(gdppc_{ij})$ are the per capita GDP explain the country's level of development and welfare and $\log(dist_{ij})$ is the weighted average of distance between two trading countries.

Results

The empirical analysis involves running the panel fixed effect model then panel random effect model and finally Hausman specification test which will help to determine to choose between random or fixed effect models. Hausman test conducted in this paper showed the value of Prob > chi2 greater than 0.05 (0.7747), which means we will accept random effect model for analysis.

TABLE 3: Random Effect Model Results

Independent Variable	Coefficient Values	P-Value
Constant	0.31	0.00***
Distance (dij)	0.44	0.10*
Entry Costs (entry costsij)	0.22	0.21
Liner Shipping Connectivity Index (lsciij)	-0.91	0.01***
Tariffs (tariffsij)	0.12	0.00***
Nominal Exchange rate (nerij)	-0.06	0.01***
GDP per capita (gdppcij)	-0.37	0.04**
R^2 = 0.82		
*, ** and *** represents the coefficient is significant at 1 per cent, 5 per cent and 10 per cent level of significance respectively.		

Source: Authors' calculations

The first variable under consideration is distance whose coefficient is positive at 0.44, indicating that 1 per cent increase in distance will result in 44 per cent increase in trade costs. Geographic distance represents transportation costs between the two trading partners. This is in line with the main idea of gravity model theory; as distance between the two trading partner increases the trade costs also increase. Hence, distance plays a crucial role in the international trade. Though the ASEAN countries has close proximity to India, still there exists significant percentage of trade costs. The major factors attributed to this is lack of infrastructure and proper road, rail and sea connectivity which are as proxy variables for distance.

The second variable is 'entry costs' which has the expected positive coefficient estimate and insignificant, though fixed costs of market entry contribute to aggregate trade costs, in this scenario it is insignificant. Since the entry cost is represented by cost to start a business in India, and according to the definition put forward by the World Bank "This indicator measures the procedures, time, cost and paid-in minimum capital required for a small or medium-size limited liability company to start up and formally operate.", shows that India has quite favorable environment supporting in set up of multinational business.

The Liner Shipping Connectivity Index (LSCI) shows negative parameters that are significant at 1 per cent and the coefficient value is -0.90 which is quite high showing a strong correlation with the trade costs. LSCI variable is a proxy for international transport connectivity. In an international trade shipping has a huge impact on the trade volume as well as on trade costs, better the port connectivity better the trade volume and lesser the trade cost. Since the conditions of port infrastructure in India is non-supportive to the trade it contributes 90 per cent to the trade costs. In order to facilitate trade and economic growth, India should focus on improving port infrastructure.

The tariff variable is also positively correlated to the trade costs. In other perspective, tariff is a result of country's protection measures. If the levels of tariffs is more in a country more will be the trade cost. Therefore, trade costs aggravate if India and its partner countries apply the tariff rates. Though India has almost eliminated the tariffs for ASEAN member nations except for the goods included under highly sensitive track.

Nominal exchange rate variable included in the study is defined in terms of local currency units to the U.S dollar. The nominal exchange rate depicts country's competitiveness and has a negative correlation with the trade costs. So, viewing the exchange rate from India's perspective,

it signifies that if exchange rate rises it will result in depreciation in Indian currency. Because of depreciation in Indian currency, export will increase and imports may fall. Thus, aggregate trade volume rises, which also shows that trade costs are decreasing.

The distance variable is positively affecting the trade costs which mean that India is facing high trade cots from its far located trading partners.

The final variable considered under observation is per capita GDP. It shows an inverse relationship indicating that the 1 per cent increase in GDP per capita will decrease the trade cost by 3.6 per cent. Finally, the value of overall R^2 is 0.82 which means that above mentioned factors of trade costs are explaining almost 80 per cent of the calculated trade costs and remaining 20 per cent still remains unexplained. Hence, other variables such as logistics performance, transport costs (freight or ice-berg), are also contributing to trade costs in India.

Conclusion

This study dealt with the determinants of trade cost as well as assessing the challenges faced by India and ASEAN countries over the years thereby contributing to trade costs. The estimates based on the empirical results showed that trade costs levels are majorly significant. The sector covered in this analysis was total trade which includes agriculture, manufacturing and service sector. Thus, giving a broader picture about the factors affecting the trade cost.

From the policy perspective, the results were significant as they indicated that level of decline of trade costs. In ASEAN countries, low-income countries face high levels of trade cost, such as Cambodia, Lao PDR, Myanmar and Vietnam. India can take advantage of low-labor costs of production by investing in these countries and thus increasing the market access. Though India and ASEAN have taken many initiatives to improve their trade relations such as agreements in goods and services for tariff reduction or elimination, there still remains a long path to achieve full integration.

The discussions and empirical results depicts clearly that there are more non – tariff barriers than tariff barriers between India and ASEAN + 3 countries. The free movement of goods, services, labor, capital and investment within ASEAN Economic Community (AEC) will be beneficial for countries like Cambodia, Laos, Myanmar, Vietnam and since India is not a part of AEC, this will hamper India’s prospects with respect to the movement of skilled labors. It is a given fact that ASEAN is a hub for Global Value Chains (GVC). India has immense opportunity

to gain by increasing its participation in these value chain, however, India's current approach towards Free Trade Agreement with ASEAN will erase the opportunity of integrating with value chains.

One of the major obstacles in India's trade is the lack of proper infrastructure and proper connectivity. Connectivity in terms of rail, road, seaports, and highways. Political conflicts and financial problems cause delay in completing these projects which are adding up to the trade costs. Furthermore, India has a comparative advantage in service sector, particularly in software service, however, service sector in ASEAN remains largely protected. Due to which India in unable to explore the ASEAN market in the service sector.

Though the level of reduction of trade costs has been low since the process of elimination of tariffs as well as other non-tariff barriers prevalent in these regions have been designed in phased manner. Various measures has been taken by India in order to reduce the non-tariff barriers such as transport connectivity, cost of doing business, infrastructure. For instance, for port development India has introduced "Sagarmala Project" which looks into port development and modification. Given the fact that port infrastructure is the crux of international trade and also the current state of India's port system requires attention, it becomes important that the Government implement the Sagarmala project properly as this will support in increasing India's trade volume.

The payoffs for ASEAN from FTA with India are substantial. Benefits from the India-ASEAN FTA with respect to economic growth, fall in prices, larger variety of products available, increased efficiency of firms and more of foreign investments substantiates this fact. However, the FTAs also negatively impact some industries. Redistribution of wealth to those industries will help. Besides, India can leverage its historical and cultural ties with the region for further expansion of economic and political ties. Apart from the economic benefits, what the countries need to look for, in regional associations, is social and human development also. These aspects will ensure a wider and more sustainable development for every country.

Therefore, in line with the econometric results trade costs has significant impact on trade volumes and in these cases the country's should focus on boosting trade facilitation performance to facilitate economic growth.

References

Anderson, J., and P. Neary. 2003. “The Mercantilist Index of Trade Policy.” International Economic Review, 44(2): 627-649.

Anderson, J., and E. Van Wincoop. 2003. “Gravity with Gravitas: A Solution to the Border Puzzle.” American Economic Review, 93(1): 170-192.

Anderson, J., and E. Van Wincoop. 2004. “Trade Costs.” Journal of Economic Literature, 42(3): 691-751.

Asher, M. G., and Sen, R. (2005). India-East Asia integration: a win-win for Asia.Economic and Political Weekly, 3932-3940.

Batra, A. (2007). Asian Economic Integration: ASEAN+ 3+ 1 or ASEAN+ 1 ASEAN Economic Bulletin, 181-204.

Chanda, R., andGopalan, S. (2009). Understanding India’s regional initiatives with East and Southeast Asia. Asian-Pacifc Economic Literature, 23(1), 66-78.

Chen, N., and D. Novy. 2011. “Gravity, Trade Integration, and Heterogeneity across Industries.” Journal of International Economics, 85(2): 206-221.

Francis, S. (2011). A Sectoral Impact Analysis of the ASEAN-India Free Trade Agreement. Economic and Political Weekly, 46(2), 46-55.

Greenaway, David, D. McGowan and Chris Milner (2009) Country Trade Costs, Comparative Advantage and the Pattern of Trade: Multi-Country and Product Panel Evidence, GEP Research Paper: 2009/96, GEP Leverhulme Centre, University of Nottingham.

Ghoshal, B. (2009). India, Southeast Asia and the FTA: Strengthening Economic Integration. Institute of Peace and Conflict Studies, Issue Brief, (114).

Head, K., and J. Ries. 2001. “Increasing Returns Versus National Production Differentiation as an Explanation for the Pattern of US-Canada Trade.” American Economic Review, 91(4): 858- 876

Helble, M., Ben Shepherd and J.S. Wilson (2007) Transparency, Trade Costs, and Regional Integration in the Asia Pacific, World Bank Policy Research Paper no: 4401, World Bank.

Jacks, D., C. Meissner, and D. Novy. 2008. “Trade Costs 1870-2000.” American Economic Review, 98(2), 529-534.

Jacks, D., C. Meissner, and D. Novy. 2011. “Trade Booms, Trade Busts, and Trade Costs.” Journal of International Economics, 83(2): 185-201

Joseph, K. J. (2009). ASEAN-India pact and plantations: Realities of the myths. Economic and Political Weekly, 14-18.

Kawai, M., andWignaraja, G. (2010). Free trade agreements in East Asia: a way toward trade liberalization. ADB Briefs, 1.

Karmakar, S. (2005). India–ASEAN Cooperation in Services–An Overview. Indian Council for Research on International Economic Relations (ICRIER), Working Paper, (176).

Kee, H.-L., A. Nicita, and M. Olarreaga. 2009. “Estimating Trade Restrictiveness Indices.” Economic Journal, 119(534): 172-199.

Miroudot, S., J. Sauvage, and B. Shepherd. 2013. “Measuring the Costs of International Trade in Services.” World Trade Review, 12(4): 719-735.

Mohanty, S. (2007). India-ASEAN FTA Negotiations: The Way Forward. India and World articles, 2434.

Novy, D. 2013. “Gravity Redux: Measuring International Trade Costs with Panel Data.” Economic Inquiry, 51(1): 101-121.

Pal, P., and Dasgupta, M. (2008). Does a Free trade agreement with aSean make Sense?. Economic and Political Weekly, 8-12.

Pal, P., and Dasgupta, M. (2009). The ASEAN-India free trade agreement: an assessment. Economic and Political Weekly, 11-15.

Rajan, R. S., and Sen, R. (2004, July). The New Wave of FTAs in Asia: with particular reference to ASEAN, China and India. In a

High-level Conference on Asia’s Economic Cooperation and Integration at the Asian Development Bank (pp. 1-2).

Saqib, M., andTaneja, N. (2005). Non-tariff barriers and India’s exports: the case of ASEAN and Sri Lanka (No. 165). Indian Council for Research on International Economic Relations, New Delhi, India.

Shepherd, Ben and J.S. Wilson (2008) Trade Facilitation in ASEAN Member Countries: Measuring Progress and Assessing Priorities, World Bank Policy Research Working Paper: 4615, World Bank.

The Role of Non-tariff measures in achieving AEC blueprint 2025, Asian Trade Centre (ATC), Policy Brief, Number 16-03, April,2016.