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# Assessing India-Vietnam Maritime Trade: An Empirical Exploration

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Discussion Paper # 284



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# Assessing India-Vietnam Maritime Trade: An Empirical Exploration

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**Abstract:** India-Vietnam relations have grown from strength to strength. Both share deep civilizational links. In 2022, both the countries commemorated 50 years of diplomatic ties. The drivers for the spectacular rise of bilateral relations between India and Vietnam are not only the growth of culture and commerce but also both strategic and security. Both the countries have witnessed significant growth in bilateral trade, with maritime trade playing a crucial role in facilitating the exchange of goods and fostering economic ties. The conventional trade policy narratives underscore the need for improved connectivity and trade facilitation between the trading partners. Going by the same logic, unlocking the trade potential between India and Vietnam also requires better connectivity, particularly maritime connectivity. Therefore, an assessment of maritime trade between India and Vietnam is a vital step towards designing the broader strategy for trade and connectivity. Understanding the maritime trade is important to policy makers, particularly those who are concerned with the economic benefits of large scale investment in connectivity. This study provides insights into the evolving trade relationship between the two countries and can be a valuable resource in understanding the trade pattern for present and future maritime engagement.

**Keywords:** Trade, Maritime trade, Ocean freight, FTA, India, Vietnam

**JEL codes:** F13, F14, F15

## 1. Introduction

The economic relations between India and Southeast Asia have made substantial progress in the last one decade. With subsiding pandemic effects, trade and investment flow between them have started growing. In

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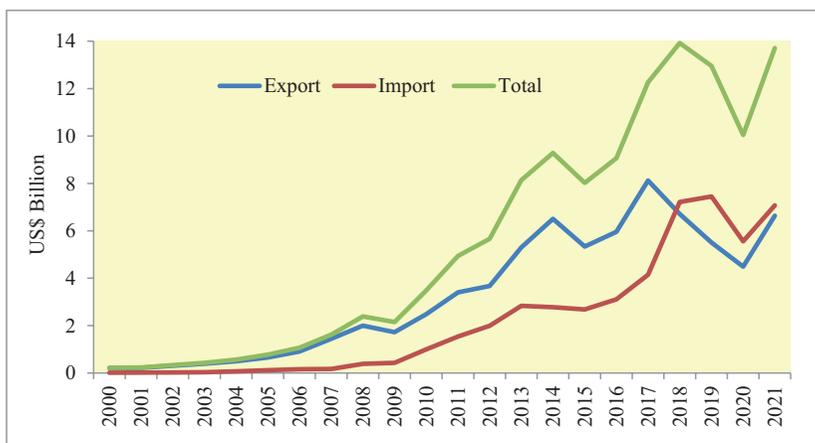
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particular, trade between Vietnam and India has taken a new momentum. Both India and Vietnam have strongly returned to the growth path. Trade between India and Vietnam has expanded from about US\$ 4 billion in 2010 to US\$ 15 billion by 2022-23.<sup>1</sup> The bilateral trade is expected to cross US\$ 20 billion by 2025.<sup>2</sup> The trend depicts a classic rise of bilateral trade, particularly after the ASEAN-India Trade in Goods Agreement in 2010 (Figure 1). Therefore, both the countries have witnessed significant growth in bilateral trade, with maritime trade playing a crucial role in facilitating the exchange of goods and fostering economic ties.

**Figure 1: Trends in India’s Trade with Vietnam: 2000-2021**



*Source:* Drawn by authors’ based on IMF DOTS.

Although the economic cooperation between India and Vietnam has reached new heights, current bilateral trade volume is much below the potential. In today’s world, trade is being reshaped by rising demand, maritime capabilities as well as a wave of new technologies.<sup>3</sup> The conventional trade policy narratives underscore the need for improved connectivity and trade facilitation between the trading partners. Going by the same logic, unlocking the trade potential between India and Vietnam also requires better connectivity, particularly maritime connectivity. Therefore, an assessment of maritime trade between India and Vietnam is a vital step to design the broader strategy for trade and connectivity (Toan *et al.*, 2023). Understanding the maritime trade is important to policy

makers, particularly those who are concerned with the economic benefits of large scale investment in connectivity. One of the forces reshaping global trade is a change in the supply chain resilience. Therefore, an assessment of maritime trade profile has several merits. For example, assessing the maritime trade volume offers valuable implications on ports and shipping, including the opportunities and challenges faced by India and Vietnam in the maritime sector. Understanding how the landscape between India and Vietnam is shifting will help policy makers and business leaders prepare for the next phase of the trade relations and the opportunities and challenges it will present. Besides, the estimated ocean shipping volume may also help policy makers to understand the intensity of decarbonisation measures that they have to undertake towards greening of the shipping industry.

In view of the above, the primary aim of this paper is to assess maritime trade volume between India and Vietnam. In other words, we estimate how much the bilateral trade between the two countries has generated the volume of maritime trade. Rest of the paper is arranged as follows. Section 2 discusses the background and research objectives. Section 3 presents methodology and data. Major findings of the analysis are then discussed in Section 4. Finally, conclusions and policy implications are briefed in Section 5.

## **Context and Research Objectives**

India and Vietnam share deep civilizational linkages. In the contemporary world, both the countries have strong cultural, economic and political ties. They are comprehensive strategic partners, and both have strong strategic vision and complement each other regionally and globally.<sup>4</sup> Vietnam is one of the active members of the Association of the Southeast Asian Nations (ASEAN) and one of the key drivers of India-ASEAN relations. India's relations with the ASEAN have grown rapidly from a sectoral dialogue partnership in 1992 to a full dialogue partnership in December 1995 to the summit partnership in 2002. In 2022, ASEAN and India had celebrated 30 years of dialogue relations, and have upgraded their strategic partnership into a comprehensive strategic partnership.

India and Vietnam have multiple engagements at global, regional and bilateral levels. Vietnam has been regarded as a cornerstone of India's Act East Policy (AEP). India and Vietnam are partners in ASEAN-India, EAS,

MGC, among others. In the words of India’s External Affairs Minister, “India-Vietnam partnership will be a significant stabilising factor in the Indo-Pacific”.<sup>5</sup> Strategic partnership between India and Vietnam has always been underpinned by their economic relations (Brewster, 2009).

In 2022-23, India’s global merchandise exports rose to a record US\$ 451 billion. Growing in the same direction, trade between India and Southeast Asia has expanded exponentially in the last decade, more due to the ASEAN-India FTA in goods and some other initiatives such as the agreement for services trade and investment. In 2022-23, India’s merchandise trade with the Southeast Asian reached a peak of US\$ 131 billion, of which India’s export was US\$ 44 billion and import was US\$ 87 billion. From ASEAN, Vietnam is India’s fifth largest trading partner, next to Indonesia, Singapore, Malaysia and Thailand. India is Vietnam’s one of the top 10 trading partners. Both the countries are actively engaged in multilateral trade and have been working together to make the multilateral trading system more fair and inclusive. At the same time, they are also FTA partners and have been discussing a bilateral FTA.<sup>6</sup> Changes in bilateral trade between India and Vietnam illustrate three important trends in terms of composition of trading relationships, and these are worth noting. Figure 2 illustrates our approach to the research objectives.

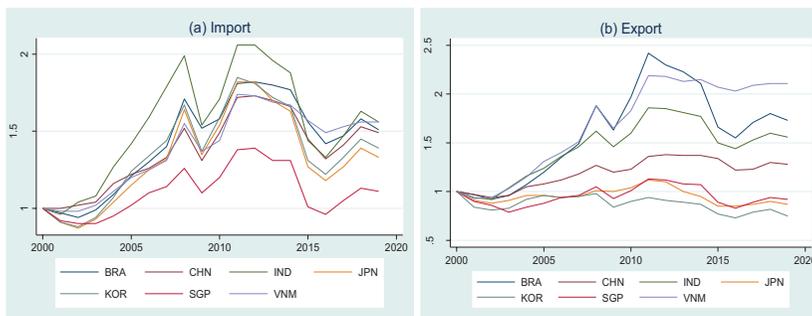
**Figure 2. Approaching the Research Objectives**



First, the paper considers the trend in trade in value versus trade in volume ratio.<sup>7</sup> In a growing economy, growth in value versus volume tells us whether changes in trade value are due to changes in volume or due to changes in prices. Observed growth (or contraction) may be due to changes in prices, changes in export volume, or both. Although trade continues to rise in absolute terms, volume of trade may differ. Figure 3 presents the trends in trade in value and trade in volume for both import and export. What comes out is that India and Vietnam follow a similar trend in volume- value ratio. Both the economies have been witnessing

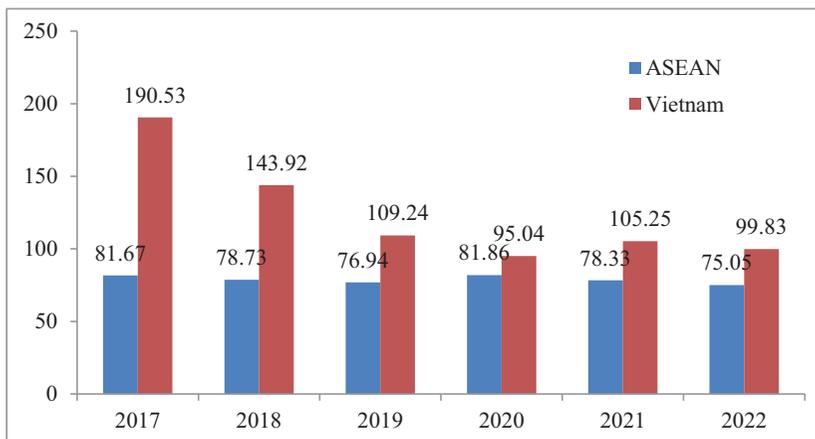
a rise in trade volume more than the trade value except for the period 2012 to 2016. Growing trade volume requires better planning in terms of trade facilitation. Flows of trade volume data play a much bigger role in identifying a proper strategy to scale up the trade relations.

**Figure 3: Trade Volume to Value Ratio**



*Source:* Calculated by authors based on WITS.

**Figure 4. Trends in India’s Trade Intensity with ASEAN and Vietnam**



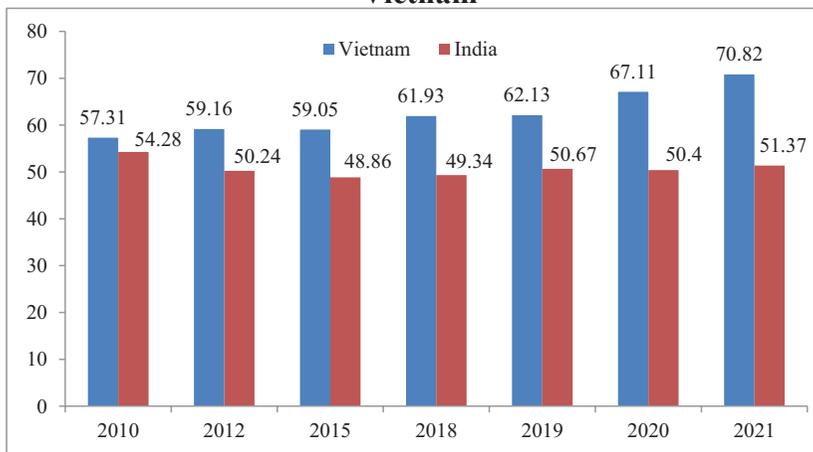
*Note:* TII greater than 100 indicates an ‘intense’ trade relationship.

*Source:* Calculated by authors based on WITS.

Second, the paper analyzes the trade intensity index (TII).<sup>8</sup> The TII suggests potential sources of future growth. The TII uses similar logic to that of revealed comparative advantage to indicate with which partners a reporter has a relatively intense trading relationship, vis-à-vis the world. The TII indicates whether a reporter exports more, as a percentage, to a partner than the world does on average. The trend reveals that although India's trade intensity with Vietnam has declined, it shows a rising trend since 2021 (Figure 4). At the same time, India's TII with Vietnam has remained higher than that of ASEAN, thereby indicating Vietnam is one of the trading partners in ASEAN with which India is having quite intensive trade relations.

Third, we consider the Trade Complementarity Index (TCI) to understand the depth of the bilateral trade relations.<sup>9</sup> The TCI evaluates the extent to which the export profile of a reporter (India) complements the import profile of a partner (Vietnam) and vice versa. Figure 5 presents trends of the TCI for the period 2010-2021 for both India and Vietnam.

**Figure 5. Trends in India's Trade Complementarity with Vietnam**



*Source:* Calculated by authors based on WITS.

The exports of India are quite complementary with the imports of Vietnam, and the converse is also true between them, although the degree has been rising over time. The rising trend of the TCI suggests

trade complementarity between India and Vietnam has been growing and there are exploitable sources of growth. Two countries may stand to gain from increased bilateral trade. A pictorial illustration in Appendix 1 also further supports the aforesaid assessment.

What follows is that changes in trade composition between India and Vietnam with rising trade intensity and complementarity underscore the need for improved connectivity between the two countries as well as a better model to assess the trade relations.

In the backdrop of the above discussion, the study aims to assess the growth and significance of maritime trade between India and Vietnam. It also identifies investment opportunities and areas of collaboration between India and Vietnam in the maritime sector. Finally, by examining the implications of India-Vietnam maritime trade on ports and shipping, this article aims to provide valuable insights for policymakers, industry stakeholders, and investors, contributing to a better understanding of the evolving trade dynamics and avenues for further growth and cooperation between the two countries.

### **3. Methodology and Data**

Trade moves primarily in four types of ocean cargo ships for transportation: (i) dry bulk items (e.g. fertilizers, grains, timbers, ores, etc.); (ii) liquid bulk items (e.g. petroleum, oil, etc.); (iii) break-bulk items (e.g. grains, coffee, cement, etc.), (iv) RO-RO items (e.g. vehicles, trains, etc.) and (iv) containerised items (garments, computers, telecom equipments, etc.). Container transportation is universal with standardized dimensions and technology. According to the UNCTAD, “Containerisation system improves productivity, reduces time and increases delivery time which meet customer’s expectation and satisfaction.”<sup>10</sup> By lowering the costs of transportation, containerisation has facilitated specialisation and the expansion of global supply chains (Rodrigue, 2020). Therefore, estimating the volume of containerized cargo may help us in understanding the implications of maritime trade on ports and shipping. Another factor that motivates us to assess the volume of containerized goods is freight charges for both maritime (and also air transportation). Container shipments allow large cost reductions in cargo handling, and therefore, with the rising level of containerization we expect lower shipping prices. Let’s see how we distill it from the basic trade theory.

The standard model for international trade:

$$V_{ij} = f(Y_i, Y_j, X') \quad (1)$$

where  $V_{ij}$  is the flow of trade between country  $i$  and country  $j$ ,  $Y_i$  and  $Y_j$  are income (GDP) of countries  $i$  and  $j$ , respectively.  $X'$  is a vector of additional regressors which include some control variables to represent internal and external factors influencing the trade flow, such as exchange rate, trade barriers, trade facilitation, etc.

Let's assume country  $i$  exports a product  $k$  to country  $j$ . The volume (quantity) and value of the export of product  $k$  are  $y$  and  $z$ , respectively. We calculate the volume of the products from the quantity data of the exported items. Therefore, Volume-Value Ratio (VVR) of product  $k$  is calculated based on:

$$VVR_{ij}^k = (y/z)_{ij}^k \quad (2)$$

Owing to the ocean freight in maritime trade, we convert the equation (2) in following OLS form:

$$\ln AFR_{ijt}^k = \beta_0 + \beta_1 \ln VVR_{ijt}^k + \beta_2 FTA_{ijt} + e_{ijt}^k \quad (3)$$

where  $AFR$  is the ad valorem freight rate of product  $k$  from exporter  $i$  to importer  $j$  at time  $t$ ,  $FTA$  is a dummy variable (1 = if trade partners members of FTA, 0 otherwise) and  $e$  is the error term.  $AFR$  is calculated based on:

$$AFR_{ijt}^k = \frac{f_{ijt}^k}{v_{ijt}^k} \quad (4)$$

where  $f_{ijt}^k$  stands for freight expenditure of product  $k$  from exporter  $i$  to importer  $j$  at time  $t$  and  $v_{ijt}^k$  is value of imports of product  $k$  from exporter  $i$  to importer  $j$  at time  $t$ .

Estimated maritime trade volume may not indicate the maritime trade intensity between trading partners. So, we calculate the maritime trade intensity ( $MTI_j$ ) based on:

$$MTI_{ij}^k = \left[ \frac{T_{ij}^k - T_{ij,min}^k}{T_{ij,max}^k - T_{ij,min}^k} \right] \quad (5)$$

where,  $T$  is the volume of maritime cargo,  $k$  is the product classified at the 6-digit HS, and  $i$  is the importing country or a region. The index is 1 for a product in a country that achieves the maximum value and it is 0 for a country that is at the minimum value.

In this study, we take two countries, namely, Vietnam and India. We aim to assess the potential of ocean trade volume between these two countries. Being theoretically consistent, assessing the trade volume will help us better understanding the trade facilitation requirements, particularly maritime trade facilitation.<sup>11</sup>

We use the equation (2) to calculate the total maritime trade volume in terms of the required number of containers at the 8-digit HS level and the corresponding number of vessels for that purpose. For the sake of analysis, we consider TEU<sup>12</sup> as a measurable unit to calculate the number of containers.

For most of the commodities (which we consider in this analysis) the units of the quantities are in kg, liter, square meter, meter and ton. We convert those into kg and tons for the TEU calculation. In doing so, we assume 18 tons per container (we assume a 20ft length standardized shipping container or TEU).<sup>13</sup> Also, there were some other commodities with other units as nos., pairs or units, which we exclude in this analysis. However, we include some of the fabric and dress materials in the analysis. Commodities with units like nos., pairs or units and some other units could not be included due to data incompatibility. All other commodities are included and categorized in the analysis. We follow unit conversions: 1 sqm=210 grams, 1 Liter=1 kg, 1 ton=1000 kgs, 1 TEU=18 tonnes.

We calculate the ocean trade between India and Vietnam for 2010-11 and 2021-22 in terms of different types of containerized and non-containerized goods.<sup>14</sup> Here, data is taken at HS 8-digit level and then aggregated to calculate the trade volume. In some cases, we consider 6-digit HS such as the AFR. The large part of the data of this analysis is collected primarily from two major sources: (i) Export-Import Databank of the Government of India, available at <https://tradestat.commerce.gov.in/eidb>; and (ii) World Integrated Trade Solution (WITS) of the World Bank, accessible at <https://wits.worldbank.org>

## Analysis and Major Findings

Table 1(a) presents the calculated volume of trade in terms of containers and refrigerated containers between India and Vietnam in 2010-11 and 2021-22. The CAGR of volume of trade shows some significant increase over the period, indicating the rising volume of the ocean trade between India and Vietnam. Table 1(b) presents the volume of trade in terms of liquid cargo and non-containerised (solid) between India and Vietnam in 2010-11 and 2021-22. Following findings are worth noting.

First, volume-wise India-Vietnam trade has gone up during 2010-11 and 2021-22. Among the four categories of cargoes, India's export of liquid cargo to Vietnam was increased by almost 94 per cent in 2021-22, compared to 2010-11. On the other hand, India's import of non-containerised (solid) cargo from Vietnam also increased by 29 per cent in the same period. India's import of both containerised and non-containerised (solid) cargoes from Vietnam witnessed a sizeable rise during the period 2010-11 and 2021-22. Vietnam's dependence on India in mineral fuels, mineral oils and products of their distillation; pharmaceuticals; chemicals, etc. has gone up. India's import from Vietnam, on the other hand, has increased in inorganic chemicals; copper, iron and steel, etc. Appendix 3 presents chapter-wise major export and import commodity groups.

**Table 1(a): India's Trade with Vietnam in 2010-11 and 2021-22: Containerized Goods**

Types of Containers	2010-11 (TEUs)		2021-22 (TEUs)		CAGR* (%)	
	Export	Import	Export	Import	Export	Import
Containerised goods	103929	31069	277474	108247	9.3	12.0
Containerised (Refrigerated) goods	46798	2953	121727	6989	9.1	8.1
<b>Total</b>	<b>150727</b>	<b>34022</b>	<b>399201</b>	<b>115236</b>	<b>9.3</b>	<b>11.7</b>

\*CAGR considers the period 2010-11 and 2021-22.

*Source:* Authors' own calculation.

**Table 1(b): India's Trade with Vietnam in 2010-11 and 2021-22: Liquid Cargo and Non-containerised (solid) Goods**

Type of Cargo	2010-11 ('000 Tons)		2021-22 ('000 Tons)		CAGR* (%)	
	Export	Import	Export	Import	Export	Import
Liquid cargo	1.38	9.81	2020.9	58.0	94.0	17.5
Non-containerised (solid) cargo	27.9	77.4	126.8	1243.2	14.8	28.7

\*CAGR considers the period 2010-11 and 2021-22.

*Source:* Authors' own calculation.

**Table 2: India's Top 10 Exports to Vietnam in terms of Volume to Value Ratio**

2-digit HS	Description	VVR (Kg per US\$)	
		2010-11	2021-22
25	Salt; sulphur; earths and stone; plastering materials, lime and cement	10.33	12.03
17	Sugars and sugar confectionery	3.52	4.94
23	Residues and waste from the food industries; prepared animal fodder	2.76	4.33
57	Carpets and other textile floor coverings	1.60	4.27
10	Cereals	3.96	3.49
68	Articles of stone, plaster, cement, asbestos, mica or similar materials	1.39	3.07
11	Products of the milling industry; malt; starches; insulin; wheat gluten	2.66	2.65
7	Edible vegetables and certain roots and tubers	3.05	2.47
53	Other vegetable textile fibres; paper yarn and woven fabrics of paper yarn	1.03	2.20
27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes	0.13	1.81

*Source:* Authors' own calculation.

Second, in the containerised segment, trade flow between India and Vietnam increased in both ways, thereby suggesting transformation of bilateral trade from primary goods to containerised goods and also possible rise in production networks between the two countries. There has been a sharp rise in value chains between India and Vietnam in electrical machinery and equipment, cotton garments, mobile phones, electronics items, etc. The rise in bilateral containerised trade confirms the rise of production networks between the two countries in electrical and electronics.

**Table 3: India's Top 10 Imports from Vietnam in terms of Volume to Value Ratio**

2- digit HS	Description	VVR (Kg per US\$)	
		2010-11	2021-22
69	Ceramic products	2.2	17.5
57	Carpets and other textile floor coverings	0.1	12.9
25	Salt; sulphur; earths and stone; plastering materials, lime and cement	9.1	5.9
27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes	0.0	3.5
44	Wood and articles of wood; wood charcoal	2.2	2.1
10	Cereals	2.2	2.1
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	1.9	1.8
28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes	1.1	1.7
5	Products of animal origin, not elsewhere specified or included	0.2	1.6
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	2.4	1.4

*Source:* Authors' own calculation.

Third, Tables 2 and 3 present the trends in volume to value ratio (VVR) of the top 10 exports and imports for 2021-22 and 2010-11 between India and Vietnam. With rising trade, the changing VVR compositions of bilateral exports and imports suggest a rise of ocean freight between India and Vietnam, thereby indicating opportunities in ports and shipping. In 2021-22, the top 10 exports from India to Vietnam had VVR between 1.03 and 12.03. For example, export of salt; sulphur; earths and stone; plastering materials, lime and cement (HS 25), sugars and sugar confectionery (HS 17) and residues and waste from the food industries; prepared animal fodder (HS 23) to Vietnam commodity groups are weight-intensive. The VVRs for these commodity groups have increased significantly between 2010-11 and 2021-22. On the import side, India's top three imports from Vietnam to India in terms of VVR in 2021-22 were ceramic products (17.5 kgs per US\$), carpets and other textile floor coverings (12.9 kgs per US\$), and salt, sulphur, earths and stone, plastering materials, lime and cement (5.9 kgs per US\$). Table 3 also shows that there has been a decrease in the VVR of some imports from Vietnam to India between 2010-11 and 2021-22. The bottom three imports from Vietnam to India in terms of VVR in 2021-22 were mineral fuels, mineral oils and products of their distillation, bituminous substances, mineral waxes (0.0 kgs per US\$), products of animal origin, not elsewhere specified or included (0.2 kgs per US\$), and vegetable plaiting materials; vegetable products not elsewhere specified or included (1.4 kgs per US\$). Commodity groups like ceramic products (HS 69), carpets and other textile floor coverings (HS 57) and mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes (HS 27) have gained the VVR during 2010-11 and 2021-22 and became more weight-intensive (Table 3). The increasing demand for these items in Vietnam also presents an opportunity for Indian exporters. India and Vietnam can capitalize on this opportunity by increasing their trade, provided both the countries introduce improved ocean shipping and faster handling of goods between them.

Fourth, when countries are increasingly concerned with supply chain resilience, the trend of VVR of a product is an important indicator for supply chain design and strategy. The trend of the VVR may help

India and Vietnam to guide/nudge the shipping in order to reach markets and consumers on time. Besides, it may help exporters and imports to select the preferred mode of transportation and accordingly make arrangements of related logistics services such as warehousing, cargo handling equipment, etc.

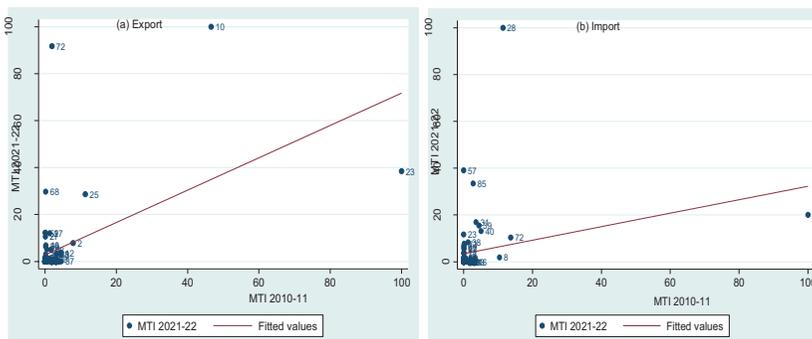
**Figure 6: Estimated Number of Cargo Vessel-Voyages of India’s Trade with Vietnam**



*Note:* Assuming each vessel’s carrying capacity is 2000 TEUs.

*Source:* Authors’ own calculation.

**Figure 7: India’s MTI with Vietnam**



*Source:* Authors’ own calculation.

Fifth, there has been a significant rise in cargo vessel-voyages, which had carried Indian exports to Vietnam in 2021-22. It is estimated that India-Vietnam trade has generated an equivalent of approx 258 container cargo vessel-voyages in 2021-22 (Figure 6) whereas the number of import cargo vessel-voyages increased more than threefold (58 in 2021-22 vis-à-vis 17 in 2010-11). This indicates a growing intensity in ocean shipping between the two countries. This is further confirmed by Figure 7, which presents scatter diagrams of MTI of India’s export and import with Vietnam, respectively. Between 2010-11 and 2021-22, Indian exports of Cereals (HS 10), Salt; Sulphur; Earths and Stone; Plastering Materials, Lime and Cement (HS 25); Articles of Stone, Plaster, Cement, Asbestos, Mica or Similar Materials (HS 68), Iron and Steel (72), etc. to Vietnam have gained higher maritime trade intensity. On the import side, commodity groups such as Salt; Sulphur; Earths and Stone; Plastering Materials, Lime and Cement (HS 25); Inorganic Chemicals; Organic or Inorganic Compounds of Precious Metals, of Rare-Earth Metals, or Radi. Elem. or of Isotope (HS 28); Carpets and Other Textile Floor Coverings (HS 57); Electrical Machinery and Equipment and Parts thereof; Sound Recorders and Reproducers, Television Image and Sound Recorders and Reproducers, and Parts (HS 85), etc. have become more maritime trade intensive in 2021-22, compared to 2010-11. These are the commodity groups, which have become more “maritime transport intensive”. The positive trend (fit) lines in Figure 7 clearly indicate that the MTI between India and Vietnam may likely to grow, *ceteris paribus*.

**Table 4: Ad Valorem Freight vs. Tariff**

Year	Trade flow	Reporter	Partner	AFR <sup>^</sup> (%)	Tariff* (%)	Product** (AFR)	Product** (Tariff)
2010-11	Import	Vietnam	India	64.50	7.67	608	1577
2021-22	Import	Vietnam	India	51.19	2.52	1103	1254
2010-11	Import	India	Vietnam	60.75	9.84	190	1045
2021-22	Import	India	Vietnam	42.67	1.04	683	1364

\*Simple average, taken from WITS. \*\*Taken at 6-digit HS <sup>^</sup>Calculated based on equation (4).

**Source:** Authors’ own calculation.

Sixth, with rising containerization, we expect a fall in AFR over time between the trading partners. This has been captured in Table 4, which presents the estimated AFR and corresponding tariff for 2010-11 and 2021-22. While tariff has come down heavily due mainly to the ASEAN-India FTA in goods, average ocean freight in ad valorem terms is alarmingly high in spite of a fall in the AFR between 2010-11 and 2021-22. Between the two countries, Vietnam continues to pay more towards ocean freight compared to India. Let's leave alone the non-tariff measures (NTMs), which are again high and complex. What follows is that ocean freight is one of the major barriers to the bilateral trade between India and Vietnam. Although a fall in tariff has presumably facilitated bilateral trade, the benefits of the free trade are perhaps wiped out by the high ocean freight. To a great extent, this disparity has caused substantial economic losses for India and Vietnam. A substantial part of the trade potential between them has remained unlocked.

**Table 5: GLM Results Dependent variable: *AFR***

<b>Variables</b>	<b>India+Vietnam</b>	<b>India</b>	<b>Vietnam</b>
	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>
VVR	-0.519***	0.507***	-0.585***
	(0.0704)	(0.0962)	(0.0706)
Tariff	-0.257***	-0.491***	0.206***
	(0.0354)	(0.0264)	(0.0544)
Infra	18.70***	-93.79***	-18.65***
	(3.187)	(3.736)	(1.041)
ER	0.000646***		
	(3.28e-05)		
FTA dummy	-28.95***		
	(1.917)		
Constant	9.347	338.9***	113.7***
	(8.687)	(11.63)	(3.148)
Year (2010, 2021)	Pooled	Pooled	Pooled
Specification	6-digit HS	6-digit HS	6-digit HS

*Table 5 continued...*

...Table 5 continued

AIC	5.441	6.951	6.576
Observations	827	192	636
Model	GLM	GLM	GLM

Robust standard errors in parentheses \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Infra stands for Quality of trade- and transport- related infrastructure, taken from the LPI Database, the World Bank, ER stands for official exchange rate, taken from the WDI. GLM counts years 2010 and 2021. AIC stands for Akaike's Information Criterion (AIC).

**Source:** Authors' own calculation.

Seventh, the estimated results of the Generalized Linear Model (GLM) in Table 5 indicate some interesting observations.<sup>15</sup> Our dependent variable is AFR, an indicator of maritime transport cost. Variables like the VVR, Tariff, Infrastructure, and FTA dummy have come out statistically significant in all the three models. Our interest is in Model 1, which presents the flow of goods from the import side at 6-digit HS (product level). Here, the FTA dummy and exchange rate have also come out statically significant. What we can infer is that since ocean trade is driven by “weight”, larger volume of ocean trade (read, containerized trade) may lead to a fall in ocean freight between India and Vietnam. In other words, scale matters in ocean freight rate between the two countries. Because of the FTA (ASEAN-India FTA in Goods), tariffs have substantially come down. Estimated results in Model 1 clearly suggest further tariff cut (at bilateral) may not have desired impact on ocean freight rate (transport cost). Rather, it may negatively impact ocean freight. Improvement of quality of trade and transport related infrastructure may lead to fall in ocean transport cost. So also exchange rate, which shows negligible impact on ocean freight. However, we add a disclaimer that the results vary when we select country samples (India and Vietnam). Estimated values of the AIC confirm the robustness of GLM estimation. Nonetheless, we cannot go far in explaining the GLM results since it is a baseline model and may suffer from omitted variable bias.

This paper is unique in terms of three new research calculations: first, volume to value ratio (VVR) of the India-Vietnam trade; second, the ad valorem freight rate as an indicator of maritime transport cost, third, the maritime transport intensity. The foregoing analysis clearly suggests the trade between the two partners is “transport” sensitive where the volume-to-value is crucial in determining the maritime transport costs between India and Vietnam.

## 5. Policy Implications

India-Vietnam relation has grown from strength to strength. Both share deep civilizational links. In 2022, both the countries commemorated 50 years of diplomatic ties. The drivers for the spectacular rise of bilateral relations between India and Vietnam are not only the growth of culture and commerce but also both strategic and security.

Bilateral trade between India and Vietnam has expanded from about US\$ 4 billion in 2010 to US\$ 15 billion by 2022-23, which is expected to cross the US\$ 20 billion mark by 2025. The trend depicts a classic rise of bilateral trade, particularly after the ASEAN-India Trade in Goods Agreement in 2010. Maritime trade has come in a big way while playing a crucial role in facilitating the exchange of goods and fostering economic ties. This study provides insights into the evolving trade relationship between the two countries and can be a valuable resource in understanding the trade pattern.

Like trade, the FDI flow between India and Vietnam has also expanded. India's investment in Vietnam is estimated to be around US\$ 1.9 billion in 2021 including investments routed through third countries. Indian investments in Vietnam have gone mainly to the sectors like energy, mineral exploration, agro-processing, sugar, tea, coffee manufacturing, agro-chemicals, IT and auto components. With trade and investment rising, there is enough scope to augment the value chains between India and Vietnam in electronics and office equipment, pharmaceuticals, agro and processed food, etc. Driven by multinationals, the GVC networks between India and Vietnam are set to rise. Besides, Vietnam is becoming a hub of FTAs viz. CP-TPP, RCEP, US-Vietnam, EU-Vietnam, etc., which all provide further scope to scale up the India-Vietnam bilateral trade, investment and value chains. Several Indian companies have invested in Vietnam and many are in pipeline.<sup>16</sup> With higher trade and investment, value chains have becoming stronger between India and Vietnam: (i) backward linkages with Vietnam in transport equipment, electronics, mobile phone, machineries, automobiles, etc.; (ii) forward linkages with Vietnam in pharma, automobiles, etc. One of India's largest conglomerates, Adani Group, has been actively investing in the development of ports and terminals in India and other countries, including Vietnam. The company has proposed to invest in the development of the Lien Chieu port in Vietnam, which is expected to enhance the maritime

connectivity between India and Vietnam. Adani Group has proposed to invest US\$ 500 million in the development of the port, which includes the construction of a deep-water port and the development of related infrastructure, such as container yards and warehouses. The proposed investment is expected to enhance the maritime connectivity between India and Vietnam and improve the trade flows between the two countries. The Lien Chieu port has the potential to become a significant transshipment hub in the region, as it is strategically located between the major ports of Singapore and Hong Kong. Adani Group's investment in the Lien Chieu port is part of its larger strategy to expand its global footprint in the port and logistics sector. More such investments are needed to strengthen the maritime partnership.

In order to further enhance maritime trade and connectivity between India and Vietnam, several key measures can be implemented to address challenges and promote collaboration. The following points highlight important steps that can be taken, supported by relevant data and facts, to strengthen maritime trade and connectivity between the two countries.

Vietnam has become a hub of economic partnerships. Vietnam has signed over 20 FTAs till date.<sup>17</sup> These agreements have significantly contributed to expanding Vietnam's trade opportunities, promoting economic integration, and attracting foreign investment. They cover various areas such as tariff reductions, trade in goods and services, investment facilitation, intellectual property protection, and legal certainty for businesses. By participating in these agreements, Vietnam has strengthened its economic ties with partner countries and enhanced its position in regional and global trade networks (Thuong and Oanh, 2021). These FTA routes provide new market access opportunities to India.

### **Phasing out Non-Tariff Measures (NTMs)**

Non-Tariff Measures (NTMs) can act as barriers to trade and hinder smooth flow of goods. According to a study by the United Nations Conference on Trade and Development (UNCTAD), Vietnam faces several NTMs, including technical barriers to trade and customs procedures, which increase the cost and complexity of doing business. Similarly, India has also implemented NTMs, such as licensing requirements and quality standards, affecting trade flows. To address these challenges, India and Vietnam can work towards phasing out or reducing NTMs through mutual recognition agreements and harmonization of trade regulations.

## **Strengthening Maritime Connectivity**

Enhancing maritime connectivity is crucial for promoting efficient and seamless trade between India and Vietnam. Both countries have been investing in port infrastructure and expanding their maritime connectivity. Vietnam has developed key deep-sea ports, including Cai Mep-Thi Vai port complex and Lach Huyen International Gateway Port. These ports have the potential to handle larger vessels and increase trade capacities. India has also undertaken initiatives such as the Sagarmala Program, which focuses on port-led development, connectivity enhancement, and coastal economic zone development. Vietnam may consider joining one of the seven pillars of India's IPOI, and similarly, India may pick up investment projects in ASEAN's AOIP.

## **Strengthening Maritime Digital Linkages**

Digital technologies play a vital role in facilitating trade and connectivity in the maritime domain. India and Vietnam can collaborate to develop and implement digital solutions to streamline trade processes and enhance efficiency. India's Port Community System, PCS1x, provides a single-window interface for port users, optimizing trade processes and reducing transaction costs. Vietnam has also made progress in digitalizing its trade procedures through initiatives such as the National Single Window and the Vietnam Automated Cargo and Port Consolidated System. By leveraging digital linkages, India and Vietnam can enhance transparency, reduce paperwork, and expedite customs clearance procedures, leading to improved trade efficiency and cost savings.

## **Promoting Trade Facilitation**

Trade facilitation measures are essential for reducing trade costs and enhancing the ease of doing business. India and Vietnam can focus on simplifying customs procedures and implementing initiatives that promote trade facilitation. Vietnam and India have made substantial progress in trade facilitation, improving the countries' rank in the LPI over time. Both the countries have implemented several reforms to streamline customs procedures, reduce the time and cost of exporting and importing goods, and enhance trade efficiency. Further trade facilitation may help strengthen the maritime linkages and trade.

## **Engaging B2B Linkages**

Strengthening business-to-business (B2B) linkages is crucial for fostering trade and investment between India and Vietnam. Both countries can encourage business delegations, industry associations, and chambers of commerce to facilitate networking, exchange of information, and business collaborations. According to the Embassy of India in Vietnam, there are over 200 Indian companies operating in Vietnam across various sectors, including manufacturing, energy, information technology, and services. Engaging these companies in B2B linkages can promote partnerships, joint ventures, and investment opportunities in the maritime trade sector. In addition, engaging think tanks and research institutions can support policy dialogue and provide recommendations for enhancing maritime trade and connectivity between India and Vietnam. These institutions can contribute valuable insights and expertise in areas such as trade policies, logistics, and infrastructure development.

## **Cooperation between Shipping Associations and Chambers**

Collaboration between shipping associations and chambers of commerce can play a significant role in promoting maritime trade and connectivity. India and Vietnam can encourage closer cooperation between their respective shipping associations and chambers to exchange information, share best practices, and explore opportunities for joint initiatives. The Federation of Indian Chambers of Commerce and Industry (FICCI) and the Vietnam Chamber of Commerce and Industry (VCCI) are important platforms that facilitate dialogue and cooperation between businesses in the two countries. Engaging these organizations can lead to the development of joint initiatives, knowledge-sharing platforms, and business matchmaking events. Cooperation between shipping associations and chambers can also foster partnerships in areas such as maritime education and training, port management, and technology adoption, thereby enhancing the overall competitiveness and efficiency of the maritime trade sector.

## **Developing Multimodal Connectivity**

In addition to maritime connectivity, the development of multimodal transportation networks can further enhance trade and connectivity between India and Vietnam. Efficient integration of ports, roads,

railways, and inland waterways can provide seamless and cost-effective transportation options for cargo movement. For instance, India's *Gati Shakti* initiative focuses on port-led development and aims to improve connectivity by developing coastal and inland waterways. Vietnam has also invested in infrastructure projects to enhance multimodal connectivity, such as the North-South Expressway and the construction of new railway lines. By integrating these transportation modes, the efficiency and competitiveness of trade can be significantly improved.

### **Promoting Regional Cooperation**

India and Vietnam can actively engage in regional cooperation initiatives to strengthen maritime trade and connectivity in the Indo-Pacific region (Sang, 2022). Platforms such as the Indian Ocean Rim Association (IORA), IPOI, AOIP, and the ASEAN-India Maritime Transport Cooperation Agreement provide opportunities for collaboration, knowledge sharing, and capacity building. By participating in these forums, both countries can exchange best practices, leverage regional resources, and develop common strategies to overcome challenges in maritime trade and connectivity.

### **Investing in Human Capital and Skill Development**

A skilled workforce is essential for effectively managing maritime trade and port operations. India and Vietnam can invest in human capital development by promoting vocational training programs, maritime education, and skill enhancement initiatives. By nurturing a skilled workforce, both countries can meet the evolving demands of the maritime industry, enhance operational efficiency, and ensure the sustainable growth of the sector. India Maritime University (IMU) may consider offering skill development programmes to Vietnam ports and shipping industry.

### **Strengthening Institutional Frameworks**

Establishing robust institutional frameworks is crucial for effective coordination and implementation of policies related to maritime trade and connectivity. India and Vietnam can enhance cooperation by establishing joint committees, task forces, or working groups dedicated to maritime trade issues. They can set up a maritime database, maritime portal and

shipping digital interface. These mechanisms can facilitate regular dialogue, exchange of information, and monitoring of progress, ensuring effective implementation of collaborative initiatives. By adopting these measures, India and Vietnam can strengthen their maritime trade and connectivity, unlocking the full potential of their bilateral relations and contributing to the broader development and prosperity of the Indo-Pacific region (Long & Yen, 2021). Through enhanced multimodal connectivity, regional cooperation, investment in human capital, sustainable practices, and strong institutional frameworks, both countries can forge a path towards a vibrant and resilient maritime trade ecosystem.

## **6. Conclusions**

The major conclusions of this study are:

First, India and Vietnam are having an active trade relation. They are also partners in the ASEAN-India FTA and have been discussing a bilateral FTA. The changes in trade composition between India and Vietnam with rising trade intensity and complementarity underscore the need for improved connectivity between the two countries as well as a better model to assess the trade relations. One of the forces reshaping global trade is a change in the supply chain resilience. Therefore, an assessment of maritime trade profile has several merits.

Second, this is the first time a study has been devoted to assess the trade flow in terms of volume (weight) of maritime trade. The study has estimated the volume-to-value of bilateral trade which itself is a major breakthrough. Based on the estimated number of vessels of this study, one can also estimate the intensity of decarbonization in the shipping industry.

Third, the calculated volume of trade for the period 2010-11 and 2021-22 between India and Vietnam shows some significant increase over the period, indicating the rising volume of the ocean trade between India and Vietnam. Among the four categories of cargoes, India's export of liquid cargo to Vietnam has witnessed a rise of almost 94 per cent in 2021-22, compared to 2010-11. On the other, India's import of non-containerized (solid) cargo from Vietnam has also increased by 29 per cent in the same period. India's import of both containerised and non-containerised (solid) cargoes from Vietnam witnessed a sizable rise during

the period 2010-11 and 2021-22. It goes without saying that maritime trade between India and Vietnam has increased substantially. Contrary to popular belief, trade flow between India and Vietnam increased in both ways, thereby suggesting transformation of bilateral trade from primary goods to containerised goods and also possible rise in production networks between the two countries.

Fourth, with rising trade, the changing VVR compositions of bilateral exports and imports suggest a rise of ocean freight between India and Vietnam, thereby indicating ample economic opportunities in ports and shipping. India and Vietnam can capitalize on this opportunity by increasing their trade, provided both the countries introduce improved ocean shipping and faster handling of goods between them.

Fifth, the trend of the VVR may help India and Vietnam to guide/nudge the shipping sector in order to reach markets and consumers on time. Besides, it may help exporters and importers to select the preferred mode of transportation and accordingly make arrangements of related logistics services such as warehousing, cargo handling equipment, etc.

Sixth, there has been a significant rise in cargo vessel-voyages, which had carried the trade between India and Vietnam, thus indicating a growing intensity in ocean shipping between the two countries. This is further confirmed by the MTI indices estimated in this study. Many of the commodity groups have become more “maritime transport intensive”, which is likely to grow further.

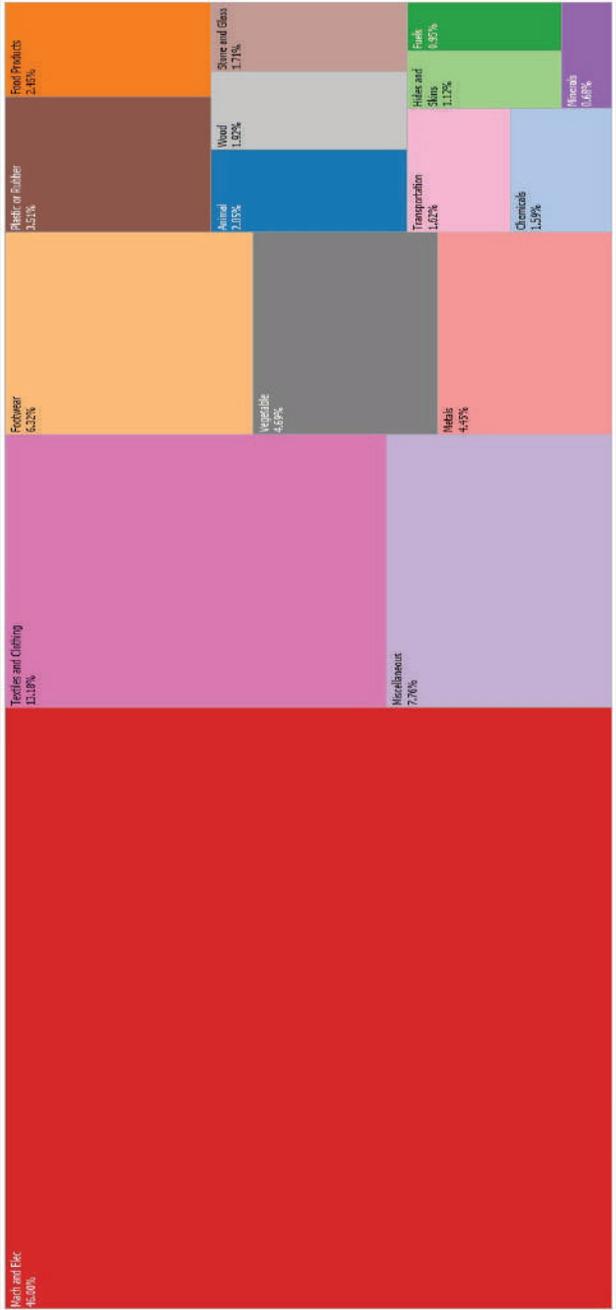
Seventh, with rising containerization, this study has noticed a fall in AFR (read maritime transport cost) over time between the trading partners. While tariff has come down heavily due mainly to the ASEAN-India FTA in goods, average ocean freight in ad valorem terms has been alarmingly high. Between the two countries, Vietnam continues to pay more towards ocean freight compared to India. What follows is that ocean freight is one of the major barriers to the bilateral trade between India and Vietnam. Although a fall in tariff has presumably facilitated bilateral trade, the benefits of the free trade are perhaps wiped out by the

high ocean freight. To a great extent, this disparity has caused substantial economic losses for India and Vietnam. A substantial part of the trade potential between them has remained unlocked. However, this judgment is contextual which must be supported by proper analysis.

Eighth, the estimated results of the Generalized Linear Model (GLM) indicate that since ocean trade is driven by “weight”, larger volume of ocean trade (read, containerized trade) may lead to fall in ocean freight between India and Vietnam. In other words, the economies of scale matters in ocean freight rate between the two countries. Because of the FTA (ASEAN-India FTA in Goods), tariffs have substantially come down. This study suggests further tariff cut (at bilateral level) may not have desired impact on ocean freight rate (transport cost). Rather, it may aggravate the maritime transport cost.

# Appendix 1: Distribution of Global Exports of India and Vietnam in 2021

Vietnam, Export by Product



Source: WITS World Bank <http://data.worldbank.org>



## Appendix 2 : Categorisation of Commodity Groups

2-digit HS	Description
Container	
11	Products of the milling industry; malt; starches; inulin; wheat gluten.
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder.
13	Lac; gums, resins and other vegetable saps and extracts.
17	Sugars and sugar confectionery.
18	Cocoa and cocoa preparations.
19	Preparations of cereals, flour, starch or milk; pastrycooks' products.
20	Preparations of vegetables, fruit, nuts or other parts of plants.
23	Residues and waste from the food industries; prepared animal fodder.
24	Tobacco and manufactured tobacco substitutes.
25	Salt; sulphur; earths and stone; plastering materials, lime and cement.
26	Ores, slag and ash.
29	Organic chemicals.
32	Tanning or dyeing extracts; tannins and their derivatives; dyes, pigments and other colouring matter; paints and varnishes; putty and other mastics; inks.
34	Soap, organic surface-active agents, washing preparations, lubricating preparations, artificial waxes, prepared waxes, polishing or scouring preparations, candles and similar articles, modelling pastes, "dental waxes" and dental preparations with a basis of plaster.
35	Albuminoidal substances; modified starches; glues; enzymes.
36	Explosives; pyrotechnic products; matches; pyrophoric alloys; certain combustible preparations.
37	Photographic or cinematographic goods.

*Appendix 2 continued...*

38	Miscellaneous chemical products.
39	Plastics and articles thereof.
40	Rubber and articles thereof.
41	Raw hides and skins (other than furskins) and leather.
42	Articles of leather; saddlery and harness; travel goods, handbags and similar containers; articles of animal gut (other than silk-worm gut).
43	Furskins and artificial fur; manufactures thereof.
45	Cork and articles of cork.
46	Manufactures of straw, of esparto or of other plaiting materials; basketware and wickerwork.
48	Paper and paperboard; articles of paper pulp, of paper or of paperboard.
49	Printed books, newspapers, pictures and other products of the printing industry; manuscripts, typescripts and plans.
50	Silk.
51	Wool, fine or coarse animal hair; horsehair yarn and woven fabric.
52	Cotton.
53	Other vegetable textile fibres; paper yarn and woven fabrics of paper yarn.
54	Man-made filaments.
55	Man-made staple fibres.
56	Wadding, felt and nonwovens; special yarns; twine, cordage, ropes and cables and articles thereof.
57	Carpets and other textile floor coverings.
58	Special woven fabrics; tufted textile fabrics; lace; tapestries; trimmings; embroidery.
59	Impregnated, coated, covered or laminated textile fabrics; textile articles of a kind suitable for industrial use.
60	Knitted or crocheted fabrics.
61	Articles of apparel and clothing accessories, knitted or crocheted.

62	Articles of apparel and clothing accessories, not knitted or crocheted.
63	Other made up textile articles; sets; worn clothing and worn textile articles; rags.
64	Footwear, gaiters and the like; parts of such articles.
65	Headgear and parts thereof.
66	Umbrellas, sun umbrellas, walking-sticks, seat-sticks, whips, riding-crops and parts thereof.
67	Prepared feathers and down and articles made of feathers or of down; artificial flowers; articles of human hair.
68	Articles of stone, plaster, cement, asbestos, mica or similar materials.
69	Ceramic products.
70	Glass and glassware.
72	Iron and steel.
73	Articles of iron or steel.
74	Copper and articles thereof.
75	Nickel and articles thereof.
76	Aluminium and articles thereof.
77	( Reserved for possible future use in the Harmonized System)
78	Lead and articles thereof.
79	Zinc and articles thereof.
80	Tin and articles thereof.
81	Other base metals; cermets; articles thereof.
82	Tools, implements, cutlery, spoons and forks, of base metal; parts thereof of base metal.
83	Miscellaneous articles of base metal.
84	Nuclear reactors, boilers, machinery and mechanical appliances; parts thereof.
85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles.

90	Optical, photographic, cinematographic, measuring, checking, precision, medical or surgical instruments and apparatus; parts and accessories thereof.
91	Clocks and watches and parts thereof.
92	Musical instruments; parts and accessories of such articles.
93	Arms and ammunition; parts and accessories thereof.
94	Furniture; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings; lamps and lighting fittings, not elsewhere specified or included; illuminated signs, illuminated name-plates and the like; prefabricated buildings.
95	Toys, games and sports requisites; parts and accessories thereof.
96	Miscellaneous manufactured articles.
97	Works of art, collectors' pieces and antiques.
	<b>Container (Refrigerated)</b>
2	Meat and edible meat offal.
3	Fish and crustaceans, molluscs and other aquatic invertebrates.
4	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included.
5	Products of animal origin, not elsewhere specified or included.
6	Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage.
7	Edible vegetables and certain roots and tubers.
8	Edible fruit and nuts; peel of citrus fruit or melons.
9	Coffee, tea, maté and spices.
10	Cereals.
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included.
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes.
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates.
21	Miscellaneous edible preparations.

Appendix 2 continued...

22	Beverages, spirits and vinegar.
30	Pharmaceutical products.
	<b>Liquid cargo</b>
27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes.
33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations.
	<b>Non-containerized cargo (solid)</b>
1	Live animals.
28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes.
31	Fertilisers.
44	Wood and articles of wood; wood charcoal.
47	Pulp of wood or of other fibrous cellulosic material; recovered (waste and scrap) paper or paperboard.
86	Railway or tramway locomotives, rolling-stock and parts thereof; railway or tramway track fixtures and fittings and parts thereof; mechanical (including electro-mechanical) traffic signalling equipment of all kinds.
87	Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof.
88	Aircraft, spacecraft, and parts thereof.
89	Ships, boats and floating structures.

**Note:** Division of trade is based on authors' discussion with shipping agents.

**Source:** Authors' own.

### Appendix 3

**Appendix Table 1: Volume-wise India's Top 10 Exports to Vietnam: 2010-11 and 2021-22**

<b>Containerised goods</b>			
<b>2010-11</b>		<b>2021-22</b>	
<b>2-digit HS</b>	<b>Description</b>	<b>2-digit HS</b>	<b>Description</b>
23	Residues and waste from the food industries; prepared animal fodder	72	Iron and steel
25	Salt; sulphur; earths and stone; plastering materials, lime and cement	23	Residues and waste from the food industries; prepared animal fodder
52	Cotton	68	Articles of stone, plaster, cement, asbestos, mica or similar materials
38	Miscellaneous chemical products	25	Salt; sulphur; earths and stone; plastering materials, lime and cement
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	52	Cotton
39	Plastics and articles thereof	17	Sugars and sugar confectionery
29	Organic chemicals	26	Ores, slag and ash
72	Iron and steel	48	Paper and paperboard; articles of paper pulp, of paper or of paperboard
17	Sugars and sugar confectionery	39	Plastics and articles thereof
69	Ceramic products	76	Aluminium and articles thereof

*Appendix 3 Table 1 continued...*

<b>Containerised (Refrigerated) goods</b>			
<b>2010-11</b>		<b>2021-22</b>	
<b>2-digit HS</b>	<b>Description</b>	<b>2-digit HS</b>	<b>Description</b>
10	Cereals	10	Cereals
2	Meat and edible meat offal	2	Meat and edible meat offal
3	Fish and crustaceans, molluscs and other aquatic invertebrates	3	Fish and crustaceans, molluscs and other aquatic invertebrates
9	Coffee, tea, mate and spices	8	Edible fruit and nuts; peel of citrus fruit or melons
7	Edible vegetables and certain roots and tubers	7	Edible vegetables and certain roots and tubers
30	Pharmaceutical products	9	Coffee, tea, maté and spices
16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates	5	Products of animal origin, not elsewhere specified or included
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	21	Miscellaneous edible preparations
8	Edible fruit and nuts; peel of citrus fruit or melons	30	Pharmaceutical products
5	Products of animal origin, not elsewhere specified or included	15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes
<b>Liquid cargo</b>			
<b>2010-11</b>		<b>2021-22</b>	

<b>2-digit HS</b>	<b>Description</b>	<b>2- digit HS</b>	<b>Description</b>
27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes	27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes
33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations	33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations
<b>Non-containerised goods (solid)</b>			
<b>2010-11</b>		<b>2021-22</b>	
<b>2-digit HS</b>	<b>Description</b>	<b>2-digit HS</b>	<b>Description</b>
28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes	28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes
31	Fertilisers	87	Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof
87	Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof	31	Fertilisers
86	Railway or tramway locomotives, rolling-stock and parts thereof; railway or tramway track fixtures and fittings and parts thereof; mechanical (including electro-mechanical) traffic signalling equipment of all kinds	44	Wood and articles of wood; wood charcoal

Appendix 3 Table 1 continued...

44	Wood and articles of wood; wood charcoal	86	Railway or tramway locomotives, rolling-stock and parts thereof; railway or tramway track fixtures and fittings and parts thereof; mechanical (including electro-mechanical) traffic signalling equipment of all kinds
		88	Aircraft, spacecraft, and parts thereof

Source: Authors' own calculation based on EXIM Databank, Department of Commerce, India.

### Appendix Table 2: Volume-wise India's Top 10 Imports from Vietnam: 2010-11 and 2021-22

Containerised goods			
2010-11		2021-22	
2-digit HS	Description	2-digit HS	Description
25	Salt; sulphur; earths and stone; plastering materials, lime and cement	57	Carpets and other textile floor coverings
72	Iron and steel	85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles
40	Rubber and articles thereof	25	Salt; sulphur; earths and stone; plastering materials, lime and cement
39	Plastics and articles thereof	39	Plastics and articles thereof

Appendix 3 Table 2 continued...

85	Electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles	40	Rubber and articles thereof
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder	23	Residues and waste from the food industries; prepared animal fodder
69	Ceramic products	72	Iron and steel
38	Miscellaneous chemical products	38	Miscellaneous chemical products
23	Residues and waste from the food industries; prepared animal fodder	73	Articles of iron or steel
11	Products of the milling industry; malt; starches; inulin; wheat gluten	69	Ceramic products
<b>Containerised (Refrigerated) goods</b>			
<b>2010-11</b>		<b>2021-22</b>	
<b>2-digit HS</b>	<b>Description</b>	<b>2-digit HS</b>	<b>Description</b>
9	Coffee, tea, maté and spices	9	Coffee, tea, mate and spices
8	Edible fruit and nuts; peel of citrus fruit or melons	8	Edible fruit and nuts; peel of citrus fruit or melons
14	Vegetable plaiting materials; vegetable products not elsewhere specified or included	14	Vegetable plaiting materials; vegetable products not elsewhere specified or included

Appendix 3 Table 2 continued...

3	Fish and crustaceans, molluscs and other aquatic invertebrates	15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes	3	Fish and crustaceans, molluscs and other aquatic invertebrates
21	Miscellaneous edible preparations	21	Miscellaneous edible preparations
10	Cereals	16	Preparations of meat, of fish or of crustaceans, molluscs or other aquatic invertebrates
22	Beverages, spirits and vinegar	22	Beverages, spirits and vinegar
5	Products of animal origin, not elsewhere specified or included	10	Cereals
6	Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage	7	Edible vegetables and certain roots and tubers
<b>Liquid cargo</b>			
<b>2010-11</b>		<b>2021-22</b>	
<b>2-digit HS</b>	<b>Description</b>	<b>2-digit HS</b>	<b>Description</b>
33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations	27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes
27	Mineral fuels, mineral oils and products of their distillation; bituminous substances; mineral waxes	33	Essential oils and resinoids; perfumery, cosmetic or toilet preparations

Appendix 3 Table 2 continued...

<b>Non-containerised (solid) goods</b>			
<b>2010-11</b>		<b>2021-22</b>	
<b>2-digit HS</b>	<b>Description</b>	<b>2-digit HS</b>	<b>Description</b>
28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes	28	Inorganic chemicals; organic or inorganic compounds of precious metals, of rare-earth metals, of radioactive elements or of isotopes
31	Fertilisers	31	Fertilisers
44	Wood and articles of wood; wood charcoal	44	Wood and articles of wood; wood charcoal
87	Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof	87	Vehicles other than railway or tramway rolling-stock, and parts and accessories thereof
47	Pulp of wood or of other fibrous cellulosic material; recovered (waste and scrap) paper or paperboard	47	Pulp of wood or of other fibrous cellulosic material; recovered (waste and scrap) paper or paperboard
88	Aircraft, spacecraft, and parts thereof	86	Railway or tramway locomotives, rolling-stock and parts thereof; railway or tramway track fixtures and fittings and parts thereof; mechanical (including electro-mechanical) traffic signalling equipment of all kinds
		88	Aircraft, spacecraft, and parts thereof
		89	Ships, boats and floating structures

**Source:** Authors' own calculation based on EXIM Databank, Department of Commerce, India.

#### Appendix 4: List of Vietnam's FTAs/RTAs

<b>Agreement</b>	<b>Signatories</b>	<b>Implemen- tation Date</b>	<b>Key Provisions and Benefits</b>
ASEAN-Australia-New Zealand Free Trade Agreement (AANZFTA)	ASEAN, Australia, New Zealand	2010	Tariff reductions, services liberalization, and investment facilitation
ASEAN-China Free Trade Agreement (ACFTA)	ASEAN, China	2010	Tariff reductions, market access, and economic cooperation
ASEAN-Hong Kong, China Free Trade Agreement (AHKFTA)	ASEAN, Hong Kong, China	2019	Tariff elimination, trade in goods, services, and investment, and improved legal certainty for businesses
ASEAN-India Free Trade Agreement (AIFTA)	ASEAN, India	2010	Tariff reductions, trade in goods, services, and investment facilitation
ASEAN-Japan Comprehensive Economic Partnership (AJCEP)	ASEAN, Japan	2008	Tariff elimination, investment promotion, and trade facilitation
ASEAN-Korea Free Trade Agreement (AKFTA)	ASEAN, Korea, Republic of	2007	Tariff reductions, trade facilitation, and investment cooperation

*Appendix 4 continued...*

Appendix 4 continued...

ASEAN Free Trade Area (AFTA)	ASEAN Member States	1993	Elimination of tariffs on most goods traded within the ASEAN region
Chile-Vietnam Free Trade Agreement (CVFTA)	Chile, Vietnam	2014	Tariff elimination, market access, and cooperation in various sectors
Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)	11 Pacific Rim Countries + Vietnam	2019	Tariff reductions, intellectual property protection, and investment provisions
European Union-Vietnam Free Trade Agreement (EVFTA)	European Union, Vietnam	2020	Tariff elimination, market access, protection of intellectual property rights, and investment facilitation
Eurasian Economic Union (EAEU)-Vietnam Free Trade Agreement	Eurasian Economic Union, Vietnam	2016	Tariff reductions, trade in goods, services, and investment facilitation
Global System of Trade Preferences among Developing Countries (GSTP)	Participating Developing Countries	1989	Preferential tariff treatment and increased market access for participating countries

Appendix 4 continued...

Japan-Vietnam Economic Partnership Agreement (JVEPA)	Japan, Vietnam	2009	Tariff reductions, investment promotion, and cooperation in various sectors
Korea-Vietnam Free Trade Agreement (KVFTA)	Korea, Republic of, Vietnam	2015	Tariff reductions, trade facilitation, and investment cooperation
United Kingdom-Vietnam Free Trade Agreement (UKVFTA)	United Kingdom, Vietnam	2021	Tariff elimination, market access, and cooperation in various sectors

Source: WTO.

## Endnotes

- <sup>1</sup> Based on the EXIM Databank, available at <https://tradestat.commerce.gov.in/idb/iecent.asp>
- <sup>2</sup> Reported in The Economic Times dated 21 November 2021, available at <https://economictimes.indiatimes.com/news/economy/foreign-trade/indonesia-vietnam-trade-expected-to-cross-20-billion-by-2025/articleshow/79335266.cms?from=mdr>
- <sup>3</sup> Read, for example, McKinsey (2019), WTO (2022), UNCTAD (2023), etc.
- <sup>4</sup> Relations between India and Vietnam are deep-rooted and multi-faceted. Refer, for example, [https://mea.gov.in/Portal/ForeignRelation/Vietnam\\_new2021.pdf](https://mea.gov.in/Portal/ForeignRelation/Vietnam_new2021.pdf)
- <sup>5</sup> Refer the Address by Dr. S. Jaishankar, External Affairs Minister of India at the celebration of 5th Anniversary of India-Vietnam Comprehensive Strategic Partnership (2016-2021), 17 December 2021, available at [https://www.icwa.in/show\\_content.php?lang=1&level=1&ls\\_id=6711&lid=4594](https://www.icwa.in/show_content.php?lang=1&level=1&ls_id=6711&lid=4594)
- <sup>6</sup> Refer, for example, <https://www.livemint.com/news/world/india-vietnam-to-begin-talks-on-trade-agreement-11674234275899.html>
- <sup>7</sup> This indicator returns indexes for trade volume and trade value from the WITS database. Value indices are the current value of imports or exports (cif) converted to US\$ and expressed as a percentage of the average of the base period (2000). Volume indices are the ratio of the import or export value index to the corresponding unit value index. Unit value indexes are based on data reported by countries with demonstrated UNCTAD quality controls using the previous year's trade values at the SITC-3 level as weights. Systematic biases remain. Refer, WITS (2023)
- <sup>8</sup> Trade intensity index is the ratio of a trading partner's share to a country/region's total trade and the share of world trade with the same trading partner. It is calculated as:

$$TII_{ij} = \frac{t_{ij} / T_{iw}}{t_{wj} / T_{ww}}$$

where  $t_{ij}$  is the dollar value of total trade of country/region  $i$  with country/region  $j$ ,  $T_{iw}$  is the dollar value of the total trade of country/region  $i$  with the world,  $t_{wj}$  is the dollar value of world trade with country/region  $j$ , and  $T_{ww}$  is the dollar value of world trade. An index of more than one indicates that trade flow between countries/regions is larger than expected given their importance in world trade. The TCI between countries  $i$  and  $j$  can be calculated as:

$$TC_j^i = 100 \left[ 1 - \left( \sum_k |m_k^i - x_k^j| / 2 \right) \right]$$

where  $TC_j^i$  is trade complementarity between countries  $i$  and  $j$ ,  $m_k^i$  is sector  $k$ 's share in  $i$ 's total imports from the world and  $x_k^j$  is sector  $k$ 's share in  $j$ 's total exports to the world. The TCI takes a value between 0 and 100, with zero indicating no overlap and 100 indicating a perfect match in the import/export pattern.

- <sup>10</sup> Refer, for example, UNCTAD (2018)
- <sup>11</sup> We consider India and Vietnam as a case study. However, the same can be extended to other country pairs or multiple trade partners.
- <sup>12</sup> A TEU or Twenty-foot Equivalent Unit is an exact unit of measurement used to determine cargo capacity for container ships and terminals. This measurement is derived from the dimensions of a 20ft standardized shipping container. Since standard containers can be 20 or 40ft in length the capacity of a container ship can depend on the ratio of the two sizes. In order to avoid confusion and standardize a ship's capacity, the number of containers a ship can load is translated into a number of 20ft containers and that measurement is known as TEU. For example, one forty foot container is two TEUs.
- <sup>13</sup> The conversation factor was considered based on consultation with a multimodal transport operator.
- <sup>14</sup> Appendix 2 presents the categorization criteria adopted in this study.
- <sup>15</sup> The GLM is suitable because the relationship between dependent (AFR) and independent (VMM, Tariff, etc.) variables are not linear. In other words, there exists some non-linear relationship between them. For further details, please refer, Stata Handbook, available at <https://www.stata.com/features/generalized-linear-models/>
- <sup>16</sup> Companies like Tata, RPG, Bank of India, ONGC Videsh, Godrej, HCL, Wipro, Marico, Mahindra, etc. Many Indian start-ups such as car rental company Zoomcar and online higher education company UpGrad, etc. have entered into the Vietnam market.
- <sup>17</sup> Refer Appendix 4 for the list of FTAs that Vietnam has executed.

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