EXAMINING THE ROLE OF NON-TARIFF BARRIERS IN TRADE REGULATION AND TRADE FLOWS: INSIGHTS FROM THE INDIA-ASEAN FREE TRADE AGREEMENT

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ABSTRACT

Within the framework of the India-ASEAN Free Trade Agreement, this study examines the effects of non-tariff trade barriers on trade flows between India and ASEAN. The study assesses the effect of non-tariff measures on trade flows between India and ASEAN members using the Frequency Index (FI), Coverage Ratio (CR), and Prevalence Ratio (PR). Our findings show that import and export volumes are negatively impacted by non-tariff measures. The paper also emphasizes how this effect varies in strength across various industries and nations, showing that certain sectors and nations have more severe repercussions than others. Decision-makers seeking to strengthen economic links between India and ASEAN must consider the implications of these findings, emphasizing the importance of this research.

Keywords: *ASEAN, FTA, India, Non-Tariff Barriers.*

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1. INTRODUCTION

International trade is important for economic development as countries exchange goods and services through the foundation of Absolute and Comparative Advantage theories of trade. Many countries are using trade restrictions by creating tariffs, quotas, and other non-tariff measures which alters the volume and pattern of trade flows and impacts competitiveness. Regional trade agreements (RTAs) are one of the new popular methods to decrease trade barriers and foster free trade among its members. This trend applies globally, and India is also heavily involved in RTAs, for example, India-ASEAN Free Trade Agreement (FTA) signed in 2009 aims to increase trade by reducing tariffs on several goods and services between India and ASEAN countries. However, as previous studies have cited, manifested into operational or non-tariff measures of trade, are an ongoing issue against trade, tariff reduction, and trade policies.

This study employs panel data covering the years 2000 to 2021 to analyze the influence of non-tariff trade barriers on trade flows between India and ASEAN in the context of India-ASEAN FTA. The evidence suggests that coordinated actions to reduce non-tariff trade barriers are necessary for trade flows between the two partner countries, with considerable implications for policy officials interested in enhancing economic ties between India and ASEAN.

2. LITERATURE REVIEW

Trade theorists have put forward numerous theoretical explanations regarding the potential effects of regionalism and bilateralism on global trade flows. These theories elucidate the manner in which regional trade blocs impact the welfare of their members as well as that of the global community. Additionally, they explain the impact of regionalism on the liberalization of international trade. Mainstream trade theory advocates for open, transparent, and undistorted trade flows of goods and services under a regime based on World Trade Organisation (WTO) norms, with the case for a global trade bloc (i.e., world free trade) being based on this premise. The idea of regional integration was first articulated by Viner in his seminal essay "The Question of the Customs Union" published in 1950(Michaely, 1976). Subsequently, significant advancements in regional integration theory were developed (Lipsey, 1960). Economic theory postulates that the most ideal trading bloc is the one that generates the most trade, and this bloc is worldwide. This group of nations has the widest range of comparative advantages, offering the most potential for new trade and the least potential for trade divergence (Schott, 1991). In this context, various studies have

been conducted to evaluate the impact of the India-ASEAN FTA (Jagdambe & Kannan, 2020; Nag & Sikdar, 2011; Sikdar, 2011; Veeramani & Saini, 2010).

After the Cold War, India introduced its Look East Policy as a crucial foreign policy strategy in 1991 to boost economic integration, improve security cooperation, and enhance political ties with Southeast Asian countries. This initiative represented a significant shift in India's perspective by acknowledging the strategic and economic importance of Southeast Asia in the country's national interests. The second phase of the policy, which began in 2003, centered on ASEAN and extended its scope beyond East Asia to include Australia. The latest phase moves beyond trade and concentrates on wider socioeconomic and military collaboration, political ties, and promoting physical connectivity via the development of transportation networks (Ahmed, 2009; Haokip, 2011).

India has identified ASEAN as its top trading partner and aims to strengthen its commercial relationship with them as part of its Act East Policy. In analyzing the trade pattern between India and ASEAN, (Banik & Kim, 2020) utilized appropriate methods for developing a comparative advantage in a particular market, such as the comparative advantage by country (CAC) and market comparative advantage (MCA). The findings reveal that India's significant ASEAN exports lack competitiveness, and governments use tariffs and non-tariff barriers to protect domestic industries, which hinders further economic integration. The research also points out sectors where India has the potential to compete but is constrained by local policy inefficiencies. Additionally, Indian businesses face challenges in joining the ASEAN supply chain network due to regional barriers, which is crucial for deeper economic integration. This study presents case reports on two sectors, aluminium vehicle components, and ready-made apparel. Despite these obstacles, India remains a significant market for businesses. The country's ability to provide affordable chemicals and reasonable medical products is advantageous, particularly during the COVID-19 pandemic (Banik & Kim, 2020).

Chakravarty & Chakrabarty (2014) applied the basic gravity model to analyze India's trade orientation between 1971 and 2010. They found that distance had a more significant impact on India's trade than the economic size of the trading partner. In a different study, the bilateral external relations of India with surrounding and landlocked nations were examined using Frankel's modified gravity model. To show the importance of size and distance in trade interactions, the research was expanded to include parameters like population and per capita income.

A literature study of India's relations with ASEAN was undertaken by (Khushboo Gupta & Shah, 2015), with an emphasis on evaluating the benefits and drawbacks of the India-ASEAN Free Trade Agreement (FTA). The authors concluded that India would see long-term economic growth, job creation, and improved productivity and competitiveness in the manufacturing sector with more liberalized trade policies. However, they also acknowledged that certain industries may face negative impacts due to increased trade openness. To identify the industries where India has a comparative advantage over ASEAN nations, (Renjini et al., 2017) conducted a study using the concept of comparative advantage and found that India has superior exporting competition in textile, grain, oilcake meals, and teas when compared to ASEAN nations.

According to (Nag & Sikdar, 2011), the full implementation of the FTA between India and ASEAN will bring significant benefits to India. ASEAN will have the advantage of supplying India's high and persistent import demand at lower prices than the average import prices in India. Ratna & Kallummal (2013) also suggest that there are enormous complementarities between ASEAN and India that have not been fully utilized yet, presenting opportunities for mutually beneficial economic cooperation. However, Veeramani and Saini's 2011 assessment of the RTA's effects on plantation commodities reveals that India's imports of agricultural goods from ASEAN countries may increase, resulting in a loss of tariff revenue but a rise in consumer surplus and net welfare. Meanwhile, Ahmed's (2009) investigation of India's ASEAN FTA sectoral dimensions reveals that the terms of trade for India deteriorated over time, with significant effects on processed food products, grain crops, textiles, and manufacturing, leading to an adverse impact on the trade balance.

A study conducted by (Ratna & Kallummal, 2013) found that the ASEAN-India FTA (AIFTA) had both positive and negative impacts on India's agricultural sector. This research focuses on the effects of AIFTA on the fishing, tea, and coffee industries. The study came to the conclusion that India's agriculture sector's internal inefficiencies reduced its ability to compete on the world market. Another study by Chandra (2012) used trade indices to analyse the trade structure between India and ASEAN and found that while India could purchase edible oil and other agricultural items, it could export food grains to smaller ASEAN nations. The importance of structural determinants in explaining India's exports to developed market countries was also underlined in research employing CMS analysis carried out by (Kapur, 1991), with the competitiveness effect at the disaggregated level highlighting the significance of India's export policy.

In recent years, policymakers and economists have grown increasingly concerned about non-tariff trade barriers (NTBs). Free trade agreements (FTAs) have multiplied, and tariffs have decreased, but NTBs continue to be a major roadblock to cross-border trade. When compared to tariff barriers, NTBs can cut commerce between nations by as much as 50%, claim Anderson and Van Wincoop (2004).

Several investigations have explored the impact of NTBs on international trade. As in SMR's analysis of NTBs on trade flows between the United States and Canada. They find that NTBs can significantly impede trade flows, particularly for the agricultural and foods sector. They also examined the impact of NTBs on trade with the United States and China in a similar fashion. They find that NTBs impede trade flows across a variety of industries, including equipment, chemicals, and agricultural (Cipollina & Demaria, 2020; Anderson & Yotov, 2016; Anson et al., 2005; J. Beghin et al., 2012; J. C. Beghin et al., 2015).

The India-ASEAN FTA launched in 2009 sought to promote trade among India and ASEAN member countries by reducing tariffs on numerous products and services. However, despite the reduction of tariffs, NTBs remain a major constraint to trade between India and the ASEAN countries.

The evidence supports that even amid FTAs, NTBs can have an important negative impact on trade flows. In order to explore the effects of NTBs on trade flows among India and the ASEAN member states, and to identify feasible corrective efforts, this case study is appealing as India and ASEAN have a FTA in place

3. INDIA-ASEAN TRADE RELATIONSHIP

The land and sea boundaries that ASEAN shares with India create a strong economic foundation for their collaboration. This partnership was significantly strengthened by the signing of the India-ASEAN Free Trade Agreement (FTA) on commodities in January 2010. Consequently, ASEAN became India's fourth-largest trading partner, and India held a similar position for ASEAN. The 'Act East Policy' implemented by India has led to numerous positive outcomes, which are quite evident. Additionally, India has been forging manufacturing linkages with nations like Singapore (digital and financial services), Thailand (vehicles), Malaysia (electronics), and others. Economic connections between ASEAN and India are anticipated to get even better as trade barriers are lowered. However, the number of non-tariff measures (NTMs) has increased, which is preventing

India and ASEAN from promoting their trade. Even if exports did rise, the gain lagged behind imports and led to a widening trade deficit. Figure 4.1 illustrates this tendency.

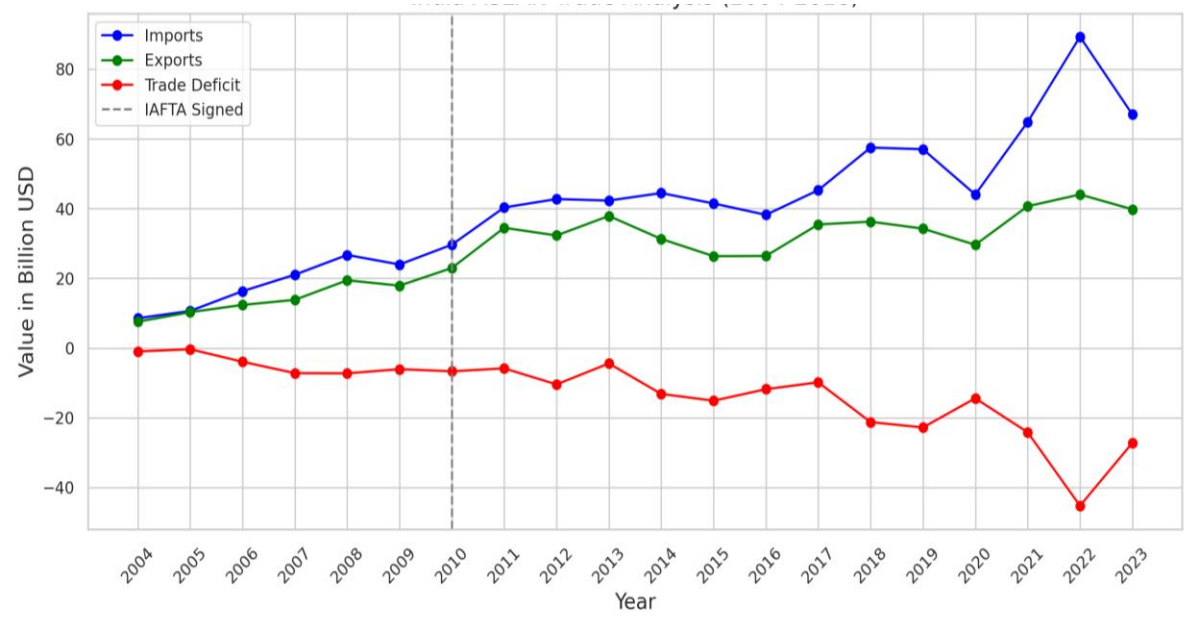

Figure 1: India-ASEAN International Trade from 2004 - 2023

Source: ITC Trade Map Database of United Nations

The India-ASEAN trade data from 2004 to 2023 reveals a significant increase in trade volume, with imports rising from 10 billion USD to 75 billion USD and exports growing from 10 billion USD to 40 billion USD, largely influenced by the 2010 India-ASEAN Free Trade Agreement (IAFTA). However, the trade deficit widened from near zero to -35 billion USD by 2023, driven by faster import growth (11% annually) compared to exports (7.5% annually), indicating India's growing reliance on ASEAN goods and limited export competitiveness. This imbalance aligns with challenges highlighted in the focus group discussion, such as regulatory barriers and standardization issues for Ayurvedic exports, which could target ASEAN markets to reduce the deficit. Strategic policy interventions, including renegotiating IAFTA terms and enhancing export capabilities, are essential to address this economic disparity and leverage post-COVID interest in traditional medicine.

The bar chart and accompanying table illustrate the average export, import, and trade deficit values between India and ASEAN before and after the India-ASEAN Free Trade Agreement (FTA), signed in 2010, using data from the World Integrated Trade Solution (WITS) and World Bank. Before the FTA, India's average imports from ASEAN were 17.9 billion USD, which surged to

50.3 billion USD after the FTA, marking a 32.4 billion USD increase. Exports also rose from 13.6 billion USD to 33.7 billion USD, an increase of 20.1 billion USD. However, the trade deficit widened significantly, growing from -4.3 billion USD to -16.6 billion USD, an increase of 12.3 billion USD. This data indicates that while the FTA substantially boosted trade volumes, it disproportionately favoured ASEAN exports to India, exacerbating the trade imbalance. The findings align with the focus group discussion's emphasis on export challenges, such as regulatory barriers, suggesting that India must address these to leverage opportunities like Ayurvedic exports and mitigate the growing deficit

	Before FTA	After FTA	Increase
Import	17.9	50.3	32.4
Export	13.6	33.7	20.1
Trade Deficit	-4.3	-16.6	-12.3

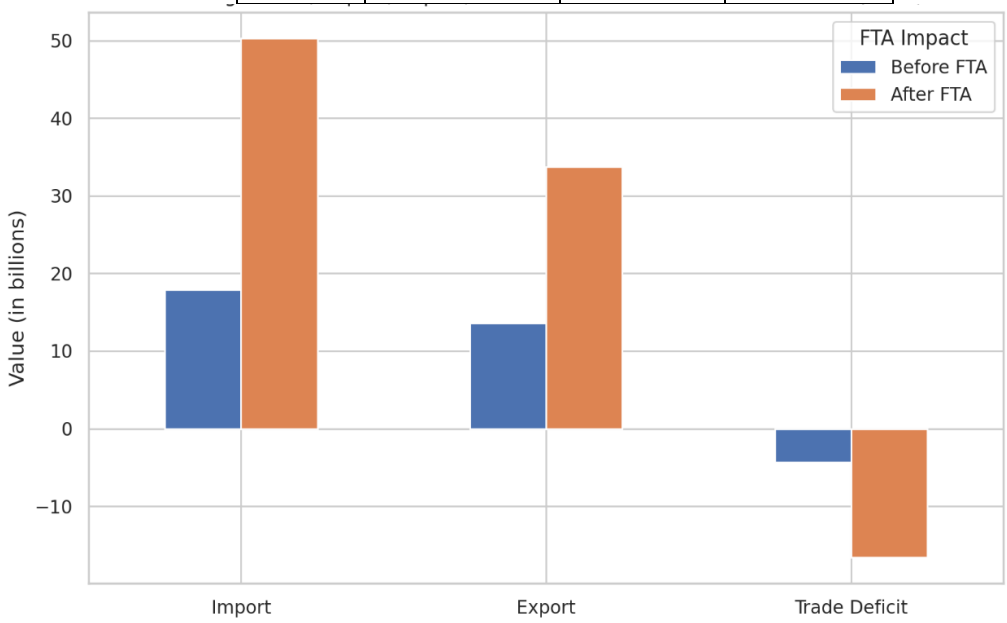

Figure 2: Average Export, Import and Trade Deficit-Before and After FTA

Source: ITC Trade Map Database of United Nations

Figure 3: ASEAN Imports from India and Rest of the World from 2001-2019

Sources: ITC Trade Map Database of United Nations

The import trends of ASEAN nations from India and the rest of the globe are shown in Figure 4.3. The graph clearly shows that, in comparison to trade with India, ASEAN countries' overall commerce and imports from the rest of the world have grown dramatically. India's trade intensity still behind several other economies, which have seen their trade with ASEAN rise significantly over the past two decades. In 2002, India's share in ASEAN's total export was a mere 2.6%, which increased to 6.5%, but remains minimal. Thus, there is a possibility of increasing India's share in ASEAN imports, which would reduce the trade deficit with ASEAN. Consequently, this study identifies the goods in which India has a competitive advantage and predicts the potential products in which India can increase its exports to ASEAN.

The fact that India's trade with ASEAN is still a meager $91 billion is evident. ASEAN is a significant trading bloc with a total GDP of nearly $2.95 trillion (Countryeconomy.com). China alone conducts an enormous two-way trade of $642 billion yearly, while the EU, the US, and other countries also have substantial trade relationships with ASEAN. India's inability to compete in the majority of product categories under the FTA with ASEAN resulted in a sharp rise in imports due to lower tariffs. Therefore, there is an urgent need for India to improve its performance in the area

of trade and commerce. Additionally, there are long-standing religious and cultural ties that both parties could strengthen for their mutual benefit.

4. Trends of NTMs imposed by ASEAN member Countries:

Currently, the interconnected economy on a global scale has led to considerable importance being placed on regional trade agreements as countries want to improve economic cooperation and create cooperative trade relationships. In this regard, the India-ASEAN Free Trade Agreement (FTA) will serve as an important milestone in the trade relationship between India and the Association of Southeast Asian Nations (ASEAN) comprising 10 member countries. The agreement has been implemented since its initial signing, with a key aim of maximizing trade liberalization, improving economic integration, and enhancing the flow of investment between two dynamic regions.

Yet, in the context of a changing global trade environment, non-tariff measures (NTMs) have emerged as an important factor affecting trade patterns and market access. Non-tariff measures is a broad term encompassing an array of policies and regulations that affect trade flows, including technical standards, sanitary and phytosanitary measures, licensing measures, customs procedures, etc. Assessing the impact of NTMs on the India-ASEAN Free Trade Agreement is essential to understand the challenges and opportunities presented by both sides.

Rank	Sum of NTM affected trade due to NTMs imposed by Asean Countries	Sum of Total Trade of Asean Countries	Percentage
Pre-Shipment Inspection And Other Formalities	1217051469	5756338221	21.14%
Technical Barriers To Trade	6150607992	36608494713	16.80%
Export-Related Measures	2771376745	17087788341	16.22%
Price-Control Measures, Including Additional Taxes And Charges	851000165	8157160606	10.43%
Finance Measures	180899420	1771273359	10.21%
Sanitary And Phytosanitary Measures	3088827671	34527799647	8.95%

Non-Automatic Licensing, Quotas, Prohibitions And Quantity-Control, Measures Other Than For Sps Or Tbt Reasons	1010889651	11381439449	8.88%
Measures Affecting Competition	87997246	1278274849	6.88%
Contingent Trade-Protective Measures	6292587	479780001	1.31%
Distribution Restrictions	2235109	702191442	0.32%
Grand Total	15367178056	117750540628	

Table 1: Sum of NTM affected trade due to NTMs imposed by ASEAN Countries
Source: The World Integrated Trade Solution (WITS), World Bank

The table 1 provided offers insights into the ranking and impact of various non-tariff measures (NTMs) imposed by ASEAN countries on intra-regional trade. Here is an analysis of the information presented:

The effects of non-tariff measures (NTMs) across ASEAN trade groups vary greatly. The pre-shipment inspection and formalities group had the largest impact among all NTMs, with a 21.14% impact on total trade. This group includes measures designed to follow trade regulations before goods are imported or exported and could facilitate trade improvement within the region if procedures are simplified and streamlined. The second significant NTM category affecting 16.80% of intra ASEAN trade is Technical Barriers to Trade (TBT). TBT members are measures that include standards and regulations that assist in protecting human health, safety issues, and environmental protection while providing for trade. The region could better facilitate trade for goods and services if the region was to tackle the issues surrounding TBTs by regulatory alignments and harmonization of standards. The third NTM impacting ASEAN trade were export-related NTMs which include licensing requirements, quotas, and prohibitions, imposing regulations and controls on the export of specific goods, accounting for a 16.22% impact on total ASEAN trade. If export NTMs were reduced, this would facilitate trade, provide more opportunities for trade growth, and open up new markets to trade-based businesses and enterprises. Price-control measures, which include additional taxes and fees, impact 10.43% of ASEAN trade. These measures intend to ensure pricing stability while promoting fair trading practices.

Nevertheless, it is essential to strike a balance between price intervention while securing market competitiveness in support of economic development. Measures related to finance, which include financial requirements such as a bank guarantee or an advance payment requirement, affect 10.21% of intra-ASEAN trade. Improved transparency, predictability and access to financial services can further enhance trade and provide seamless transaction pathways. Sanitary and Phytosanitary (SPS) measures which are related to protecting human, animal and plant health impact 8.95% of ASEAN trade. Compliance to SPS measures is necessary to ensure food safety and prevent the transmission of disease. Improvements in coordination, mutual recognition and harmonization of SPS measures could improve trade of agricultural and food products. Non-automatic licensing and quotas that restrict the import or export of goods for reasons other than SPS and TBT, account for 8.88% of ASEAN trade. Streamlining licensing, and eliminating unnecessary trade obstacles to facilitate trade and contribute to regional market integration is needed.

The influence of measures that affect competition, such as antitrust laws and policies against unfair competition, ranked eighth - accounting for only 6.88% of intra-ASEAN trade. Promoting fair competition and protecting intellectual property rights in order to secure a level playing field may facilitate trade and enhance investment. Trade measurements that can be used to protect trade (for example, safeguards and countervailing duties) is only valued at 1.31% of ASEAN trade. These measures are generally used to protect domestic industries from some form of specific trade impediments. Improving transparency, predictability, and compliance with international trading rules can deepen trust and confidence between trade partners. The last area, distribution restrictions, governs the distribution and sales of products in the region only represents 0.32% of all intra-ASEAN trade. Improvements in the distribution process through a reduction of unnecessary trade barriers would lead to more fluid intra-regional trade. In conclusion, consistent improvements on NTMs through regulatory harmonization, simplification, and cooperation could have major impacts on trade facilitation in ASEAN improving economic integration and increased sustainable growth.

Sector	Count of NTM Coverage ratio	Count of NTM Frequency ratio	Count of NTM affected product - count
All sectors	100.00%	15.27%	582
Animal	56.87%	8.68%	331
Chemicals	67.35%	10.28%	392
Food Products	63.75%	9.73%	371
Footwear	14.78%	2.26%	86
Fuels	23.20%	3.54%	135
Hides and Skins	13.40%	2.05%	78
Mach and Elec	24.40%	3.73%	142
Metals	24.57%	3.75%	143
Minerals	35.40%	5.40%	206
Miscellaneous	33.51%	5.12%	195
Plastic or Rubber	30.24%	4.62%	176
Stone and Glass	26.63%	4.07%	155
Textiles and Clothing	23.20%	3.54%	135
Transportation	20.79%	3.17%	121
Vegetable	64.26%	9.81%	374
Wood	32.65%	4.98%	190
Grand Total			3812

Table 2: Sector specific Non-Tariff Measures (NTMs) imposed by the ASEAN

Source: The World Integrated Trade Solution (WITS), World Bank

The study of non-tariff measures (NTMs) implemented by ASEAN nations across industry sectors demonstrates their high prevalence and impact on trade. The total coverage ratio shows that NTMs exist in all industry sectors while the frequency ratio shows that NTM impact an industry on average at 15.27%. This indicates that NTMs are vastly present across the ASEAN economies. Examining each sector, the animal sector shows an NTM frequency rate of 8.68% with a high coverage ratio of 56.87% signifying NTM coverage in a portion of the industry. The chemicals, food products and vegetable sectors show high coverage ratios in the range of 63.75% to 67.35%

indicating the extent of NTMs prevalence; however, they frequency ratios showing moderate NTM impact on trade in the range of 9.73% to 9.81%. The footwear, fuels, hides and skins, and textiles and clothing sectors all have low coverage and frequency ratios indicating the limitations of NTM coverage across trade in these industry sectors. Other industries including machinery and electronics, metals, minerals, miscellaneous goods, plastics and rubber, stone and glass, transportation and wood show varying coverage and frequency ratios demonstrating the extent of NTMs across individual industry sectors. Additionally, the count of NTM-affected products across ASEAN countries stands at 3,812, signifying that a substantial number of products are subject to NTMs, thereby influencing trade across multiple sectors.

NTM Type	NTM Description	Count of NTM affected product - count
B	Technical Barriers To Trade	1250
A	Sanitary And Phytosanitary Measures	1110
P	Export-Related Measures	651
F	Price-Control Measures, Including Additional Taxes And Charges	283
E	Non-Automatic Licensing, Quotas, Prohibitions And Quantity-Control, Measures Other Than For SPS Or TBT Reasons	257
C	Pre-Shipment Inspection And Other Formalities	174
G	Finance Measures	47
H	Measures Affecting Competition	26
J	Distribution Restrictions	10
D	Contingent Trade-Protective Measures	4

Table 3: Major classification of Non-Tariff Measures (NTMs) imposed by the ASEAN

Source: The World Integrated Trade Solution (WITS), World Bank

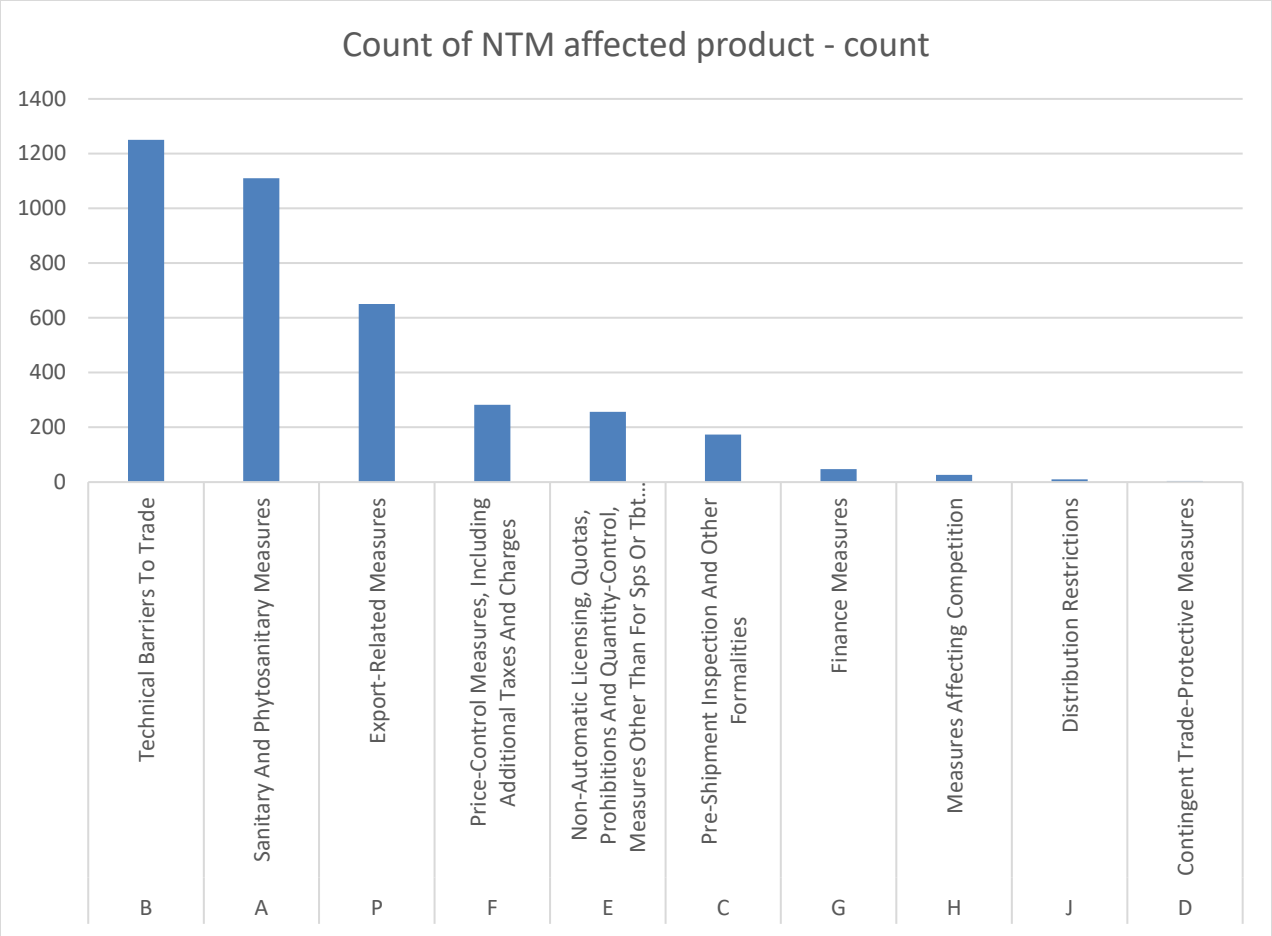

Figure 04: Count of NTM affected product

Source: The World Integrated Trade Solution (WITS), World Bank

The table above indicates the number of products impacted by each kind of non-tariff measure (NTM) with the corresponding terminology for those measures. The following is an evaluation of the data provided. The category for Technical Barriers to Trade NTMs (B), which include laws and standards on product quality and performance, impacts 1250 distinct commodities. Technical requirements, testing standards, and certification procedures, among others, are examples of these sorts of safety, quality, and standard compliance efforts. The Sanitary and Phytosanitary Measures (A) NTMs impact 1110 products, and deal with policies relating to sanitary or phytosanitary measures meant to protect public, animal, or plant health. These measures typically include regulations and inspections regarding plant protection, animal health, and food safety. Export-related measures (P) NTMs impact 651 products, including export licenses, export restrictions, and export prohibitions. These measures and regulations pertaining to the export of good control

trade effects, and protect domestic businesses. Finally, price-control measures (F) NTMs impact 283 goods, including greater taxes and fees.

These regulations, which often aim to support local businesses or stabilize local markets, are aimed at regulating prices and ensuring fair trade. 257 products are affected by non-automatic licencing, quotas, prohibitions or quantity control measures (E), except those that relate to sanitary and phytosanitary or technical barriers. They are regulatory policies associated with the importation of specific products, including import licences, import quotas, import prohibitions, and quantity control. 174 products are affected by Pre-Shipment Inspection and Other Formalities (C) NTMs, which are linked to pre-shipment inspection and formalities. These measures require goods to be inspected or certified before shipment to ensure compliance with quality standards, labeling requirements, or other regulations. 47 products are affected by Finance Measures (G) NTMs, which fall under the category of finance measures. Such regulations entail monetary requirements, such as bank guarantees, an upfront payment, or trade transaction documentation requirements. (H) Measures Affecting Competition NTMs impact the ability of 26 products to compete. Some examples include antitrust legislation, laws prohibiting unlawful commercial conduct, and regulations to promote ethical trade behavior and fair competition in the market. (J) Limits on distribution refers to laws or restrictions prohibiting or limiting the sale and distribution of specific products within ASEAN countries. Ten products are impacted by this group of NTMs. (D) Safeguards, countervailing duties, and other forms of trade protection are used in response to unfair trade practices or points of trade concern. Four products are impacted by this type of NTMs that are used to respond to specific trade-related concerns or protect domestic industries.

5. Research Methodology:

This investigation will rely on secondary data. First of all, to address the various challenges and issues in the India-ASEAN FTA on product-specific trade, supporting information was sourced from various studies and academic papers. This research has leveraged secondary data from a number of sources, like Trade Map, WITS, Export-Import Data bank, and India's Trade portal, to evaluate possible impacts of the India-ASEAN FTA on India and ASEAN Member. This research examined trade flows between India and ASEAN member countries by estimating the influence of non-tariff measures using the Frequency Index (FI), Coverage Ratio (CR), and Prevalence Ratio (PR) estimates. This work used "FI, CR and PR" models to reflect the prevalence of NTMs across

India and ASEAN. The FI, which simply evaluates the presence or absence of an NTM, generates a ratio of the commodities for which one or more NTMs are implemented. More specifically, the FI for NTMs imposed by country j is calculated as follow:

$$Fi = \left[\frac{\sum DiMi}{Mi}\right].100$$

The CR measures the incidence of NTMs on net exports by showing the ratio of net trade value with NTMs for the importing country. The HS 6-digit PR shows the average number of NTMs that are applied at each item level. The CR is a measure of the share of imports affected by NTMs. It demonstrates the importance of NTMs to imports overall. To obtain the coverage ratio (Cj) for importing country j.

$$Cj = \left[\frac{\sum DiVi}{\sum Vi}\right].100$$

Vi = value of imports in product j

The FI and CR, by contrast, do not accommodate the prospect of employing more than one type of NTM to the same product. In many instances, there are a range of regulatory measures applied to a single product. The prevalence ratio technique to utilize prevalence to compute prevalence of NTMs. The PR indicates the average number of NTMs affecting imports. It captures the actual prevalence when more than one NTM is used on a single product (not captured by FI and CR). The following illustrates how PR is calculated:

$$Pj = \left[\frac{\sum NiMi}{\sum Mi}\right]$$

Where, Ni = Count of NTMs

Mi = Dummy variable indicating whether there are imports of product i

6. Results and Discussion:

India -ASEAN FTA reduce the tariff barriers by lowering the import duties, therefore the trade between these India-ASEAN increased significantly. As discussed earlier, India's imports increase more than export. Therefore, in this section, we tried to learn the different non-tariff barriers imposed by ASEAN nations.

	Frequency Index	Coverage Ratio	Prevalence Score
Brunei	46%	60%	2.4

Cambodia	96%	98%	4.4
Indonesia	61%	70%	3.0
Laos	99%	99%	3.2
Malaysia	48%	63%	2.4
Myanmar	88%	88%	2.6
Philippines	84%	88%	4.0
Singapore	47%	60%	2.6
Thailand	28%	38%	2.1
Vietnam	89%	92%	5.0

Table 4: Non-tariff barriers imposed by ASEAN

Source: Authors calculation on the basis UNCTAD database

The non-tariff obstacles implemented by ASEAN economies are discussed in Table 4. The FI, CR, and PR were used to determine these non-tariff barriers. According to the Frequency index, Cambodia (96%), Laos (99%), Myanmar (88%), and Vietnam (89%), have placed the most non-tariff barriers on products originating in other countries. Secondly, the CR is used to compute the ratio of trading subjected to non-tariff measures for the importing nation. According to the CR, Cambodia (98%), Laos (99%), Myanmar (88%), the Philippines (88%), and Vietnam (92%) have the greatest share of commerce subjected to NTMs. Finally, if the country has more than one NTM, they are all implemented to the identical item and the PR is determined. The ASEAN prevalence score indicates that Vietnam, the Philippines, and Cambodia each have more than one NTM for items entering these markets.

7. CONCLUSION

In conclusion, our research offers important new insights into the impact of non-tariff barriers on trade flows between India and the Association of Southeast Asian Nations (ASEAN) under the India-ASEAN Free Trade Agreement. We are able to quantitatively estimate the effects of non-tariff measures on bilateral trade using applied metrics including, the Frequency Index (FI), Coverage Ratio (CR), and Prevalence Ratio (PR).Our findings clearly show that non-tariff trade barriers have an overall negative and significant impact on the flow of goods and services, resulting in substantial reductions in trade imports and exports between India and ASEAN member

countries. These non-tariff trade barriers prevent trade from occurring in an efficient manner, hindering the full advantages the free trade agreement offers, as well as stifling regional trade growth.

The investigation also shows that the extent of this effect varies across the different nations and sectors in question. While some countries and sectors appear to be negatively impacted at a greater level than others, some nations and sectors appear to be negatively impacted at a lesser degree. This variability illustrates the multifaceted nature of the problem and the requirement for solutions tailored to non-tariff measures according to individual sector- and country-specific attributes. The implications of our research for both trade negotiators and policymakers are considerable. There must be a sustained priority placed on addressing and eliminating non-tariff barriers to ensure that the benefits of the India-ASEAN Free Trade Agreement are maximized, and economic integration is enhanced. If the barriers to trade are addressed, both India and the ASEAN countries will be better positioned to reap the benefits of the many opportunities for development and wealth creation.

Coordination is necessary to converge non-tariff measures, enhance transparency, and facilitate smoother trade logistics to bolster India-ASEAN economic ties. In addressing these impediments to trade and investment, we need policymakers to be constructive and coordinated in their discussions about unnecessary and obstructive non-tariff measures. More specifically, our study serves as a call to action for policymakers to recognize the importance of non-tariff measures and their impact on trade flows between India and ASEAN. The elimination of these measures will enable us to realize the full gains from the India-ASEAN Free Trade Agreement, resulting in a win-win scenario that facilitates economic growth, enhances regional cooperation, and elevates both India and ASEAN as relevant players in the global economy.

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