

De, Prabir; Kumarasamy, Durairaj

**Working Paper**

## What role should connectivity play in reenergising South Asia?

ARTNeT Working Paper Series, No. 188

**Provided in Cooperation with:**

Asia-Pacific Research and Training Network on Trade (ARTNeT), Bangkok

*Suggested Citation:* De, Prabir; Kumarasamy, Durairaj (2020) : What role should connectivity play in reenergising South Asia?, ARTNeT Working Paper Series, No. 188, Asia-Pacific Research and Training Network on Trade (ARTNeT), Bangkok

This Version is available at:

<https://hdl.handle.net/10419/214198>

**Standard-Nutzungsbedingungen:**

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

**Terms of use:**

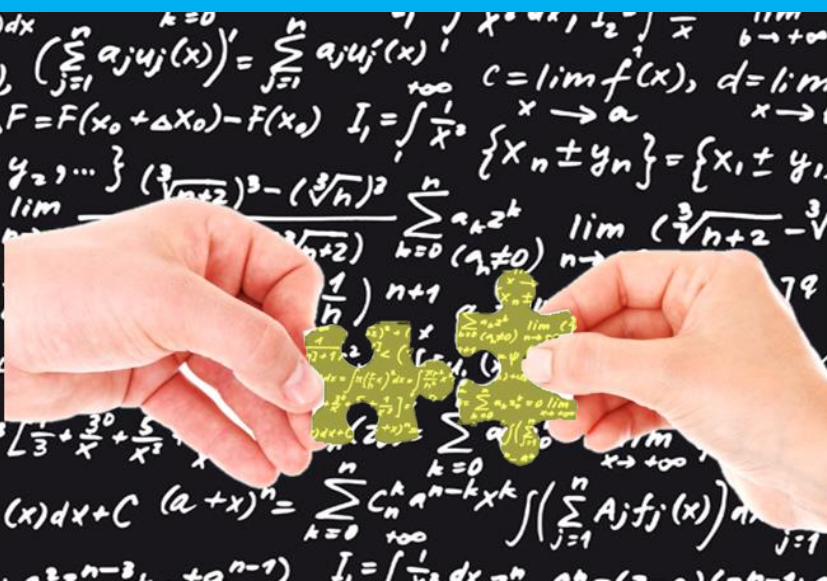
*Documents in EconStor may be saved and copied for your personal and scholarly purposes.*

*You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.*

*If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.*



# What role should connectivity play in reenergising South Asia?



**Prabir De**  
**Durairaj Kumarasamy**

ASIA-PACIFIC RESEARCH AND TRAINING NETWORK ON TRADE

# Working Paper

NO. 188 | 2020

The Asia-Pacific Research and Training Network on Trade (ARTNeT) is an open regional network of research and academic institutions specializing in international trade policy and facilitation issues. ESCAP, WTO and UNCTAD, as key core network partners, and a number of bilateral development partners, provide substantive and/or financial support to the network. The Trade, Investment and Innovation Division of ESCAP, the regional branch of the United Nations for Asia and the Pacific, provides the Secretariat of the network and a direct regional link to trade policymakers and other international organizations.

The ARTNeT Working Paper Series disseminates the findings of work in progress to encourage the exchange of ideas about trade issues. An objective of the series is to publish the findings quickly, even if the presentations are less than fully polished. ARTNeT Working Papers are available online at [www.artnetontrade.org](http://www.artnetontrade.org). All material in the Working Papers may be freely quoted or reprinted, but acknowledgment is requested together with a copy of the publication containing the quotation or reprint. The use of the Working Papers for any commercial purpose, including resale, is prohibited.

**Disclaimer:**

The designations employed and the presentation of the material in this Working Paper do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries. Where the designation “country or area” appears, it covers countries, territories, cities or areas. Bibliographical and other references have, wherever possible, been verified. The United Nations bears no responsibility for the availability or functioning of URLs. The views expressed in this publication are those of the author(s) and do not necessarily reflect the views of the United Nations. The opinions, figures and estimates set forth in this publication are the responsibility of the author(s) and should not necessarily be considered as reflecting the views or carrying the endorsement of the United Nations. Any errors are the responsibility of the author(s). The mention of firm names and commercial products does not imply the endorsement of the United Nations.



## What role should connectivity play in reenergising South Asia?

Prabir De<sup>1</sup> and Dujairaj Kumarasamy<sup>2</sup>

**Please cite this paper as:**

Prabir De and Dujairaj Kumarasamy (2020). “What role should connectivity play in reenergising South Asia?”, ARTNeT Working Paper Series No. 188, February 2020, Bangkok ESCAP.

Available at <http://artnet.unescap.org>

---

<sup>1</sup> Professor, Research and Information System for Developing Countries (RIS), New Delhi, e-mail: [prabirde@hotmail.com](mailto:prabirde@hotmail.com) (corresponding author)

<sup>2</sup> Consultant (Assistant Professor), Research and Information System for Developing Countries (RIS), New Delhi, e-mail: [durairaj@ris.org.in](mailto:durairaj@ris.org.in)

An earlier version of the paper was presented at the 12th South Asia Conference on “India’s Neighbourhood First Policy: Regional Perceptions”, Organised by the Institute for Defence Studies and Analyses (IDSA), held on 28-29 January 2020 at New Delhi. Views are the authors’ own. The authors are and grateful to the ARTNeT secretariat for the technical support in preparing then paper for posting.

## **Abstract**

South Asia could unleash its full potentials, provided, it improves the infrastructure facilities, which are at present not sufficient to meet the growing demand of the region. The renewed and shared agenda of the South Asian regional cooperation should aim to reduce both intra- and inter- regional trade facilitation gaps as well as to expand the connectivity. South Asia has to enact its own connectivity and trade facilitation arrangement to take forward the agenda of South Asian integration. The analysis of this paper indicates that South Asia may gain enormously if they reduce the conflicts across the border and secure improvement in both hard and soft infrastructure. Facilitating business beyond border means an enhanced trade facilitation and connectivity in the region. South Asia connectivity needs a new vision to compete globally. This paper examines the determinants of connectivity in the region with a view to making appropriate policy choices.

**Keywords:** South Asia, Trade, Connectivity, Trade Facilitation, Regional Integration

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

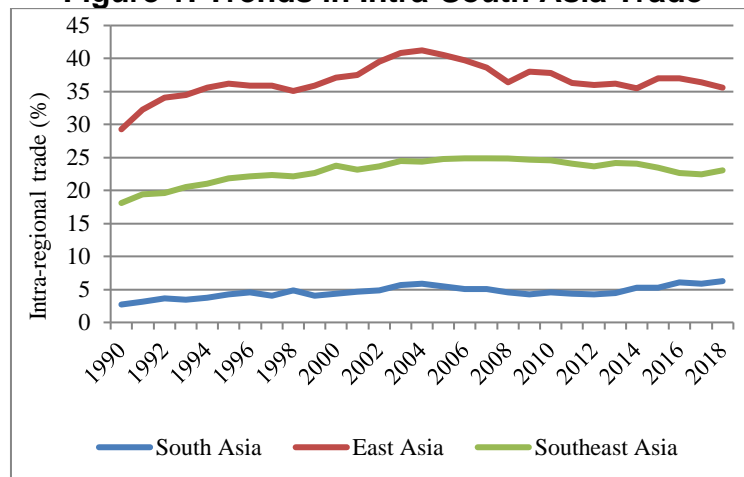
## Table of contents

<b>1. Introduction.....</b>	<b>1</b>
<b>2. Trends in South Asian trade: Three emerging scenarios.....</b>	<b>3</b>
<b>3. Trade logistics and facilitation: The rising gap in South Asia.....</b>	<b>11</b>
<b>4. Assessing the trade – Connectivity linkages in South Asia.....</b>	<b>16</b>
<b>4.1 Results and discussion.....</b>	<b>20</b>
<b>5. Policy implications and conclusions.....</b>	<b>23</b>
<b>Rferences.....</b>	<b>26</b>
<b>Appendix 1: Bilateral Trade Costs*.....</b>	<b>27</b>
<b>Appendix 2: Major Commodity-wise Intra-Regional Trade in South Asia.....</b>	<b>29</b>
<b>Appendix 3: Data Definition and Sources.....</b>	<b>30</b>
<b>Appendix 4: Diagnostic Tests for 2SLS Model.....</b>	<b>31</b>

## 1. Introduction

Trade has always been at the forefront of South Asia's economic policies. Intra-regional trade in South Asia has increased from less than 2 percent in 1990, to about 5 percent in 2006 when the SAFTA was signed, to over 6 percent in 2018 (figure 1). The well-established fact is that the neighbouring Southeast Asia or East Asia outperforms South Asia in intra-regional trade. Although the rise in intra-South Asia trade is marginal, South Asian countries recognize that regional connectivity is the key to unlocking the trade potentials.<sup>3</sup> Today, South Asian countries have about US\$ 31 billion intra-regional trade against a potential of over US\$ 90 billion at current price<sup>4</sup>. How does connectivity lead to higher trade and then strengthen the integration? Simply put, better connectivity between nations facilitates higher growth and trade, *ceteris paribus*.

**Figure 1: Trends in Intra-South Asia Trade**



Source: Authors

South Asian progress in trade has always been undermined by the excessive costs and lengthy time associated with export and import of goods and services in the region. South Asian countries have increasingly recognized the importance of regional connectivity in boosting their competitiveness and accelerating growth. South Asian countries, compared to 2010, are now well connected, except between India and Pakistan, where connectivity has been withdrawn gradually. Connectivity challenges are different in large economies than island or mountain or landlocked economies in

<sup>3</sup> Refer, for example, Hashim and Razzaque (2016), De (2019a,b), etc.

<sup>4</sup> Estimated potential taken from Hashim and Razzaque (2016)

South Asia. There has also been high variation among the modes of transportation between countries while moving the goods across the borders. What is missing is that transportation networks are yet to be fully operationalised or integrated with South Asia. Inter-operability is yet to happen in digital networks and trade transactions. Non-physical barriers at borders in terms of both trade and transport exist in a large way, resulting in higher transaction costs and time that the trade faces in the region. Paperless trade, for example, is yet to see meaningful progress in South Asia. What follows is that the entire region lacks an integrated regional connectivity vision.

Regional trade liberalization, such as the South Asian Free Trade Area (SAFTA), has not been sufficient to achieve increased intraregional trade. Equally essential is infrastructure development, capacity building, removal of non-tariff barriers, and the presence of supportive policies and institutions that promote economic activities along identified transport corridors. As a regional public good, regional connectivity generates “non-rival” and “non-excludable” benefits (benefits that are endless and everyone gets access to) that, if properly designed and implemented, exceed the costs. Continuous investment in logistics infrastructure and services can positively impact international trade.<sup>5</sup> To sustain growth, the South Asian region should invest about 9 per cent of its GDP on infrastructure development over the next one and a half decades, of which India alone may need to invest about US\$ 260 billion.<sup>6</sup> Falling short of the required investment may lead to slow down the growth and integration.

Yet, the role that connectivity can and should play in the re-energising of regional integration in South Asia still remains somewhat unclear at the present regional geo-political context. South Asian integration process through SAARC has slowed down in recent years. At this challenging time, South Asian countries have been facing enormous task to strengthen the integration. Improved connectivity, particularly digital connectivity, may encourage innovation, new competition and lead to generate social benefits. This is the new area which South Asian countries need to do more than anything else. At the same time, re-energising the regional integration process in South Asia may not only strengthen the political commitments but also bring a new vision and a stagey for the region.

---

<sup>5</sup> Refer, for example, Gani (2017)

<sup>6</sup> Refer, for example, ADB (2017)



In view of the above, the primary objective of this paper is to unravel such relationship and present a narrative to reenergise the South Asian regional economic integration. Rest part of the paper is organised as follows. Section 2 presents the current profile of regional trade in South Asia and future trade potential. Section 3 discusses South Asia's performance in trade logistics and facilitation whereas Section 4 analyses the impact of connectivity on trade flows in South Asia. Concluding remarks are drawn in Section 5.

## **2. Trends in South Asian trade: Three emerging scenarios**

South Asia is one of the fastest growing regions of the world. In South Asia, Bangladesh, India and Nepal have been growing relatively faster than other countries. Over time, South Asia's global trade has witnessed rapid expansion. However, the intra-South Asia trade lags behind many others. South Asia's intra-regional export has expanded marginally from US\$ 23.33 billion in 2015 to US\$ 31.69 billion in 2018, contributed only 8 percent to South Asia's global export (Table 1). The trend also suggests that South Asia's extra-regional trade integration is relatively higher than that of intra-regional trade. Today, South Asia is one of the least integrated regions in the world in terms of intra-regional trade.

South Asia's global trade has crossed US\$ 1 trillion in 2018 amidst the rising uncertainties. This expansion of trade is accompanied by high variation in growth, lopsided distribution and high concentration. For example, India's share in South Asia's global trade has increased from about 68 percent in 2000 to about 77 percent in 2018, whereas the same of other South Asian countries have either declined or gained marginally over time (Table 2). It also suggests that South Asia's global trade is heavily India-centric. India is aiming for US\$ 1 trillion export by 2024-25 and a GDP of US\$ 5 trillion.<sup>7</sup> Therefore, size of economy matters for trade, and not just the growth alone.

---

<sup>7</sup> Refer, the speech delivered by Indian Commerce Minister on 30 July 2019 at Delhi who stressed that in order to achieve the target of US\$ 5 trillion economy, India's exports will have to contribute at least USD 1 trillion, Read more at: <https://economictimes.indiatimes.com/news/economy/foreign-trade/indias-exports-need-to-contribute-usd-1-trillion-in-economy-piyush-goyal>

**Table 1: Trends in South Asia's Export**

Year	Intra-South Asia	Rest of the world	Total export of South Asia
1995	2.43	45.34	47.77
2000	2.92	61.52	64.44
2005	9.11	124.47	133.58
2010	16.55	254.91	271.46
2015	23.33	307.33	330.66
2018	31.69	367.79	399.48

Source: UNCTAD Stat

**Table 2: Country-wise Trend in South Asia's Trade**

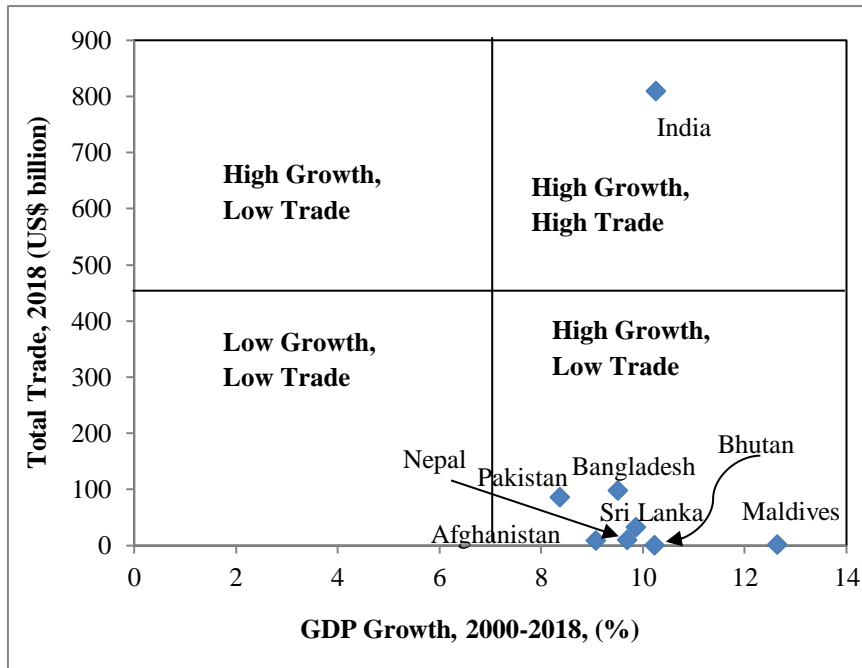
Country	Export		Import		Total Trade	
	2000	2018	2000	2018	2000	2018
	(US\$ billion)					
Afghanistan	0.16	1.28	0.78	7.83	0.94 (0.63)	9.11 (0.86)
Bangladesh	6.48	39.66	7.5	58.66	13.98 (9.40)	98.32 (9.33)
Bhutan	0.03	0.35	0.02	0.77	0.05 (0.03)	1.13 (0.11)
India	47.83	319.33	52.8	490.93	100.61 (67.73)	810.26 (76.90)
Maldives	0.26	0.58	0.4	2.4	0.66 (0.44)	2.98 (0.28)
Nepal	0.73	1.27	0.87	10.14	1.60 (1.08)	11.4 (1.08)
Pakistan	8.72	25.22	10.3	62.19	19.01 (12.78)	87.40 (8.29)
Sri Lanka	5.34	11.68	6.58	21.44	11.92 (8.01)	33.12 (3.14)
South Asia	69.55	399.37	79.20	654.36	148.77	1053.72

Note: Data in parentheses represent country's share in global trade (in percent)

Source: Authors based on IMF DOTS

While South Asian countries have secured a GDP growth of average 9 to 13 percent at current US\$ over the period 2000 to 2018, India is the only country that has emerged as the best performer, witnessed both high growth and high trade (Figure 2). Rest South Asian countries do not match with India's performance in spite of their high growth. This trend also indicates that robust and sustained growth indeed helped South Asian countries to achieve higher trade. However, trade integration in the region shows different scenario; South Asian countries do not trade much within the region.

**Figure 2: Trade Performance of South Asian Countries**



Source: Authors based on DOTS IMF and WDI, World Bank

South Asia’s intra-regional trade has increased from about US\$ 3 billion in 2000 to US\$ 31 billion in 2018, witnessed 14 percent annual growth during this period. India has alone contributed about 79 percent of regional trade in 2020, increased from 63 percent in 2000 (Figure 2). Intra-South Asia trade shows higher concentration in favour of India. Barring Bhutan and India, intra-regional trade share has declined or remained static in case of other South Asian countries. This also poses serious challenges since trade has gradually concentrated in favour of India. Under such high concentration, a fall in regional connectivity, which connects India with its South Asian neighbours, is thus a matter of great concern, particularly for those countries those are landlocked.

South Asian landlocked countries, namely, Afghanistan, Bhutan and Nepal, depend on South Asia more than any other South Asian countries for their regional and global trade. This has been well captured in Figure 3, which illustrates the dependency ratio of South Asian countries for the years 2000 and 2018. Over 95 percent of Bhutan’s global trade is conducted within the South Asian region (2018), which was about 48 percent in 2000. In case of Afghanistan, the current dependency ratio is 84 percent and that for Nepal is 57 percent. Except Maldives, trade dependency of South Asian countries in the region has gone up with variation between landlocked and coastal

countries. Contrary to popular belief, Maldives's export to the South Asian region (particularly to Sri Lanka) has declined from US\$ 14 billion in 2000 to US\$ 11 billion in 2018. On the other, China has become one of the major trade partners of most of the South Asian countries including India.

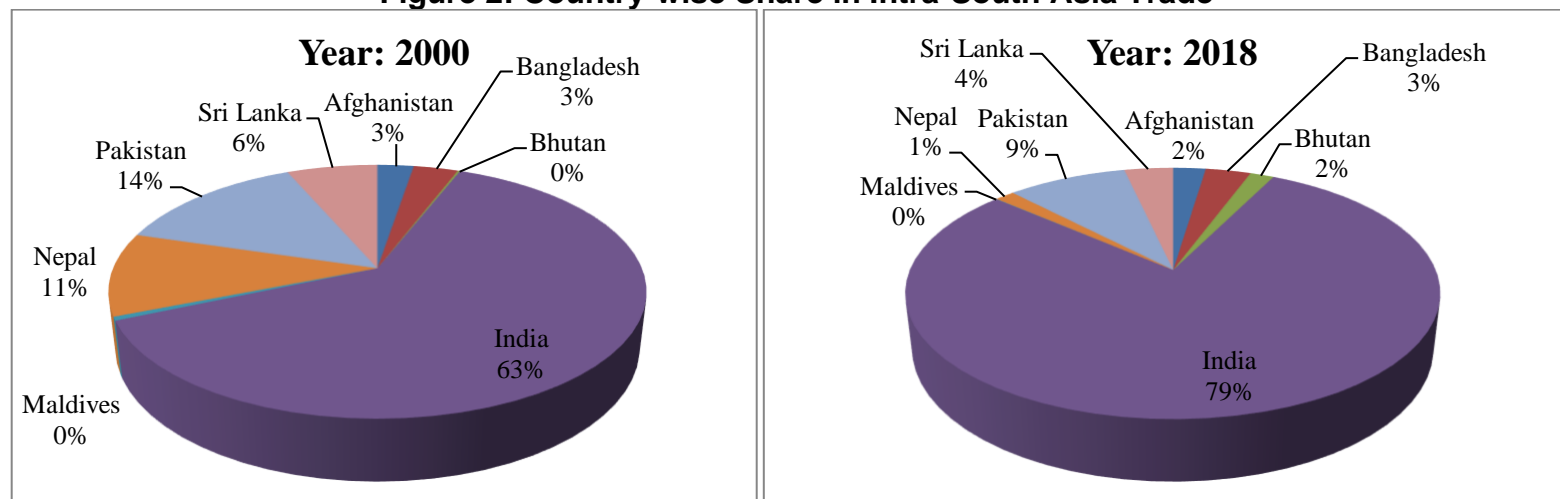
**Table 3: Intra-South Asia Trade Matrix, 2000 and 2018\* (US\$ million)**

Partner →	Afghanistan		Bangladesh		Bhutan		India		Maldives		Nepal		Pakistan		Sri Lanka		South Asia	
Reporter ↓	2000	2018	2000	2018	2000	2018	2000	2018	2000	2018	2000	2018	2000	2018	2000	2018	2000	2018
Afghanistan							34.52	359.44					41.72	378.24			76.23	737.68
Bangladesh	4.27	5.46			0.90	5.04	50.13	877.28			1.32	40.68	34.51	70.95	2.47	24.11	93.59	1023.52
Bhutan			0.25	7.83			4.39	529.09				2.31		0.12			4.64	539.35
India	27.73	728.71	860.33	8826.53	2.72	654.03			20.28	220.94	143.40	7343.39	163.33	2,362.21	604.90	4662.49	1822.68	24798.30
Maldives				2.13			0.24	2.82							13.58	6.20	13.81	11.15
Nepal		0.00	1.90	11.36		0.56	307.20	433.46	0.04	0.01			0.10	0.29		0.11	309.24	445.79
Pakistan	121.90	1211.17	139.35	746.42	0.30	0.00	57.85	377.08	1.40	5.55	2.73	1.27			81.04	367.22	404.57	2708.71
Sri Lanka	0.18	0.36	10.22	132.94		0.01	58.03	769.25	90.94	110.77	0.80	10.19	29.70	82.14			189.88	1105.65

\*In terms of exports

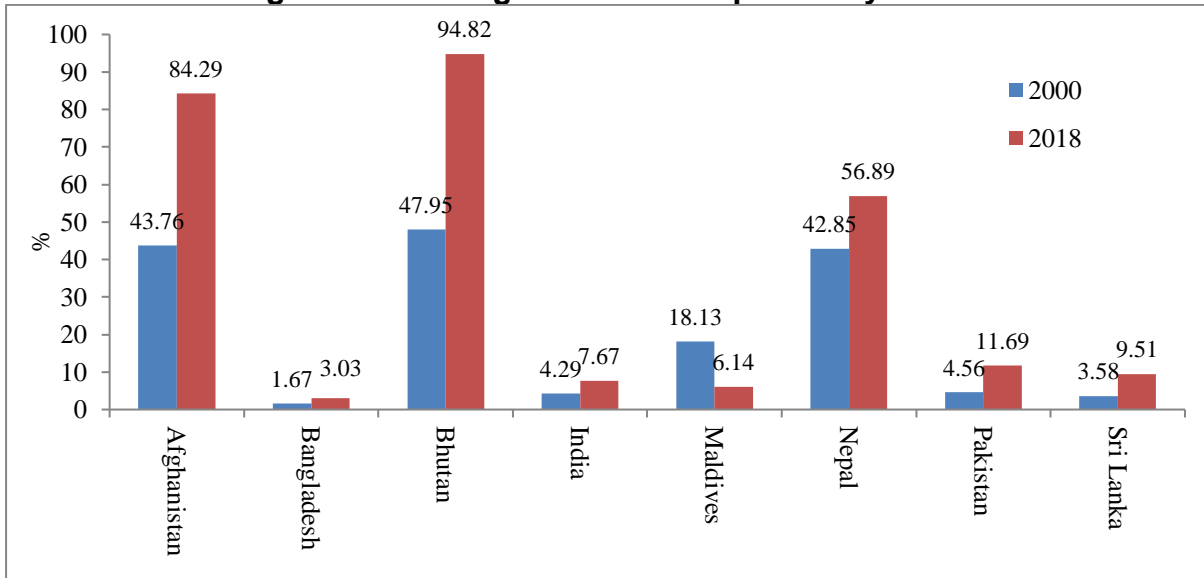
Source: Calculated based on IMF DOTS

**Figure 2: Country-wise Share in Intra-South Asia Trade**



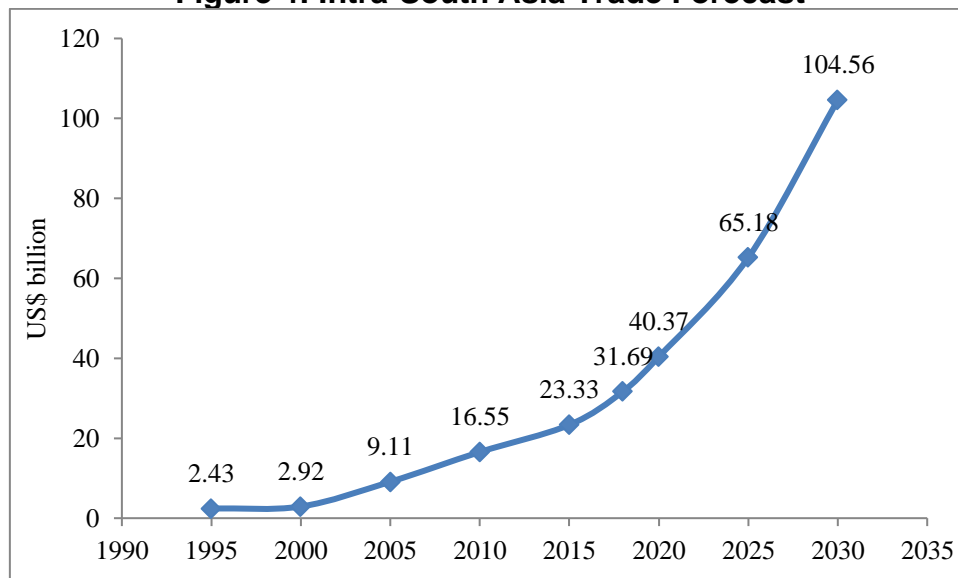
Source: Authors, based on IMF DOTS

**Figure 3: Intra-regional Trade Dependency Ratio**



Source: Authors, based on IMF DOTS

**Figure 4: Intra-South Asia Trade Forecast**

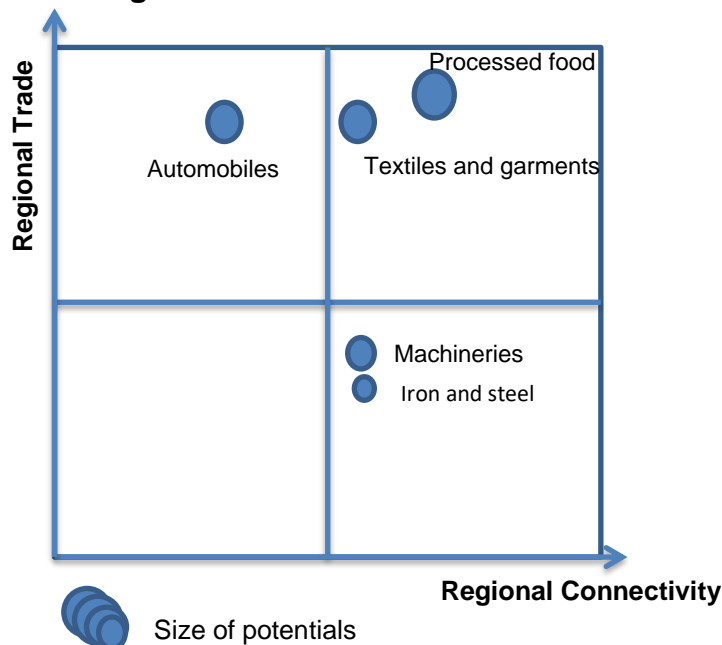


Source: Authors' own

With a rise in economic size and development momentum, one expects a fall in trade costs, given the fixed distance between trade partners. Trade cost is nothing but all costs (and time) associated with any trade consignment. Here, South Asian countries have witnessed a mixed performance. Except between India-Maldives or India-Bangladesh, bilateral trade costs in South Asia have gone up over time (Appendix 1). We expect that the intra-regional trade from present US\$ 1 billion is likely to touch US\$

40 billion by 2020, US\$ 69 billion by 2025 and US\$ 105 billion by 2030, *ceteris paribus* (Figure 4).<sup>8</sup>

**Figure 5: Regional Value Chain Potentials in South Asia**



Source: Authors' own

At the product level, South Asian countries have also witnessed substantial growth in regional export (Appendix 2). For example, commodity groups which have witnessed substantial growth in intra-regional trade during the period 2010 and 2018 are Animal oils and fats; Hides, skins and furskins, raw; Fertilizers; Machinery specialized for particular; Crude animal and vegetable material; Coal, coke and briquettes; Cork and wood; Miscellaneous edible products; Essential oils and resinoids; Paper, paperboard; Crude fertilizers, other than; and Gas, natural and manufactured. In the same period, some commodity groups have witnessed negative growth such as Feeding stuff for animals; Crude rubber (including synthetic articles); Sugars, sugar preparations and hone; Animal or vegetable fats and oils, and Special transactions and commodities. Several commodity groups have witnessed higher intra-South Asia trade such as Coal, coke and briquettes; Gas, natural and manufactured; Live animals other than animals of; Animal oils and fats; Fertilizers; Textile fibres; Hides, skins and furskins, raw; Dairy products and birds/eggs; Vegetables and fruit; Miscellaneous edible products; Animal

<sup>8</sup> Based on regional export-GDP elasticity under the business as usual scenario. Trade and GDP data are taken from IMF. Log-Log model is considered to calculate the elasticity.

or vegetable fats and oils; Sugars, sugar preparations and honey; Cork and wood; Crude rubber (including synthetic articles); Feeding stuff for animals, etc. Owing to positive association between regional connectivity and regional trade, industries that show high potentials for South Asia regional value chains are (i) textile and garments; (ii) iron and steel; (iii) processed food; (iv) machineries; and (v) automobiles. To unlock such potentials, South Asian countries need to enhance the regional connectivity.

Three distinct scenarios have emerged from the trends of intra-South Asian trade. First, the dependency of landlocked countries in South Asia in terms of regional trade has increased over time. Second, an island economy, which is vulnerable to climate change, is showing declining trade dependency on South Asia. Third, South Asian trade, which is heavily driven by India, needs special attention while aiming for an intra-regional trade volume of US\$ 105 billion by the turn of the ongoing decade. The challenge for South Asia is, therefore, to sustain the growth of trade by beating the trade costs, particularly at a time when global trade has been facing a slowdown. South Asia connectivity plan must address the above scenario in order to energise the South Asian integration process.

South Asian countries require specialised connectivity programme that must win the “heart” of landlocked and island countries. At the same time, improvement in connectivity between India and the partner countries and also with rest of the world, easing the burden of non-tariff measures, improvement in trade governance, etc, are some of the measures which are identified as the best possible solutions to South Asian trade. For example, regional trade facilitation for trade in pharmaceuticals may consider the faster mobility by air, whereas trade in iron and steel may need multimodal transportation, particularly overland, or mutual recognition of standards will pave the way to unlock the regional trade in textiles and clothing and processed food. Nevertheless, success would depend on the quality of trade logistics and the mobility of associated services<sup>9</sup>.

---

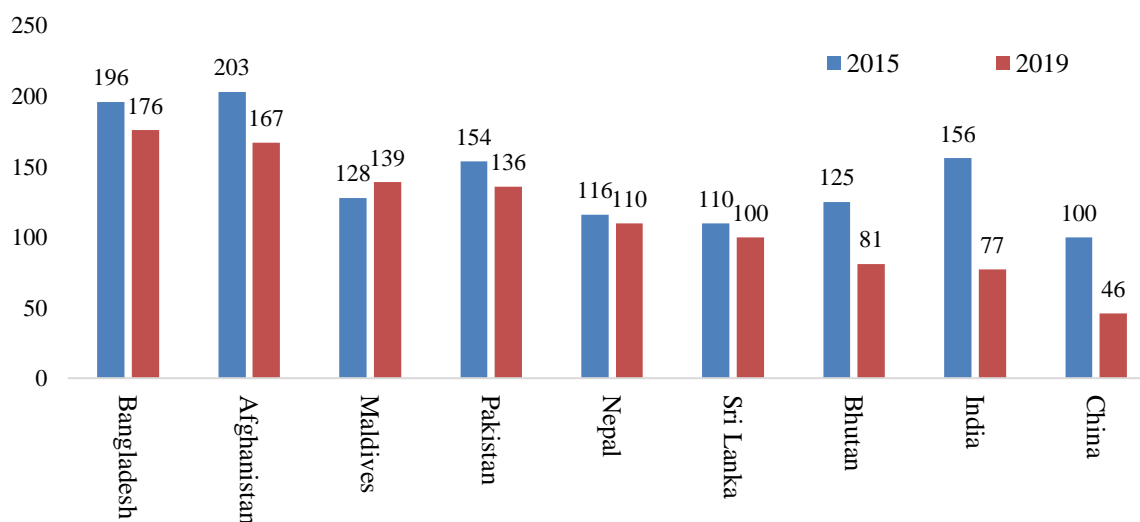
<sup>9</sup> Refer, for example, Gani (2017)



### 3. Trade logistics and facilitation: The rising gap in South Asia

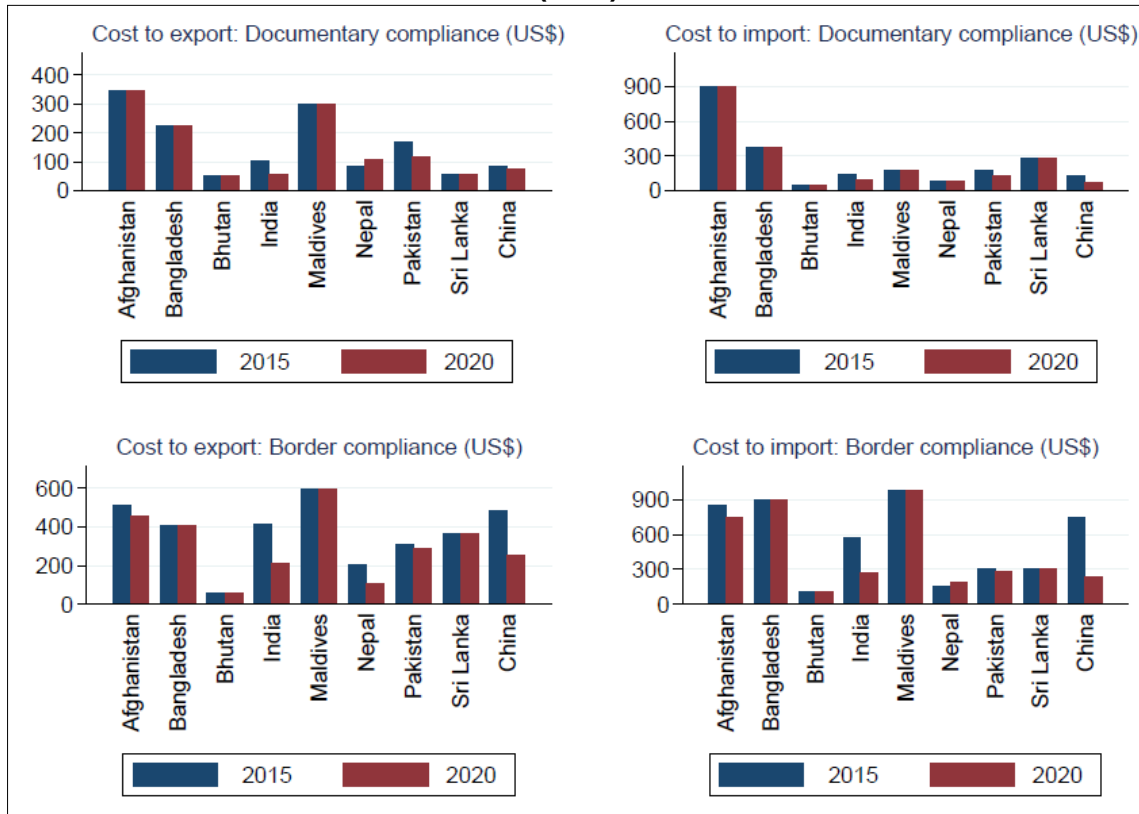
South Asian countries face with dual challenges – first is to sustain the improving business environment (ease of doing business), and second is to reduce the costs of border transactions through improved connectivity. Except Maldives, the rest of the South Asian countries have successfully improved the Ease of Doing Business (EDB) rank between 2015 and 2019 (Figure 6). India’s performance in improving the EDB rank has been phenomenal. Barring Bhutan and India, global ranks of rest South Asian countries are above 100, thereby widening the gap with India. Therefore, the task would be to narrow the gap in EDB between India with rest of South Asian countries through proactive policy reforms, adding further transparency and build investor’s confidence, to mention a few. India’s significant improvement in EDB rank through improvements in resolving insolvency, dealing with construction permits, registering property, trading across borders and paying taxes indicators offer important lessons to other South Asian countries. However, the gap between India and China in EDB rank is still wide, thereby indicating further scope to improve the global rank in EDB.

**Figure 6: Ease of Doing Business Rank**



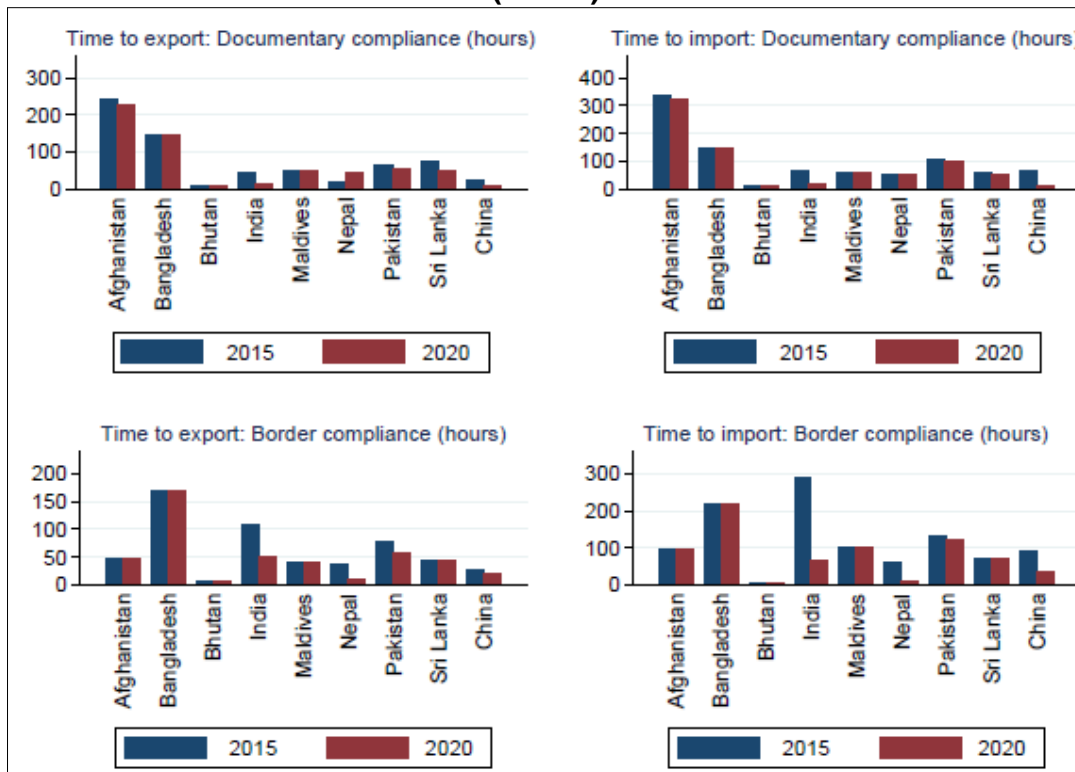
Source: World Bank Database

**Figure 7(a): Cost to Export and Import: Documentary and Border Compliance (US\$)**



Source: World Bank Doing Business Database

**Figure 7(b): Time to Export and Import: Documentary and Border Compliance (hours)**



Source: World Bank Doing Business Database

According to the World Bank's *Trading Across Border* indicators,<sup>10</sup> documentary compliance captures the time and cost associated with compliance with the documentary requirements of all government agencies of the origin economy, the destination economy and any transit economies. On the other, border compliance captures the time and cost associated with compliance with the economy's customs regulations and with regulations relating to other inspections that are mandatory in order for the shipment to cross the economy's border, as well as the time and cost for handling that takes place at its port or border.

When comes to documentary and border compliance, the performance of South Asian countries is rather mixed in terms of both time and cost (see Figure 7(a) and 7(b)). In the case of border and documentary compliance costs and time, Bhutan is the best performer in South Asia, whereas Afghanistan and Bangladesh lag behind others. Afghanistan being a landlocked country is yet to achieve substantial gains from the trade facilitation. South Asian countries suffer heavily on account of the cost of border compliance in both export and import and achievements during 2015 and 2020 has been negligible and also how high variation. India, on the other, has achieved phenomenal progress in reducing border and documentary compliance time in both export and import. In comparison, Afghanistan and Bangladesh still take a long time to clear export and import consignment when the goods arrive at the border or in the documentary preparation.

India's progress in trade facilitation deserves a special mention. India has been able to reduce the border compliance cost of export consignment from over US\$ 400 in 2014 to about US\$ 250 in 2018, which has been less than that of recorded for China. Although the cost of documentary compliance of export in India is about US\$ 78 in 2018, marginally higher than that of China, India has successfully reduced the gap in documentary compliance cost of export with China during 2014 and 2018. Compared to export, the absolute cost of border compliance of import consignment has come out to be expensive in India. However, India has remarkably halved the border compliance cost of import between 2017 and 2018, thereby narrowing the gap with China in trade

---

<sup>10</sup> Methodology was developed based on Djankov et al (2008) and was revised in 2015.

facilitation. In the case of documentary compliance cost, it takes about US\$ 100 in India to import a consignment, lower than that of China in 2018. On the contrary, China offers faster clearance of goods, both in cases of border and documentary compliance. Figure 6(b) illustrates the time to border and documentary compliance. Although India still takes on average 97 hours towards border clearance for an import consignment, India's achievement has been phenomenal in reducing border compliance time, particularly between 2017 and 2018. The progress has happened due mainly to the application of digital technology along with procedural reforms. Not only border compliance time, turn-around time at ports has also been improved from a peak of 5 days to about 2 days. Documentary compliance time for export cargo has also been reduced from over two days to just 15 hours in India during 2014 and 2018. By making e-filing of documents mandatory, India has witnessed substantial progress in reducing the documentary burden on exporters and importers. Owing to such reforms, documentary compliance time for both export and import cargoes have been reduced to just a few hours in India. In a landmark initiative to reduce documentary compliance, India has rationalized the documentation requirement for both exports as well as imports to just 3 from 7 and 10 respectively.<sup>11</sup>

However, India still takes over 4 days to complete the border compliance time for import cargo, which used to be 12 days in 2014. While India's performance in border compliance time of import cargo is laudable, India has to improve it further in order to ease the burden of mandatory border regulations and inspections. It is encouraging to note that costs and time have been declining and in some years fall has been quite rapid; costs and time of border compliance and documentary compliance in India at the same time have been higher than that of many other countries such as Singapore. One of the critical factors for the rise in costs and time could be inefficient logistics and border infrastructure, which has also reduced the trade competitiveness.

In view of the high priority that the government attaches to improving trade facilitation in the country, South Asian countries have ratified the WTO's Trade Facilitation Agreement (TFA) in April 2016, which came in to force in February 2017. TFA aims to expedite the movement, release and clearance of goods in trading across borders.

---

<sup>11</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)

India ratified an impressive over 70 percent of the provisions under Category A, and, in fact, has also implemented certain provisions of category B (like SWIFT, RMS) for which it had opted five years time. India has completed its mandates much before the time. Notwithstanding the progress in WTO TFA, South Asian countries need to improve performance in logistics.

**Table 4: Logistics Performance Index: Overall Rank (1=highest performance)**

	2007	2010	2012	2014	2016	2018
Afghanistan	150	143	135	158	150	160
Bangladesh	87	79		108	87	100
Bhutan	128	128	107	143	135	149
India	39	47	46	54	35	44
Maldives		125	104	82	104	86
Nepal	130	147	151	105	124	114
Pakistan	68	110	71	72	68	122
Sri Lanka	92	137	81	89		94

Source: World Bank LPI Database

**Table 5: Quality of Trade and Transport-related Infrastructure: Rank (1=highest performer)**

	2007	2010	2012	2014	2016	2018
Afghanistan	150	139	141	158	154	158
Bangladesh	82	72		138	87	100
Bhutan	127	141	117	132	151	150
India	42	47	56	58	36	52
Maldives		111	93	82	81	71
Nepal	144	143	149	122	112	123
Pakistan	71	120	71	69	69	121
Sri Lanka	105	138	89	126		85

Source: World Bank LPI Database

When comes to the performance of the logistics sector, barring India, rest South Asian countries perform rather poorly (Table 4). In terms of the World Bank's LPI, some of the South Asian countries even had drastic fall in LPI rank such as Pakistan; the country's LPI rank had declined from 71 in 2007 to 121 in 2018. India is still ahead of other South Asian countries in quality of trade and transport-related infrastructure (Table 5), but slipped further in 2018. The trend suggests that the gap between India and rest of South Asian countries in logistics performance has widened over time, which indeed has made the region's trade less competitive in comparison with the performing region such as Southeast Asia.

What follows is that India has succeeded to reduce documents required to export and import, but India still takes considerable time for export and import. In particular, the import takes more time than export. In a comparative global perspective, India's performance in trade facilitation has been phenomenal. Rest of the South Asian countries lag behind. Nonetheless, there is ample scope for improvement of the performance in border and documentary compliance. In particular, South Asian countries may opt for further simplification of documentary requirements and bridging alignment with international standards with the application of digital technology.<sup>12</sup> India has recognised the application of modern information and communication technology (ICT) as an important component of national trade facilitation programmes. India has achieved phenomenal progress in automation of trade documentation. For example, almost 100 percent of trade documents are now filed electronically in India through customs single window called SWIFT.<sup>13</sup> Therefore, India's EDI system offers immense lessons to other South Asian countries. This also calls for South Asia-wide interoperability of Customs Single Windows to start with, leading to a Regional Single Window over time.

#### **4. Assessing the trade – Connectivity linkages in South Asia**

One of the objectives is to examine the effect of connectivity on trade flows in South Asian countries. We have considered bilateral gravity analysis in 2SLS (two-Stage least squares) framework to estimate the impact of connectivity on trade flows, and the empirical estimation is based on a panel data for the period 2000 to 2016. Another advantage of using the gravity analysis in 2SLS framework is to check the endogeneity in the model.

To address the impact of connectivity on trade, we have included several indicators of both soft and hard infrastructures. Hard infrastructures include liner shipping

---

<sup>12</sup> Refer, for example, CII (2018). Also read, CBIC's presentation on WTP TFA, available at <http://www.cbic.gov.in/resources//htdocs-cbec/implmntin-trade-facilitation/tfa-presentation.pdf;jsessionid=4307CF3FCC8A6F0FE94D4BD524634D0A>

<sup>13</sup> It also handles all e-filing, e-payments, drawback disbursement and message exchange with stakeholders-almost 100 percent India's international trade.

connectivity index (LSCI), quality of port infrastructure (QPI), Time to Export, border compliance (TEBC), whereas we have used index on information and communication technologies (ICT) as a proxy for digitalisation in custom procedures, electronic single window systems and other initiatives those help to reduce time and cost of trade to represent the soft infrastructure. Here, we attempt to investigate the effect of connectivity indicators on trade costs and its impact on bilateral export.

### First Stage: Trade Costs Model

$$\ln t_{ij} = \alpha + \beta_1 Dist_{ij} + \beta_2 Language_{ij} + \beta_3 Colony_{ij} + \beta_4 Contig_{ij} + \beta_5 Tariff_{ij} + \beta_6 LSCI_{it} + \beta_7 LSCI_{jt} + \beta_8 QPI_{it} + \beta_9 QPI_{jt} + \beta_{10} TEBC_{it} + \beta_{11} TEBC_{jt} + \beta_{12} ICT_{it} + \beta_{13} ICT_{jt} + \varepsilon_{ij} \quad (1)$$

For the first stage equations, following Arvis *et al* (2013) and Duval *et al* (2018), we have modelled the trade costs functions including geographical distance and cultural and historical distance such as common language, common colony, etc<sup>14</sup>. In addition, we have included both hard and soft infrastructures of both exporting and importing countries to estimate the effect on trade costs.

Here,  $t_{ij}$  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.  $DIST_{ij}$  is 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 larger the distance, trade costs would increase due to transportation costs.

$Language_{ij}$  is the common official language between countries  $i$  and  $j$ . We have assigned 1 if two countries share a common language (official or commercial) and 0 otherwise. Common language is expected to reduce transaction costs as speaking the same language helps facilitate trade negotiations.

---

<sup>14</sup> We did not consider including a dummy variable for regional trade agreements, as this study focusing on South Asian countries which are under SAARC FTA is in action already.

Contig<sub>ij</sub> is the dummy variable to identify a pair of countries that are adjacent or contiguous or share a border. We have taken 1 if two countries have a common border and 0 otherwise. This dummy is in addition to the inclusion of the distance variable to account for the possibility of centre-to-centre distance overstating the effective distance between neighbouring countries that may often engage in large volumes of border trade.

Common Colony<sub>ij</sub> is equal to 1 if i and j were colonies after 1945 with the same colonizer 1 if two countries are under the same colony or 0 otherwise. Countries under the same colonial rule have established a trade network and tend to trade more.

To capture the effect of physical connectivity on trade costs, we have considered LSCI<sub>ijt</sub>, which presents the liner shipping connectivity index; QPI<sub>ijt</sub>, which is the indicator of the quality port index; and TEBC<sub>ijt</sub>, which presents the border compliance time to export.

The information and communication technology (*ICT<sub>ijt</sub>*) has been used as a proxy to measure soft connectivity. *ICT<sub>ijt</sub>* indicates the strength of application of modern information and communication technologies (ICT) in a country that may help to enhance the trade procedures and other customs automation initiatives through digital connectivity. The index of ICT includes (i) fixed broadband subscriptions (per 100 people), (ii) fixed telephone subscriptions (per 100 people), (iii) internet users (per 100 people), (iv) mobile cellular subscriptions (per 100 people), and (v) secure internet servers (per 1 million people). Each of the three indicators is normalized for the size of the economy so that it is not affected by the scale. *ICT<sub>ijt</sub>* has been estimated with the help of Principal Component Analysis (PCA). The weights are calculated by dividing the rotated factor loading of any variable by the sum of rotated factor loadings. Thus, weights make intuitive sense since they express the contribution of each variable to the total variance of the common factor. The data for measuring ICT index are all collected from the World Development Indicators, World Bank Database.

## **Second Stage: Export Model**

$$\ln Export_{ij} = \alpha + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j + \beta_3 \hat{t}_{ij} + \beta_6 Conflicts_{it} + \beta_7 Conflicts_{jt} + \beta_4 Institution_{it} + \beta_5 Institution_{jt} + \varepsilon_{ij} \quad (2)$$



In the second stage equation, we have estimated the impact of trade costs, particularly physical and soft infrastructure connectivity 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.

Here,  $\text{LnExport}_{ij}$  is log of export from country  $i$  to country  $j$ .  $\text{LnGDP}_i$  and  $\text{LnGDP}_j$  are the log of gross domestic product of reporting and partner countries, respectively, to measure the size of the economy.

In addition to the infrastructure connectivity, we have also investigated the effect of conflicts and terrorism on bilateral trade between the South Asian countries. Several studies have shown that conflicts and terrorism have major obstacles for trade and increase trade costs, particularly in developing countries. Studies have found that doubling the number of terrorist incidents is associated with a decrease in bilateral trade among 200 countries by about 4 percent<sup>15</sup>. Given that South Asian countries have a long history of fighting against terrorism and facing several incidents of internal and external conflicts within and among the neighbouring countries, we have included the business cost of terrorism as a proxy for  $\text{Conflicts}_{ijt}$  in both importer and exporter countries to study the effect on trade. Conflicts in terms of terrorism may raise the costs of doing business across national borders. For instance, conflicts may disrupt trade with neighbouring countries may force to trade with far-away countries, which may tend to increase trade costs rather than reducing it<sup>16</sup>. Therefore, we expect a negative effect of Conflicts on bilateral trade.

The study has also included Institution Index ( $\text{Institutions}_{ijt}$ ) to measure the quality of Institutions. We have used Kaufmann *et al* (2010) worldwide governance indicators, which cover six dimensions of governance such as Voice of Accountability, Political Stability and Absence of Violence, Government Effectiveness, Regulatory Quality, Rule of Law and Control of Corruption. Institutional Index has been estimated using

---

<sup>15</sup> Refer, for example, Nitsch and Schumacher (2004)

<sup>16</sup> Refer, for example, Bandhyopadyay and Younas (2017)

the Principal Component Analysis (PCA). The quality of institutions is highly correlated with trade<sup>17</sup>. Kaufmann *et al* (2010) have found that export performance and the propensity to participate in the trading system depend on Institutional quality. Institutions also indirectly affect trade via strengthening investment and productivity<sup>18</sup>. Therefore, we expect the institutional index to have a positive effect on bilateral trade.

### **Data Sources**

We have used the WITS database to collect bilateral exports of all the countries included in the analysis.  $t_{ij}$  is log of *comprehensive* trade costs collected from the World Bank-ESCAP trade costs database. Variables such as GDP and Indicators of physical and soft infrastructure connectivity such as LSCI, QPI, TEBC, ICT are collected from the World Development Indicators (WDI), World Bank. Variables to measure institutional index are collected from the World Governance Indicators (WGI), World Bank. Variable to measure the Conflicts is collected from the Global Competitiveness Index (GCI), World Economic Forum. The definition of variables and the corresponding data sources are given in Appendix 3. We have included only six South Asian countries such as Bhutan, Bangladesh, India, Nepal, Pakistan and Sri Lanka for the period 2000 to 2017 and forced to exclude Afghanistan and Maldives due to data paucity.

## **4.1 Results and discussion**

In the 2SLS model, we have included a fixed effect (country effect) of both partner and reporting countries to control the cross-country heterogeneity and also to improve the estimation efficiency. We have also included clustered cross-country pairs in the robust standard errors. The diagnostic tests given in Appendix 4 suggest that all the estimated results have come out well and there is no problem of identification issues.

The results of First Stage Regression are given in Table 6. It shows that both geographical distance and cultural and historical distance in all the models have expected signs and statistically significant. The estimated coefficient of Distance ( $Dist_{ij}$ ) has come out positive, suggesting a significant influence on the trade costs.

---

<sup>17</sup> Refer, for example, Francois and Manchin (2006)

<sup>18</sup> Refer, for example, Meon and Sekkat (2008)

Similarly, estimated coefficients of cultural and historical distance variables such as common border (*Contig<sub>ij</sub>*), common official language (*Language<sub>ij</sub>*) and common colony (*Colony<sub>ij</sub>*) show negative signs and statistically significant in all the models. A shared language and colonised country could facilitate trade, thus reducing the bilateral trade costs.

**Table 6: Two-Stage Lease Square Results:  
First Stage with Trade Costs Model (Equation 1)**

Dep.Var.= $Int_{ij}$	Model 1		Model 2	
	Beta	p-val	Beta	p-val
Distance <sub>ij</sub>	0.00***	0.00	0.01***	0.00
Colony <sub>ij</sub>	-0.14***	0.00	-0.15***	0.00
Language <sub>ij</sub>	-0.11***	0.00	-0.12***	0.00
Contig <sub>ij</sub>	*0.51***	0.00	-0.52***	0.00
Tariff <sub>ijt</sub> (ad valorem)	0.04***	0.00	0.03***	0.00
LSCI <sub>it</sub>	-0.009*	0.11	-0.002*	0.12
LSCI <sub>jt</sub>	-0.025**	0.06	0.032*	0.08
QPI <sub>it</sub>	-0.02***	0.002	-0.009***	0.03
QPI <sub>jt</sub>	-0.36*	0.08	-0.28*	0.11
ICT <sub>it</sub>	-0.002**	0.05	-0.005*	0.06
ICT <sub>jt</sub>	-0.20*	0.10	0.06*	0.09
TEBC <sub>it</sub>	0.0009***	0.00	0.02***	0.00
TEBC <sub>jt</sub>	0.008***	0.00	0.42***	0.00
constant	-7.96	0.16	9.12	0.40
Country Effect	Yes		Yes	

Note: The level of significance is indicated as follows: \*  $p < .10$ , \*\*  $p < .05$ , \*\*\*  $p < .01$ .  
Source: Authors' own

The positive and significant relation between tariff and trade costs indicates that despite several efforts taken globally in terms of bilateral and multilateral trade agreements, further reduction of the tariff would lead to effectively minimize the trade costs in the region.

Physical infrastructure for connectivity variables such as shipping connectivity (*LSCI<sub>ij</sub>*), port infrastructure (*QPI<sub>ij</sub>*) have come out negative and statistically significant in case of both exporting and importing countries in both the models, thereby suggesting better infrastructure development at port and maritime sector would reduce trade costs in South Asia. Similarly, the estimated coefficient of border compliance measures such as time to export (*TEBC<sub>ij</sub>*) is positive and statistically significant in both the models, indicating that longer the time to export, higher would be the trade costs, due to delay

in export-related expenditure like storage and labour charges.

The coefficient of  $ICT_{ij}$  as a proxy for the soft infrastructure is negative and significant at 10 percent level in both models. The result suggests that supply-side endowment factors of ICT do facilitate custom procedures and promote the bilateral trade engagements for the traders.

In the second stage analysis (Table 7), in addition to  $\ln GDP_i$  and  $\ln GDP_j$ , we have included the predicted trade costs variable  $\hat{t}_{ij}$  obtained from the first stage equation. Model 1 is the baseline regression to study the impact of the size of the economy and trade costs on bilateral exports. In Model 2, we have included the  $Conflicts_{ijt}$  and  $Institutions_{ijt}$  to understand how conflicts within and between the countries and institutional factors are an impediment to bilateral trade in South Asian countries.

The estimated coefficients of both  $\ln GDP_i$  and  $\ln GDP_j$  are positive and strongly significant in both the models. This shows that higher level of income in both exporting and importing countries indicates a country's ability to produce more export and higher level of demand for export goods. Predicted trade costs ( $\hat{t}_{ij}$ ) shows negative sign and statistically significant in both the models, thereby suggesting cutting trade costs between countries would significantly increase bilateral trade.

**Table 7: Gravity Model Two-Stage Least Square Results:  
Second Stage with the Effect of Trade Costs and  
Conflicts on Trade Model (Equation 2)**

Dep.Var.=LnExport	Model 1		Model 2	
	Beta	p-val	Beta	p-val
$\ln GDP_i$	0.86***	0.01	0.88***	0.01
$\ln GDP_j$	0.48***	0.01	0.44***	0.01
$\hat{t}_{ij}$	-0.28***	0.005	-0.36***	0.004
$Conflicts_{it}$			-0.0007*	0.08
$Conflicts_{jt}$			-0.056***	0.07
$Institutions_{it}$			0.23	0.13
$Institutions_{jt}$			0.56	0.20
Constant	6.12	0.51	9.75	0.8
N	92		66	
Period	2000 to 2017		2007 to 2017	

Note: The level of significance is indicated as follows: \* p<.10, \*\* p<.05, \*\*\* p<.01  
Source: Author's own

The coefficient of *Conflicts* of exporting and importing countries in Model 2 are negative and significant at about 10 percent level, suggesting that countries vulnerable to conflicts do affect bilateral trade in South Asia. In fact, the impact of conflicts does affect both exporting and importing countries in South Asia. This also indicates that going ahead, South Asian countries may benefit from lowering the conflicts between countries, which would then intensify trade in the region. Unlike other regions, South Asian countries have common cultural and ethnic values, which can be utilised to intensify trading across border, leading to reenergise the regional integration.

Although the estimated coefficient of an institutional index is positive, it is statistically insignificant in Model 2. Countries in South Asia are making an effort to improve the institutional factors such as government regulations, transparency, rule of law, control of corruption, which together or individually promote trade and development. South Asian countries must put additional effort in promoting bilateral trade through the measures of enhanced logistics and connectivity, among others.

The analysis indicates that South Asia may gain enormously if they reduce the conflicts across the border and secure improvement in both hard and soft infrastructure. Given that the trade is a dynamic concept, connectivity disruption costs cause havoc to the region, which then allows passage to non-South Asian countries to gain through aggressive market access. Therefore, facilitating business beyond the border means enhanced trade facilitation and connectivity in the region. South Asia connectivity needs a new vision to compete globally. This also calls for a review of South Asia's performance in trade logistics and facilitation.

## **5. Policy implications and conclusions**

India is the only country in the South Asia region which shares land borders with its four neighbouring countries, namely, Afghanistan, Bangladesh, Bhutan, Nepal, and Pakistan; maritime border with the Maldives; and sea routes with Sri Lanka, Maldives, Pakistan and Bangladesh. Road and rail links between those countries have to pass through India. Multimodal transportation thus would be useful to landlocked countries like Nepal and Bhutan or smaller island countries like Maldives to access third-country

market using South Asian soil. Ideally, geographically connected countries in South Asia can play the role of transportation “hub” for one another.

The development of trade infrastructure has to commensurate the growth of the region. South Asia could unleash its full potentials, provided it improves the infrastructure facilities, which are at present not sufficient to meet the growing demand of the region. Failing to narrow the infrastructure gap, the region’s growth and development will slow down. In other words, this also indirectly indicates high investment potentials in roadways, railways, power and the associated components in South Asia. The renewed and shared agenda of the South Asian regional cooperation should, therefore, aim to reduce both intra- and inter- regional trade facilitation gaps as well as to expand the connectivity. The process of South Asian regional integration has to contribute to narrowing the gaps by providing resources for the development of trade infrastructure. The resource requirements for bridging these gaps are nevertheless substantial, but manageable if we take a concerted approach to utilise the region’s financial resources. Finally, South Asia has to enact its own connectivity and trade facilitation arrangement to take forward the agenda of South Asia integration.

The analysis of this paper indicates that South Asia may gain enormously if they reduce the conflicts across the border and secure improvement in both hard and soft infrastructure. Given that the trade is a dynamic concept, connectivity disruption costs cause havoc to the region, which then allows passage to non-South Asian countries to gain through aggressive market access. Therefore, facilitating business beyond the border means enhanced trade facilitation and connectivity in the region. South Asia connectivity needs a new vision to compete globally.

Reactivating the SAARC Secretariat is a must for undertaking enhanced regional connectivity. Sri Lanka will takeover the SAARC Secretary General’s post in the first quarter of 2020. Reactivating needs consensus and commitments. With a new vision of regional integration, SAARC Secretariat can facilitate the connectivity agenda for the region.

South Asian countries may agree to constructively engage the dialogue partners in trade facilitation project. ASEAN has set-up ACCC to coordinate with ASEAN dialogue partners in connectivity projects being implemented by dialogue partners. When resources are scarce, SAARC shall constitute a committee with the Secretariat to coordinate with dialogue partners, which will help the region to source valuable technology and capital to finance connectivity projects, technical assistance, training and capacity building, etc.

To conclude, connectivity and trade facilitation measures such as the simplification, harmonisation, and automation of procedures and documents and streamlining NTMs involve interagency coordination and collaboration. Their successful implementation requires not only political and governmental support in terms of both policy directives and human and financial resources, but also an in-depth understanding about existing business processes, including their related information flows, laws, rules, and regulations.

## References

- Asian Development Bank (ADB) (2012) *CAREC 2020: A Strategic Framework for the Central Asia Regional Economic Cooperation Program 2011-2020*, Manila
- Bandyopadhyay, Subhayu and Javed Younas (2017) "Trade and Terror: The impact of Terrorism on Developing Countries", *The Regional Economist*, Fourth Quarter, pp.1-2
- De, Prabir (2019a) "Trade Facilitation Measures for South Asia Economic Union", in SAARC Secretariat (ed.) *Next Steps to South Asian Economic Union*, Kathmandu
- De, Prabir (2019b) "Developing Economic Corridors in South Asia: Priorities and Tasks Ahead", in SAARC Secretariat (ed.) *Next Steps to South Asian Economic Union*, Kathmandu
- Duval, Yann, Chorthip Utoktham, Alexey Kravchenko (2018) "Impact of implementation of digital trade facilitation on trade costs", Working Papers AWP 174, ARTNeT, UNESCVAP, Bangkok
- Francois, J., and M. Manchin. (2006), "Institutional Quality, Infrastructure, and the Propensity to Export" World Bank, Washington, DC.
- Gani, A (2017) "The Logistics Performance Effect in International Trade", *The Asian Journal of Shipping and Logistics*, Volume 33, Issue 4, December 2017, pp. 279-288
- Hashim, DA and Razzaque, MA (2016) *Revisiting South Asian integration: Trade flows and implied distances between members*, International Trade Working Paper 2016/11, Commonwealth Secretariat, London
- Jha, Shikha and Rosa Mia Arao (2018) "Infrastructure Financing in South Asia", ADB South Asia, Working Paper # 59, Asian Development Bank (ADB), Manila
- Kaufmann, Daniel, Kraay, Aart and Mastruzzi, Massimo. (2010) "The Worldwide Governance Indicators: Methodology and Analytical Issues", Policy Research Working Paper No. 5430, The World Bank, Washtington, D.C.
- Meon, Pierre-Guillaume and Sekkat, Khalid (2008) "Institutional quality and trade: which institutions? Which trade?", *Economic Inquiry*, Vol.46, No. 2, pp. 227-240.
- Nitsch, Volder and Schumacher, Dieter (2004) "Terrorism and international trade: an empirical investigation", *European Journal of Political Economy*, vol.20, issue. 2, pp. 423-433.
- SAARC Secretariat (2006) *SAARC Regional Multimodal Transport Study (SRMTS)*, Kathmandu
- SAARC Secretariat (2019) *Next Steps to South Asian Economic Union*, Kathmandu
- UNESCAP (2007) *Towards a Harmonized Legal Regime on Transport Facilitation in the ESCAP Region: Guidelines*. ST/ESCAP/2489, United Nations (UN), New York



### Appendix 1: Bilateral Trade Costs\*

Reporter Name	Partner Name	1995	2000	2005	2015
Afghanistan	Afghanistan				
Afghanistan	Bangladesh				324.27
Afghanistan	Bhutan				
Afghanistan	India				139.07
Afghanistan	Nepal				
Afghanistan	Pakistan				94.97
Afghanistan	Sri Lanka				
Afghanistan	Maldives				
Bhutan	Afghanistan				
Bhutan	Bangladesh		258.19	152.98	
Bhutan	Bhutan				
Bhutan	India		133.14	91.89	
Bhutan	Nepal				
Bhutan	Pakistan				
Bhutan	Sri Lanka			688.42	
Bhutan	Maldives				
Bangladesh	Afghanistan				324.27
Bangladesh	Bangladesh				
Bangladesh	Bhutan		258.19	152.98	
Bangladesh	India	146.77	161.06	125.25	121.03
Bangladesh	Nepal		321.90	249.36	272.86
Bangladesh	Pakistan			137.40	164.66
Bangladesh	Sri Lanka		201.99	169.84	188.56
Bangladesh	Maldives				270.57
India	Afghanistan				139.07
India	Bangladesh	146.77	161.06	125.25	121.03
India	Bhutan		133.14	91.89	
India	India				
India	Nepal		126.40	98.14	98.34
India	Pakistan			147.92	156.56
India	Sri Lanka		116.52	80.17	103.67
India	Maldives	294.64	240.80	291.15	267.52
Maldives	Afghanistan				
Maldives	Bangladesh				270.57
Maldives	Bhutan				
Maldives	India	294.64	240.80	291.15	267.52
Maldives	Nepal				
Maldives	Pakistan				
Maldives	Sri Lanka		62.72	80.19	102.81
Maldives	Maldives				
Nepal	Afghanistan				
Nepal	Bangladesh		321.90	249.36	272.86

Nepal	Bhutan				
Nepal	India		126.40	98.14	98.34
Nepal	Nepal				
Nepal	Pakistan			291.95	409.76
Nepal	Sri Lanka		392.80	244.23	320.39
Nepal	Maldives				
Pakistan	Afghanistan				94.97
Pakistan	Bangladesh			137.40	164.66
Pakistan	Bhutan				
Pakistan	India			147.92	156.56
Pakistan	Nepal			291.95	409.76
Pakistan	Pakistan				
Pakistan	Sri Lanka			123.94	157.96
Pakistan	Maldives				
Sri Lanka	Afghanistan				
Sri Lanka	Bangladesh		201.99	169.84	188.56
Sri Lanka	Bhutan			688.42	
Sri Lanka	India		116.52	80.17	103.67
Sri Lanka	Nepal		392.80	244.23	320.39
Sri Lanka	Pakistan			123.94	157.96
Sri Lanka	Sri Lanka				
Sri Lanka	Maldives		62.72	80.19	102.81

\*Ad valorem equivalent (%)

Source: UNESCAP

## Appendix 2: Major Commodity-wise Intra-Regional Trade in South Asia

2-digit SITC, ver 4	Product Description	Intra-regional Trade in South Asia (US\$ million)		Share of Intra-South Asia Export in South Asia's Global Export (%)		CAGR (2010-2018) (%)
		2010	2018	2010	2018	
41	Animal oils and fats	0.23	21.46	1.2	54.5	76.29
21	Hides, skins and furskins, raw	0.74	11.11	9.8	38.2	40.30
56	Fertilizers	16.01	65.18	24.1	49.4	19.18
72	Machinery specialized for particular	284.67	997.17	12.3	18.8	16.96
29	Crude animal and vegetable material	101.91	294.09	8.7	16.6	14.16
32	Coal, coke and briquettes	102.16	286.93	33.4	96.5	13.78
24	Cork and wood	7.01	19.26	21.2	22.8	13.47
9	Miscellaneous edible products	59.65	163.3	21.9	29.4	13.42
55	Essential oils and resinoids	132.27	355.53	10.9	14.6	13.16
64	Paper, paperboard	129.02	338.89	15.5	17.7	12.83
27	Crude fertilizers, other than	125.99	309.21	9.6	13.5	11.88
34	Gas, natural and manufactured	109.12	266.05	93	93.5	11.78
67	Iron and steel	907.78	1882.32	8.2	15.4	9.54
5	Vegetables and fruit	800.15	1605.7	26	29.6	9.10
26	Textile fibres	944.22	1423.41	21	41	5.26
65	Textile yarn, fabrics, made-up	2522.75	3583.94	11.1	13.7	4.49
2	Dairy products and birds/eggs	94.81	133.52	39.7	30.1	4.37
63	Cork and wood manufactures	52.12	66.75	24.3	17.1	3.14
0	Live animals other than animals of	30.41	33.79	77.3	83.6	1.33
8	Feeding stuff for animals	462.77	380.18	21.1	21.2	-2.43
23	Crude rubber (including synthetic articles)	82.7	49.25	25.5	22.8	-6.27
6	Sugars, sugar preparations and hone	704.43	409.57	59.2	22.9	-6.55
43	Animal or vegetable fats and oils,	82.42	39.26	59.5	27	-8.85
93	Special transactions and commodities	143.48	33.91	3.3	15.2	-16.50

Source: WITS Database, World Bank

### Appendix 3: Data Definition and Sources

Variable	Definition	Source
InExport <sub>ij</sub>	Log of Bilateral export between country i and country j	WITS Database
tariff <sub>ij</sub>	Tariff rate between country i and country j	
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.	
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.	
Colony <sub>ij</sub>	Dummy variable equal to 1 if country i and j had a common colonizer after 1945 and zero otherwise.	
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.	
LSCI <sub>ijt</sub>	Average scores of liner shipping connectivity index of country i and j	World Development Indicators, World Bank Database
QPI <sub>ijt</sub>	Quality Port Index of country i and j	
TEBC <sub>ijt</sub>	Time to Export, border compliance of country i and j	
GDP <sub>ijt</sub>	Log of Gross domestic product (current US\$) for country i and j	
ICT <sub>ijt</sub>	Information and communication technology (ICT) index is calculated based on principal component analysis (PCI) comprising: (i) fixed broadband subscriptions (per 100 people), (ii) fixed telephone subscriptions (per 100 people), (iii) internet users (per 100 people), (iv) mobile cellular subscriptions (per 100 people), and (v) secure internet servers (per 1 million people)	
Institutions <sub>ijt</sub>	Institutional Index calculated based on principal component analysis (PCI) comprising: (i) Control of Corruption, (ii) Government Effectiveness, (iii) Regulatory Quality, (iv) Rule of Law and (v) Voice and Accountability.	Worldwide Governance Indicators, World Bank Database
Conflicts <sub>ijt</sub>	Business cost of terrorism for country i and j	Global Competitiveness Index (GCI)
Int <sub>ijt</sub>	Log of Comprehensive trade costs between country i and country j	UNESCAP Database

Source: Authors' own

#### Appendix 4: Diagnostic Tests for 2SLS Model

	<b>Model 1</b>	<b>Model 2</b>
F value	159.7***	122.2***
Centered R <sub>2</sub>	0.73	0.65
Uncentered R <sub>2</sub>	0.77	0.68
RMSE	1.80	1.30
Anderson Canon. Corr. LM Statistic for Under identification test	268.7***	126.7***
Cragg-Donal Wald F Statistic for Weak Identifications test	220.4***	140.82***
Sargan Statistic for over identification test for all instruments	57.75***	43.4***

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