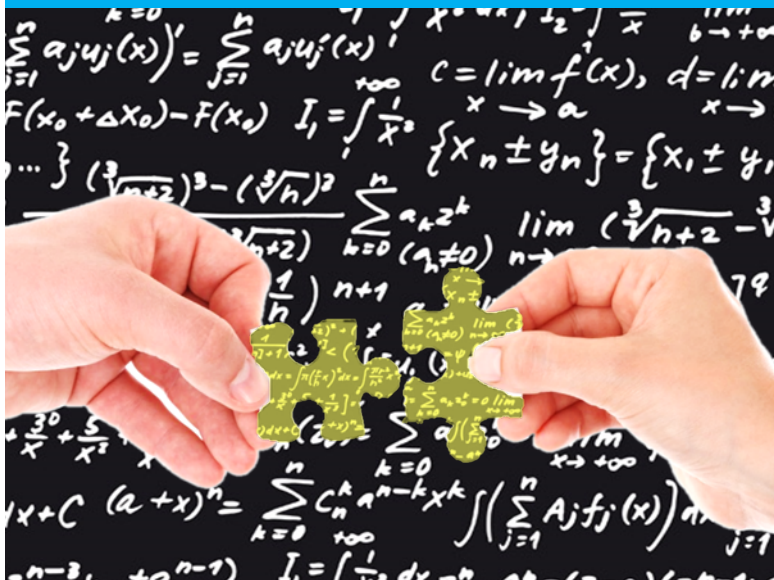




Trade and trade facilitation along the Belt and Road Initiative corridors



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ASIA-PACIFIC RESEARCH AND TRAINING NETWORK ON TRADE

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WORKING PAPER

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Abstract

The Belt Road Initiative (BRI) suggested by China's President Xi Jinping provides an ambitious vision encouraging a new level of cooperation among countries along several economic corridors spanning most of the Asian economies member of ESCAP. This paper reviews the trade and trade facilitation situation of economies along each of the corridors and analyzes the potential impact on trade from improvements in hard (physical connectivity via good quality transportation networks) and soft (efficient trade facilitation via an effective border administration and use of ICT) infrastructures. The review highlights enormous differences among the economies involved, as well as the 6 BRI corridors studied – namely, Bangladesh-China-India-Myanmar (BCIM), China-Mongolia-Russia (CMR), China-Central Asia-West Asia (CAWA), China-Indochina Peninsula (ICP), China-Pakistan (CP), and the New Eurasian Land Bridge (NELB). Results of the econometric analysis show the importance of both hard and soft infrastructures in enhancing export performance of economies involved in the BRI. Trade gains from improvements in trade facilitation and other trade enablers vary from corridor to corridor. Our analysis suggests that trade gains from incremental trade facilitation improvements would be highest for the CMR, CP, and the ICP corridors, in this order. On the other hand, trade gains from hard infrastructure investments would be relatively higher in the CP, ICP and BCIM corridors, also in this order. Finally, improvements in ICT availability and use may yield relatively higher trade returns in the CMR and the NELB corridors.

Keywords: Belt Road Initiative, BRI, trade facilitation

JEL Codes: F02, F13, R4, O19

Abbreviations

ADB	Asian Development Bank
AFTA	ASEAN Free Trade Area
AIIB	Asian Infrastructure Investment Bank
APTA	Asia Pacific Trade Agreement
ASEAN	Association of Southeast Asian Nations
BCIM	Bangladesh-China-India-Myanmar economic corridor
BIMSTEC	Bay of Bengal Initiative for Multi-sectoral Technical and Economic Cooperation
BRI	Belt Road Initiative
CAWA	China-Central Asia-West Asia economic corridor
CISFTA	Commonwealth of Independent States Free Trade Area
CMR	China-Mongolia-Russian Federation economic corridor
CP	China-Pakistan economic corridor
EAEC	Eurasian Economic Community
EAEU	Eurasian Economic Union
EU	European Union
ETI	Enabling Trade Index
FTA	Free Trade Agreement/Area
ICP	China-Indochina peninsula economic corridor
ICT	Information and communication technologies
NELB	New Eurasia Land Bridge economic corridor
PDR	People's Democratic Republic
RCEP	Regional Comprehensive Economic Partnership
RTA	Regional Trade Agreement
SAARC	South Asian Association for Regional Cooperation
SAR	Special Administrative Region
SCO	Shanghai Cooperation Organization

UNESCAP	United Nations Economic and Social Commission for Asia and the Pacific
UNNExT	United Nations Network of Experts for Paperless Trade and Transport in Asia and the Pacific
WEF	World Economic Forum

Contents

Abstract	i
Abbreviations	ii
1. Introduction	1
2. Trade and trade facilitation among BRI economies: an overview	4
3. Trade and trade facilitation along the BRI economic corridors	9
I. BANGLADESH-CHINA-INDIA-MYANMAR (BCIM) ECONOMIC CORRIDOR -----	10
II. CHINA-CENTRAL ASIA-WEST ASIA (CAWA) ECONOMIC CORRIDOR -----	12
III. CHINA-INDOCHINA PENINSULA (ICP) ECONOMIC CORRIDOR -----	14
IV. CHINA-MONGOLIA-RUSSIAN FEDERATION (CMR) ECONOMIC CORRIDOR -----	16
V. NEW EURASIA LAND BRIDGE (NELB) ECONOMIC CORRIDOR -----	18
VI. CHINA-PAKISTAN (CP) ECONOMIC CORRIDOR -----	21
4. BRI: impact of hard and soft infrastructure on trade	23
5. Discussion	32
6. Conclusion and recommendations	36
7. References	39
Annex	41
ANNEX 1. ECONOMIES ALONG THE BRI ECONOMIC CORRIDORS -----	41
ANNEX 2. GRAVITY MODEL: SUPPLEMENTARY DATA AND RESULTS -----	42

Table of figures

Figure 1. The Belt and the Road	2
Figure 2. Regional trade agreements between Asian BRI economies	5
Figure 3. Enabling Trade Index of Asian and other selected BRI Economies.....	7
Figure 4. Effect of infrastructure improvements on exports in a low/high trade facilitation environment.....	29
Figure 5. Effect of trade facilitation improvements on exports in a low/high quality infrastructure environment	30

Table of tables

Table 1. BCIM Corridor: Selected Trade and Trade Facilitation Indicators	10
Table 2. CAWA Corridor: Selected Trade and Trade Facilitation Indicators	13
Table 3. ICP Corridor: Selected Trade and Trade Facilitation Indicators.....	15
Table 4. CMR Corridor: Selected Trade and Trade Facilitation Indicators	17
Table 5. NELB Corridor: Selected Trade and Trade Facilitation Indicators.....	20
Table 6. CP Corridor: Selected Trade and Trade Facilitation Indicators.....	21
Table 7. Changes in Exports in selected BRI Economies from Improvements in Hard and Soft Infrastructure (%).	27
Table 8. Changes in Exports along BRI Corridors from Improvements to China's performance level (%)	29
Table 9. Results from Corridor-specific models	31

1. Introduction

Six months after being elected President of the People's Republic of China, during a visit to Central Asia in September 2013, Xi Jinping suggested the idea of jointly building the new Silk Road Economic Belt. A month later while visiting Southeast Asia, a complementary 21st Century Maritime Silk Road was further introduced. This saw the beginnings of the One Belt One Road strategy or the Belt Road Initiative (BRI). The initiative is essentially an economic effort but when implemented would also “strengthen exchanges and mutual learning between civilizations and promote world peace and development” (NDRC, 2015). Based on openness, harmony, inclusivity, mutual benefit and market operations, the BRI aims at connecting the “vibrant East Asia” and the developed Europe by land and by sea. Dozens of countries along the modern Silk routes may benefit from this long-term initiative,¹ provided sufficient political will and trust among all economies concerned.²

As shown in Figure 1, the BRI encompasses the development of 6 economic corridors:³

1. The New Eurasia Land Bridge (NELB) Economic Corridor, which connects China and Europe. The backbone of this corridor is an international railway line from Jiangsu Province to Rotterdam in the Netherlands. Upon exiting the province of Xinjiang, the railway line cuts through Kazakhstan, Russia, Belarus and Poland where it joins the European railway network.
2. The China-Mongolia-Russia (CMR) Economic Corridor will see the Russia Eurasia Land Bridge renovated and the development of Mongolia's Steppe Road.

¹ The Hong Kong Trade Development Council (HKTDC) lists more than 60 countries that would come under the BRI, based on a compilation by the Chinese Academy of Social Sciences. <http://china-trade-research.hktdc.com/business-news/article/One-Belt-One-Road/The-Belt-and-Road-Initiative-Country-Profiles/obor/en/1/1X3CGF6L/1X0A36I0.htm>

² Risk assessments are particularly important for long-term projects. Since the BRI mainly involves large infrastructure projects, the EIU's (2015) risk assessment survey of the BRI countries warns of the political risks involved, as these projects require support and involvement of the respective governments. A change in leadership could mean a delay in the projects. The EIU highlights the delays in on-going port and dam projects in Sri Lanka and Cambodia respectively, as examples of such delays.

³ <http://china-trade-research.hktdc.com/business-news/article/One-Belt-One-Road/The-Belt-and-Road-Initiative/obor/en/1/1X3CGF6L/1X0A36B7.htm>

3. The China-Central Asia-West Asia (CAWA) Economic Corridor connects the railway network from Xinjiang through Central Asia and West Asia to the Arabian Peninsula and the Mediterranean Sea. It connects China, Kazakhstan, Kyrgyzstan, Uzbekistan, Tajikistan, Turkmenistan, Iran and Turkey.
4. The China-Indochina Peninsula (ICP) Economic Corridor connects China with the five countries in Indochina and extends this to Malaysia, Singapore and Indonesia.
5. The China-Pakistan (CP) Economic Corridor connects Kashgar in Xinjiang Province to Gwadar Port in Pakistan.
6. The Bangladesh-China-India-Myanmar (BCIM) Economic Corridor involves co-operation among these 4 countries that share common borders.

Figure 1. The Belt and the Road



Source: <http://china-trade-research.hktdc.com>

In this paper, we examine the current state of the trade and trade facilitation among the countries along each of these 6 corridors. We then estimate and compare the effect of improvements in the physical infrastructure and trade facilitation (in particular,

border administration) at the corridor level, followed by a discussion. In the final section, we summarize our findings and provide recommendations.

2. Trade and trade facilitation among BRI economies: an overview

Trade has been identified as a key means of implementation of the 2030 Agenda for Sustainable Development. It is known to be an important engine of economic growth for both developed and developing economies. If BRI's ultimate goal is to raise economic growth and contribute towards regional economic development, then international trade is definitely the tool that will accelerate this objective. In this section, we describe broadly the trade and trade facilitation situation among 37 economies expected to be affected by the initiative.⁴ These economies are either along the 6 corridors identified earlier and/or are along the way of the belt and road.

Exports from these 37 economies account for about 36.7% of total world exports and about 42% of world imports (excluding the EU), in part because some major trading economies like China, Germany, South Korea, Singapore and Hong Kong SAR are included. The importance of trade in each economy varies widely, with trade representing less than 40% of GDP in Myanmar or Pakistan, but more than 100% of GDP in Kyrgyzstan or Viet Nam.

Overall, despite many headwinds, particularly the financial crisis of 2008, the growth in exports and imports over the last few years has remained above the world average in many of the economies. We note the strong performance of countries like Turkmenistan, Cambodia, Vietnam, Lao PDR and Myanmar – In contrast, Tajikistan, Iran and Greece experienced negative growth rates.

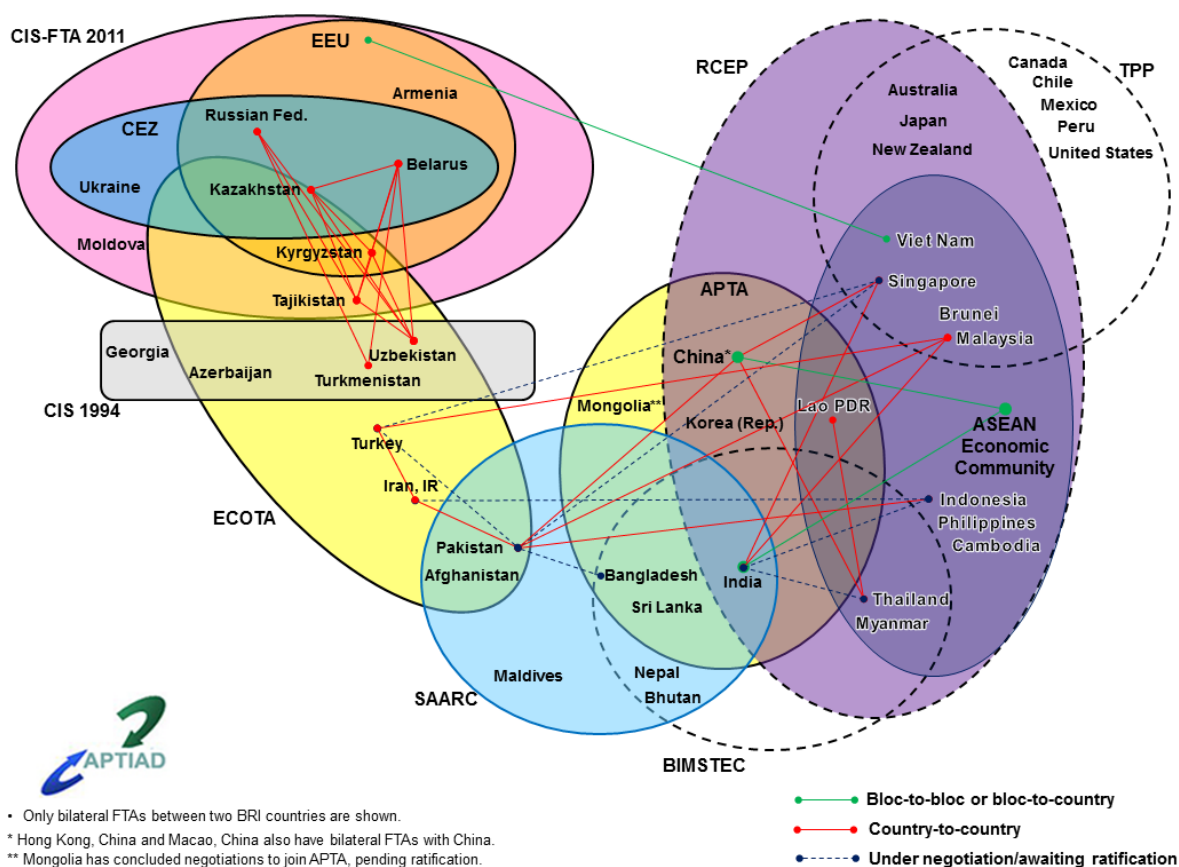
Generally, the bilateral trade among the 37 economies forms a significant part of the total trade of these economies. All countries record more than 40% trade to their BRI counterparts. Twenty (27) of these economies export (import) more than 70% of their goods to (from) other BRI-37 economies. However, it must be noted that a significant portion are for China in the East and the EU in the West. These two economies usually make up a significant portion of trade.

Many countries in the BRI have been active in signing preferential trade agreements. For example, Pakistan and Viet Nam have signed agreements with 23 other

⁴ The 37 economies selected include all 25 Asian and European economies along the BRI Corridors, as well as another 12 Asian economies member of ESCAP on the periphery of the BRI. See Annex 1 for details.

economies, while China is engaged in preferential trade agreements with at least 19 economies.⁵ As shown in Figure 2, many countries are part of several overlapping agreements. However, none of the trade agreements in force encompass all Asian countries involved in the BRI. In particular, while institutional trade links are extensive within Central Asia and within East Asia, links between countries of the two regions are rather weak.⁶

Figure 2. Regional trade agreements between Asian BRI economies



Source: APTIAD, ESCAP

That said, however, major trade facilitation efforts are also taking place outside formal trade agreements. For example, the ADB-led Central Asia Regional Economic

⁵ As of November 2016, based on www.unescap.org/content/aptiad

⁶ The trade agreement between the Eurasian Economic Union (EEU) and Viet Nam stands out in this regard.

Cooperation (CAREC)⁷ initiative includes Central Asian economies as well as China, Mongolia and Pakistan and has a strong emphasis on transport and trade facilitation – it does not however include Russia. The Shanghai Cooperation Organization (SCO)⁸, which includes both China and Russia, has also taken an active and increasingly important role in economic development and transport facilitation. Finally, the new UN treaty on facilitation of cross-border paperless trade in Asia and the Pacific finalized in 2016 provides a forward looking regional cooperation platform open to all Asian BRI economies.⁹

The ease of engaging in trade among the countries involved in the BRI may be best summarized in the Global Trade Enabling Report 2016, measured by the World Economic Forum (WEF). The Enabling Trade Index (ETI) consist of 7 pillars that measures various trade barriers that exist in a country, both policy induced as well as natural barriers. The 7 pillars are: 1) Domestic market access; 2) Foreign market access; 3) Efficiency and transparency of border administration; 4) Availability and quality of transport infrastructure; 5) Availability and quality of transport services; 6) Availability and use of ICTs; and 7) Operating environment (WEF, 2016).¹⁰

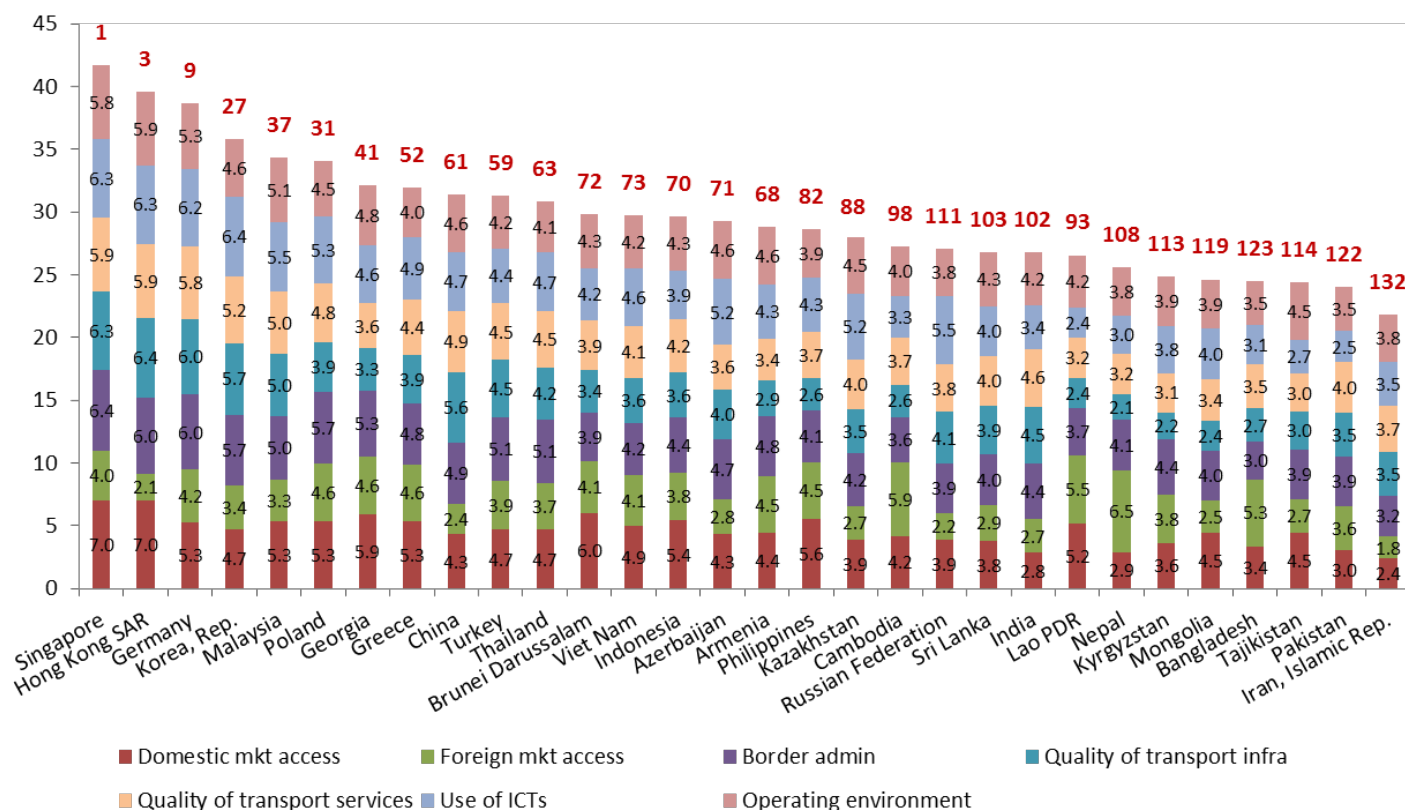
⁷ <http://carecprogram.org/>

⁸ <http://eng.sectSCO.org/>

⁹ <http://www.unescap.org/resources/framework-agreement-facilitation-cross-border-paperless-trade-asia-and-pacific>

¹⁰ These pillars are measured using various data sources including the Doing Business and Logistics Performance Index of the World Bank, as well as Executive Opinion Surveys of the WEF.

Figure 3. Enabling Trade Index of Asian and other selected BRI Economies



Source: Authors, based on World Economic Forum global Enabling Trade Report 2016.

Note: Country scores for each of the 7 ETI pillars are indicated along each bar (max. score for all pillars is 7). The ETI world ranking of each country is indicated at the top of the bar. WEF gives different weights to each pillar when calculating the overall world ranking.

Figure 3 shows the ETI scores of countries included in our analysis.¹¹ The ETI range of the BRI countries is wide. Singapore and Hong Kong SAR are ranked 1 and 3 respectively, while Bangladesh and Iran are ranked 123 and 132 respectively (out of a possible 136 countries in the 2016 study). In general, countries that have higher rankings perform better in all the 7 pillars. The difference in scores between the pillars shows where improvements are required. For example, in Iran and Bangladesh, the need for better quality infrastructure is necessary. However, improvements in border administration are considered low hanging fruits that could be harvested through better policies and enforcement. The latter requires relatively less investment and results can

¹¹ The ETI 2016 is not available for Belarus, Macao SAR, Korea DPR, Tajikistan and Uzbekistan.

be seen within a shorter time period (within 4 years, according to ADB & UNESCAP, 2013).

In general, the countries along the BRI are important trading partners. However, China and the EU are important sources and destination for most countries in the initiative and trade between some of the smaller and less developed countries appears to be limited. The wide range in terms of both trade and trade facilitation performance observed between countries in the BRI suggest that the initiative would provide significant opportunities for learning lessons from each other.

3. Trade and trade facilitation along the BRI economic corridors¹²

The BRI Economic Corridors are very diverse in terms of number of countries involved, as well as in terms of level of development and amount of trade between countries in each corridor. Two of the corridors, i.e. CP and CMR corridors, involve cooperation between a small number of countries, while other corridors involve much more complex cooperation between 8 or more ESCAP member states. Intra-corridor trade relative to total trade of countries in each corridor ranges from less than 1% for CP to more than 20% for the CI corridor.¹³

The level of trade integration along each corridor also varies greatly. The CI corridor is already well covered by the China-ASEAN cooperation, including a preferential trade agreement. This is also the case for the CP corridor, with a bilateral trade agreement between China and Pakistan in place since 2007. On the other hand, CAWA corridor seems to be the least integrated, with the many countries along this corridor belonging to different economic groupings with limited institutional trade links to China. No formal trade agreement also exists among the three countries in the CMR corridor.

In terms of trade costs and readiness in terms of trade facilitation and trade logistics, the CI corridor generally outperforms the others, although there are great variations in trade costs between pairs of countries in this corridor. CAWA corridor is the weakest among BRI Economic Corridors in this area. Importantly, China is found to be generally the best performing country in all but the CI corridors.

Greater details on trade and trade facilitation among countries along each of the six corridors of the BRI are provided below, based on a standard set of indicators (see tables 1 to 6).

¹² The corridor-specific discussion also draws on more disaggregated analysis of the trade and trade facilitation data for each corridor, collected in preparation of this paper. Such data and analysis is made available on request.

¹³ The corridors are of different economic importance to China. The most important is the Indochina Economic Corridor which makes up about 11% and 10% of China's exports and imports, respectively. This corridor includes a large number of countries (8) including some important trade partners like Indonesia, Thailand and Singapore. The Bangladesh-China-India-Myanmar Economic Corridor can be considered the next most important one for China as 3.6% of China's exports and 1.1% of its imports are to this region. This is followed by the Central Asia-West Asia Corridor which involves 2.28% of China's exports and 1.95% of China's imports.

I. Bangladesh-China-India-Myanmar (BCIM) Economic Corridor

Total trade of the four countries amounted to USD 4,712 billion in 2015; while intra-BCIM trade amounted to USD 205 billion (see Table 1). Exports from Bangladesh and China to other countries in the corridor are quite insignificant relative to their total exports. However, India's exports to China are large, representing 7.2% of India's total exports. Myanmar's exports to China and India are also quite significant – the two countries are Myanmar's first and third largest trading partners in 2015 respectively. On the import side, China is an important source for all 3 countries in the corridor, as is India to an extent.

Table 1. BCIM Corridor: Selected Trade and Trade Facilitation Indicators

Indicator	Value	Notes
Total trade of BCIM (total exports and imports: USD billion, 2015)	4,712	Largest trade flows: China-India (USD 72 billion)
Total intra trade of BCIM (USD billion, 2015)	205	Smallest trade flows: Bangladesh-Myanmar (USD 52 million)
% of intra BCIM to BCIM trade to the world (%)	4.35	
Trade growth of BCIM (% change of 2015, compared to 2005)	303.25%	Highest growth: Bangladesh-China (493%) Lowest growth: Bangladesh-Myanmar (27%)
Tariff rate (simple average: %)	8.79	Highest rate: Bangladesh (9.7%) Lowest rate: Myanmar (2.4%)
Trade similarity index (export index: 0-1)	0.21	Most similar: China-India (XI = 0.4, MI = 0.54)
Trade similarity index (import index: 0-1)	0.41	Least similar: China-Myanmar (XI = 0.1, MI = 0.3)
Trade costs, excluding tariff (simple average: %)	184.32	Highest trade costs: Bangladesh-Myanmar (309%) Lowest trade costs: China-India (83%)
Logistics performance index (LPI) 2016 (scale: 1-5)	3.05	Highest performer: China (3.7) Lowest performer: Myanmar (2.5)
Ease of trading across border 2016 (scale: 0-100)	53.87	Highest performer: China (69) Lowest performer: Bangladesh (35)
Total trade facilitation implementation (scale: 1-100)	52.69	Highest performer: China (81); Lowest performer: Myanmar (29)
Paperless trade implementation (scale: 0-29)	15.59	Highest performer: China (25); Lowest performer: Myanmar (6)
Related RTAs	7	APTA; SAFTA; SATIS; BIMSTEC; RCEP; ASEAN-China; ASEAN-India

Sources: Trade data and tariff rates are from UNCTAD STAT; Tariff rate is based on most recent year available; Trade similarity index is based on 2013 data; Trade costs is based on the latest year available from the ESCAP-World Bank Trade Cost Database; LPI is from lpi.worldbank.org; Ease of trading across border is from doingbusiness.org; Total trade facilitation implementation and Paperless Trade Implementation are from: <https://unnex.unescap.org/UNTFSurvey2015.asp>

Trade between countries in this corridor grew by approximately 303% in the last 10 years (see Table 1). Among the four countries, there are a few common goods that are exported to each other including textiles, apparels and raw materials like copper, iron and steel as well as transportation equipment like motorcycles. However, analysis of the structure of trade between the countries at the product level reveals that the economies in this corridor do not share many similarities, especially in their exports.¹⁴ Opportunities for further trade are definitely available for all countries.

Turning now to barriers to trade, average tariff between all countries in the corridor is approximately 9% (see Table 1). Bangladesh has the highest tariff rates and Myanmar has the lowest, whether measured by simple or weighted average. Consumer goods have the highest levels while raw materials the lowest. India has the highest tariffs for intermediate goods.

Bilateral comprehensive trade costs, excluding tariff, between countries in the corridor are high, averaging at 184% (see Table 1). Costs are the highest for trade involving Myanmar, in most cases more than 200%. These particularly high trade costs may be attributed in part to the relatively recent opening up of the Myanmar economy, as well as lack of infrastructure. Costs involving manufactured goods between China and India are the lowest but still costing traders 83% of the value of the goods (more than twice as high as costs between the main EU economies).

Looking specifically at trade facilitation and logistics among countries in the corridor, we find that Myanmar is the weakest link, while China is generally the best performer based on the various indicators reviewed (see Table 1). Implementation of trade facilitation and paperless trade measures stands at 81% (out of the full implementation of 100%) and 25% (out of the full implementation of 29%) implementation rate, respectively, with China showing strongest implementation among all countries in the corridor.

Countries along the BCIM corridors are linked through different RTAs, with no single agreement covering all the countries. The long-standing Asia Pacific Trade Agreement

¹⁴ This is based on the calculation of an Index of similarity of merchandise trade, indicating “whether the structure of exports or imports by product of a given country or group of countries differs from that of its counterpart country or group of countries”. When the index is closer to 1 it signifies greater similarity between two countries.

(APTA) involves the most countries in the corridors (Bangladesh, China and India). The Bay of Bengal Initiative for Multi-sectoral Technical and Economic Cooperation (BIMSTEC), which covers Bangladesh, India and Myanmar, is not an FTA but may become one in the future. BIMSTEC is also seen as a potential bridge between the ASEAN and SAARC cooperation. The Regional Comprehensive Economic Partnership (RCEP) could also eventually facilitate trade along the BCIM corridor given that all countries but Bangladesh are involved in its negotiation.

II. China-Central Asia-West Asia (CAWA) Economic Corridor

This corridor connects China to the EU through the Central Asian republics and West Asian countries of Iran and Turkey. Total trade of CAWA is approximately USD 4,607 billion; while the intra-corridor trade amounted to USD 218 billion (see Table 2). China is also an important trading partner for the Central Asian countries; trade with China has dominated exports or imports or both over the last decade. Trade among the Central Asian (CA) countries is generally limited. As the BRI progresses, the trade relationship among the CA countries is likely to improve.

Average growth of trade between countries in this corridor over the period 2005-2015 is approximately 194% (see Table 2). The exports to China by countries in the region (except the EU) are raw materials, especially ores like iron, copper, stones and gravel. On the other hand, China exports mainly machinery (like telecommunication equipment) and consumer goods (like footwear and apparel) to the countries in this corridor. Among the CA countries themselves, exports are more varied, ranging from food items (SITC 0) to raw materials like petroleum. Overall, the similarity of exports and imports shows that the countries in the region are similar in their resource endowment.

Table 2. CAWA Corridor: Selected Trade and Trade Facilitation Indicators

Indicator	Value	Note
Total trade of CAWA (total exports and imports: USD billion, 2015)	4,607	Largest trade flows: China-Iran (USD 34 billion)
Total intra trade of CAWA (USD billion, 2015)	218	Smallest trade flows: Greece-Tajikistan (USD 19 thousand)
% of intra CAWA to CAWA trade to the world (%)	4.72%	
Trade growth of CAWA (% change of 2015, compared to 2005)	194.38%	Highest growth: China-Turkmenistan (7762%) Lowest growth: Greece-Tajikistan (-100%)
Tariff rate (simple average: %)	8.26	Highest rate: Iran (21%) Lowest rate: Turkey (2%)
Trade similarity index (export index: 0-1)	0.24	Most similar: Iran-Kazakhstan (XI = 0.7) , Iran-Turkey (MI =0.7)
Trade similarity index (import index: 0-1)	0.50	Least similar: Iran-Turkmenistan (XI = 0.07), China-Tajikistan (MI = 0.3)
Trade costs, excluding tariff (simple average: %)	137.13	Highest trade costs: Greece-Kyrgyzstan (386%) Lowest trade costs: Iran-Turkmenistan (50%)
Logistics performance index (LPI) 2016 (scale: 1-5)	2.72	Highest performer: China (3.7) Lowest performer: Tajikistan (2.1)
Ease of trading across border 2016 (scale: 0-100)	64.65	Highest performer: Greece (94) Lowest performer: Iran (39)
Total trade facilitation implementation (scale: 1-100)	47.00	Highest performer: China (81); Lowest performer: Uzbekistan (22)
Paperless trade implementation (scale: 0-29)	13.36	Highest performer: China (25); Lowest performer: Uzbekistan (6)
Related RTAs	12	EAEC; EAEU; Central Asia-USA; ECOPTA; CISFTA; ; EEA; TPS/OIC; Kazakhstan-Kyrgyzstan; Kazakhstan-Uzbekistan; Kyrgyzstan-Tajikistan; Kyrgyzstan-Uzbekistan; Tajikistan-Uzbekistan

Sources: Refer to table 1.

The simple average of tariffs of all countries is approximately 8% (see Table 2). Most countries in the region have a lower tariff rate than China. While Turkey exhibits low tariff barrier of approximately 2.4%, Iran, on the other hand, imposes average tariff of 21% for all goods. Generally raw materials have a higher tariff rate than consumer goods in some CA countries. Bilateral trade costs, excluding tariff, for the countries in the corridor are moderately high (137%). The tariff equivalent costs are the highest for trade with Greece (a member of the EU), reaching as high as 386% for Greece-Kyrgyzstan trade. The cost of trade is relatively low for trade between the CA countries.

Moving to trade facilitation and logistics among countries in the corridor, Greece and China are those strong performers in this corridor, while Iran, Tajikistan, and

Uzbekistan are weak performers in trade facilitation (see Table 2). The World Bank's Trading Across Borders index shows Greece and Turkey are countries which are closest to the best-practice frontier while Iran, Uzbekistan and Tajikistan are the furthest. This is also confirmed in the LPI which again shows Tajikistan, Kyrgyzstan and Turkmenistan scoring low for most of the LPI indicators. In terms of trade facilitation implementation, China is the leader of the corridor, whereas Uzbekistan shows the lowest rate of trade facilitation implementation (22% and 6% of total trade facilitation and paperless trade implementation, respectively).

Finally, as for membership in trade agreements, the CA countries are members of the Eurasian Economic Community (EAEC), Eurasian Economic Union (EAEU) and the Commonwealth of Independent States Free Trade Area (CISFTA). These CA countries as well as Iran and Turkey are also members to the Economic Cooperation Organization Trade Agreement (ECOFTA). China does not have any FTAs with other countries while Turkey is linked to the EU through a bilateral trade arrangement.

III. China-Indochina Peninsula (ICP) Economic Corridor

This is perhaps the most active corridor when it comes to intra-regional trade simply because ASEAN goes back as far as 1967 with AFTA and China-ASEAN FTA being established in 1992 and 2005 respectively. Table 3 shows the total trade of China-Indochina Economic Corridor amounted to USD 6,070 billion, with intra-corridor trade of approximately USD 1,238 billion. China is an important destination of exports for all the countries, ranging from 5% of total Cambodian exports to 25.7% of total Laotian exports in 2015. The situation is quite similar for imports.

Table 3. ICP Corridor: Selected Trade and Trade Facilitation Indicators

Indicator	Value	Note
Total trade of ICP (total exports and imports: USD billion, 2015)	6,070	Largest trade flows: China-Malaysia (USD 97 billion)
Total intra trade of ICP (USD billion, 2015)	1,238	Smallest trade flows: Cambodia-Myanmar (USD 1 million)
% of intra ICP to ICP trade to the world (%)	20.39%	
Trade growth of ICP (% change of 2015, compared to 2005)	149.86%	Highest growth: China-Lao PDR (1861%) Lowest growth: Lao PDR-Singapore (-37%)
Tariff rate (simple average: %)	6.20	Highest rate: Cambodia (12%) Lowest rate: Singapore (0.2%)
Trade similarity index (export index: 0-1)	0.30	Most similar: Malaysia-Singapore (XI = 0.6) , Malaysia-Singapore (MI =0.7)
Trade similarity index (import index: 0-1)	0.55	Least similar: Lao PDR (XI = 0.06), Cambodia-China (MI = 0.3)
Trade costs, excluding tariff (simple average: %)	130.18	Highest trade costs: Indonesia-Myanmar (324%) Lowest trade costs: Thailand-Malaysia (46%)
Logistics performance index (LPI) 2016 (scale: 1-5)	3.09	Highest performer: Singapore (4.1) Lowest performer: Lao PDR (2.1)
Ease of trading across border 2016 (scale: 0-100)	72.00	Highest performer: Singapore (89) Lowest performer: Myanmar (55)
Total trade facilitation implementation (scale: 1-100)	62.72	Highest performer: Singapore (90); Lowest performer: Myanmar (29)
Paperless trade implementation (scale: 0-29)	18.52	Highest performer: Singapore (29); Lowest performer: Myanmar (6)
Related RTAs	15	ASEAN-China; AFTA; (APTA; ASEAN-EU; ASEAN-India; India-ASEAN; ASEAN-Korea; GSTP; BIMSTEC; D-8 PTA; RCEP; TPP; China-Singapore; China-Thailand; Lao PDR-Thailand)

Sources: Refer to table 1.

Trade between Indonesia, Malaysia, Thailand and Singapore is also significant with Singapore acting as an important hub. Similarly, trade between Cambodia, Lao PDR, Myanmar and Viet Nam is also important with Thailand acting as the main hub. For Lao PDR, Myanmar and Cambodia, trade among members of this corridor is significant, making up over 50% of their total trade. Growth of trade among countries in the corridor is approximately 150% in the past decade (see Table 3).

The exports of countries in Southeast Asia to China generally consist of raw materials and agricultural produce. China, on the other hand, export mainly manufactured goods and machinery, including parts and components for telecommunication equipment. On the import side, we see a similar situation in imports from China by Southeast Asian countries and from the Southeast Asian countries by China. The Trade Similarity Index

is quite high for both exports and imports between China and Thailand, Malaysia, and Vietnam, but less so between China and less developed countries such as Cambodia, Laos and Myanmar.

The corridor exhibits moderately low average tariff rates of 6% (see Table 3). Cambodia has the highest tariff rates (both simple and weighted average). The lowest is Singapore, which is close to tariff free. Most countries in the region have a lower tariff rate than China. Tariff rates are also below the global average for all countries, except Cambodia. Generally raw materials have a lower tariff rate than consumer goods in most countries.

Cost of bilateral trade, excluding tariff, between countries in the corridor are around 130% (see Table 3). As seen in our discussion in the South Asian corridor, trade costs are the highest for Myanmar. Lao PDR also record high trade cost. The results in other trade facilitation indicators also confirm that strongest performer in the region is Singapore, while Cambodia, Myanmar and Lao PDR are weak performers in this corridor (see Table 3). Trade facilitation implementation rate in Myanmar is approximately 29% while Cambodia and Lao PDR are not exceeding 60% rate of implementation.

The countries in this corridor are active in regional trade agreements, particularly the ASEAN FTA and the China-ASEAN FTA. The Regional Cooperation and Economic Partnership (RCEP) and the Trans Pacific Partnership (TPP) are also important groupings in this region.

IV. China-Mongolia-Russian Federation (CMR) Economic Corridor

In terms of trade, Mongolia and the Russian Federation are not relatively important for China; however, China is the most important destination of trade in Mongolia and Russian Federation. Russian Federation is also an important source of imports for Mongolia (about 28% of total imports in 2015) but Mongolia is an insignificant trading partner for Russian Federation. In terms of trade relationship, Russian Federation, in general, has a more significant relationship with the EU, while Mongolia has a more significant relationship with China.

Table 4 shows the total trade of CMR Economic Corridor of USD 4,494 billion, with the intra corridor trade of 144 billion. Overall trade growth among countries in this corridor is approximately 155% in the past decade. China mainly export consumer goods like shoes, garments as well telephones and PCs to Russia whereas to Mongolia the main items are garments and electricity. Russia exports mainly petroleum related products to China while Mongolia's main exports to China and Russia are ores. In general, we find that the exports of these countries are generally not similar but the degree of similarity is higher among imports. This may imply that while exports to each other can be increased because the endowments among these countries appear to be different, there may be limits to the inter-industry trade as imports are relatively more similar.

Table 4. CMR Corridor: Selected Trade and Trade Facilitation Indicators

Indicator	Value	Note
Total trade of CMR (total exports and imports: USD billion, 2015)	4,494	Largest trade flows: China-Russian Federation (USD 68 billion)
Total intra trade of CMR (USD billion, 2015)	144	Smallest trade flows: Mongolia-Russian Federation (USD 1 billion)
% of intra CMR to CMR trade to the world (%)	3.21%	
Trade growth of CMR (% change of 2015, compared to 2005)	154.91%	Highest growth: China-Mongolia (522%) Lowest growth: China-Russian Federation (134%)
Tariff rate (simple average: %)	6.91	Highest rate: Russian Federation (8%) Lowest rate: Mongolia (5%)
Trade similarity index (export index: 0-1)	0.15	Most similar: Mongolia-Russian Federation (XI = 0.3) , Mongolia-Russian Federation (MI =0.5)
Trade similarity index (import index: 0-1)	0.42	Least similar: China-Mongolia (XI = 0.05), China-Mongolia (MI = 0.3)
Trade costs, excluding tariff (simple average: %)	118.44	Highest trade costs: Mongolia-Russian Federation (133%) Lowest trade costs: China-Russian Federation (97%)
Logistics performance index (LPI) 2016 (scale: 1-5)	2.91	Highest performer: China (3.7) Lowest performer: Mongolia (2.5)
Ease of trading across border 2016 (scale: 0-100)	61.27	Highest performer: Mongolia (77) Lowest performer: Russian Federation (37)
Total trade facilitation implementation (scale: 1-100)	58.42	Highest performer: China (81); Lowest performer: Mongolia (34)
Paperless trade implementation (scale: 0-29)	15.77	Highest performer: China (25); Lowest performer: Mongolia (9)
Related RTAs	0	

Sources: Refer to table 1.

Looking at tariff barrier, imposition by the three countries are relatively low – simple average of less than 7% (see Table 4). Tariff imposed by Mongolia is the lowest. China imposes a relatively high tariff on consumer goods whereas the tariff imposed on raw materials is the highest in Russian Federation. Average trade costs, excluding tariff, in this corridor is relatively low (118%) (see Table 4). Despite the low tariffs imposed by Mongolia, the cost of trade is the highest among countries in this corridor. The ad valorem tariff equivalent cost of trade is as high as 133% for Mongolia-Russian Federation, while the lowest costs for overall traded goods is between China and Russian Federation (97%). China, in general, has the lowest cost of trade.

In terms of trade facilitation, although Mongolia performance is the best in terms of World Bank's Trading across Borders, Logistics Performance Index shows Mongolia to be the weakest in this corridor (see Table 4). This may imply an inconsistency between the efficiencies of border administration and the sophistication of transportation infrastructure. Average trade facilitation implementation rate in this corridor is approximately 58%; China is the strongest leader in trade facilitation implementation (81%), while Mongolia still lack behind other members in the corridor (34%) (see Table 4).

There are no RTAs among the countries in this corridor, although Mongolia is set to ratify membership to the Asia Pacific Trade Agreement – of which China is already a member. China, Mongolia and Russia signed a trilateral agreement in June 2016 to develop the CMR economic corridor.¹⁵ This was followed by the signing of an Intergovernmental Agreement on International Road Transport in December 2016 to enable exchange of traffic rights along their respective highways.¹⁶

V. New Eurasia Land Bridge (NELB) Economic Corridor

The NELB connects China and Europe through Kazakhstan, Russian Federation and Belarus. China's exports and imports to and from Russian Federation is not more than 2% of their total. On the other hand, the three other countries are quite important for

¹⁵ <http://theubpost.mn/2016/06/27/mongolia-russia-and-china-agree-to-establish-economic-corridor/>

¹⁶ <http://www.unescap.org/news/china-mongolia-and-russian-federation-open-new-era-trade-cooperation>

Russian Federation. Russian Federation for instance imports nearly 19% of goods from China. This corridor is even more important for Kazakhstan as more than 50% of its imports are from China and Russian Federation. Russian Federation is an important trading partner for Belarus, while China is becoming increasingly important. Table 5 exhibits trade of NELB amounted USD 4,623 billion, with USD 242 billion for intra-corridor trade. Average growth in trade among countries in the corridor over the last decade is lower than other corridors: 105%.

There are 5 main items traded among the countries in this corridor. China's exports to Kazakhstan, Russian Federation and Belarus are quite similar - mainly garments and telecommunication equipment. Kazakhstan exports mainly ores and minerals to its partners in this corridor. Russian Federation exports petroleum related goods to China as well as other commodities like coal and wood. Petroleum is also Russian Federation's main exports to Kazakhstan and Belarus although engines are also important items. Food, furniture and vehicles are main exports to Kazakhstan and Russian Federation. As for imports, China mainly imports raw materials from the other countries in the corridor. Trade similarity index in 2013 exhibits the high value for exports from Russian Federation to Kazakhstan (0.51) and to Belarus (0.50). However, the low index is involving China (0.14). As with other corridors, the similarity index for imports is generally higher (see Table 5).

Average tariffs level among these countries which is relatively low: 7% (see Table 5). Russian Federation has the highest simple and weighted average tariff rates. China's tariffs on consumer goods are the highest whereas Russian Federation imposes the highest tariff on raw materials. Belarus generally has low tariff rates. When considering the cost of trade, excluding tariff, is 92% on average (see Table 5). Russian Federation and Belarus exhibits lowest trade costs in this corridor; the cost is as low as 49% tariff equivalent. On the other hand, the cost of trade between Belarus and China is 145% for overall traded goods.

In terms of trade facilitation, although Belarus is the closest to the frontier in Doing Business – Trading across Border, low performance is found in Logistics Performance Index. In terms of the LPI, China performs well in all aspects of trade facilitation. In

terms of trade facilitation implementation, Kazakhstan still has more room for improvement in order to catch up with other members in the corridor (see Table 5).

Table 5. NELB Corridor: Selected Trade and Trade Facilitation Indicators

Indicator	Value	Note
Total trade of NELB (total exports and imports: USD billion, 2015)	4,623	Largest trade flows: China-Russian Federation (USD 68 billion)
Total intra trade of NELB (USD billion, 2015)	242	Smallest trade flows: Belarus-Kazakhstan (USD 567 million)
% of intra NELB to NELB trade to the world (%)	5.24%	
Trade growth of NELB (% change of 2015, compared to 2005)	104.92%	Highest growth: Belarus-China (299%) Lowest growth: Russian Federation-Belarus (37%)
Tariff rate (simple average: %)	7.37	Highest rate: Russian Federation (8%) Lowest rate: Belarus (7%)
Trade similarity index (export index: 0-1)	0.28	Most similar: Russian Federation-Kazakhstan (XI = 0.5) , Russian Federation-Kazakhstan (MI =0.7)
Trade similarity index (import index: 0-1)	0.54	Least similar: China-Kazakhstan (XI = 0.07), China-Russian Federation (MI = 0.4)
Trade costs, excluding tariff (simple average: %)	91.92	Highest trade costs: Belarus-China (145%) Lowest trade costs: Belarus-Russian Federation (49%)
Logistics performance index (LPI) 2016 (scale: 1-5)	2.85	Highest performer: China (3.7) Lowest performer: Belarus (2.4)
Ease of trading across border 2016 (scale: 0-100)	65.45	Highest performer: Belarus (95) Lowest performer: Russian Federation (37)
Total trade facilitation implementation (scale: 1-100)	59.86	Highest performer: China (81); Lowest performer: Kazakhstan (39)
Paperless trade implementation (scale: 0-29)	15.77	Highest performer: China (25); Lowest performer: Kazakhstan (9)
Related RTAs	11	CEZ; CISFTA; EAEC; Eurasian Economic Union (EAEU); Kazakhstan-Russian Federation-Belarus; Russian Federation - Kazakhstan; Kazakhstan-Russian Federation-Vietnam-Belarus; Vietnam-Eurasian Economic Union (EAEU); Kazakhstan-Russian Federation-Belarus-European Free Trade Association (EFTA); Kazakhstan-Russian Federation-New Zealand-Belarus; Russian Federation - Belarus

Sources: Refer to table 1.

Russian Federation, Belarus and Kazakhstan are members of several RTAs including the Eurasia Economic Union and the Commonwealth of Independent States FTA as well as a trilateral agreement among the three. China does not have any trade

agreements with these countries, but economic cooperation is taking place through in particular the Shanghai Cooperation Organization.

VI. China-Pakistan (CP) Economic Corridor

This is the only corridor that is bilateral.¹⁷ Pakistan has been an important partner for China in many respects. Not surprisingly, the amount of Chinese investments in physical infrastructure of Pakistan is substantial. In turn, China is an important export destination and even more important import source for Pakistan.

Table 6. CP Corridor: Selected Trade and Trade Facilitation Indicators

Indicator	Value	Note
Total trade of CP (total exports and imports: USD billion, 2015)	4,030	
Total intra trade of CP (USD billion, 2015)	32	
% of intra CP to CP trade to the world (%)	0.79%	
Trade growth of CP (% change of 2015, compared to 2005)	352.92%	
Tariff rate (simple average: %)	10.69	Highest rate: Pakistan (14%) Lowest rate: China (8%)
Trade similarity index (export index: 0-1)	0.26	
Trade similarity index (import index: 0-1)	0.47	
Trade costs, excluding tariff (simple average: %)	99.97	
Logistics performance index (LPI) 2016 (scale: 1-5)	3.29	Highest performer: China (3.7) Lowest performer: Pakistan (2.9)
Ease of trading across border 2016 (scale: 0-100)	53.62	Highest performer: China (69) Lowest performer: Pakistan (38)
Total trade facilitation implementation (scale: 1-100)	63.98	Highest performer: China (81); Lowest performer: Pakistan (47)
Paperless trade implementation (scale: 0-29)	18.82	Highest performer: China (25); Lowest performer: Pakistan (13)
Related RTAs	1	China-Pakistan (FTA & EIA)

Sources: Refer to table 1.

¹⁷ It is worth noting, however, that the corridor passes through Kashmir, which is subject to a territorial dispute between Pakistan and India.

Table 6 shows total trade of USD 4,030 billion for this corridor, with USD 32 billion between 2 countries. Bilateral trade growth is approximately 353% in the past decade. China's export to Pakistan saw a significant increase in 2009. Pakistan exports to China however have seen declines in the last few years. China's exports are quite varied ranging from fabric to steel. Pakistan's exports are also in yarn and fabric although exports of ores are also important. The trade similarity index is rather high for the imports of the two countries indicating that intra-industry trade is important.

Average tariff rates of both countries are approximately 11%. Pakistan's tariff rates are higher, in some cases, twice the rates of China. Average trade costs, excluding tariff, is around 100% for overall traded goods. This could be due to the various barriers that exist on Pakistan's side as it lags behind China substantially in terms of Trading across Border index, LPI and trade facilitation implementation (see Table 6). It seems obvious that both countries need to make use of the bilateral FTA that exists to reduce the cost of trade and hence facilitate greater movement of freight between both countries.

4. BRI: impact of hard and soft infrastructure on trade

The BRI is an ambitious vision that encourages a new level of cooperation among countries along the various corridors. The Vision document states a number of initiatives ranging from free trade areas along the corridors to an international summit forum on the BRI. However, two main initiatives that make up a significant portion of the Vision document are:

- a. To improve the region's infrastructure and put in place a secure and efficient network of land, sea and air passages, raising the connectivity to a higher level, and
- b. To further enhance trade and investment facilitation, establish a network of free trade areas that meet high standards so that economic ties among member economies can be further deepened.

In other words, the BRI has a dual objective of improving both the hard and soft infrastructure of the economies aligned to the initiative. Portugal-Perez and Wilson (2010) explain that trade facilitation in a broad sense can be undertaken along these two broad dimensions. The hard dimension relates to tangible infrastructure like roads, ports, highway and telecommunications whereas the soft dimension relates to transparency, customs management, the business environment and other institutional factors. The distinction between the two can assist in policy. Portugal-Perez and Wilson (2010) also state that both dimensions are complementary in nature, as one dimension reinforces the other in lowering the cost of trade. They do however find that improvements in infrastructure quality have the greatest benefits for export growth, particularly for lower income countries. The marginal impact of ICT usage on export performance, on the other hand, is greater for richer countries.

The impact of infrastructure improvement (air, land and sea) is simulated by Herrero and Xu (2016) for the BRI countries. Using a gravity model and using distances as proxy for transportation costs, they find that a 10 percent reduction in railway, air and maritime costs will increase export by 2, 5.5 and 1.1 percent respectively. The marginal impact of a reduction in air and railway costs is greater than a reduction in ad valorem tariffs. Infrastructure projects, however, require a huge amount of investment and political cooperation and will definitely be scrutinized by public opinion

on its social and environmental impact. On the other hand, the soft infrastructure, more specifically trade facilitation is relatively cheaper, and is less obvious to the public eye.

In this section, we conduct an in-depth analysis to compare the magnitude of impact of these hard and soft infrastructures along the corridors of the BRI. We demonstrate the impact of capacity building by raising the quality of infrastructure, increasing the efficiency of border administration and the improvements in ICT capabilities as well as a combined effect of these enablers of trade in the six corridors of the BRI.

Data, Models and Methods

Rather than developing a unique dataset for the issues of interest as done by Portugal-Perez and Wilson (2010), Otsuki (2011) and Herrero and Xu (2016), we use the pillar-level indicators calculated by the World Economic Forum's Enabling Trade Index (ETI) explained earlier.¹⁸

To reiterate, the ETI comprises of 7 pillars – 1) domestic markets access, 2) foreign market access, 3) efficiency and transparency of border administration, 4) availability and quality of transport infrastructure, 5) availability and quality of transport services, 6) availability and use of ICTs and 7) operating environment. We are particularly interested in pillars 3, 4 and 6. Among the variables considered in pillar 3 include customs services, customs transparency, number of documents, days and cost to import and export as well as irregular payments involved. Pillar 4 on the other hand includes the quality and availability of air, rail, road and port infrastructure. Pillar 6 includes the internet penetration rate as well as the extent of ICT use in business transactions. Pillars 1 and 2 were not included as these are not our main focus in this paper while Pillars 5 and 7, though relevant, were excluded to avoid multicollinearity issues in modeling.

Each pillar in the ETI is normalized within a range of 1 (lowest quality) to 7 (highest quality). Our gravity model based on Portugal-Perez and Wilson (2010) and Otsuki (2011) uses mixed effects model of panel data estimation with more than 70,000 bilateral trade relationships among 139 countries worldwide for the period between

¹⁸ Refer to figure 3 discussed earlier.

2008 and 2014 (years for which consistent ETI data is available). The gravity modeling method is proven to be remarkably successful in predicting bilateral trade flows based on the mass of the exporting and importing economy, the geographical distance between the two economies, and other attributes according to the researcher's interests.

As our main interest is the impact of improvements in trade facilitation and infrastructure along the various corridors of the BRI, we specify the following gravity model to which we append the selected enabling variables of the exporting country:

$$y_{ij} = \alpha_{j[t]} + b_1(Border_i) + b_2(Infra_i) + b_3(ICT_i) + \beta X + \delta T + \epsilon_{ij} \quad [1]$$

where

y_{ij}	= the value of exports from country i to country j
<i>Border</i>	= the efficiency of border administration in the exporting country i
<i>Infra</i>	= the quality and availability of transport infrastructure in the exporting country i
<i>ICT</i>	= the availability and quality of ICT in the exporting country i
$\alpha_{j[t]}$	= fixed effects for importer j
T	= fixed effects for each year t
ϵ_{ij}	= the random error term

X consists of a basket of variables that are commonly included in a gravity model, which include real GDP of both countries, the size of population of both countries, the physical distance between trading partners, dummy variables for sharing a common border, a shared language, colony-colonizer relationship, land-locked countries and if a Regional Trading Arrangement (RTA) exists with the partner country relationship and for land-locked countries.

All variables are log-transformed, except for dummy variables. Equation 1 is a varying intercept model and controls for the importing country j. Sources of data are reported in Annex 2 Table 1.

We extend our analysis in several ways. First, to consider the possible interacting effects of various pillars on export performance, we added three interaction variables - [border * infra], [border * ICT] and [infra * ICT] - to the original model as shown in Equation [2]. To reduce multicollinearity, all the R.H.S variables in equation [2], except

for the dummy variables, are centered. The model also takes into account the fixed effects of importer country j and time T .

$$y_{ij} = \alpha_{j[i]} + b_1(Border_i) + b_2(Infra_i) + b_3(ICT_i) + b_4(Border_i \cdot Infra_i) + b_5(Border_i \cdot ICT_i) + b_6(Infra_i \cdot ICT_i) + \beta X + \delta T + \epsilon_{ij} \quad [2]$$

Second, in order to evaluate the relative importance of soft and hard enablers within and across the six corridors, we include a dummy variable D to represent countries along a specific corridor and an interaction term between each selected enabler and the dummy variable¹⁹. In other words,

$$y_{itj} = b_o + D + b_1border_{it} + b_2Infra_{it} + b_3ICT_{it} + \partial_1(D \cdot border_{it}) + \theta T + \alpha_{[j]i} + \beta X' + \epsilon_{ijt} \quad [Eq.3]$$

$$y_{itj} = b_o + D + b_1border_{it} + b_2Infra_{it} + b_3ICT_{it} + \partial_2(D \cdot Infra_{it}) + \theta T' + \alpha_{[j]i} + \beta X' + \epsilon_{ijt} \quad [Eq.4]$$

$$y_{itj} = b_o + D + b_1border_{it} + b_2Infra_{it} + b_3ICT_{it} + \partial_3(D \cdot ICT_{it}) + \theta T' + \alpha_{[j]i} + \beta X' + \epsilon_{ijt} \quad [Eq.5]$$

Other variables are similar to the description in [1]. b_1 , b_2 and b_3 denote the main effects of the enablers and by interacting the location dummy and the enablers it allows for an examination of the specific effects of soft and hard enablers on exports for the six corridors. The “ratio” of the coefficients of the interactive term (D multiplied by the enabler) and the main enabler (border, infra or ICT; i.e. relative to the base) provides an indication of the relative size of the *additional* effect to export due to specific enablers both within and across the corridor.

Results

The fitted model for Equations (1) and (2) are reported in Annex 2 Table 2 Panels A and B, respectively. The fitted model yield a goodness of fit (Snijders-Bosker) $R^2 >$

¹⁹ Only Asian countries in the corridor were included. EU countries like Greece, Poland, and Germany were not considered part of the corridor in this analysis. Belarus was also not included because no ETI data was available.

0.8. In the fitted equation [1], the coefficients for *border*, *infra* and *ICT* are all positive and significant indicating that these are indeed enablers of export.

A one-percent increase in the efficiency of border administration and transport infrastructure will increase exports by 1.5 percent and 0.7 percent, respectively. A one-percent improvement in the quality of ICT on the other hand can increase exports by 1.4 percent. Clearly, among the three enablers in the model, improvements in the efficiency of border administration have the largest impact on exports, *ceteris paribus*.

Table 7. Changes in Exports in selected BRI Economies from Improvements in Hard and Soft Infrastructure (%)

Economy	% Change in Exports under Scenario (1): Improvement to China's performance level			% Change in Exports under Scenario (2): Improvement to top BRI performer's level		
	Border Admin	Infrastructure	ICT	Border Admin	Infrastructure	ICT
Myanmar	95.9	104.3	188.5	200.4	141.3	454.1
Bangladesh	106.4	72.7	72.8	216.5	103.9	231.9
Mongolia	236.7	72.7		416.3	103.9	85.7
Lao PDR	86.2	50.9	82.4	185.5	78.2	250.2
Cambodia	86.2	63.1	25.1	185.5	92.6	140.2
Tajikistan	234.4	26.3	107.1	395.1	35.8	188.7
Uzbekistan	232	19.2	119	409.1	40.7	320.6
Kyrgyz Republic	95.9	58.8	11.3	200.4	87.5	113.7
Iran, Islamic Rep.	95.9	29.5	36.1	200.4	52.9	161.3
Pakistan	24.9	32.1	64.1	91.5	56	215.2
Kazakhstan	130.4	27		253.3	50	34.6
India	30	12.4	36.1	99.3	32.8	161.3
Vietnam	41.2	34.8		116.6	59.2	68.7
Indonesia	20.1	27		84.1	50	92
Russian Federation	68.9	20.2		159.1	42	34.6
Thailand	7.3	10.7		64.6	30.7	79.7
Turkey		9		53.3	28.7	85.7
China				53.3	18.1	92
Malaysia				38.6	15	31.2

Source: Authors

Using the estimations from Equation 1, we can calculate the improvements in export performance that will accrue to countries if they reach higher standards of performance in border administration, infrastructure and ICT – presumably through the support provided by the BRI in these areas. Two scenarios are considered: (1) Countries

involved in BRI whose standards were lower than China improve their performance to the level of China; (2) Countries involved in BRI improve their performance to that of the top performer.²⁰

The results of selected countries are shown in Table 7. Our estimations suggest that Mongolia, Tajikistan and Uzbekistan could see their exports more than triple if they can align the efficiency of their border administration with that of China (scenario 1). Mongolia is found to gain most from advances in trade facilitation under the China benchmarking scenario, as do most other countries. On the other hand, Myanmar gains relatively more from improvements in transport and ICT infrastructure and services.

Thailand and Turkey, whose performance on trade facilitation are higher than China, are two other countries who gain most from hard infrastructure improvements under scenario 1. However, considering scenario 2 where BRI economies all upgrade their performance to that of the best performer among them, improvements in trade facilitation and ICT are generally found to be most important in raising exports.

Looking at these numbers from a corridor perspective (see Table 8), results from the improvement of trade facilitation to China level suggests that exports would increase most for countries along the NELB as well as the CMR, essentially due to the fact that countries along these corridors currently stand well below China's performance in this area. In contrast, the CP corridor stands out in terms of potential export increases if infrastructure and the use of ICT can be improved.

²⁰ Singapore is chosen as the reference for this second scenario since it ranked as number one for border administration (Pillar 3) and infrastructure (Pillar 4) and among the top ten countries for ICT (Pillar 6) in the ETI 2014.

Table 8. Changes in Exports along BRI Corridors from Improvements to China's performance level (%)

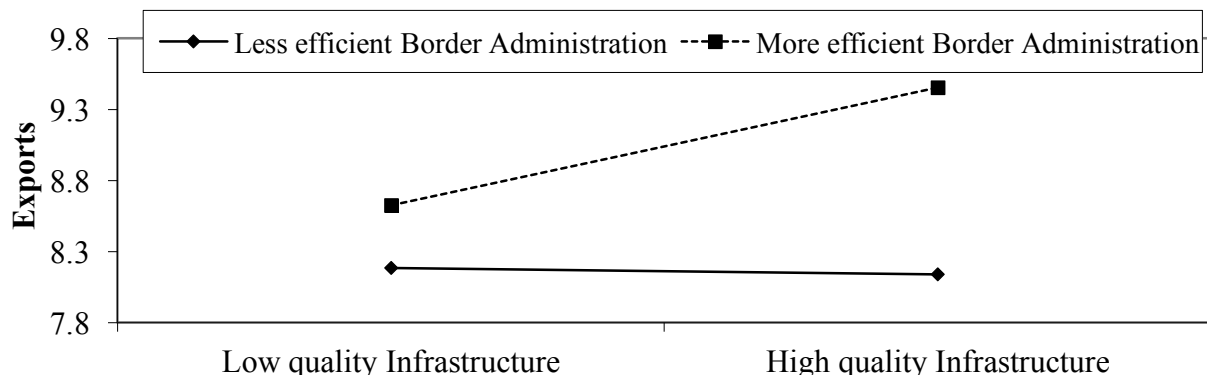
Corridors	Border Admin	Infrastructure	ICT
ICP	17.51%	18.06%	2.17%
BCIM	39.43%	20.63%	43.00%
CP	24.90%	32.10%	64.10%
CMR	68.90%	20.20%	0.00%
CAWA	60.17%	19.11%	3.95%
NELB	76.12%	21.00%	-

Source: Authors

Note: numbers shown reflect aggregate changes in exports to the world of all Asian economies in each corridor other than China.

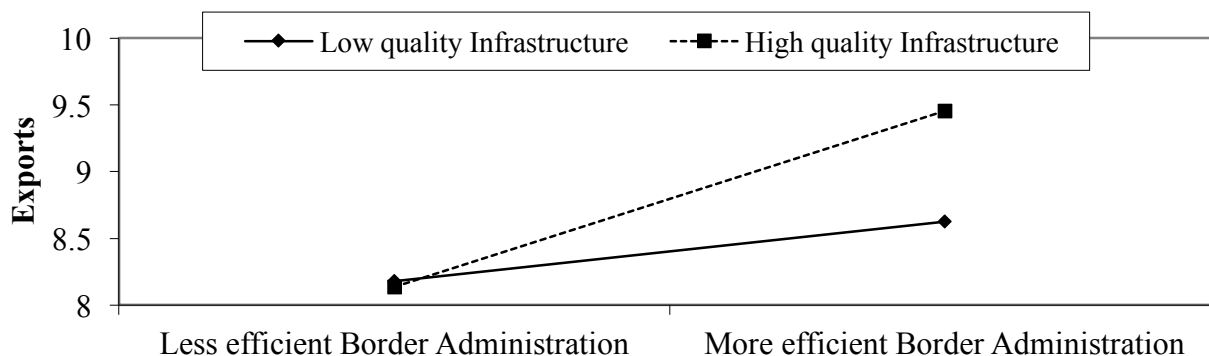
Turning now to interactions between hard and soft infrastructure as modeled in equation [2], we find strong evidence to show that border administration and infrastructure complement each other. As shown in Figure 4, our results strongly suggest that improving hard infrastructure in a context of inefficient border crossings and trade procedures may not result in an increase in trade. At the same time, however, countries with better quality infrastructure tend to gain more from a more efficient border administration (Figure 5). These results do confirm our earlier findings that trade facilitation is a critical driver of export performance.

Figure 4. Effect of infrastructure improvements on exports in a low/high trade facilitation environment



Source: Authors

Figure 5. Effect of trade facilitation improvements on exports in a low/high quality infrastructure environment



Source: Authors

Significant interactions are also found between ICT and infrastructure. In particular, while improving ICT has a positive effect on exports for countries with both high and low quality infrastructure, the effect is greater in countries with lower levels of infrastructure. As for ICT and trade facilitation, improvements in ICT have similar positive effects on exports, regardless of the level of trade facilitation.

Finally, looking at the corridor-specific models, we find evidence that, although the positive effects of border administration, physical infrastructure and ICT on exports has been established in Equations [1] and [2], the relative importance of these enablers differ across corridors. The relative importance of the enablers in the different corridors can be seen from the slope drifters in the fitted equations [3], [4] and [5] reported in Table 9 - the row marked “Ratio” as explained earlier provides an indication to the additional effect on exports from the specific enabler in the stated corridor with respect to the expected improvement for an average trading partner.

Comparing the “Ratios” vertically, we find that border administration has the greatest additional effect on export for the CMR corridor. Infrastructure, on the other hand, has the greatest additional effect for the CP corridor, BCIM corridor and the Indochina corridor. ICT has the greatest additional impact for the Eurasian corridor and the CAWA corridor. Comparing the “Ratios” horizontally²¹, better border administration has the most additional impact for the CMR corridor, followed by the CP corridor.

²¹ Comparison between corridors should only be seen as general indications as the six corridors in the BRI are different in terms of the number of countries (2 for the China-Pakistan to 9 in the Indochina corridor), geographic size, population size etc.

Better infrastructure has the most additional impact for the CP corridor, while ICT has the most additional impact for the CMR corridor.

Table 9. Results from Corridor-specific models

		CMR		NELB		CAWA		CP		BCIM		ICP	
Eq.3	Border	^[1] 1.483	***	^[1] 1.439	***	^[1] 1.155	***	^[1] 1.481	***	^[1] 1.554	***	^[1] 1.608	***
	D	0.196	***	0.583	***	1.660	***	0.675	***	0.279	***	0.401	***
	D•Border	^[2] 4.898	***	^[2] 0.704	**	^[2] 0.040	insig	^[2] 2.081	***	^[2] 0.512	***	^[2] 1.646	***
	Ratio [1]/[2]	3.303		0.490		-		1.405		0.330		1.024	
Eq.4	Infra	^[1] 0.637	***	^[1] 0.669	***	^[1] 0.359	***	^[1] 0.627	***	^[1] 0.612	***	^[1] 0.496	***
	D	0.003	insig	0.544	***	1.650	***	0.266	***	0.270	***	0.402	***
	D•Infra	^[2] 4.077	***	^[2] 0.012	insig	^[2] 0.179	insig	^[2] 2.174	***	^[2] 0.554	***	^[2] 1.218	***
	Ratio [1]/[2]	-		-		-		3.468		0.905		2.454	
Eq.5	Ict	^[1] 1.423	***	^[1] 1.443	***	^[1] 1.344	***	^[1] 1.364	***	^[1] 1.398	***	^[1] 1.344	***
	D	0.907	***	0.824	***	1.672	***	0.378	***	0.298	***	0.483	***
	D•Ict	^[2] 2.433	***	^[2] 0.950	***	^[2] 0.311	***	^[2] 0.161	insig	^[2] 0.094	insig	^[2] 0.074	insig
	Ratio [1]/[2]	1.709		0.658		0.231		-		-		-	

Source: Authors.

***, ** denote 1% and 5% significance level, respectively. [1] is the 'grand' coefficient of the selected enabler which can be conceived as an average effect of the enabler across countries; [2] is the corridor-specific effect of the selected enabler which allows the grand coefficient to vary between countries of the corresponding corridor and countries outside the corridor.

Taken together, these corridor-specific results suggest that significant additional benefits in terms of export development may be achieved through stronger emphasis on trade facilitation and ICT development in the CMR corridor in particular. Similarly, trade benefits may be maximized by emphasizing a well-balanced mix of trade facilitation and transport and logistics infrastructure development along the CP and the ICP corridors. Finally, while the trade gains from improvements in trade facilitation and other enablers remain large in all corridors, CAWA corridor seems relatively less promising than other corridors in terms of trade benefits from incremental trade facilitation and infrastructure improvements.

5. Discussion

Banomyong (2013) explained that a transport corridor is one where an area or region is connected physically by transportation networks. A logistics (or a trade facilitation) corridor takes the transport corridor to another level as the institutional framework is harmonized such that freight, people and information are able to move within the corridor much more efficiently. Finally, an economic corridor is one that is able to attract investments into the region, which will generate greater economic activities. Since the BRI is designed to develop economic corridors, efforts that focus on transport and trade facilitation corridors as a pre-requisite make strategic sense.

Our analysis of the trade and trade facilitation data of countries affected by the BRI clearly points to the fact that the improvement of both transportation networks and trade facilitation procedures as well as ICT capacities do indeed encourage and increase trade flows between countries. Our findings suggest that on average, a one percent improvement in trade facilitation will increase exports by more than 1.5 percent, while a one percent improvement on the quality of transport infrastructure will increase exports by about 0.69 percent. In fact, we find that both strategies complement each other and that an integrated cross-sectoral approach would be most effective. The movement of people and freight will be delayed at the border if procedural issues are overwhelming, no matter how good the transportation networks are. Similarly, getting to and crossing the border will be delayed if transportation networks are poor in quality and uncoordinated, no matter how advanced trade facilitation procedures are.

Countries that perform well in trade are those that excel in both. However, improvements in physical infrastructure will have a much more important effect on export performance in countries that have relatively more efficient border administration. This highlights the need for countries with weak trade facilitation to take stock of their weaknesses and work on improving their border administration if they wish to receive the full effect of better infrastructure. This also implies that the BRI has to dedicate enough importance on both strategies – border administration and physical connectivity- although not necessarily equal emphasis as the impact differs from one corridor to another.

Our findings do find an overwhelming positive impact on exports as a result of improvement in trade facilitation in all corridors, but the impact of improvements in this area is highest for the CMR and CP economic corridors. In turn, upgrading of infrastructure may bring relatively more trade benefits in the CP, ICP and the BCIM corridors. Improvements in ICT on the other hand have particular significance for the CMR and NELB corridors.

A review of the literature on trade facilitation efforts of the Asian sub-regions covered by the six corridors in the BRI tends to point to a common set of problems in each of the corridor – customs and other authorities who require excessive documentation and/or do not apply modern ICT to trade procedures; a lack of harmonization of various standards and procedures within and between countries; and inadequate border infrastructure facilities at the border and between borders.²²

However, there is still insufficient knowledge about the bottlenecks that hamper the seamless flow of freight along the corridors. While business process analyses of trade procedures (BPA) have been carried out for more than 50 goods involving 13 countries in the Asia-Pacific region since 2010, only a few of them have focused on cross-border trade and transport processes directly relevant to the BRI. Therefore, there is an urgent need to better understand the procedures involved in moving popular products along the various corridors in the BRI. In particular, BPA and BPA+ studies²³ of the top products crossing borders, as well as along the corridors to identify the bottlenecks are necessary. Identifying and releasing the bottlenecks for these goods will be the low-hanging fruits that can be harvested and gain support from the various players, both public and private, in the trading activity. These studies should also identify which type of infrastructure – soft or hard – contributes more towards the bottlenecks so that policies and projects can be prioritized effectively.

In the case of building and utilizing fully ICT capabilities, firstly, a technological leapfrogging is required (Fong, 2009). Without capacity building in ICT and its

²² For example, refer to UNNEXt Brief No. 11 <http://www.unescap.org/resources/unnext-brief-no-11-insights-escap%E2%80%99s-trade-process-analysis-database>

²³ BPA+ extends the BPA to the Time-Cost-Distance (TCD) and Time-Release Studies (TRS) methodologies, providing reliable and detailed data so that bottlenecks can be identified and addressed. This information can provide the basis for establishment of integrated and sustainable Trade and Transport Facilitation Monitoring Mechanisms (TTFMM) at the national or regional levels (UNESCAP, 2014).

widespread use, paperless system will be a mirage. Investing in broadband and leapfrogging into future internet systems and extending the use of mobile phone and its various applications in facilitating trade procedures are all strategies well-worth considering. In fact, given that the BRI consists of China as a leading country in computer and mobile phone hardware and India as a leading software developer, eradicating digital poverty in the BRI is well within reach.

This requires governments of individual countries to allocate a larger portion of their resources into building these digital capabilities. This could also be achieved by attracting more multinationals from China, India and other countries to invest in their countries. We have shown elsewhere five simple policies that attract Chinese companies (Ramasamy and Yeung, 2016). These include minimizing institutional risks by reducing corruptive practices and establishing free trade agreements with China. Liberalizing the telecommunication industry and inviting foreign investors can achieve technological leapfrogging and building human resource capacity in ICT. Building ICT capacity would be an important step towards cross-border paperless trade facilitation in the BRI.

Secondly, an extensive usage of ICT in facilitating trade procedures is necessary. In other words, a paperless initiative at a national level should be a policy priority (UNESCAP 2014). The paperless system should consider decreasing the need for repetitive information, and connect digitally the various national agencies involved in regulating the movement of goods and services. Further, allowing exporters and importers to make online submissions of relevant documents follow (Rastogi and Arvis, 2014). The UN Global Survey on Trade Facilitation and Paperless Trade Implementation finds that even when internet connection is available among Customs and other regulatory bodies within a country, electronic application and the issuance of various certificates like the Certificate of Origin is yet to be implemented (UNESCAP 2015). Once a single window system can be implemented at a national level, harmonizing the necessary rules, regulations and requirements can be considered at a sub-regional, regional and corridor level. The adoption in May 2016 at ESCAP of a Framework Agreement on Facilitation of Cross-border Paperless Trade in Asia and the Pacific is worth noting in this context, as it could provide the neutral and dedicated platform for countries to reduce non-tariff barriers and trade costs through digitalization of procedures.

Free trade agreements among countries within specific corridors can act as a catalyst towards greater cooperation between countries. In each of the three corridors that has been the focus of this study, there are often at least one or two FTAs that unite a majority of countries along the corridor – ASEAN and ASEAN China-FTA for the Indochina Corridor, China-Pakistan FTA for the CP corridor SAFTA and BIMSTEC for BCIM, and the EEC for Central Asia. However, two additional points need to be considered. First, China needs to step up its relationship with other regions. Currently, only its relationship with ASEAN seems to be at an advanced stage with the China-ASEAN FTA. There is no such agreement with the EAEC nor with the Russian Federation while with South Asia, the link with China is only with India through the APTA. No doubt, the proportion of China's exports in 2015 to the Commonwealth of Independent States (CIS) and the SAARC were only 3% and 4% of total exports respectively, these are also regions with high potential. Second, a coordinating body needs to be established to facilitate greater trade relationships between regions as well as to share capacities and knowledge among regions. In this regard, existing institutions like ESCAP or the AIIB could act as initiators. A less formal organization (like the APEC) to forge closer political and economic ties among the countries of the BRI could also be considered.

6. Conclusion and recommendations

The BRI is an ambitious initiative that aims at developing economic corridors connecting China to Europe by land and sea and developing trade between all economies involved. As such, it is potentially fully supportive of the implementation of the Sustainable Development Agenda, in which trade has been identified as a key means of implementation.

In this study, we reviewed the trade relationships among countries located along 6 corridors that form the backbone of the BRI. There is great diversity among the Asian BRI economies and the various corridors in terms of level of trade development and integration. The ICP corridor is ready to become a major economic corridor, while other corridors such as the CAWA or NELB corridors will likely take longer to develop. Key findings from our analysis of the trade data and trade facilitation efforts in the BRI may be summarized as follows:

1. Trade facilitation and the development of soft infrastructure are keys to trade development along all the BRI corridors. Most countries along the corridors still have significant trade barriers and inefficient procedures in place. Our empirical analysis indicated that average export growth that could be expected from a 1% improvement in trade facilitation performance in BRI countries was twice what could be expected from a similar change in terms of transport infrastructure. The quantitative analysis also highlighted that trade benefits from improvement in transport and logistics infrastructure development could not be reaped in an environment where trade regulations are not harmonized and implemented in a transparent and efficient manner.
2. Potential trade gains from improvements in trade facilitation and other trade enablers vary from corridor to corridor – as well as from country to country. Our analysis suggests that trade gains from incremental trade facilitation improvements would be highest for the CMR, CP, and ICP corridors, in this order. In turn, trade gains from hard infrastructure investments would be relatively higher in the CP, ICP and BCIM corridors, also in this order. Finally, improvements in ICT availability and use may yield relatively higher trade returns in the CMR and NELB corridors.

3. Improvements in trade facilitation, transport infrastructure and ICT are complementary, i.e., trade benefits along corridors can be maximized by adopting an integrated and multi-sectoral approach to corridor development. While finding the right balance between the different trade enablers may require more detailed studies, the corridor-specific models estimated suggest that the countries involved in the CMR and the NELB corridors may benefit relatively more from interventions encompassing both trade facilitation and ICT improvements, while those involved in the CP, BCIM and ICP corridors may benefit relatively more from projects combining trade facilitation and transport infrastructure development.
4. Within each corridor, a number of countries can be identified as “weak links”, e.g., Myanmar in the BCIM corridor, Tajikistan in the CAWA corridor, Mongolia in the CMR corridor. The BRI will need to pay special attention to the needs of these less developed countries and reduce the performance gap across countries in order to successfully develop economic corridors. Importantly, these countries are set to gain most from upgrading their trade facilitation and infrastructure performance based on China’s experience and know-how.
5. While the CP and the ICP corridors are well covered by trade agreements, China appears to have limited formal trade arrangements with countries in the CAWA, NELB and CMR corridors. Accordingly, it may need to step up its efforts in concluding trade agreements with South and Central Asia to ensure that improved physical connectivity can effectively lead to more intra-regional trade. Given the relatively large number of existing and overlapping trade agreements in the region, this may best be done through expansion of existing agreements and initiatives, or through agreements between China and existing trade blocs.

While physical infrastructure may require investment from foreign firms and governments, trade facilitation is very much an internal effort that requires commitment and actions of national governments. The return on investment in physical infrastructure along the BRI corridors is likely to be limited unless political will for trade facilitation is secured. In that regard, China and BRI countries may consider the following recommendations:

- (1) Jointly undertake a mapping and analysis of trade regulations and procedures for products of strategic interest along the BRI corridors. Such analysis may be

done cooperatively by country teams following a common established methodology and modelling language, such as the one outlined in the UNNExT Business Process Analysis Guide for the Simplification of Trade Procedures. While the outcome of the analysis would be important and provide data needed to define specific joint priorities and actions, the process involved in jointly collecting and validating data may be even more important in building cooperation and understanding between government and other stakeholders in the different BRI countries involved.

- (2) Join and actively participate in the implementation of the Framework Agreement on Facilitation of Cross-Border Paperless Trade in Asia and the Pacific. This new UN treaty opened to all Asian countries involved in the BRI in October 2016. Both China and Russia, along with 28 other Asian countries, collaborated in its development. It provides a dedicated, neutral and highly flexible platform for countries at all levels of development to work towards next-generation trade facilitation measures, building upon existing bilateral, subregional as well as global trade facilitation initiatives. Becoming a party to the Framework Agreement would not only show strong political commitment to trade facilitation but also provide opportunities for capacity building and the development of concrete pilot projects, as envisaged in the treaty.²⁴

Implementation of these specific recommendations could be readily supported by ESCAP and may be seen as small but important stepping stones towards the creation of a conducive and collaborative trade facilitation environment along the BRI corridors.

²⁴ For details, see: <http://www.unescap.org/resources/framework-agreement-facilitation-cross-border-paperless-trade-asia-and-pacific>

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Annex

Annex 1. Economies along the BRI Economic Corridors

Economies directly affected by BRI (25 economies)*	<i>China, Cambodia, Lao PDR, Malaysia, Myanmar, Singapore, Thailand, Viet Nam, Bangladesh, India, Indonesia, Pakistan, Iran, Kazakhstan, Kyrgyzstan, Mongolia, Tajikistan, Turkmenistan, Uzbekistan, Turkey, Belarus, Russian Federation, Greece, Poland and Germany.</i>
Economies on the periphery of BRI (46 economies)*	<i>Azerbaijan, Kenya, Czech Republic, Philippines, Sri Lanka, Afghanistan, Georgia, Bahrain, Egypt, Iraq, Albania, Bosnia, Bulgaria, Croatia, Hungary, Lithuania, Latvia, Macedonia, Moldova, Montenegro, Romania, Serbia, Slovakia, Slovenia, Ukraine, Brunei, Timor Leste, Bhutan, Maldives, Nepal, Armenia, Israel, Jordan, Kuwait, Lebanon, Oman, Palestine, Qatar, Saudi Arabia, Syria, United Arab Emirates, Yemen, Republic of Korea, Democratic Republic of Korea, Hong Kong China, and Macau China.</i>
New Eurasia Land Bridge (NELB)	China, Kazakhstan, Russian Federation, Belarus, Poland (EU), Germany (EU)
China-Mongolia-Russia (CMR)	China, Mongolia and Russian Federation
China-Central Asia- West Asia (CAWA)	China, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, Turkmenistan, Iran, Turkey, Greece (EU)
China-Indochina Peninsula (ICP)	China, Thailand, Vietnam, Laos, Cambodia, Myanmar, Malaysia, Singapore, Indonesia
China-Pakistan (CP)	China, Pakistan**
Bangladesh-China-India-Myanmar (BCIM)	China, Bangladesh, India, Myanmar

*BRI economies member of ESCAP are shown in *italics*. **This corridor goes through disputed territory between India and Pakistan

Annex 2. Gravity Model: Supplementary Data and Results

Variables and Data Source

Variable	Details	Source
Border	Efficiency and transparency of border administration	Various issues of Global Enabling Trade Report 2008 – 2014
Infra	Availability and quality of transport infrastructure	
ICT	Availability and use of ICTs	
Exports	Amount of exports from country i to country j (in million USD)	UNCTAD's Data Centre
GDP	Real GDP of country i and j (in million USD, constant)	
Population	Size of population in country i and j (in 1000)	
distance	Geographic distance between country i and j	dist_cepil.xls from CEPII
contig	Dummy variable set equal to 1 if country i and j share a common border	
comlang	Dummy variable set equal to 1 if country i and j share a common language	
col45	Dummy variable set equal to 1 if country i and j had a colonial relationship after 1945	
comcol	Dummy variable set equal to 1 if country i and j had a common colonizer after 1945	
landlocked	Dummy variable set equal to 1 for landlocked countries, 0 otherwise	geo_cepil.xls from CEPII
RTA	Dummy variable set equal to 1 if country i and j are members of an RTA, 0 otherwise	De Sousa (2012) http://jdesousa.univ.free.fr/data.htm

Effects of Border Administration, Infrastructure and ICT on Exports

Panel A: Equation 1 [Main Effect Model]; n=73868			
Variable	Coefficient	Std.Error	z
landlocked	-0.765**	0.137	-5.58
contig	1.368**	0.052	26.28
comlang	0.684**	0.026	26.02
col45	0.763**	0.083	9.18
comcol	0.963**	0.033	28.81
distance	-1.111**	0.013	-87.25
GDP(i)	0.724**	0.013	55.34
GDP(j)	0.935**	0.034	27.51
Population(i)	0.525**	0.013	40.04
Population(j)	0.088**	0.044	1.99
Border	1.532**	0.061	25.05
Infra	0.686**	0.054	12.81
ICT	1.400**	0.057	24.54
RTA	0.571**	0.025	23.16
Panel B: Equation 2 [Interaction Model with centered Data]; n=73868			
Variable	Coef.	Std.Err.	z
Landlocked	-0.765**	0.137	-5.57
contig	1.369**	0.052	25.86
comlang	0.683**	0.026	25.46
col45	0.758**	0.083	9.70
comcol	0.960**	0.033	28.57
distance	-1.111**	0.013	-88.01
GDP(i)	0.724**	0.013	54.36
GDP(j)	0.934**	0.034	27.48
Population (i)	0.525**	0.013	39.40
Population(j)	0.089*	0.044	2.03
Border	1.701**	0.063	27.17
Infra	0.686**	0.054	12.67
ICT	1.264**	0.058	21.69
RTA	0.574**	0.025	23.28
Border*Infra	2.943**	0.236	12.47
Border*ICT	-0.510**	0.139	-3.66
Infra*ICT	-1.701**	0.153	-11.09

Note: * and ** refers to level of significance at 1% and 5% respectively.



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