Trade Intensity: An Empirical Assessment of India–ASEAN Economic Integration under the Act East Policy

PRARTHANA SAIKIA AND BANGALORE MORARJI*
Department of Social Sciences, School of Social Sciences and Languages,
Vellore Institute of Technology, Vellore,
Tamil Nadu,
INDIA

*Corresponding Author

Abstract: - This study analyses the trade relations between India and ASEAN (Association of Southeast Asian Nations) by adopting Foreign Direct Investment (FDI) inflows, Trade Intensity Indices (TII), Trade Openness Index (TOI), and connectivity projects to observe the long-term structural shift in trade engagement after the inauguration of the Act East Policy. The research period is taken between 2014-24 by obtaining secondary data through various government websites and reports. Applying proper empirical economics, the study finds that in 2024 the Trade Openness Indicator value increased to 107.52, signalling stronger engagement uniting India-ASEAN. A steady decline trajectory was highlighted in the Export Intensity Index. In the Import Intensity Index, Singapore topped with a value of 1.132 in 2024. The CAGR deteriorated from 25.67% during 2007-14 to 0.66% in 2015-21, indicating weak economic integration between the regions. It is observed that Myanmar's Export Intensity Index declined steeply and consistently. Also, three member countries display shallow Import Intensity Index declines: Thailand, Myanmar and Brunei. Infrastructure projects under the Act East Policy performed as a key player in easing trade and investment flows. The study probes to understand India's trade dependence on ASEAN. This study underscores the need for better trade integration between India and ASEAN, which can help India grow economically under the Policy. The study helps policymakers contribute pragmatic insights by scaling up the relaxations in tariffs and trade agreements, which can improve the economic engagement between India and ASEAN along with the development of Northeast India.

Key-Words: - India-ASEAN, Trade Openness Index, Trade Intensity, Foreign Direct Investment, Act East Policy

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1 Introduction

India's interest in Southeast Asia, often referred to as the ASEAN region, has a long history and is far from a recent development. India and ASEAN have shared deep historical, economic, cultural, political, and strategic ties, with exchanges dating back to ancient times. After the end of the Cold War, India's close engagement with ASEAN developed largely. India generally avoided joining regional associations within Asia during that period. However, after the Cold War and with globalisation gaining momentum in the 1990s, India recognised the need to engage with ASEAN for mutually beneficial cooperation. India's economic ties with Southeast Asian nations have strengthened the country's economic reforms after the inauguration of the Look East Policy in the early 1990s. The merchandise trade and investment intensity and scale flows have increased significantly between India and ASEAN following the launch of the Look East Policy. In 2014, the transition from the Look East Policy to the Act East Policy (AEP) featured some good elements and a potential focus on economic development and border connectivity through the Northeast. The Act East Policy extended its border scope to East Asia and the Asia Pacific region with special attention to CLMV countries-Cambodia, Laos, Myanmar, and Vietnam. Hence, beyond economic to strategic, political, cultural, and security dimensions are considered the principal shift between the Look East Policy and the Act East Policy. This foreign policy emphasised the Northeast as the primary beneficiary actor to connect with Southeast Asia. The North East region serves as a vital link with ASEAN; hence, India chose it as the strategic location [1], [2].

The primary reason for India's engagement with ASEAN is its strategic location, particularly in the

Northeast Region, which serves as a vital link. India shares maritime borders with Indonesia and Thailand, and a 1,600-kilometre land border with Myanmar, as they are natural partners geographically. The Northeast region shares about 5,182 kilometres of international borders, which account for nearly 98% of its total boundary, including various neighbouring sovereign states. It shares borders with several regions and countries. The Tibet Region of China (autonomous) is to the north (about 1,395 km), Myanmar to the east (around 1,640 km), Bangladesh to the southwest (about 1,596 km), Nepal to the west (around 97 km), and Bhutan to the northwest (about 455 km). The region remains economically less developed than other parts of India, mainly because of poor connectivity. The Northeast region is associated with the rest of India only through a narrow stretch of land called 'Chicken's Neck.' In 1947, India's partition and the creation of Bangladesh in 1971 left this region landlocked, which severely hindered its economic progress for decades. That's why many believe that, under the Act East Policy, connecting the Northeast with East Asia, South Asia, and Southeast Asia will create new opportunities for trade and investment, paving the way for economic growth in the region and for India as a whole [3].

India's exports to ASEAN grew from US$31.29 billion in FY 2014 to US$41.21 billion in FY 2024, demonstrating substantial growth over the decade [4]. This signifies that ASEAN has emerged as a significant export market for India. The Ministry of Commerce reported that ASEAN nations constituted 9.76% of India's total exports in the fiscal year 2022-2023. The total Foreign Direct Investment (FDI) equity inflows from ASEAN nations into India amounted to USD 130.16 billion by December 2021 (According to the Department for Promotion of Industry and Internal Trade (DPIIT)), representing around 22.7% of India's total FDI equity inflows. The increasing economic connectivity can be observed sharply between India and ASEAN through these stats.

Several studies have been conducted on India-ASEAN economic relations. Prior research focuses on economic relations from a single development angle. A limited statistical tool is used to measure the trade relationship. The Northeast's development concerns were less emphasised in most studies under the Act East Policy. Even though various studies have already been conducted on the economic relations of India and ASEAN, the Northeast has not been fully empirically examined. To fill these gaps, the study used three statistical tools. It evaluates the progress of India and the Northeastern Region in particular after the implementation of the Act East Policy. It focuses on regional development based on the impact of India-ASEAN economic relations. The study starts with the assessment of the volume of ASEAN's merchandise trade with India vis-à-vis World trade through the Trade Openness Indicator. Additionally, the study further discusses Trade Intensity Indices. It subsequently investigates whether India's economic environment has been enhanced by Foreign Direct Investment inflows from ASEAN countries. This study observed an improvement in India's trade through the Act East Policy, owing to the enhanced economic ties between India and ASEAN through superior connectivity and infrastructure. It establishes the understanding that increased trade openness, enhanced market access and the establishment of robust cross-border ties can yield notable advantages for the region. The Northeast continues to be a primary issue for India. Hence, a noticeable significance is given to the efficacy of the Act East Policy in transforming the Northeast. Examining these connections helps to show whether enhanced connectedness and trade openness are resulting in tangible developmental benefits.

2 Materials and Methods

This section displays the materials and methodologies of the study, organised into four principal sections: Trade Openness Indicator, Trade Intensity Index, Foreign Direct Investment and the Act East Policy. The Trade Intensity Index is further divided into two parts: the Export and Import Intensity Index.

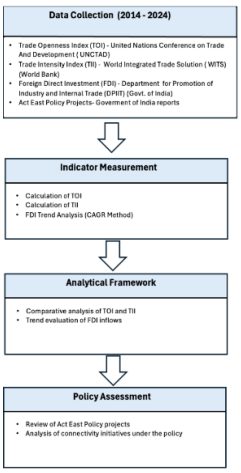


Fig. 1: Outlines data collection, measurements and analysis process
Source: created by the authors.

Figure 1 demonstrates a step-by-step approach for the long-term quantitative methodologies applying statistical evaluation, followed by the secondary source of data collection. The shifts of the study compare and examine the trend to understand India's trade dependence on ASEAN. The results explained a substantial observation into the nature and direction of economic correlation

2.1 Trade Openness Index (TOI)

This research is based on raw and analysed data to examine the trade trends and economic ties between India and ASEAN. The data have been directly sourced from UNCTAD to evaluate the TOI from 2014 to 2024. The study aims to investigate India's ties with the global market by comparing total trade (exports plus imports) and Gross Domestic Product (GDP). It aids in evaluating the fluctuation of India's involvement with the external sector during the past decade. The import and export data (in million USD) and GDP data for India and all ten ASEAN member countries have been collected. The TOI was calculated using these datasets and a standard formula:

$$TOI = \frac{(Imports+Exports)}{GDP} \times 100. \quad (1)$$

This formula represents the level of each country's engagement with global trade. To estimate each country's TOI annually from 2014 to 2024, this study combined the total values for all ten ASEAN nations to obtain the overall trade openness level for ASEAN-10. Finally, the study calculates the aggregate of ASEAN-10 for each ASEAN country from 2014 to 2024 to analyse long-term fluctuations in trade openness. The aggregate is designed as the arithmetic mean of the TOI values of the ten member countries for each year. The average was calculated using the standard formula:

1.

$$TOI_t^{ASEAN} = {}^1/_{10} \sum_{i=1}^{10} TOI_{it}, \quad i = 1, 2, \dots, 10 \quad (2)$$

2.

2.2 Trade Intensity Index

To comprehensively analyze the bilateral trade patterns, the study adopts the methodology introduced by Kojima (1964) and Drysdale (1969) [5], [6]. Trade intensity indexes reflect whether the trade between India and ASEAN is stronger or weaker than expected based on each partner's percentage of global trade. The following method calculates import and export intensity indices for 2015-2024 using the World Integrated Trade Solution (WITS) data. These indices measure the significance of ASEAN for India's exports and imports, as well as India's role within the ASEAN trading framework. The study discusses the growth of trade between India and ASEAN by analysing trajectories in trade openness intensity and directions over time. Additionally, it examines the impact of global or regional factors on trade flows and measures the stability of their economic ties over the decade. The Export Intensity Index (EII) was calculated by:

$$EII_{ij} = (M_j^w / M_t^w)/(X_{ij}/X_{it}) \quad (3)$$

where: X_{ij} represents India's exports to ASEAN countries; X_{it} indicates total exports of India to the world.

$M^w{}_j$= ASEAN country *j*'s total imports from the world; $M^w{}_t$ = Total world imports.

The Import Intensity Index (III) is calculated using the equation:

$$III_{ij} = (X_j^w / X_t^w)/(M_{ij}/M_{it}) \quad (4)$$

where: M_{ij} = India's imports from ASEAN countries; M_{it} = India's total imports from the world; $X^w{}_j$ = ASEAN country *j*'s total exports to the world; $X^w{}_t$ = Total world exports. For both calculations, the standard Kojima-Drysdale formula was used.

2.3 Foreign Direct Investment (FDI)

The present study is based on secondary data of FDI equity inflows from ASEAN to India. The data (in million USD) have been compiled from the DPIIT. To analyze the impact of the AEP on ASEAN's FDI inflows to India, the study adopts a quantitative and comparative methodology to observe changes in growth, directional trends, magnitude, and volatility in ASEAN's FDI inflows to India. The study has been divided into two distinct phases:

Before AEP: 2007-2014.
After AEP: 2015-2021.

To calculate and evaluate differences between the aforementioned periods, the CAGR (Compound Annual Growth Rate) method has been applied. The CAGR is calculated by the equation:

$$CAGR = (({}^{EV}/_{RV})^{1/n} - 1) \times 100 \quad (5)$$

Where n = number of years, BV = Beginning value, EV = Ending value.

2.4 Act East Policy (AEP)

The study looks at India's Act East Policy, which forms the basis for reviewing the connectivity projects included in this research. The analysis uses

data from the Press Information Bureau (PIB), the Asian Development Bank and the Ministry of External Affairs. These sources provide details of major rail, road, and waterway projects that connect India's Northeast with Myanmar, Thailand, and the wider ASEAN region. These programmes transform policy into actual connectivity. They also facilitate market access, which enhances the movement of commodities and individuals across borders. As a result, it saves time for transport as well as expenses. India's closer integration with ASEAN has been improved by better connectivity, which facilitates smooth trade flows and enhances regional supply chains. The trade flows generate investment in border and inland markets. Additionally, the Northeast serves as an essential avenue for India's relations with Southeast Asia through the expansion of transport networks. This secures economic collaboration and supports developmental connections.

3 Results and Discussion

This section is arranged into three principal portions: an analysis of India's trade with ASEAN, FDI inflows from ASEAN to India and performance under the Act East Policy. This section studies and discusses the empirical primary data and interpretation in a detailed manner.

3.1 Analysis of India's Trade with ASEAN

India's foreign trade has seen a noteworthy change after the initiation of the Look East Policy in 1992. Subsequently, to fortify relations with the Asia-Pacific region, it was expanded to the Act East Policy. India's trade focus moved from the West to East Asian countries to build strong economic bonds with ASEAN. As a result, the government focuses on the growth of India's Northeast and considers it a key gateway to Southeast Asia by improving trade links and connectivity. ASEAN-10 has become a high-potential region as an attractive place for business, investment, and trade over the last fifty years. This represents a significant economic and social gain for the government.

The ASEAN economy has grown more than 100 times, reaching to an aggregate GDP of US$2.55 trillion in 2016, which was 6.2% of global GDP (based on PPP at US$). ASEAN's merged GDP was the 3rd -largest in Asia and made it the sixth-highest economy worldwide in 2016 [7]. ASEAN is expected to keep growing, with regional real GDP projected at 4.7% in 2024 [8]. India's economy has grown in importance, becoming the 5th largest in the world in 2024 with a GDP of US $3,912,686 million, up from 10th place in 2014 [9]. In the global economy, India's share has doubled from 1.6% in 2000 to 3.4% in 2023. The economy also grew by 6.5% in GDP in 2024 [10].

ASEAN and India have strengthened both their economic and political association and diplomatic relations. Although the exchange of investment and trade between India and ASEAN is lower than with ASEAN's other partners, the absolute volumes have kept rising steadily. This study focuses on the growing trade dynamics between ASEAN and India through the Trade Openness Index. This illustrates the interdependency between domestic economies and the global market, which is a key element in international trade.

East Asian economies are significant beneficiaries of post-World War II governmental reforms and globalization. Market liberalization and the adoption of export-induced growth strategies were the key factors contributing to the increased demand for manufactured goods in Western countries. This is evident from the Table 1 (Appendix) values for ASEAN-10 between 2014 and 2024, where fluctuations in ASEAN's Trade Openness Index are mostly due to global economic conditions, commodity prices, variations and shifts in external demand. Between 2014-16, the index declined to a value of 87.62 because China's economic slowdown resulted in a notable drop in global commodity prices and reduced demand for imports. It was further affected by ASEAN's exports, even though the internal conditions remained stable [11]. From 2016-18, there was a robust recovery to a value of 96.72 that was driven by multiple factors, including rising global trade, higher external demand and stable commodity prices. This increased ASEAN's industrial exports and demonstrated its growing role in global value chains. However, growth decelerated again in 2018-2019 to a value of 94.22 due to rising tensions in US-China trade and weaker global demand. This generated disruptions in supply chains and uncertainty for China, especially with intermediate goods [12].

ASEAN exhibited flexibility during the initial COVID-19 disturbance in 2019-2020. The resilience was shown because of the steady demand and support from China and regional collaboration [13]. Trade openness rose significantly to a value of 117.06 during the post-pandemic period as global demand started to recover, supply chains became stabilised, and policy support enhanced trade flows. This development was seen from 2020 to 2022 and acknowledged as the period of prominent rise.

However, again in 2022-2023, there was a remarkable acceleration after the execution of the ASEAN Comprehensive Recovery Framework [14]. By 2023-2024, the global market started to recover and strengthen, with a total ASEAN TOI value of 107.52, that enhanced regional integration through the Regional Comprehensive Economic Partnership (RCEP). As a result, ASEAN's trade performance began to stabilise globally [15].

Global economic cycles highly influence ASEAN's trade openness, as seen from the ten-year pattern. Geopolitical events and fluctuations in China's market also play a vital role in the trade performance of ASEAN with India. The region started growing after 2020 with structural strength, enhanced regional integration, and a continuous transition from reliance on commodities to more diversified and value-added trade. Although the region remains exposed to external shocks, it recovered very strongly during that period of time. Overall, ASEAN's growing role as a competitive and interconnected hub for the global economy manifests a trend of decline, recovery, slowdown and stabilization.

3.2 Trade Intensity Index

The Trade Intensity Index (TII) studies the pattern of exports and imports between two partner countries in comparison to world trade (Drysdale, 1969; Kojima, 1964). This is further divided into the Export Intensity Index (EII) and the Import Intensity Index (III). These indices are discussed as follows.

A) Export Intensity Index - The ratio of the share of exports of a country/region to the world exports share of a partner country. The meaning of an Export Intensity Index in Table 2 (Appendix) above 1 is that India exports more to a country than that country's share of world imports would predict. It means strong export relations. Similarly, values below 1 indicate India exports less than expected, which exhibits a weak export trend. The missing values for the country Laos in the year 2023-24 are indicated by NA in Table 2 (Appendix) because of the unavailability of data.

India's export relationship with ASEAN countries has grown unsteadily. Table 2 (Appendix) shows that Indonesia and Malaysia have index values above 1 for many years. This shows comparably strong export intensity. Cambodia, Lao PDR, and Brunei have index values below 1, showing declining export links with India. The overall trend for India is mixed. Singapore is the major partner country for India within ASEAN. The export intensity index for these major countries, such as Singapore, displays spikes (steep increases) followed by a drop. Singapore rose to about 1.15 in 2017 and then fell to around 0.79 in 2023. India's exports to the small ASEAN countries are not stable either. They suggest that India's market share is not accessible to them. The fact that some larger ASEAN countries have values above 1 shows India has strong export links with them, but the differences over time and across countries point to structural and competitive challenges.

There is a visible shift between India and the ASEAN Export Intensity Index (EII) from 2015 to 2024. This period mainly reflects the international situation, raw material prices, internal policies, and political affairs, which have changed over the years. The global prices for leading commodities, especially crude oil, declined considerably in 2015. This also reduced the value of India's petroleum exports and lowered export intensity with different ASEAN states. In 2016, there was a slight enhancement in commodity prices. During that period, the situation improved slightly as commodity prices became more stable. Although the slow global demand prevented any significant rise in export activity [16]. India's Merchandise Exports from India Scheme (MEIS) incentives served to drive export intensity rise for a short period of time in 2017. The strong buying interest of Southeast Asia and improved global trade growth positively influenced the growth of that period [17]. In 2018, Indian exports became more competitive with a weakening rupee and growing trade disputes. But new governmental nationalist measures could not give stable results for ASEAN [16]. The sluggish economic momentum in China and several parts of Southeast Asia led to a slight reduction in India's EII values across the region in 2019 [18]. The COVID-19 epidemic in 2020 disturbed maritime routes, logistics chains and movements across borders, reducing export intensity for almost all ASEAN member nations. The decline was so sudden that a dramatic fall could be observed worldwide, except for those requiring essential commodities [19]. There was a rapid expansion in global prices for petroleum, edible oil and metals during the partial reopening period in 2021. This fluctuation raised export intensity for countries like Malaysia and Indonesia by a value of 1.4 and 2, respectively, due to supply difficulties. It kept the performance unsteady elsewhere for those countries [20]. Again, the Russia-Ukraine conflict in 2022 increased global commodity prices even higher, with the increasing value of India's exports to product-based ASEAN markets. At that time, inflation reduced overall demand in other parts of the region [21]. The situation in several countries

started to normalize by 2023 after the pandemic. Although commodity prices were decreasing, ASEAN increased its cooperation under the Regional Comprehensive Economic Partnership (RCEP). It shifted trade preferences away from India and reduced EII for several member countries. In 2024, Southeast Asia saw a gradual recovery with a stabilized supply chain. India expanded its export portfolio, leading to a moderate improvement. However, the strong competition from China, Japan, and South Korea continued to limit India's export intensity [22].

The statistics raise some concerns from a strategy and policy perspective. It suggests that India experienced some falling intensity because it did not completely utilize the opportunity of the region despite creating some strong export links with certain ASEAN partners. Secondly, there were some difficulties with market access and trade policies of ASEAN. This resulted in low index values for several ASEAN countries and suggested supply-side issues (India's exports don't match ASEAN's demand). Third, Table 2 (Appendix) shows ASEAN's imports were expanding rapidly and leading to a widening trade deficit. India's overall exports to ASEAN are gradually rising. But the export-intensity index doesn't always indicate a better trade balance, performance and competitiveness.

In short, the export-intensity index of ASEAN shows uneven progress, while India has made a progressive export connection with ASEAN. This region focuses on a few countries that have not been steadily rising over time. India should focus on regional demand, address the issues of competition and make effective and efficient use of trade agreements to meet export requirements. In this way, India could make better use of the ASEAN market to improve its export connectivity with ASEAN. Although, the progress scenario varies from country to country within ASEAN. India's export market with ASEAN was very stable for some specific products such as palm oil, coal, petroleum, electronic parts and several farm items. Despite all these inequalities, India's trade connections were strong with a few countries such as Singapore, Malaysia, Myanmar and Vietnam. Since the late 1990s, the large economies like China, the United States and the European Union have been the major trade partners of ASEAN. India has depended on the region for some important supplies. However, India's export base with ASEAN is gradually becoming broader and helping to add some more value to the wider trade network. India needs to improve its competitive strength, introduce new trade policies with revised tariff relaxation and meet its export demands to benefit more from the ASEAN market.

B) Import Intensity Index - The ratio of the import share of a country/ region to the share of world imports going to a partner country. The meaning of an Import Intensity Index in Table 3 (Appendix) above 1 is that India imports more from a country than that country's share of world exports would predict. It means a strong import relation. Similarly, values below 1 indicate India imports less than expected, which exhibits a weak import trend

Table 3 (Appendix) reveals the year-to-year movements of India's Import Intensity Index (III) with ASEAN from 2015 to 2024. It shows the broader macroeconomic shocks, complex interactions of global commodity patterns and sector-wise sourcing cycles. It also explains the effect of variation in worldwide rates, industry-level sourcing decisions, and extensive economic movements on the trend in the annual fluctuation of India with ASEAN

There was a substantial drop in global prices of crude oil, coal and various agricultural goods and commodities in 2015. Due to this condition, the index remained comparatively inactive and stagnant. It also weakened the measured import intensity index by reducing the nominal value of India's purchases from major ASEAN suppliers [23]. But a small recovery took place in 2016, which stabilised the commodity markets during the period. India experienced moderate upward movements in the index during this period by extending its purchases of palm oil, coal and electronic components from Indonesia, Malaysia and Vietnam [24]. India's internal purchases and strong global trade momentum enhanced import intensity in 2017 with improved conditions. For intermediate goods, countries like Singapore and Indonesia are essential hubs. As a result, India's internal demand expanded, and the situation improved as world trade picked up its momentum [25]. In 2018, a more prominent shift developed. There was an increase in tensions between the U.S. and China, which forced companies to adjust production networks throughout East and Southeast Asia. India increased imports of machinery, electronics, and other inputs from ASEAN [26]. This modification boosted the index to its highest value of the period for Singapore (1.492) and Malaysia (1.055). In 2019, the ascending trajectory decreased due to a decline in regional economic activity. India adopted a more cautious approach, leading to import growth, which resulted in a moderate decrease in import intensity index (III) values [27]. In 2020, the whole world

experienced a sharp outbreak of the COVID-19 pandemic. Most of the ASEAN economies were fragmented due to the closure of industrial facilities, restrictions on maritime shipping and overall supply chain disruptions [28]. Indonesia and Vietnam relatively maintained higher levels as suppliers of essential commodities during this time period. These Countries also remained stronger in their principal exports. While, most of the ASEAN states experienced a decrease in import intensity due to factory shutdowns, shipping issues and broken supply chains during the Covid-19 period.

India's import intensity rose once again with ASEAN members with the partial reopening of economies in 2021. This was accompanied by a global surge in crude oil, edible oils, electronic inputs and metals. At the same time, the overall trend remained inconsistent due to persistent shipping delays and high shipping costs. However, due to shipping delays and high shipping costs, the overall pattern remained uneven [29]. In 2022, the Russia-Ukraine conflict directly affected international commodity prices, which further added a new dimension to the instability in global commodity prices. India started to address this by increasing its purchases of energy products and industrial inputs from Malaysia, Indonesia, and Vietnam. This resulted in a temporary upward push in India's import intensity. By 2023, the supply chains were normalised, and global prices were moderate [30]. India also placed a stronger emphasis on "Atmanirbhar Bharat" by reducing its reliance on specific ASEAN countries. India collectively took the initiative for import substitution and diversification under "Atmanirbhar Bharat".

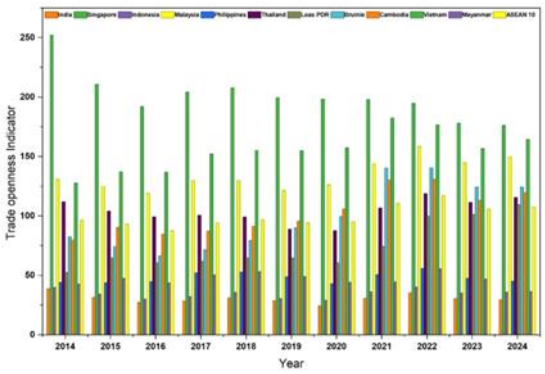


Fig. 2: TOI between India and ASEAN, 2014-2024
Source: created by the authors.

The trend continued into 2024, as a more stable economic environment in Southeast Asia and India's intentional transition away from re-export-dominated hubs. Here, most notably, Singapore experienced moderate declines in import intensity with India. The overall developments highlighted a progressive transition toward more balanced, diversified, and sustainable sourcing relationships within the ASEAN region. These changes and fluctuations indicate consistent progress toward more diverse and stable sourcing ties across the ASEAN region [31]. The visual representation of TOI between India and ASEAN countries is shown in Figure 2. This is a bar diagram of TOI for each year from 2014to 2024. It is observed from Figure 2 that Singapore has the highest trade openness throughout the period.

3.3 FDI inflows from ASEAN to India

A country's economic growth is mostly based on its Foreign Direct Investment (FDI) inflows. Global investments place more emphasis on Asian economies as they cannot generate sufficient internal savings to meet their investment goals. In recent times, FDI has been the most efficient driver of economic growth for Asia. Hence, for Asia, FDI is the most effective way to connect globally and vice versa for promoting economic growth. FDI promotes a country's economic growth in different ways: (1) increasing the efficiency and volume of investment, (2) sharing advanced technology from developed to developing countries, (3) increasing employment opportunities and providing advanced training to workers, skill development, and new management practices. This study adopts the Compound Annual Growth Rate (CAGR) method to calculate the FDI inflows to India from ASEAN after the implementation of the Act East Policy.

Table 4 (Appendix) shows strong FDI inflows from ASEAN countries to India with a sustained expansion for the pre-policy period. It shows strong empirical evidence of growth for the period since it enhances productivity by bringing capital, skills and technology to the country. Figure 3 exhibits an explosive line of regression with an upward curving trajectory for the years 2007-2014, with higher FDI investment in manufacturing than services in India. Table 4 (Appendix) shows a high Compound Annual Growth Rate (CAGR) of approximately 25.6%, which reflects average annual growth throughout the period. This growth spurt can be partly attributed to the second ASEAN-India Summit in 2003, where the ASEAN- India Framework Agreement on Comprehensive Economic Cooperation was signed. This agreement provides a systematic pathway towards the creation of an India-ASEAN Free Trade Area, comprehensive trade in goods, services and investment, which energises the economic environment in a favourable manner to increase the

cross-border investment flow. The study observes that rather than a scattered inflow, the trendline shows a stable and relatively systematic investment pattern. From the economic development trajectory, the trendline is reinforced by progressive FDI policy liberalisation and an advantageous, extensive investment situation. The study also reflects the deepening regional economic linkage from the ASEAN-India Investment Agreement 2014, which increases the confidence of investors in India as a destination for ASEAN capital. Overall, the trendline and CAGR provide empirical evidence of a continuously accelerating investment momentum during the pre-policy period.

Table 4 (Appendix) shows a significantly weaker Foreign Direct Investment (FDI) inflow from ASEAN countries to India during the post-policy period through the same empirical lens. It shows a clear decline in growth with flatter data, although the exponential trendline before 2015 was relatively high. The visual assessment of Table 4 (Appendix) shows a sharp decline in Compound Annual Growth Rate (CAGR) to about 0.66%, which reflects a slow average growth over the period. Figure 4 demonstrates a weak line of regression with a wider dispersion of data points, with increased volatility and inconsistency for the years 2015-2021

The Act East Policy's reflective, deliberative, and diplomatic scope didn't transform into a sustained investment acceleration from the economic development perspective. Hence, the post-policy period shows a growing gap with the pre-policy period in terms of policy goals and investment outcomes. As a result, the overall outcome is shaped by external macroeconomic pressures and systemic restraints rather than by a lack of engagement alone.

According to the Economic Survey 2023-2024, in FY 2023-24, India's net FDI inflows were moderate due to the global decline in FDI. The survey report also highlights the existing profitable opportunities and external uncertainties, which significantly reduce the net FDI inflow, despite gross FDI inflow remaining steady and higher levels of returns and withdrawals by foreign investors [32]. Moreover, the study observed that geopolitical tensions and tariff barriers have impacted the cross-border flow in the post-policy period momentum. Here, the COVID-19 pandemic played a major role in the decline of the investment flow.

To attract more investment and savings, and to reduce risk, economic liberalisation is very important for boosting growth. It is widely believed that FDI is a key factor in driving economic growth for both advanced and emerging economies and plays an important role in economic development. The inflow of foreign capital increases the host country's capital base, opens the way for new technologies and skills, and also helps to boost productivity growth [33].

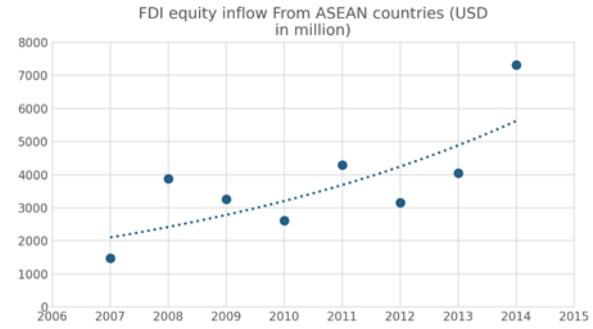


Fig. 3: India ASEAN FDI inflow graph from 2007-2014
Source: created by the authors.

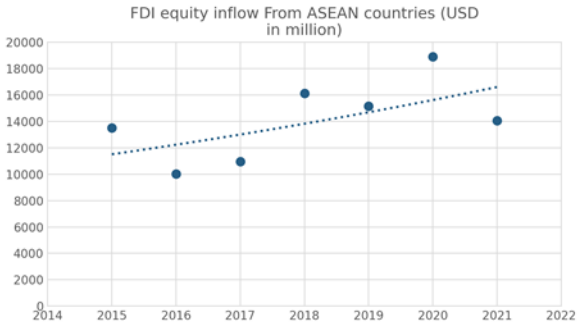


Fig. 4: India ASEAN FDI inflow graph from 2015-2021
Source: created by the authors.

3.4 Statistical Analysis

Table 5 (Appendix) shows the descriptive statistics for Export Intensity Index (EII) and Import Intensity Index (III) for ASEAN countries during 2015 to 2024 (pooled country-year observations; n = 98 for EII with two missing values in 2023 and 2024, both for Laos PDR and 100 observations for III). Both distributions are symmetric within their interquartile range, but EII is strongly right-skewed overall (g_1 = 1.95) because of a long upper tail observable to Myanmar's early panel years; III is efficiently symmetric (g_1 = −0.05). EII's variance is 4.47 times that of III.

Paired samples t-test: The paired t-test is the correct instrument for a within-unit comparison because it analyses the differences (EII − III) rather than the two variables separately. Both indices were modelled as a function of country and year fixed effects.

Table 6 (Appendix) shows the paired t test for EII and III. The positive values indicate EII exceeds III. The point estimate is stable across units of

analysis (0.268 at country level versus 0.271 pooled, excluding Myanmar), while the confidence interval width differs by a factor of about three, indicating the individuality assumption in the pooled analysis. The paired differences departed from normality

F test for equality of two variances: Both parametric procedures above rest on assumptions about spread, and the relative dispersion of the two indices is itself substantively informative: a measure with much greater variance is a less stable index, which matters where either might be used as a proxy for trade openness.

The variance of EII is 4.47 times that of III reflecting EII's longer upper tail. It is observed from F-distribution that Export Intensity Index (EII) showed considerably bigger dispersion than Import Intensity Index (III) (variance ratio 4.47, 95% CI [3.00, 6.66], $F(97, 99) = 4.47$, $p < 0.001$).

The F test assumes normality, and EII departs noticeably from it ($g_1 = 1.95$; Shapiro-Wilk $W = 0.81$, $p < 0.001$ on paired differences). Since the F test is known to over-reject under non-normality, the Fligner–Killeen test, which makes no distributional assumption, was applied to the same comparison. It corresponded ($\chi^2(1) = 9.76$, $p = 0.002$), confirming that the variance inequality is not an artefact of the skewness.

Two-way analysis of variance (ANOVA): To answer whether EII and III differ across the ten ASEAN member countries and across the ten years (2015-2024), we need to perform ANOVA. Both factors are categorical and the response is continuous, so analysis of variance is the appropriate framework. Type II sums of squares were used, suitable for the unbalanced design (Laos PDR, n = 8) in the absence of an interaction. Results for EII are reported in Table 7 (Appendix) and for III in Table 8 (Appendix). The two indices differ sharply in their temporal behaviour. EII showed no year effect in aggregate ($F(9, 79) = 1.09$, $p = 0.379$), whereas III showed a highly significant one ($F(9, 81) = 10.58$, $p = 1.16 \times 10^{-10}$). Because observations within a country are not independent, the test was repeated on country-level means (n = 10), which gave a consistent result. Excluding Myanmar, EII exceeded III by a mean of 0.27. No significant difference was found between the pre-2019 and post-2019 periods (COVID-19) when countries were analysed as paired units.

In Figure 5, each panel shows one ASEAN country; navy denotes EII and red denotes III. Panels are organized alphabetically and use independent y-scales to accommodate the tenfold difference in range between members (EII spans 0.19–4.00; III spans 0.20–1.49). The panel demonstrates directly that nine members' EII series are flat while Myanmar's declines sharply from 4.00 to 1.06, and that III varies far less across member countries, with only shallow country-specific declines in Thailand, Myanmar and Brunei. Annual paths are revealed without fitted trends.

It is observed from Figure 6 that, for EII, two members' trends exclude zero: Myanmar (−0.317 points per year, 95% CI [−0.367, −0.266]) and the Philippines (−0.054, [−0.104, −0.004]); the remaining eight lie between −0.036 and +0.049 with intervals spanning zero. For III, three members declined significantly, Thailand (−0.029, [−0.043, −0.016]), Myanmar (−0.019, [−0.032, −0.005]) and Brunei (−0.014, [−0.027, −0.0004]), the remaining seven showing no trend. Intervals for non-Myanmar members are optimistic under the near-saturated EII specification; Myanmar's EII estimate is confirmed by a single-country regression and the Philippines by inspection of its annual path.



Fig. 5: · Export Intensity Index (EII) and Import Intensity Index (III) of ASEAN countries, 2015–2024

Source: created by the authors.

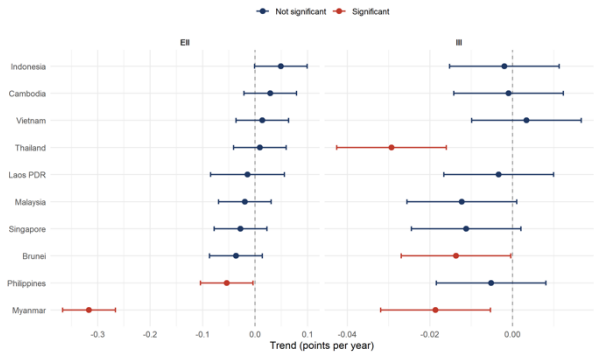


Fig. 6: · Country-specific trends in Export Intensity Index (EII) and Import Intensity Index (III) of a SEAN countries, 2015–2024

Source: created by the authors.

The difference between the indices (EII − III) is plotted in Figure 7 against their mean for all country-year observations. It is observed that,

Myanmar in 2015 and 2016, lie above the fitted line, which under-predicts their difference by approximately half a unit; they are also the points that give EII its long upper tail. The plotted means range from 0.25 to 2.45, well inside the range of the indices themselves (EII 0.19–4.00; III 0.20–1.49), since high values of one index are generally paired with lower values of the other.

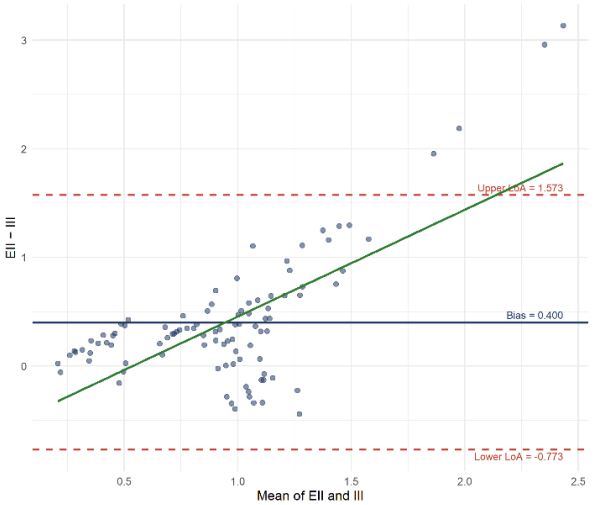


Fig. 7: · Agreement between Export Intensity Index (EII) and Import Intensity Index (III) of a SEAN countries
Source: created by the authors.

3.5 The Performance under the Act East Policy

The government's renewed focus on building infrastructure and improving connectivity is seen as a different approach for the Northeast under the Act East Policy. This policy has increased budgetary allocation since 2014 for multimodal connectivity, transport corridors and border infrastructure, creating new opportunities for trade, investment, and economic growth in the Northeast and across India under the Act East Policy. Despite the government's decision to increase funding for infrastructure, the Northeast has stayed economically underdeveloped because of poor infrastructure and investment, inadequate governance, low productivity of the factors of production, market inaccessibility, and dependence on the central government [34]. There are "five I's" which are considered the major barriers to the region. They are not only the "Initial conditions, infrastructure deficiency and Insurgency, but also Imperfection in factor and product markets, and Indifferent governance [35]. There are "four deficits: basic needs deficit, an infrastructural deficit, a resource deficit and a two-way deficit of understanding with the rest of India", which compounds the others [36]. The Northeast is India's natural gateway to Southeast Asia and still has poor road, rail, and border trade infrastructure. Points like Moreh, Dawki, and Zokhawthar have limited cross-border trade. The exports of the Northeast (₹30.9 billion) made up only 0.13% of India's total exports in FY 2019, based on the Directorate General of Commercial Intelligence and Statistics data. India-ASEAN trade still moves through distant ports instead of the Northeast. Despite its potential to be India's trade gateway to other South Asian and ASEAN countries, the Northeast's international trade remains very small. Hence, improving connectivity and trade infrastructure is essential to make the Northeast a key economic bridge between India and ASEAN.

3.6 Budget Distribution

The government has concentrated on connectivity and infrastructure in the Northeast under the Act East Policy by increasing budget support. According to estimates, actual spending in the Northeast from 2014-2015 to 2023-2024 was ₹5,744.38 billion [37], showing a clear upward trend in expenditure. The government has been carrying out various infrastructure projects, including air, road, waterways, rail, power, and telecom connectivity. From 2016-2017 to 2021-2022, 28 air connectivity projects were completed at a cost of ₹9.79 billion, and 15 ongoing projects worth ₹22.12 billion are in progress in the Northeast [38].

As of 01.04.2022, the Ministry of Railways had approved 19 projects and, since 2014, has sanctioned projects worth ₹77,930 crore for 1,909 km in the Northeast. These projects are at dissimilar phases of approval, planning, or execution. So far, 409 km have been completed, and ₹30,312 crore has been spent up to March 2022. These involve: (i) 14 new line projects which covers 1,181 km at a cost of ₹61,520 crore, of which 361 km have been completed and ₹27,458 crore spent by March 2022; and (ii) 5 doubling/multi-tracking projects covering 728 km at a cost of ₹16,410 crore, of which 48 km have been completed and ₹2,854 crore spent by March 2022 [39].

A total of 4,016.48 km of projects worth ₹58,385 crore are currently under development in the Northeast Region. These projects have been ongoing for the past five years. The total completed projects in the Northeast cover 3,099.50 km at a cost of ₹15,570.44 crore. As per the Press Information Bureau of India (2022) report, several major capital road projects are ongoing in the North-East. Some of those projects start in Assam and are connected to the different states of the Northeast. Major highway

projects for development in this region include the four-laning of the road in Nagaland, which connects Dimapur to Kohima Road (62.9 km). Another infrastructure project in Assam with a four-laning bypass in Nagaon, which diverts the road towards Arunachal Pradesh (Holongi, 167 km). In Sikkim, there is an alternate highway of two-lane from Bagrakote to Pakyong (NH-717A) (152 km). As well as in Mizoram, NH-54 (351 km) is a two-lane highway that connects Aizawl and Tuipang. In Manipur, 75.4 km of the two-laning road, along with four-laning of the Imphal-Moreh section of NH-39 (20 km). [40].

3.7 Infrastructure and Road Connectivity

The Dhaka-Guwahati-Shillong and Kolkata-Dhaka-Agartala routes cut travel distance by about a thousand kilometres [41]. The government has also offered assistance for development projects of roads to improve physical interconnection with Myanmar. One of these is the advancement near the Manipur border of the approximately 160 km long Tamu-Kalewa-Kalemyo road in Myanmar. Other notable ongoing work includes the Kaladan Multi-Modal Transit Transport Project. Under this project, from the Sittwe port of Myanmar to Mizoram, different road and inland waterways plans are being initiated. It has also upgraded Rhi-Tiddim Road (about 60 km) in Myanmar near Mizoram, and parts of the Trilateral Highway Project (about 1,360 km) that connects Moreh (Manipur, India) to Mae Sot (Thailand) running by way of Myanmar [42].

Additionally, the Stilwell Road, which connects Ledo (Assam, India) to Myitkyina (Myanmar) and Kunming (China), is of paramount importance for the Act East Policy because it can establish direct connectivity between Northeast India and Southeast Asia as well as China by land, thereby reducing India's overdependence on the narrow Siliguri Corridor. Reopening this route would turn the Northeast from a "land-locked" region into a "land-linked" one [43].

3.8 Waterways Connectivity

Building physical infrastructure is essential to implement the Act East Policy into action for Southeast Asia. Road infrastructure is especially important for connectivity as it serves as a gateway to the region. In the frontier region, roads are closely linked to markets that are geographically landlocked. The inadequate basic infrastructure hinders the smooth movement of goods and people. But investing in roads and communication infrastructure is necessary to expand markets within and between states. The Government of India has been working to build and improve the India-Myanmar-Thailand Trilateral Highway to boost connectivity with Southeast Asia since signing the border trade agreement with Myanmar on January 21, 1994. For the Northeast and for India-ASEAN trade, projects such as the Kaladan Multimodal Transit Transport Project, the Bangladesh-China-India-Myanmar corridor, and the Mekong-India Economic Corridor are highly beneficial. Between India's Tripura state and Bangladesh, the 'Maitri Setu' bridge has been built over the Feni River [36], [39], [43].

3.9 Implication

The study suggests that India should prioritise intensifying trade intensity rather than trade openness. Undoubtedly, expanding trade with the rest of the world is important for India, but it should place considerable focus on the bilateral relationship with ASEAN. The government should rationalise tariff and non-tariff barriers under the ASEAN-India Free Trade Agreement (AIFT). Low tariffs of 0–5% apply to 70–80% of goods. Sensitive products with 5–10% tariffs in the exclusion list still restrict trade. There are 35% non-tariff barriers related to regional value content. India's foreign policies and agreements need to be simplified, and trade facilitation procedures improved to reduce delays in customs and other obstacles [44].

According to the Department for Promotion of Industry and Internal Trade, 2024, there is a gradual decline and fluctuation in ASEAN investment in India. The government should put efforts into improving investment linkages and enhancing the investment environment to attract more FDI inflows from ASEAN. Additionally, under the Act East Policy, India should come up with policies that encourage ease of doing business, targeted incentives, promote sustainable economic integration and long-term capital inflows with regulatory stability.

Lastly, the findings of the study underscore the importance of infrastructure development to strengthen trade linkages of the Northeast with the region of Southeast Asia. This Northeastern region is highly beneficial for India to connect with Southeast Asia. The Improvement of the Northeast is one of the most significant objectives of the Act East Policy. The Ministry of Development of the Northeastern Region (DONER) should focus on investment in cross-border projects, railways, roads, water, and air networks to improve market accessibility through this area. Therefore, the ongoing projects under the policy should be completed as soon as possible to support efficient

and effective movement of goods and services and empower the Northeastern region to emerge as a gateway for bilateral trade.

3.10 Recommendations

The findings of the study highlight a clear fluctuation in trade under the Act East Policy. It shows an increase in trade openness, uneven trade inflows and outflows, along with trade intensity and FDI, along with the gradual progress of connectivity projects. It implies procedural and regulatory constraints that restrict deeper economic engagement. As a result, policymakers should give attention to simplifying the trade process through digitalisation. The government can also adopt a single-window clearance system and revise coordination among the regulatory bodies. It can also focus on minimising delays at border points, reducing documentation formalities and ensuring transparency in standards, which can significantly lower transaction costs as well as attract investment inflows into India. The strongest recommendation of this study is that focusing only on the enhancement of the administrative system is not enough for India. The government and policymakers should extend their vision to the connectivity projects. Only through connectivity can the country expect better trade growth, more investment from ASEAN and sustainable economic integration for the future.

Present findings convey a methodological implication for regional monitoring. Since the year impact was steady in aggregate but substantial for a single member, reporting ASEAN-level openness aggregates would conceal the actual change of interest. Member-level series, tested for interaction, are essential. Likewise, the wide limits of agreement between the two intensity indices specify they should not be used interchangeably, since their divergence is highest at high openness, the range where policy attention concentrates. Also, the region's openness structure is tiered in spite of continuous. Therefore, benchmark comparators should be drawn from within a member's tier rather than from rank ordering across all ten member countries.

4 Limitations

Along with valuable empirical insights, the study has several limitations:

Data and Time Constraints: In this study, we used two different time periods to calculate trade intensity and CAGR. Constraints in data availability across sources limit the analysis. Moreover, the time period is from 2014 to 2024. However, data for a short period of time (quarterly or monthly) could give deeper insights into trade and investment between India and ASEAN.

Usage of Collective Parameters: The analysis establishes composite measures that may not cover the sector-or product-specific trade dynamics.

Connectivity Measurement: The various infrastructure projects under the Act East Policy could not provide a better assessment of the direct impact on trade and investment because they are not quantitatively estimated.

5 Conclusion

The findings are summarized below:

1. Treating each country as a paired unit, Export Intensity Index exceeded Import Intensity Index by a mean of 0.395 (95% CI [0.035, 0.755], $t(9) = 2.48$, $p = 0.035$).
2. ASEAN country levels span a varied range, from Laos PDR (0.354) to Myanmar (2.35), with six members forming a statistically indistinguishable middle tier.
3. Myanmar's Export Intensity Index declined steeply and consistently, from 4.00 in 2015 to 1.06 in 2023 (-0.317/yr, $t(8) = -6.58$, $p < 0.001$, $R^2 = 0.84$), with a partial recovery to 1.84 in 2024.
4. Import Intensity Index discriminates between member countries distant more sharply than Export Intensity Index, 42 of 45 pairwise contrasts significant, against a six-member indistinguishable group under Export Intensity Index.
5. Import Intensity Index has no comparable cross-country pattern in its dynamics but does bring temporal structure: a significant year effect ($F(9, 81) = 10.58$, $p = 1.16 \times 10^{-10}$) in the form of a shared arch peaking in 2018 and falling to troughs in 2020 and 2024.
6. Three member countries display shallow Import Intensity Index declines: Thailand (-0.029/yr), Myanmar (-0.019) and Brunei (-0.014), all an order of magnitude smaller than Myanmar's Export Intensity Index fall.

All the trends in trade, investment, and connectivity can bring major economic spillover benefits for India. The findings of the study indicate that, although ASEAN has deeper regional integration, the opportunities have not yet translated into a sustainable improvement and benefit for the country. India's Trade Openness Indicator trajectory has increased, and the Trade Intensity Index reveals an uneven trade engagement with ASEAN nations. Similarly, the stagnant FDI inflow indicates that

under the Act East Policy, the policy and infrastructure initiatives have not transformed into a sustainable investment flow. The result suggests that during 2014 to 2024, India was more integrated in global trade, but ASEAN did not respond proportionally to strengthen trade integration with India. The empirical evidence of the study shows no significant shift in trade intensity and investment flow from ASEAN. Trade growth was uneven and limited to a small number of member countries, which indicates that regional integration and connectivity improvements are not sufficient. Based on the research findings, the study concludes that, for future enhancement to strengthen the Act East Policy, the government should aim to reduce tariff and non-tariff barriers, simplify import taxes and cross-border trade. To create opportunities in cross-border trade, different connectivity projects are underway, such as the India-Myanmar-Thailand Trilateral Highway and the Kaladan Multimodal Transit Project, which can provide opportunities to further strengthen these links. By expanding the presence of multinational companies in India and the Northeast, the government can attract more investment flows under the policy. According to the DPIIT report for 2024, Singapore has become India's largest investor by investing money into IT, fintech, real estate, and renewable energy. The major challenge for the country is that better land connectivity could lead to increased illegal immigration and cross-border smuggling issues for Assam and Meghalaya. While improving connectivity is important, it is equally necessary to tackle illegal immigration through strong bilateral policies and measures. Under the policy, there are still many incomplete projects that are facing delays due to political complexity and external factors, where India needs to adopt a more diplomatic approach.

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Declaration of Generative AI and AI-assisted Technologies in the Writing Process

During the preparation of this work, the author(s) utilized artificial intelligence (AI) technologies solely for the purpose of linguistic refinement and grammatical correction. Following the application of these tools, the author(s) comprehensively reviewed, verified, and edited the resulting text. The author(s) maintain full accountability and responsibility for the accuracy, integrity, and final content of the publication.

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All authors contributed equally from collecting, designing and analysing the data to preparing the final manuscript.

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The authors of this manuscript declare no conflicts of interest.

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APPENDIX

Abbreviations:
ASEAN: Association of Southeast Asian Nations, AEP: Act East Policy, TOI: Trade Openness Indicator, EII: Export Intensity Index, III: Import Intensity Index, FDI: Foreign Direct Investment, CAGR: Compound Annual Growth Rate, UNCTAD: United Nations Conference on Trade and Development, WITS: World Integrated Trade Solution, DPIIT: Department for Promotion of Industry and Internal Trade. MESI: Merchandise Exports from India Scheme.

Table 1. Trade Openness Indicator of India and the ASEAN Nations (2014-2024)

Year	Singapore	Indonesia	Malaysia	Philippines	Thailand	Laos PDR	Bruinie	Cambodia	Vietnam	Mayanmar	ASEAN 10
2014	251.95	39.79	130.97	43.97	111.75	52.21	82.51	79.57	127.68	42.59	96.30
2015	210.61	34.04	124.74	43.59	103.90	64.66	74.11	90.19	136.95	47.50	93.03
2016	192.03	30.06	118.98	44.64	99.09	60.44	66.26	84.50	136.67	43.50	87.62
2017	204.08	32.07	129.59	51.94	100.39	61.74	71.37	87.07	152.10	50.16	94.05
2018	207.85	35.39	129.62	52.65	98.90	64.62	79.15	91.08	154.97	52.97	96.72
2019	199.39	30.29	121.36	48.63	88.70	64.45	90.15	95.69	154.82	48.74	94.22
2020	198.29	28.79	126.13	42.74	87.48	60.51	99.54	105.78	157.33	43.84	95.04
2021	197.80	36.05	143.84	50.49	106.55	74.20	140.17	130.17	182.40	44.44	110.61
2022	194.76	40.14	158.46	55.59	118.73	99.83	140.36	130.71	176.67	55.40	117.06
2023	178.00	35.06	144.76	47.44	111.18	101.11	124.05	113.04	156.63	46.73	105.80
2024	176.17	35.69	149.48	44.90	115.37	109.45	124.13	119.43	164.21	36.31	107.52
Average	**200.99**	**34.31**	**134.36**	**47.87**	**103.82**	**73.93**	**99.25**	**102.48**	**154.58**	**46.56**	**99.82**

Source: created by the authors

Table 2. Export Intensity Index

Year	Singapore	Malaysia	Indonesia	Cambodia	Thailand	Myanmar	Lao PDR	Brunei	Vietnam	Philippines
2015	1.04	1.26	1.24	0.53	0.8	4	0.35	0.72	0.99	1.4
2016	1.08	1.29	1.29	0.41	0.81	3.83	0.47	0.91	0.95	1.25
2017	1.15	1.9	1.53	0.37	1.05	3.07	0.19	0.95	1.1	1.12
2018	1.05	1.81	1.6	0.54	1.1	2.84	0.55	1.01	1.06	0.98
2019	0.94	1.65	1.47	0.59	1.13	2.14	0.39	1.17	1.04	0.89
2020	0.91	1.98	1.7	0.49	1.15	2.09	0.35	0.86	1.09	1.62
2021	0.93	1.4	2	0.68	0.99	1.39	0.22	0.4	1.18	0.99
2022	0.9	1.34	2.16	0.73	1.04	1.27	0.31	0.47	1.07	0.76
2023	0.79	1.36	1.67	0.69	0.95	1.06	-	0.52	1.2	0.87
2024	0.94	1.26	1.34	0.61	0.9	1.84	-	0.86	1.02	0.82

Source: created by the authors.

Table 3. Import Intensity Index

Year	Brunei	Cambodia	Indonesia	Lao PDR	Malaysia	Myanmar	Philippines	Singapore	Thailand	Vietnam
2015	0.615	0.315	0.766	0.222	0.942	0.866	0.592	1.168	1.145	0.708
2016	0.578	0.291	0.807	0.238	0.969	0.872	0.556	1.154	1.092	0.756
2017	0.602	0.322	0.883	0.249	1.025	0.881	0.612	1.376	1.178	0.854
2018	0.627	0.347	0.948	0.265	1.055	0.884	0.633	1.492	1.209	0.923
2019	0.601	0.31	0.824	0.24	0.921	0.843	0.573	1.278	1.066	0.839
2020	0.565	0.28	0.734	0.211	0.819	0.802	0.514	1.193	0.96	0.754
2021	0.557	0.293	0.751	0.197	0.869	0.785	0.528	1.165	0.971	0.798
2022	0.523	0.305	0.992	0.21	0.904	0.761	0.553	1.24	0.977	0.841
2023	0.494	0.316	0.789	0.218	0.921	0.744	0.571	1,185	0.945	0.812
2024	0.501	0.309	0.759	0.224	0.895	0.728	0.56	1.132	0.925	0.785

Source: created by the authors.

Table 4. India-ASEAN FDI inflows from 2007-2021

Year	FDI equity inflow From ASEAN countries (USD in million)	Year	FDI equity inflow From ASEAN countries (USD in million)
2007	1476.64	2015	13511.08
2008	3881.62	2016	10034.03
2009	3259.06	2017	10947.96
2010	2614.03	2018	16128.52
2011	4288.39	2019	15145.26
2012	3150.07	2020	18909.19
2013	4051.67	2021	14056.36
2014	7311.32	-	-

Source: created by the authors.

Table 5. Descriptive statistics for Export Intensity Index (EII) and Import Intensity Index (III) of ASEAN countries

	Min	Q1	Median	Mean	Q3	Max	IQR (Q3 −Q1)	Skewness (g1, moment based)	Bowley skewness (quartiles)
Export Intensity Index (EII)	0.19	0.8025	1.040	1.1446	1.3275	4.000	0.525	1.953	+0.095
Import Intensity Index (III)	0.197	0.5467	0.7755	0.7338	0.9293	1.492	0.383	−0.047	−0.196

Source: created by the authors.

Table 6. Paired t test for Export Intensity Index (EII) and Import Intensity Index (III)

Comparison	Unit	n	Estimate	95% C I	P value
EII − III, all members	Country means	10	0.395	[0.035, 0.755]	0.035
EII − III, excl. Myanmar	Country means	9	0.268	[0.021, 0.515]	0.037
EII − III, all members	Pooled rows	98	0.400	[0.280, 0.520]	< 0.001
Pre vs post 2019	Country means	10	0.186	[−0.237, 0.610]	0.346

Source: created by the authors.

Table 7. Two-way analysis of variance (ANOVA) for Export Intensity Index (EII)

Source	Sum Square	Degrees of Freedom (df)	Mean Square	F	p
Country	28.866	9	3.207	21.73	$< 2 \times 10^{-16}$
Year	1.449	9	0.161	1.09	0.379
Residual	11.658	79	0.148		

Source: created by the authors.

Table 8. Two-way analysis of variance (ANOVA) for Import Intensity Index (III)

Source	Sum Square	Degrees of Freedom (df)	Mean Square	F	p
Country	9.046	9	1.0051	406.17	$< 2 \times 10^{-16}$
Year	0.236	9	0.0262	10.58	1.16×10^{-10}
Residual	0.200	81	0.0025		

Source: created by the authors.