

## AIC Working Paper

# Driving India's Trade in an Uncertain World: An Empirical Analysis

**Prabir De**

**Durairaj Kumarasamy**



**RIS**

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# Driving India's Trade in an Uncertain World: An Empirical Analysis<sup>#</sup>

Prabir De\* and Durairaj Kumarasamy\*\*

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## Abstract

*The Covid-19 has triggered an ongoing global crisis, which has had a huge effect on people's lives and livelihoods, as well as their basic well-being and productivity of countries across the world. Besides, it has also disrupted the supply chain networks and the supply of intermediate inputs and final goods in the developing world, especially those countries that are integral parts of global value chains. Countries have been implementing effective trade facilitation reforms such as digitizing possible trade procedures and expediting standard operating procedures that would enable smooth supply chain flow and helps the MSMEs sustain their businesses during the pandemic. Facilitating business beyond the border means enhanced trade facilitation and connectivity in the region. On the above background, this study examines the impact of trade costs on India's exports, particularly deriving the role of trade facilitation on affecting India's exports. India has made significant improvement in digital trade facilitation measures and this study indicates that significant improvement in trade facilitation measures would facilitate country's export.*

**Keywords:** Trade, Digitalization, Trade Facilitation, Regional Integration

**JEL codes:** F1, F13, F15

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\* Professor, ASEAN-India Centre (AIC), Research and Information System for Developing Countries (RIS), New Delhi.

\*\* Consultant, AIC at RIS, New Delhi.

# 1. Introduction

The world has been facing an unprecedented crisis, unleashed by the Coronavirus. The economic crisis triggered by the Covid-19 hit hard most of the countries across the world. The developing world has been disproportionately impacted by the pandemic, especially those countries which are an integral part of the global value chains. The IMF commented: “The cumulative loss in global output relative to the pre-pandemic projected path is forecasted to grow from US\$ 11 trillion over 2020-2021 to US\$ 28 trillion over 2020-2025”.<sup>1</sup> Faced with the greatest crisis since the Great Depression of the 1930s, the stronger multilateral cooperation is, therefore, felt *sine qua non* to not only containing the pandemic and mitigate its social and economic effects but also bringing back the world economy to the growth path.

The COVID-19 pandemic is a supply shock as well as a demand shock, and in both respects, it has affected the global trade. The negative impact of the exporters’ burden is seen more prominently in developing countries as compared to developed countries (Hayakawa and Mukunoki, 2020).

The global economy has faced with supply chain disruptions in several locations across the world. This situation eventually resulted in shortages of parts and equipment to downstream industries – most notably the automotive, chemicals, computer equipment, garments and textiles, machinery, metal and metal products industries, and those relating to precision instruments (ILO, 2020). In a post-COVID-19 scenario, the widespread internalisation of value chain activities is unlikely to lead to greater resilience but may well necessitate substantial switching costs (Strange, 2020). Particularly, the issue of trade facilitation is critical in the current crisis to ensure the faster movement of essential supplies such as medical supplies as well as food. Besides, implementing reforms such as digitizing possible trade procedures and expediting standard operating procedures could prove useful to keep trade flowing. There are also significant wider economic benefits from these reforms: for example, the OECD reports that implementing the WTO TFA will result in trade cost reductions of 14 per cent to 18 per cent, with low and lower-middle-income countries experiencing the greatest reductions (OECD, 2020). The Trade Facilitation Agreement (TFA) of the World Trade Organization (WTO) provides governments with a solid structure for strengthening trade facilitation and border management. (Sela *et al.*, 2020). Measures that prevent supply chain disruptions include relaxing procedures and requirements, expediting clearance, and reducing customs cost (Ugaz and Sun, 2020)

In view of the above, this paper attempts to assess the impact of the Covid-19 on trade openness and value chain participation. Besides, the study also examines the impact of trade costs on India’s exports, particularly deriving the role of trade facilitation on affecting India’s exports. Finally, the

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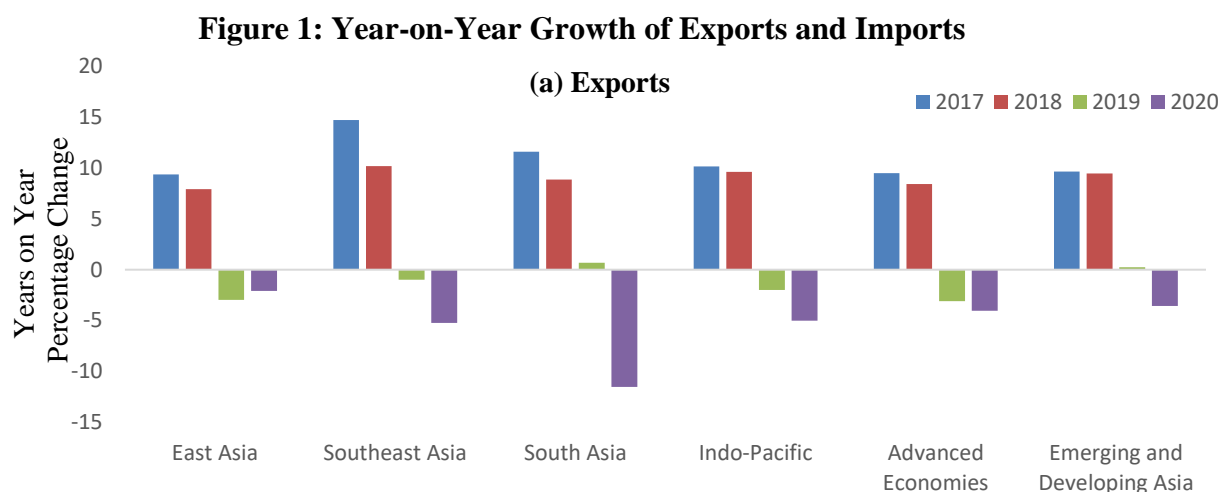
<sup>1</sup> Refer, IMF (2020)

study attempts to forecast India's exports for the year 2021 and 2025 based on a gravity modelling framework.

The rest of the paper is organised as follows. Section 2 describes the trends in trade. Section 3 presents the countries export growth experience during Covid-19 period. Section 4 examines the impact of trade costs on India's exports, in the context of how trade facilitation influencing trade costs that in turn affecting India's exports. It also briefly discusses the data and methodology and the results and discussion for the analysis. Finally, concluding remarks are given in Section 5.

## 2. Trends in Trade Flows

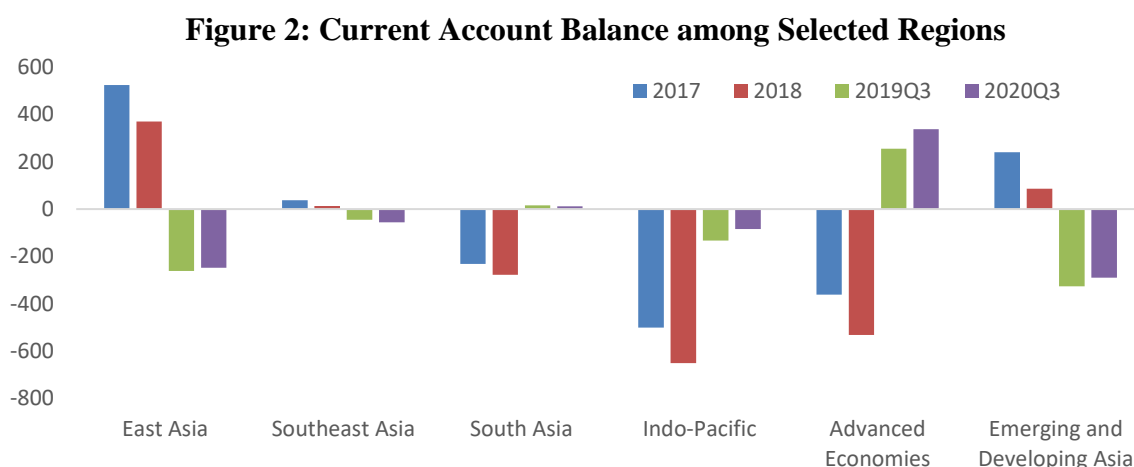
The world has been facing extraordinary challenges due to the outbreak of Coronavirus pandemic. The world has witnessed a sharp decline in economic growth and trade, more particularly in the first half of 2020. The recent release of the growth forecast of IMF indicates that a rebound is expected in 2021 in developing Asia. The IMF has reported that the impact of Covid-19 on economic growth is even worse than the global financial crisis of 2007-08, and the global growth is expected to contract by 4.4 per cent in the year 2020, and 5.2 per cent in 2021<sup>2</sup>. According to IMF, the cumulative loss in output relative to the pre-pandemic projected path is expected to grow to US\$ 28 trillion by 2025 (IMF, 2020). The pandemic-driven global crisis is going to have long-lasting effects on economies both developed and developing countries.



<sup>2</sup> Refer, for example, IMF (2020).



Note: Growth rate for 2020 is between 2019 Q3 and 2020 Q3  
Source: DOTS, IMF.



Source: DOTS, IMF.

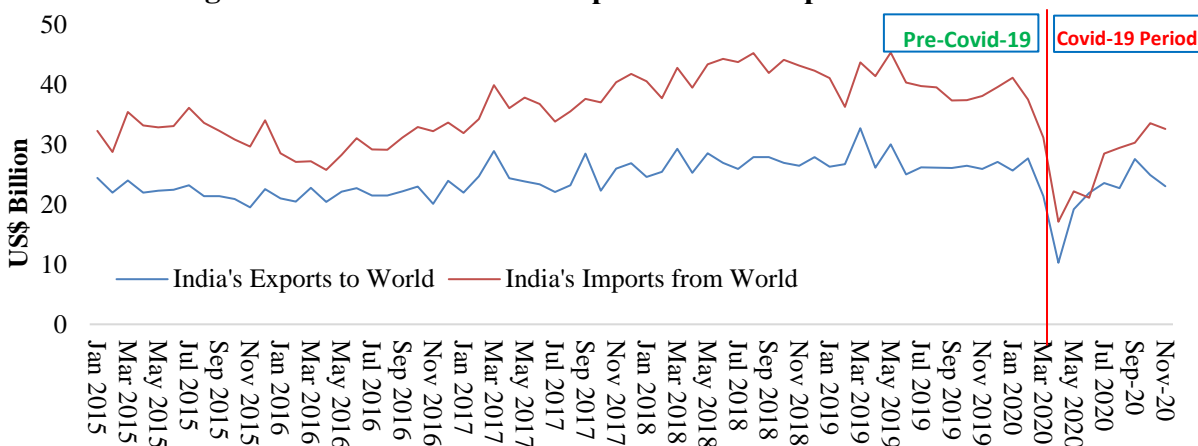
Similarly, according to the WTO, “world trade was expected to fall between 13 per cent and 32 per cent in 2020 due to the Covid-19 pandemic”<sup>3</sup>. Growth of exports and imports has deteriorated – South Asia’s trade has declined by almost 12 per cent. Both East Asia and Southeast Asia have experienced a negative growth rate of about -2 per cent to -5 per cent for the period 2019Q3 to 2020Q3 (Figure 1). Besides, both the regions have also witnessed a trade deficit of about US\$ 218 billion and US\$56 billion in 2020Q3. A similar pattern is also revealed for the Indo-Pacific and advanced economies. On the contrary, South Asia has experienced a relative trade surplus of about US\$ 12 billion in 2020 Q3 (Figure 2).

A similar trend is also revealed for India, where both exports to and imports from the world have declined negatively about by -11 per cent and -14.5 per cent based on year on year growth rate between November 2019 and November 2020 (see Figures 3 and 4). It is expected that trade

<sup>3</sup> WTO (2020)

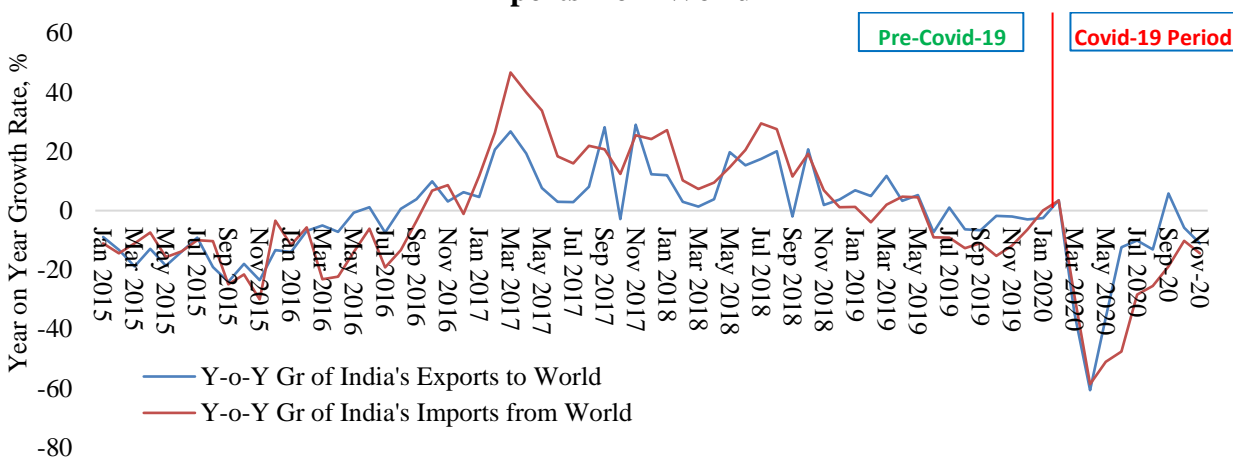
may pick up the pace when the world is coming back to a growth path. For example, India's exports started growing after contracting for six consecutive months.

**Figure 3: Trends of India's Exports to and Imports from World**



Source: DoTS, IMF

**Figure 4: Trends of Year-on-Year Growth Rate of India's Exports to and Imports from World**



Source: DoTS, IMF

Table 1 shows that India's import has significantly declined by about 37 per cent between 2019 Q3 and 2020 Q3 and India's export too has slightly declined by about 2 per cent to 10 in Southeast Asia and South Asia, respectively. For instance, India's export has increased significantly with China by about 17 per cent, followed by South Korea of about 14 per cent between 2019 Q3 and 2020 Q3. Table 1 also shows that India's export has not significantly affected due to the Covid-19 pandemic, whereas India's import from major regional and trading partners has declined significantly due to the pandemic.

**Table 1: India's Exports to and Imports from Major Regions and Selected Countries**

	India's Exports (US\$ Billion)						Growth Rate, %		
	2015	2018	2019	2018 Q3	2019 Q3	2020 Q3	2018 – 2019	2018Q3 – 2019Q3	2019Q3 – 2020Q3
South Asia	17.69	24.79	22.46	6.1	5.3	5.2	-9.4	-13.7	-1.8
Southeast Asia	26.49	36.08	34.30	9.4	8.1	7.5	-4.9	-13.7	-7.5
China	9.69	16.39	17.27	3.8	4.3	5.1	5.3	13.1	17.4
Japan	4.73	4.74	4.82	1.2	1.1	1.0	1.6	-4.2	-11.2
Korea	3.68	4.80	4.65	1.2	1.1	1.3	-3.1	-10.1	14.0
EU	45.92	59.07	57.31	14.4	13.6	13.1	-3.0	-5.5	-3.3
Latin	13.08	15.78	16.13	3.6	3.4	3.6	2.2	-6.3	6.3
Africa	28.14	29.04	33.96	8.6	8.9	8.4	16.9	4.1	-5.7
Central Asia	49.69	50.17	50.87	11.9	11.9	8.7	1.4	-0.2	-26.8
USA	40.40	51.61	54.22	13.5	13.5	13.9	5.1	0.0	3.2
Canada	2.09	2.79	2.89	0.7	0.7	0.8	3.7	-1.0	14.5
World	266.16	323.27	324.86	81.8	78.4	73.9	0.5	-4.1	-5.8
	India's Imports (US\$ Billion)						Growth Rate, %		
South Asia	3.03	0.86	3.68	0.9	0.9	0.8	-4.5	-5.0	-4.9
Southeast Asia	41.53	57.22	57.05	15.0	14.0	10.7	-0.3	-6.5	-23.2
China	61.59	73.76	68.34	19.0	19.0	16.4	-7.3	-0.2	-13.9
Japan	9.64	12.53	12.74	3.3	3.2	2.2	1.7	-2.3	-32.5
Korea	13.13	16.37	16.11	4.5	4.1	2.5	-1.5	-9.9	-37.9
EU	65.65	70.9	68.27	18.8	15.5	11.5	-3.7	-17.5	-25.6
Latin	23.62	28.2	24.3	6.7	4.1	3.5	-13.8	-38.5	-16.1
Africa	50.55	78.24	62.4	19.8	14.7	9.5	-20.2	-25.7	-35.2
Central Asia	64.58	84.97	87.58	20.9	21.1	14.6	3.1	0.9	-30.9
USA	20.7	33	34.95	9.4	8.6	6.4	5.9	-8.9	-25.6
Canada	3.87	3.45	3.93	0.8	1.1	0.8	12.2	25.6	-28.1
<b>World</b>	<b>392.23</b>	<b>508.98</b>	<b>479.89</b>	<b>131.0</b>	<b>116.7</b>	<b>88.3</b>	<b>-5.7</b>	<b>-10.9</b>	<b>-24.4</b>

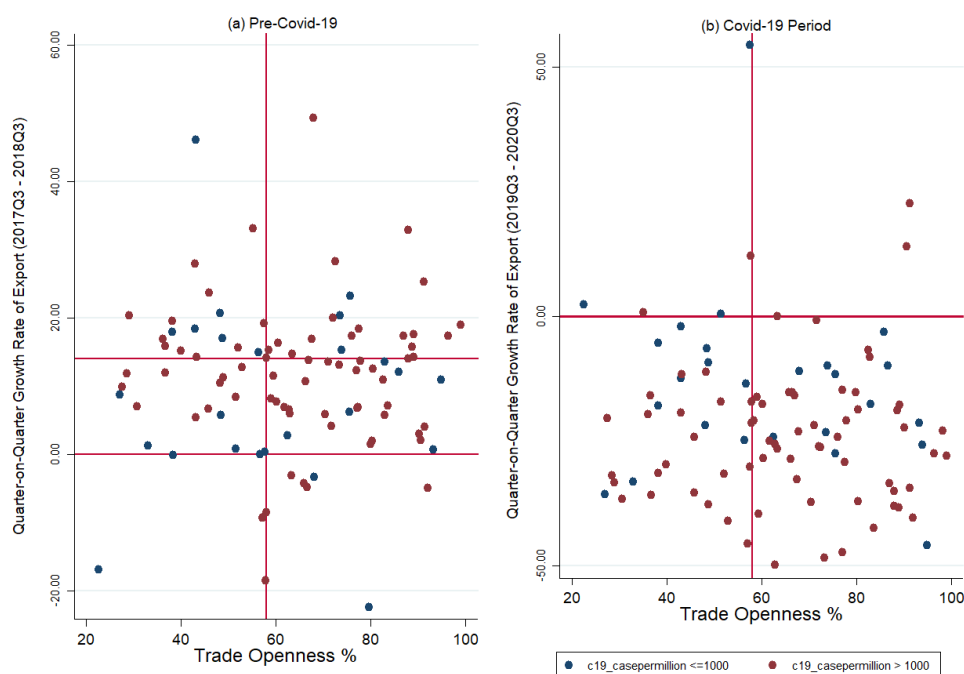
Source: DoTS, IMF

### 3. Export Growth Experience during Covid-19 period

Globalisation and increased trade liberalisation have been significant aspects of recent decades and important growth drivers. The degree to which a country participates in the global trading system is measured by trade openness. As a consequence of the international diffusion of advanced technologies, new endogenous growth models describe a positive relationship between trade openness and economic growth (Coe and Helpman, 1995; Grossman and Helpman, 1991a). This means that a country with a higher level of trade openness has a stronger ability to use technology

developed in advanced economies, and as a result, it can expand faster than a country with a lower level of trade openness. However, the Covid-19 pandemic has invariably affected both inter-and intra- trade relations across the world and also disrupted the movement of raw materials, intermediate and finished goods, which has exposed the vulnerability of global supply chains.

**Figure 5: Export Growth vs Trade Openness in Covid-19 period**



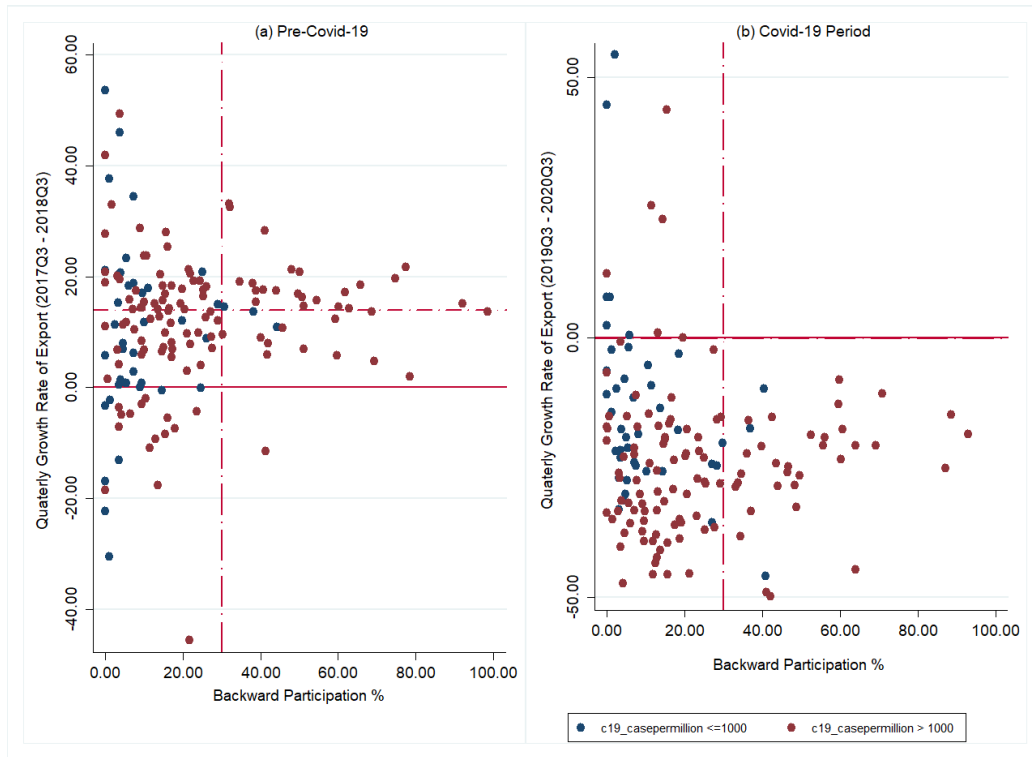
Notes: Blue dots indicate less the 1000 Covid-19 cases per million population; Red dots indicate more than 1000 Covid-19 cases per million population; and Dash line show average value of respective axis

Source: Authors' own based on DoTS, IMF and [www.worldmeters.info](http://www.worldmeters.info)

For instance, Figures 5 and 6 illustrate the relationship with export growth on trade openness and global value chain (GVC) by comparing pre-Covid-19 and Covid-19 period. Figure 5 presents scatter plots between trade openness and quarter-on-quarter export growth in pre-Covid-19 and the Covid-19 period. The quarter-on-quarter growth of exports in pre-Covid-19 considers the period 2017Q3 to 2018Q3, and for the Covid-19 period, a quarter-on-quarter growth of exports covers the period 2019Q3 to 2020Q3. A country's trade openness is the percentage share of total exports and imports in GDP. Figure 5 exhibits that compared to pre-Covid-19 scenario (Figure 5a), the quarter-on-quarter growth of exports during the covid-19 period is found to be negative for the countries, which have a trade openness of more than 60 per cent. Figure 5b also shows the severity of the Covid-19 outbreak. Here, red scatter points represent those countries that have reported more than 1000 per million population confirmed Covid-19 cases. Most of the red scatter points are close to zero or negative, thereby indicating the high severity of the Covid-19 outbreak on trade.



**Figure 6: Export Growth vs Global Value Chain in Covid-19 Period**



Notes: Blue dots indicate less the 1000 Covid-19 cases per million population; Red dots indicate more than 1000 Covid-19 cases per million population; and Dash line show average value of respective axis

Source: Authors' own based on DoTS, IMF and [www.worldmeters.info](http://www.worldmeters.info)

Figure 6 exhibits the scatter plots between GVC backward participation and quarter-on-quarter growth of exports for both pre-Covid-19 and Covid-19 periods. It clearly shows that in the pre-Covid-19, the quarter-on-quarter growth of exports is found to be positive for most of the countries, whereas in the Covid-19 period (2019 Q3 –2020 Q3), the growth of export is found to be negative across countries falling under the GVC backward participation. Most of the quarter-on-quarter export growth has come out negative in the range of 0 to -50 per cent and scattered between 10 and 80 per cent of the GVC participation rate. Figure 6b also shows that some of the countries, which have experienced positive export growth are in the low-level backward participation phase.

The COVID-19 pandemic has exposed the vulnerabilities of global value chains. Global trade has contracted in 2020, partly due to the supply chain disruptions. This can be attributed to factors such as the interruption of the supplies of key inputs to GVC production by delayed shipments and dwindling inventories. Countries that acted as the central nodes of GVCs, such as the USA, China and the Euro area are also the ones that have been worst hit by the pandemic. To mitigate the supply shocks and rebound strongly in post-Covid-19 periods, Japan has initiated the Supply Chain Resilience Initiative (SCRI), a trilateral approach to trade, partnering with India and Australia. The SCRI is set to reshape the geographical contour of the cross-border production networks in the region and would help in diversifying the supply risks across nations instead of being dependent

on one or a few countries. Re-location of industries away from China may create a new wave of industrialisation. This also shows that the emerging developing countries such as South Asia and Southeast Asian countries have potential opportunities to engage regional value chain integration and also have a scope to attract foreign direct investment that is planning to re-locate the firms to look for a sustainable value chain across the region to avoid high dependency on any particular country(s). MNCs engaging in a production network may likely look for a sustainable trade network to avoid trade disruptions. Thereby, firms may try to establish new trade networking channels for more consistent trade routes. In this regard, countries may gain direct or indirect trade benefits through bilateral trade relations and also with the already established backward and forward participations. However, to explore this opportunity, countries should have to upgrade the skill, improve logistics services, strengthen the transportation infrastructure and actively implementing trade facilitation measures. Needless to mention, trade facilitation helps to reduce trade costs, enable trade across borders faster, and cheaper and more predictable, whilst ensuring its safety and security<sup>4</sup> through several policy actions in addition to tariffs and non-tariff measures. The focus of trade facilitation is to simplify and harmonize the formalities, procedures, and sharing information between different trade partners in the supply chain. Trade facilitation measures enable both the physical movement of goods and the information flows associated with the transit of goods in the supply chain through various government agencies and private business entities.

#### **4. Impact of Trade Facilitation on Trade Costs and Its Impact on India's Exports**

One of the key challenges to India's export is to maintain competitiveness in the global and regional markets by improving trade facilitation measures domestically and also as the competitive trade partner. High transaction costs and time are serious deterrents to trade competitiveness<sup>5</sup>. There is little room for fostering trade of a country or a region in presence of the large trade barriers among the trading partners. Lack of timely delivery and increase in costs would affect the survival of manufacturing exporters, particularly, efficient product network requires timely production and Just-in-Time delivery.<sup>6</sup> Table 2 shows the indicators related to the time and cost of selected countries, including India. India has made substantial progress in documentary and border compliances, both in terms of time and cost.

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<sup>4</sup> This is a common definition of trade facilitation, drawn upon UN's trade facilitation implementation guide, available at <http://tfig.unece.org/details.html>

<sup>5</sup> A strong set of literature indicate why high transaction costs and time are serious constraints to trade competitiveness. Refer, for example, Anderson and van Wincoop (2003), OECD-WTO (2015), OECD (2009), De (2008), to mention a few.

<sup>6</sup> Refer, for example, UNESCAP (2018)

**Table 2: Trading Across Border Indicators among Selected Countries, 2019**

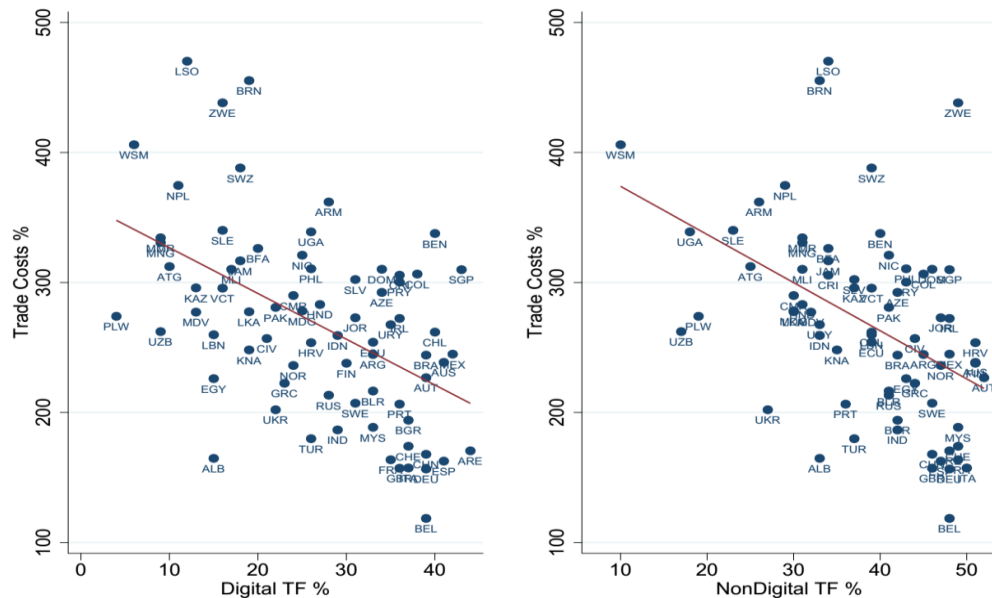
	Time to Export (hours)		Cost to Export (US\$)		Time to Import (hours)		Cost to Import (US\$)	
	Documentary compliance	Border compliance	Documentary compliance	Border compliance	Documentary compliance	Border compliance	Documentary compliance	Border compliance
Indonesia	61.3	56.3	138.8	211.1	106.2	99.4	164.4	382.6
Malaysia	10	28	35	212.5	6.5	36	60	212.5
The Philippines	36	42.5	52.5	456	96	120	67.5	689.5
Singapore	2	10	37	335	3	33	40	220
Thailand	11.3	44	96.9	222.6	4	50.2	43.5	232.5
Vietnam	50	55	139.2	290	76	56	182.5	373
India	11.6	52.1	58	211.9	19.9	65.3	100	266.1
China	8.6	20.7	73.6	256.2	12.8	35.7	77.3	241.3
Japan	2.4	26.7	54	272.4	3.4	39.6	107	314.8
South Korea	1	13.4	11.1	184.7	1	6	26.8	314.6
Australia	7	35.5	264	766	4	39	100	539
New Zealand	3	37	67	337	1	25	80	366.5

Source: Doing Business Database, the World Bank.

In terms of time to export and import documentary compliance, some of the Southeast Asian countries such as Singapore, Malaysia and Thailand take less than 10 hours, whereas, in terms of border compliance, these countries take about 10 to 50 hours, respectively. In the case of India, the time to export and import take about 11 to 20 hours for documentary compliance and 50 to 65 hours for border compliance. India takes almost double the time for documentary and border compliance. However, in terms of export and import costs, India's border costs are lower than that of China and relatively closer to Japan. Barring Indonesia, the cost to export and import is between US\$ 35 to US\$ 100 for most of the Southeast Asian countries. Lack of proper infrastructure and delay in customs clearance add to the rise of trade costs, which affect a country's value chain participation. In this regard, East Asian countries like China, Japan and South Korea and some of the Southeast Asian countries like Singapore, Thailand and Malaysia have successful in minimising the time and costs to trade, compared to India. India has been taking several initiatives in reducing border compliance time and costs. India has made significant progress in reducing the documentary burden on exporters and importers by making e-filling of documents mandatory. Documentary enforcement time for both export and import cargoes has been reduced to only a few hours in India as a result of these reforms. India has reduced the number of documents needed for both exports and imports to just three from seven and ten, respectively, in order to minimise documentary compliance.<sup>7</sup>

<sup>7</sup> Refer, CBIC, [http://www.cbic.gov.in/htdocs-cbec/home\\_links/trade\\_agreement](http://www.cbic.gov.in/htdocs-cbec/home_links/trade_agreement)

**Figure 7: Trade Costs versus Trade Facilitation, 2019**



Source: Authors' own based on UN Global Survey on Trade Facilitation and Paperless Trade Implementation (2019) and Comprehensive trade costs database by UN ESCAP Database

The recent Covid-19 outbreak has further forced the producers of goods and services to move towards the digitalisation of business operations. In particular, digitalizing the supply chain would help achieve business resilience against supply chain disruptions amidst Covid-19 outbreak. Studies<sup>8</sup> have shown strong positive linkages between countries' internet usage and GVC participation, where about 30 per cent of ICT-enabled services are embodied in inputs that are imported and both suppliers and customers frequently communicate through internet-based technologies. Figure 7 shows both digital and non-digital trade facilitation measures has an inverse relationship with trade costs. Countries are, therefore, engaged to ease the burden of trade costs through trade facilitation measures at both global and regional levels. Therefore, digital technology in the trade facilitation measures would promote trade and also strengthen the supply chains. To facilitate digital trade, India has initiated several digital trade facilitation measures which have effectively improved the trade facilitation process.<sup>9</sup>

India has ratified the WTO's Trade Facilitation Agreement (TFA) in April 2016, which came in to force in February 2017<sup>10</sup>. TFA aims to improve transparency, increase possibilities to participate in global value chains, and reduce the scope of corruption. It also sets out measures for effective cooperation between customs and other appropriate authorities on trade facilitation and customs compliance issues. India ratified an impressive over 70 per cent of the provisions under

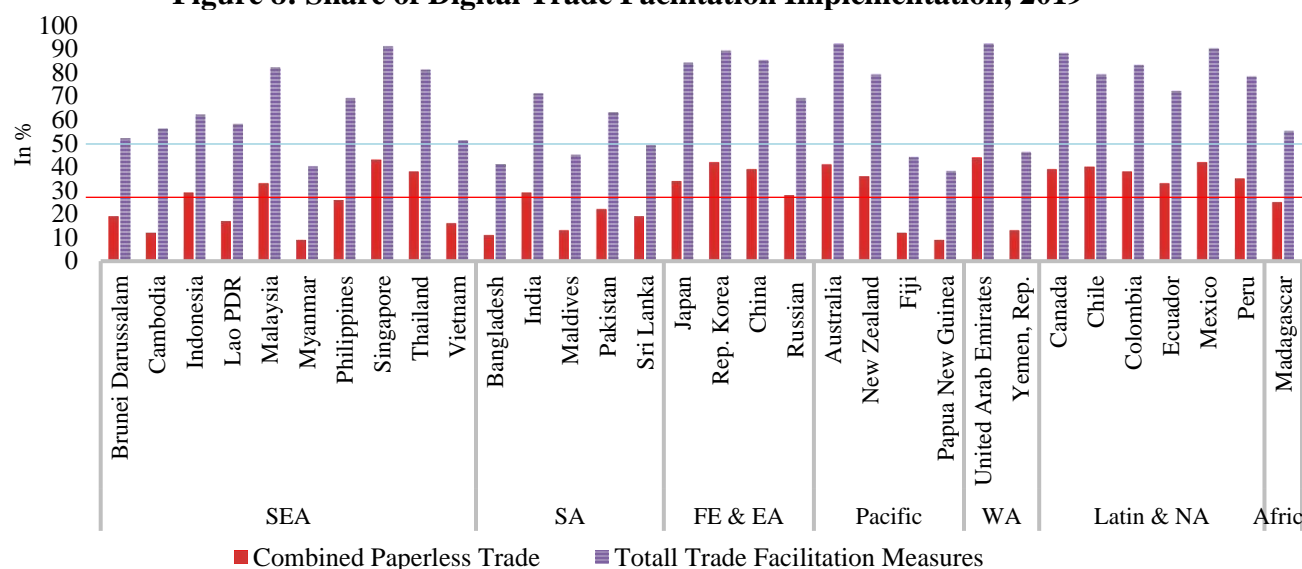
<sup>8</sup> Refer, for example, WDR (2020) and UNESCAP (2018) for detailed literature.

<sup>9</sup> Refer, for example, De and Kumarasamy (2020).

<sup>10</sup> India ratified the WTO TFA on 22 April, 2016 which came in force in February 2017

Category A, and, has also implemented certain provisions of category B (like SWIFT, RMS) for which it had opted five years. With the available digital technology, further simplification of documentary requirements and harmonising with international standards could be possible<sup>11</sup> and India has also recognised the potential of ICT for the national trade facilitation programmes. India has achieved phenomenal progress in the automation of trade documentation. For example, almost 100 per cent of trade documents are now filed electronically in India through customs single window called SWIFT.<sup>12</sup> India's EDI system offers immense lessons to other developing countries in the world.

**Figure 8: Share of Digital Trade Facilitation Implementation, 2019**



Note: SEA – Southeast Asia; SA – South Asia; FE & EA – Far East and East Asia; WA – West Asia and NA – North America

Source: UN Global Survey on Trade Facilitation and Paperless Trade Implementation

Figure 8 shows the UN Global Survey of Trade Facilitation Measures implemented by selected countries in 2019. India has implemented about 70 per cent of trade facilitation measures with most of the emerging developing and developed countries; of which, India has digital trade facilitation of about 30 per cent closer to the average implementation of all the countries in 2019. Most of the countries have a varying implementation in terms of both digital trade facilitation measures such as paperless and cross-border paperless trade and non-digital trade facilitation measures such as transparency, formalities and institutional arrangement cooperation (Figure 9). What follows is that implementing trade facilitation commitments including improving border management may lead to reduce trade costs and strengthen value chain linkages across the region.

<sup>11</sup> Refer, for example, CII (2018). Also read, CBIC's presentation on WTP TFA, available at <http://www.cbic.gov.in/resources/htdocs-cbec/implmntn-trade-facilitation/tfa-presentation.pdf;jsessionid=4307CF3FCC8A6F0FE94D4BD524634D0A>

<sup>12</sup> It also handles all e-filing, e-payments, drawback disbursement and message exchange with stakeholders-almost 100 percent India's international trade.

In view of the above, this section investigates the impact of trade facilitation measures on India's exports with particular reference to digital trade facilitation.

## 4.1 Data and Methodology

To assess the effect of electronic trade facilitation measures on India's exports, we have empirically estimated the relation between trade flows and trade facilitation indicators using panel data for the period 2015 to 2019. We have conducted bilateral gravity analysis in the 2SLS framework to estimate the effect of digital trade facilitation on India's exports.<sup>13</sup> Digital trade facilitation simplifies the trade procedures, including implementation of automated customs systems, electronic single windows and other initiatives those help to reduce the time and cost of a trade. Here, we attempt to investigate the effect of digital trade facilitation measures on trade costs and its impact on India's export through the gravity model framework. To check the endogeneity issue, we use the gravity analysis in 2SLS framework.

### *First Stage: Trade Costs Model*

$$\ln t_{ij} = \alpha + \beta_1 Dist_{ij} + \beta_2 Language_{ij} + \beta_3 Colony_{ij} + \beta_4 Contig_{ij} + \beta_5 RTA_{ij} + \beta_6 Tariff_{ij} + \beta_7 Digital\_TF_i + \beta_8 NonDigital\_TF_i + \beta_9 LSCI_i + \beta_{10} QPI_i + \beta_{11} TEBC_i + \varepsilon_{ij} \quad (1)$$

Following Arvis et al (2013) and Duval et al (2018), we modelled trade costs functions such as geographical distance, cultural and historical distance (e.g., common language, common colony), regional trade agreements, infrastructure indicators such as liner shipping connectivity, quality port index, time to export, and border compliance measures, as well as regional trade agreements, infrastructure indicators such as liner shipping connectivity, quality port index, time to export, and border compliance measures for the first stage equations. We have included trade facilitation measures of the reporting country, to analyse the effect of own countries trade facilitation measures on trade costs and its effect on home countries export to partner countries.

where,  $t_{ij}$  is log of *comprehensive* trade costs collected from the World Bank-UNESCAP trade costs database. The estimated trade costs variable is based on the Novy (2013) inverse gravity model approach.  $(DIST_{ij})$  population-weighted distance between two countries  $i$  and  $j$  i.e.  $(\ln \left[ \sum_{k \in i} \left( \frac{pop_k}{pop_i} \right) \sum_{l \in j} \left( \frac{pop_l}{pop_j} \right) D_{kl} \right])$ . Distance between the importer and exporter  $(DIST_{ij})$  is typically expected to have a positive impact on trade costs. It implies that the larger the distance, trade costs would increase due to transportation costs.

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<sup>13</sup> Two-Stage least squares (2SLS) regression analysis is an extension of the OLS method. It is used when there is endogeneity in the system, meaning error terms are correlated with the independent variables.

The popular official language of countries  $i$  and  $j$  is  $language_{ij}$ . If two countries share a common language (official or commercial), we've given them a 1; otherwise, we've given them a 0. The use of a common language is supposed to lower trading costs because it facilitates trade negotiations.

The dummy variable  $Contig_{ij}$  is used to describe two countries that are neighbouring, contiguous, or share a boundary. If two countries share a wall, we've taken 1; otherwise, we've taken 0. This dummy is added to the distance variable to account for the possibility that the centre-to-centre distance overstates the effective distance between neighbouring countries that often engage in border trade.

If  $i$  and  $j$  were colonies after 1945 with the same coloniser,  $Common_{ij}$  equals 1; if two countries are under the same colony, it equals 0; otherwise, it equals 0. Countries that were governed by the same colonial power formed a trade network and prefer to trade more.

The Regional Trade Agreements (RTA) between countries  $i$  and  $j$  are known as  $RTA_{ij}$ . To facilitate bilateral trade, countries frequently enter into regional trading agreements. For both countries in a pair belong to the same regional community, the dummy variable is 1; otherwise, it is 0.

$Digital\_TF_i$  and  $NonDigital\_TF_i$  indicate the rate of implementation of trade facilitation measures based on the United National Global (UNTF) Survey. The survey has broadly categorized into paperless trade, cross-border paperless trade, Transparency, Institutional arrangement and cooperation, and Formalities.  $Digital\_TF_i$  covers both paperless and cross-border trade facilitation measures, whereas,  $NonDigital\_TF_i$  includes Transparency, institutional arrangements and cooperation and formalities.  $Digital\_TF_i$  covers the perception on the application of modern information and communication technologies (ICT) to trade procedures and other customs automation initiatives through digital connectivity such as broadband connections. It is expected that digital trade facilitation measures reduce the trade costs, and thus promote trade between the countries.  $NonDigital\_TF_i$  emphasizes on the performance of governances and institutional facilitation to smoothen the trade procedures.

Port and connectivity infrastructure indicators are  $LSCI_i$ , which present the liner shipping connectivity index;  $QPI_i$  is the indicator of the quality port index and  $TEBC_i$  is the indicator of border compliance time to export.

### ***Second Stage: Export Model***

$$\ln Export_{ij} = \alpha + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j + \beta_3 \hat{t}_{ij} + \beta_4 WTO\_TFA_i + \beta_5 Digital\_TF_i + \beta_6 NonDigital\_TF_i + \beta_7 CustomsEDI_i + \varepsilon_{ij} \quad (2)$$

In the second stage equation, we have estimated the impact of trade costs, particularly digital trade facilitation measures on bilateral exports, by including the predicted values of trade costs variables that are derived from the first stage equations (1). Owing to such inclusion, we did not include other gravity variables such as geographical distance and cultural and historical distance in the second stage model.  $LnExport_{ij}$  is log of export from country  $i$  to country  $j$ .  $LnGDP_i$  and  $LnGDP_j$  are the log of the gross domestic product of reporting and partner country to measure the size of the economy.  $WTO\_TFA_j$  is a dummy, which takes 1 if the country has signed the WTO Agreement on Trade Facilitation and 0, otherwise for the partner countries.  $Custom\ EDI_j$  is the dummy, which assigns 1 if the country has implemented the electronic data interchange (EDI)<sup>14</sup> to facilitate export and import or 0 otherwise for the partner countries.<sup>15</sup>

### **Data Sources**

We have used WITS database to collect bilateral exports of all the countries included in the analysis. Implementation of Trade Facilitation rates is collected from the United Nations Global Trade Facilitation (UNTF) Survey 2015, 2017 and 2019<sup>16</sup>. Trade costs data are collected from the World Bank-ESCAP database. The macro variables like GDP, GDP per capita, trade openness are collected from the World Development Indicators (WDI), World Bank. The list of countries that signed the WTO TFA Agreement is taken from the WTO, whereas the Customs EDI information is collected from the World Customs Organisation (WCO). Gravity model-related variables like distance, common language and landlocked are collected from CEPII database. The detailed variables and their corresponding data source are given in Appendix 1. We have included only 108 countries for the analysis due to the paucity of data for other countries. The lists of selected countries are given in Appendix 2.

## **4.2 Results and Discussion**

In the 2SLS model, we have included a fixed effect for partner countries ( $Country_j$ ) to control the cross-country heterogeneity to improve the estimation efficiency. We have also included clustered cross-country pairs in the robust standard errors. we have only included trade facilitation measures for India in the analysis to assess the impact on India's exports. The diagnostic tests given in Appendix 3 suggest that all the models have come out well and there is no problem of identification issues.

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<sup>14</sup> Including part or full implementation of customs single window

<sup>15</sup> We did not include the dummy variable for  $WTO\_TF_i$  and  $CustomsEDI_i$  for reporting country, i.e., for India's exports.

<sup>16</sup> Refer, The UN Global Survey on Trade Facilitation and Paperless Trade Implementation for the detailed classification of Trade Facilitation measures.



**Table 3: Gravity Model Two-Stage Lease Square Results:  
First Stage with Trade Costs Model**

Dep.Var.=t <sub>ij</sub>	Southeast Asia	Indo-Pacific	All Countries
	Beta	Beta	Beta
Distance <sub>ij</sub>	0.01***	0.01***	0.01***
Colony <sub>ij</sub>	-21.11**	-34.23***	-35.23***
Language <sub>ij</sub>	-20.65**	-22.24**	-26.51**
Contig <sub>ij</sub>	-40.69**	-42.27**	-43.47**
RTA <sub>ij</sub>		-29.69**	-35.63**
Tariff (ad-valorem) <sub>ij</sub>	10.54***	9.39***	8.25***
Digital_TF <sub>i</sub>	-1.02*	-1.23**	-1.18***
NonDigital_TF <sub>i</sub>	-0.98*	-0.85**	-1.16***
LSCL <sub>i</sub>	-0.03	-0.11**	-0.06*
QPI <sub>i</sub>	-2.24	-3.38*	-6.81***
TEBC <sub>i</sub>	0.45*	0.34**	0.17***
constant	-955.2***	-848.2***	-833.3***

Note: The level of significance is indicated as follows: \* p<.10, \*\* p<.05, \*\*\* p<.01.

The ‘Indo-Pacific’ region<sup>17</sup>, which has been endorsed by several countries, has substantial potential to generate trade and investment. The share of ASEAN countries in intra-regional trade among Indo-Pacific countries has witnessed more than 80 per cent (about US\$ 1.11 trillion) in 2019, followed by ASEAN Plus countries held about 71.4 per cent (US\$ 2.93 trillion) in 2019<sup>18</sup>. The emerging Indo-Pacific has the potential to facilitate regional comprehensive economic arrangement through a rules-based international system. On average, India has about 70 per cent of intra-regional trade among Indo-Pacific, indicating strong interdependency in trade in the Indo-Pacific. The study by Rahman *et al.* (2020) investigate the potential economic effect of the Indo-Pacific, particularly the quadrilateral alliance between the US, Japan, Australia, and India along with South and Southeast Asia would lead to substantial economic gain. The study also found that in case of reductions of tariff and improved trade facilitation, the Indo-Pacific group may generate over US\$ 1.12 trillion welfare gain. Improvements in infrastructure and connectivity, leading to reduced trade-transportation costs, are a necessary step in order to realise the trade potential of the Indo-Pacific. Therefore, Indo-Pacific could become a powerful bloc if South and Southeast Asia could be linked through stronger connectivity, with special focus being placed upon developing maritime linkages and buttressed by improved trade facilitation and other networks that would reduce trade costs. In this context, we carried out the analysis concerning India’s exports to Southeast Asia and the Indo-Pacific region and also India’s export to all the countries.

<sup>17</sup> The Indo-Pacific has been gaining new geopolitical construct over the last few years. ASEAN centrality and India’s economic and strategic partnership with Southeast Asian countries is one of the important aspects of Indo-Pacific (De and Kumarasamy, 2020).

<sup>18</sup> Ibid.,

The results of First Stage Regression are given in Table 3. The analysis result shows that in all the models both geographical distance and cultural and historical distance have expected sign and statistically significant. Distance ( $Dist_{ij}$ ) is positive and significant influence trade costs. This shows that physical distance matters for raise in trade costs. Similarly, cultural and historical distance variables like common border ( $contig_{ij}$ ), common official language ( $Language_{ij}$ ) and common colony ( $Colony_{ij}$ ) are negative and statistically significant in all the models. A shared language and colonised country could facilitate trade, thus reduce bilateral trade costs. The result also shows that countries that are engaging in regional trade agreements ( $RTA_{ij}$ ) would reduce trade costs.

The positive and significant relation between tariff and trade costs indicates that despite several efforts that have been taken globally in terms of bilateral and multilateral trade agreements; there is still needed to further reduce the tariff rate to effectively minimize the trade costs.

Infrastructure variables such as shipping connectivity ( $LSCI_i$ ), port infrastructure ( $QPI_i$ ) have come out negative and statistically significant in most of the models, thereby suggesting better infrastructure development at port and maritime connectivity would reduce trade costs. Similarly, the estimated coefficient of border compliance measures such as time to export ( $TEBC_i$ ) is positive and statistically significant in all the models, indicating that the longer the time to export, the higher would be the trade costs, due to delay in export-related expenditure like storage and labour charges.

In the case of trade facilitation implementation measures, both  $Digital\_TF_i$  and  $NonDigital\_TF_i$  are negative and significant in all the models. It indicates that significant improvement in trade facilitation measures in the reporting country would facilitate the traders to promote export to the partner countries.

**Table 4: Gravity Model Two Stage Lease Square Results:  
Second Stage with the Effect of Trade Costs on India's Exports**

Dependent Variable = LnExport	Southeast Asia	Indo-Pacific	All Countries
	Beta	Beta	Beta
$LnGDP_{ij}$	0.82***	0.92***	0.98***
$LnGDP_{ij}$	0.64***	0.59***	0.71***
$t_{ij}$	-0.10***	-0.03***	-0.02***
Digital $TF_i$	0.14	0.01**	0.01**
WTO_ $TF_j$	0.78	0.122	0.12
Customs $EDI_j$	0.36**	0.28***	0.28**
Constant	-197.96***	-158.71***	-255.84***
N	55	175	540

Note: The level of significance is indicated as follows: \* p<.10, \*\* p<.05, \*\*\* p<.01.

In the second stage analysis (Table 4), in addition to  $LnGDP_i$  and  $LnGDP_j$ , we have included the predicted trade costs variable  $\hat{t}_{ij}$  obtained from the first stage equation. Further we have also included the  $Digital\_TF_i$  to understand the impact of digital trade facilitation on India's exports.

The coefficients of both  $LnGDP_i$  and  $LnGDP_j$  are positive and strongly significant across the models. This shows that a higher level of income in both exporting and importing countries indicates a country's ability to produce more export and also a higher level of demand for export goods. Predicted trade costs ( $\hat{t}_{ij}$ ) shows negative and statistically significant in all the models clearly show that lower trade costs significantly increase India's exports.

To understand whether the implementation of trade facilitation measures affects positively on India's exports, we have included digital trade facilitation ( $Digital\_TF_i$ ) measures and also dummy variable ( $CustomsEDI_j$ ) to capture Customs electronic data interchange (EDI) for the clearance of export and import electronically for the partner countries. We have also included the dummy ( $WTO\_TFA_j$ ) to capture the countries that signed the WTO Trade Facilitation Agreement (WTO-TFA). We have found that the coefficient of  $Digital\_TF_i$  is positive and statistically significant only for the case of Indo-Pacific and all countries sample. Besides,  $Customs\ EDI_j$  show positive and significance, which shows that customs EDI implemented has also promoted India's exports to the partner countries. Therefore, the result indicates that the rate of implementation of electronic trade facilitation does promote India's exports.

## 5. Concluding Remarks

The Covid-19 has disrupted the global economy. Our analysis suggests that the growth of exports in countries, which are engaged in GVC and also support trade openness, has been negatively affected in the Covid-19 period. Besides, the study also shows that emerging developing countries in South and Southeast Asia have the potential opportunities to engage in both inter- and intra-regional trade and also have a scope to attract foreign direct investment for the firms which are planning to re-locate in order to avoid high dependency on any particular country(s). However, to explore this opportunity, countries have to upgrade the skill, improve logistics services, strengthen transportation infrastructure and actively implement trade facilitation measures. Trade facilitation is an area where a common set of facilitation measures are being implemented globally through regional and multilateral agreements and countries are moving towards adopting a common standard. India has achieved a phenomenal progress in introducing a digital customs ecosystem in the country.

Analysis carried out in this study suggests that the longer the time to export higher would be the trade costs due to delay in export-related expenditure such as storage and labour charges, *ceteris paribus*. This study also shows that better infrastructure development at port and maritime connectivity would lead to reduce trade costs. India has made significant improvement in digital

trade facilitation measures, and the analysis indicates that improvement in trade facilitation measures in the reporting country will facilitate its export to the partner countries. Therefore, India should continue to gain and implement new advancements in digital trade facilitation through reforms and new technologies. Further, the analysis shows that the implementation of electronic trade facilitation does promote exports.

There are many areas where India can do better in trade facilitation, particularly in the neighbourhood. For example, India can introduce coordinated border management with the neighbouring countries based on approaches such as colocation of facilities, close cooperation between agencies, the delegation of administrative authority, cross-designation of officials, and effective information sharing. Inter-operability of single windows with partner countries is another line of activities that India may initiate. In a futuristic sense, India may think for One-Stop Border Post (OSBP) in the neighbourhood, particularly with friendly countries, which allow bordering countries to coordinate import, export, and transit processes to ensure that traders are not required to duplicate regulatory formalities on both sides of the same border. Signing of the UN's paperless trade agreement may add further momentum in the digital trade facilitation programmes. India may consider conducting national trade facilitation performance monitoring mechanisms. At the same time, India must reform the domestic policy to push manufacturing competitiveness, promoting global and regional value chain to benefit from tariff liberalisation. The focus should be given to the rise of MSMEs by making simple and business-friendly business to promote India's trade.

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**Appendix Table 1: Data Definition and Sources**

<b>Variable</b>	<b>Definition</b>	<b>Source</b>
Export	Bilateral export between country i and country j	WITS Database
Dist <sub>ij</sub>	Weighted Geographical distance between country i and country j	CEPII
Contig <sub>ij</sub>	Dummy variable of contiguity equal to 1 if country i and j share a common border and zero otherwise.	CEPII
Language <sub>ij</sub>	Dummy variable of common language equal to 1 if country i and j use the same common official language and zero otherwise.	CEPII
Colony <sub>ij</sub>	Dummy variable equal to 1 if country i and j had a common colonizer after 1945 and zero otherwise.	CEPII
RTA <sub>ij</sub>	Dummy variable equal to 1 if country i and j are members of the same regional trade agreement and zero otherwise.	CEPII
LSCI <sub>ij</sub>	Average scores of liner shipping connectivity index of country i and j	
QPI <sub>ij</sub>	Quality Port Index of country i and j	WDI
TEBC <sub>ij</sub>	Time to Export, border compliance	WDI
Digital_TF	Sum of percentage of cross border paperless trade and paperless trade components of trade facilitation of country i and j based on Global Trade Facilitation Survey	UN Global Survey on Trade Facilitation and Paperless Trade
NonDigital_TF	Sum of percentage of cross border paperless trade and paperless trade components of trade facilitation of country i and j based on Global Trade Facilitation Survey	UN Global Survey on Trade Facilitation and Paperless Trade
TF	Overall percentage of trade facilitation implementation of country i and j (including cross border paperless trade, paperless trade, formalities, institutional arrangements and transparency) based on Global Trade Facilitation Survey	UN Global Survey on Trade Facilitation and Paperless Trade
GDP	Gross domestic product (current US\$)	World Development Indicators, World Bank Database
GDPPC	Per capita Gross domestic product (Current US\$)	World Development Indicators, World Bank Database
WTO_TF	Dummy variable equal to 1 if WTO Trade Facilitation agreement signed by country i and country j	WCO
Customs_edi	Implementation of Single window system in country i and country j	WCO
tariff <sub>ij</sub>	Tariff rate between country i and country j	WITS
t <sub>ij</sub>	Comprehensive trade costs	World Bank UN ESCAP Database

*Note:* presents the variables, data sources, definitions, data treatment, source and expected sign from econometric estimation. Where available, the average of the most recent data from 2012 onwards is used in the estimation. Data filling for LSCI is required to ensure inclusion of landlocked economies. Port countries are used as proxies for landlocked countries' portal performance. For the TF components and credit information index, zeros are replaced by 0.0001 to prevent observations being omitted from the estimation. The lists of countries included in the analysis are presented in Annexes.

## Appendix 2: List of Countries included in the Analysis

Afghanistan	Egypt, Arab Rep.	Myanmar	Uruguay
Albania	El Salvador	Nepal	Uzbekistan
Antigua And Barbuda	Estonia	Netherlands	Vanuatu
Argentina	Eswatini	New Zealand	Vietnam
Armenia	Fiji	Nicaragua	Yemen, Rep.
Australia	Finland	Norway	Zimbabwe
Austria	France	Pakistan	
Azerbaijan	Gabon	Palau	
Bahrain	Germany	Palestine	
Bangladesh	Greece	Panama	
Belarus	Hungary	Papua New Guinea	
Belgium	India	Paraguay	
Benin	Indonesia	Peru	
Bhutan	Iraq	Philippines	
Brazil	Ireland	Portugal	
Brunei Darussalam	Italy	Qatar	
Bulgaria	Jamaica	Republic of Korea	
Burkina Faso	Japan	Russian Federation	
Burundi	Jordan	Singapore	
Cambodia	Kazakhstan	Solomon Islands	
Cameroon	Kirbati	Spain	
Canada	Kyrgyzstan	Sri Lanka	
Chile	Lao PDR	Sweden	
China	Lebanon	Switzerland	
Colombia	Lesotho	Tajikistan	
Congo, Rep.	Madagascar	Thailand	
Costa Rica	Malaysia	Timor-Leste	
Cote D'ivoire	Maldives	Tonga	
Croatia	Mali	Trinidad and Tobago	
Cuba	Malta	Turkey	
Democratic Rep. of Congo	Mexico	Uganda	
Dijibouti	Moldova	Ukraine	
Dominican Republic	Mongolia	United Arab Emirates	
Ecuador	Montenegro	United Kingdom	

**Appendix Table 3: Diagnostic Tests for 2SLS Model**

	<b>ASEAN</b>	<b>Indo-Pacific</b>	<b>All Countries</b>
F value	266.80***	295.14***	275.08***
Centered R <sup>2</sup>	0.59	0.65	0.79
Uncentered R <sup>2</sup>	0.57	0.62	0.82
Anderson Canon. Corr. LM Statistic for Under identification test	124.2***	276.7***	372.0***
Cragg-Donal Wald F Statistic for Weak Identifications test	121.1**	216.7***	316.5***
Sargan Statistic for over identification test for all instruments	27.7**	47.54***	75.2***

Note: The level of significance is indicated as follows: \* p<.10, \*\* p<.05, \*\*\* p<.01.



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Considering the work of the ASEAN-India Eminent Persons Group (AIEPG), and its Report with recommendations for forging a closer partnership for peace, progress and shared prosperity, the Heads of the State/Government of ASEAN and India at the ASEAN-India Commemorative Summit 2012, held at New Delhi on 19-20 December 2012, recommended the establishment of ASEAN-India Centre (AIC), which was formally inaugurated by the External Affairs Minister of India on 21 June 2013 at RIS. AIC serves as a resource centre for ASEAN Member States and India to fill the knowledge gaps that currently limit the opportunities for cooperation. The AIC is closely working with the Indo-Pacific Division of the Ministry of External Affairs (MEA), Government of India to undertake and disseminate evidence-based policy research and provide policy recommendations.

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## Contact us at:

ASEAN-India Centre (AIC)  
Research and Information System of Developing Countries (RIS)  
Zone-IV-B, Fourth Floor, India Habitat Centre, Lodhi Road  
New Delhi – 110003, India  
Tel. +91-11-24682177-80  
Fax: +91-11-24682173-74  
E-mail: [aic@ris.org.in](mailto:aic@ris.org.in)  
Visit our website at: <http://aic.ris.org.in>

@AIC\_AseanIndia

