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APEC Supply-Chain Connectivity Framework Action Plan 2017-2020: Interim Review of External Indicators

APEC Policy Support Unit

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EXECUTIVE SUMMARY

The interim review looks at APEC's progress in addressing the five chokepoints identified in the second phase of the APEC Supply-Chain Connectivity Framework Action Plan 2017-2020 (SCFAP-II). Relevant external indicators are assigned to each chokepoint to measure changes since the last update in 2017. They are derived from secondary sources, namely, the World Bank, Transparency International, UNCTAD, DHL, OECD and Universal Postal Union. Not all chokepoints have been equally represented by the available data. Chokepoint 1, which addresses the lack of coordinated border management and underdeveloped border clearance and procedures, has 11 relevant indicators to measure changes reasonably well. On the other hand, chokepoints 2 and 5 relating to inadequate quality and lack of access to transportation infrastructure and services, and underdeveloped policy and regulatory infrastructure for e-commerce, respectively, have only three external indicators each.

In assessing APEC's performance, external indicators are compared to APEC averages from the last update (in 2015/2016) and at times to OECD averages. Secondary literature is also used to support the arguments where necessary. A review of the indicators shows that APEC's overall performance has been relatively mixed. Results have been promising for chokepoint 1 (lack of coordinated border management and underdeveloped border clearance and procedures) and chokepoint 2 (inadequate quality and lack of access to transportation infrastructure and services). All external indicators addressing chokepoint 1 have improved except for the amount of physical and multiple inspections. With regard to chokepoint 2, there has been a positive change in all relevant indicators.

The performances under chokepoints 3 and 5 have been relatively mixed. For chokepoint 3 (unreliable logistics services and high logistical costs), some APEC averages concerning efficiency have improved, while others measuring timeliness of shipments, ease of arranging competitively priced shipments, and tracking of consignments have worsened. The reductions in these indicators are, however, minimal; at less than 2 percent. Under chokepoint 5 regarding e-commerce, significant progress is recorded in the UNCTAD B2C e-commerce index; although worsening performance of APEC economies in the UPU postal index calls for more efforts within APEC to improve postal services and infrastructure.

Performance for chokepoint 4 relating to limited regulatory cooperation and best practices has been less favourable. Results of three of the four trade facilitation indicators applicable to the chokepoint have worsened with one of them dropping by 23 percent.

APEC has conducted numerous projects and initiatives to address the five chokepoints. However, several challenges may have hindered the region's supply chain connectivity performance from reaching its full potential. Some of these key issues and challenges are: (i) adoption of automation; (ii) harmonisation of regulations; (iii) lack of logistics skills; (iv) financial constraints; and (v) resilience of supply chains.

More work on these areas within APEC is recommended to support the larger goals of SCFAP-II to reduce trade costs and to support business competitiveness throughout the region.

A. INTRODUCTION

The second phase of the APEC Supply-Chain Connectivity Framework Action Plan (or SCFAP-II) covers the period 2017-2020 and contains five chokepoints:

1. Lack of coordinated border management and underdeveloped border clearance and procedures;
2. Inadequate quality and lack of access to transportation infrastructure and services;
3. Unreliable logistics services and high logistical costs;
4. Limited regulatory cooperation and best practices; and
5. Underdeveloped policy and regulatory infrastructure for e-commerce.

The goal of SCFAP-II is 'to reduce trade costs across supply chains and to improve supply chain reliability in supporting the competitiveness of business in the Asia Pacific region'. In order to track the progress and achievement of this goal, the APEC Committee on Trade and Investment (CTI) has developed a monitoring framework outlining the key challenges, stakeholders involved and external indicators from the World Bank, the World Economic Forum, and other international organisations.

The external indicators will serve as performance indicators to measure and benchmark the progress of SCFAP-II. Most of these indicators or metrics are outcome-focused and are meant to describe how well APEC has achieved the goal of SCFAP-II. It is important to note that these indicators should be viewed as proxies for the actual progress of SCFAP-II. They are constructed from the aggregation of complex regulatory realities and dimensions represented in a single number or score based on certain assumptions that may not be universally applicable.

The APEC Policy Support Unit (PSU) completed a report on the review of external indicators to monitor progress for SCFAP-II in 2017. Last year, CTI (led by Singapore) also completed a stock-take of the activities in APEC that have supported SCFAP-II.

To further support the implementation of SCFAP-II, it is necessary to look at how SCFAP-II has been progressing so far. The external indicators' review will support CTI in assessing the progress of SCFAP-II by using available metrics and by identifying key issues moving forward. Note that the Enabling Trade Index (ETI) report and some indicators from the World Bank Logistics Performance Index (LPI) report were not (yet) available at the time of writing. Hence, the following indicators are excluded: LPI cost to import, LPI cost to export, ETI efficiency of the clearance process, ETI customs services index, ETI availability and quality of transport infrastructure, ETI availability and quality of transport services, and ETI availability and use of ICT. This report will also complement the analysis with relevant literature and statistics where possible.

This report will cover the following:

1. Review the external indicators of SCFAP-II as indicated in the Monitoring Framework and PSU report (2017); calculate how these indicators have changed and understand the gaps and progress.
2. Based on the gaps in the metrics, identify key policy issues under each chokepoint.
3. Distil the lessons learned and the possible way forward.

B. CHOKEPOINT 1: Lack of Coordinated Border Management and Underdeveloped Border Clearance and Procedures

Table 1. List of external indicators under Chokepoint 1

No.	Indicators	APEC average 2015/16	APEC average 2017/18 or latest	% of improvement (% of change)	General remarks
1.1	LPI declarations submitted and processed electronically and online (%)	91.0%	91.4%	+0.5%	Slight improvement
1.2	LPI physical inspection (%)	9.1%	14.3%	+56.7%	Worsened
1.3	LPI multiple inspection (%)	2.7%	3.9%	+47.4%	Worsened
1.4	LPI clearance time with physical inspection (days)	2.8 days	2.6 days	-7.1%	Strong improvement
1.5	LPI clearance time without physical inspection (days)	1.6 days	1.3 days	-15.8%	Strong improvement
1.6	LPI efficiency of customs clearance process	3.2	3.2	+0.1%	Slight improvement
1.7/1.8	DB Cost to Import (documentary and border compliance)	USD 497.9 (91.8+406.1)	USD 471.1 (89.5+381.6)	-5.4%	Strong improvement
1.9/1.10	DB Time to Import (documentary and border compliance)	87.1 hours (39.9+47.2)	81 hours (36.2+44.8)	-7.0%	Strong improvement
1.11/1.12	DB Cost to Export (documentary and border compliance)	USD 440.8 (81.4+359.4)	USD 424.4 (80.9+343.6)	-3.7%	Significant improvement
1.13/1.14	DB Time to Export (documentary and border compliance)	65.9 hours (28.8+37.1)	61.9 hours (26.5+35.3)	-6.1%	Strong improvement
1.15	Trading Across Borders Score	78.4	79.5	+1.4%	Improved

Source: World Bank LPI 2016 and 2018 reports; and World Bank Doing Business 2017 and 2019 reports.
Note: The raw figures for LPI efficiency of customs clearance process are 3.18 for 2015/16 and 3.19 for 2017/18.

The first chokepoint addresses uncoordinated or underdeveloped border clearance and procedures with the objective of improving coordination through modernisation and harmonisation within border agencies. This chokepoint uses indicators from the World Bank LPI and Doing Business (DB) to analyse performance. These indicators broadly evaluate time and costs involved in trading across borders with regard to clearance, compliance and inspections.

In today's rapidly changing and technologically advanced world, economies try to stay competitive in international trade by streamlining and digitising their trade processes and

procedures. Doing so improves efficiency of border management processes by promoting greater speed and visibility in the supply chain, and also improving sustainability. According to a 2017 UNESCAP survey[1], 15 APEC economies have fully implemented electronic or automated customs systems while the remaining have at least partially implemented the same. The UNESCAP survey also found that electronic submission of customs declarations is common in APEC with only three economies left to fully implement the digital service. Furthermore, 15 APEC economies have either partially or completely implemented electronic single window systems. However, the 2018 LPI figures noted a slow increase in declarations submitted and processed electronically and online, with the APEC average rising by only 0.5 percent since 2016. Only Hong Kong, China; Mexico; and Viet Nam submitted and processed more declarations online in 2018 compared to 2016.

The increased digitisation of trade processes has evidently contributed to making trade 6-7 percent faster and 4-5 percent cheaper. As a component of trade costs, documentary compliance costs involved in importing and exporting have decreased by 2.5 and 0.6 percent, respectively, among APEC economies between 2016 and 2018. Time spent on documentary compliance for import and export has also reduced by 7-9 percent during the same period.

However, the path to customs digitisation is not without obstacles. A study by AEB (2018)[2] found that businesses are concerned with the loss of control over data due to the lack of properly trained employees. This is aggravated by the tendency of companies to underinvest in proper training for their employees.

Apart from digitising customs processes, border management can also be improved through better cooperation. A large number of respondents labelled compulsory warehousing and pre-shipment inspections as the main causes of delay in 2018[3]. Improved border agency cooperation and alignment of procedures will help reduce these delays by enabling better planning.

APEC economies have not been successful in reducing the amount of pre-shipment inspections. Both physical and multiple inspections have increased by about 50 percent since 2016. However, efficiency of customs clearance processes has improved marginally by 0.1 percent. This can also be seen from the large decrease in clearance times with and without physical inspection by 7.1 percent and 15.8 percent, respectively. Overall, border management among APEC economies has improved. Cost and time spent on border compliance have decreased by about 5 percent each.

The 2017 UNESCAP survey analysed economies' standing on border agency cooperation matters. All APEC economies were noted to have a domestic legislative framework and institutional arrangement that allow cooperation among border agencies albeit most of them only being partially implemented. APEC economies have performed decently in this measure with a score of 2.3[4]. However, the OECD has performed relatively better with a score of 2.6[5].

[1] The survey does not cover Hong Kong, China; Chinese Taipei; and the United States of America.

[2] AEB and DHBW. 2018.

[3] World Bank. 2018a.

[4] Average of 18 APEC economies (https://untfsurvey.org/compare-measures) [accessed 10 July 2019].

[5] Average of 25 OECD economies (https://untfsurvey.org/compare-measures) [accessed 10 July 2019].

There is still room for improvement among APEC economies in the following measures: government agencies' delegation to customs authorities, and alignment of formalities and procedures with neighbouring economies. In both these measures, APEC's average score was much lower than the OECD score. For the former measure, APEC scored 1.2 while the OECD score was 2.4. As for the alignment of formalities and procedures, APEC scored 1.7 and the OECD recorded a score of 2.5.

APEC has done considerable strategic work to improve overall border management. The Connectivity Blueprint 2015-2025 pursues better institutional connectivity by pushing for economies to develop their own Single Window systems and to ensure interoperability through coordination of regulations, standards, and processes. Capacity building projects to provide assistance for Authorised Economic Operators (AEO) implementation have also been conducted. In 2017, a workshop was held to identify factors and practices that impact MSMEs' import and export processes so as to encourage adoption of procedures that promote MSME internationalisation[6]. In addition, the Asia Pacific Model E-Port Network (APMEN) is working on developing an E-Port network that will improve supply chain visibility and reduce clearance times significantly: processing time per consignment is expected to drop from 2 days to 1 hour[7]. Over time, APEC economies have embarked on significant improvements in border management by adapting to digitisation and addressing cooperation issues.

APEC's performance in ease of trading across borders which is reflected by the Doing Business 'Trading across Border' score[8] shows a 1.4 percent improvement since 2016. Twelve APEC economies have either declined in performance or maintained status quo. The Doing Business 2019 report emphasised the importance of education and training, together with communication with customs clearance officials and customs brokers, in ensuring successful implementation of trade-related reforms. In fact, the average time required to clear customs is about 34 percent lower in economies where clearance officers receive regular training.

In addition, improvements in digitisation contribute to sustainable supply chain management which is increasingly becoming an area of concern. According to the 2018 World Bank's LPI report[9], 28 percent of surveyed respondents from the top quintile economies often requested for environmentally friendly shipping options. However, this figure does drop to 5 percent among the fifth quintile economies[10].

On the whole, APEC economies noted improvements in almost all indicators measuring border management and clearance performances except for the number of physical and multiple inspections carried out. According to the 2018 LPI report[11], more inspections are necessary when dealing with time sensitive goods but having improved clearance times and greater visibility across the supply chain would allow businesses to adopt just-in-time practices which

[6] https://aimp2.apec.org/sites/PDB/Lists/Proposals/DispForm.aspx?ID=1923 [accessed 10 July 2019].

[7] The 2nd APEC Public-Private Dialogue on Advancing Trade Facilitation and Supply Chain Connectivity through APMEN. Presentation by AEOtrade.com.

[8] http://www.doingbusiness.org/en/methodology/trading-across-borders [accessed 10 July 2019].

[9] World Bank. 2018a.

[10] The quintiles are based on LPI performance. Hence, top quintile refers to the highest performance group; similarly the bottom quintile refers to the poorest performing group.

[11] Ibid.

would eliminate perishability concerns. Hence, more efficient border management practices may enable APEC economies to employ just-in-time practices and consequently reduce the number of inspections. Moreover, cooperation of health and sanitary and phytosanitary (SPS) agencies through automation will also quicken the process of inspecting. According to ESCAP's 2017 database, only three APEC economies have fully implemented the automation of the application, verification and issuance of SPS certificates[12].

C. CHOKEPOINT 2: Inadequate Quality and Lack of Access to Transportation Infrastructure and Services

Table 2. List of external indicators under Chokepoint 2

No.	Indicators	APEC average 2015/16	APEC average 2017/18 or latest	% of improvement (% of change)	General remarks
2.1	LPI quality of trade and transport infrastructure	3.3	3.3	+0.4%	Slight improvement
2.2	UNCTAD Liner Shipping Connectivity Index	57.2	60.5	+5.2%	Strong improvement
2.3	TI corruption perception index	54.6	54.7	+0.1%	Slight improvement

Source: World Bank LPI 2016 and 2018 reports; UNCTADstat database; and Transparency International Corruption Perceptions Index 2018 database.
Note: The raw figures for LPI quality of trade and transport infrastructure are 3.31 for 2015/16 and 3.32 for 2017/18.

The second and third chokepoints of SCFAP II address the performance of transportation and all other logistical services. The second chokepoint specifically looks into transportation infrastructure and services with the following objectives: to improve transportation infrastructure quality including port facilities, promote multi-modal transportation, and encourage private participation and transparency related to financing transportation infrastructure projects.

Indicators involved in evaluating this chokepoint examine access to and quality of transport infrastructure and transport services, shipping connectivity and public-private partnerships (PPP) for infrastructure procurement. The indicators included are from the World Bank LPI, Transparency International (TI), and UNCTAD.

Availability of quality transportation services is a key ingredient to efficient international trade. Rodrigue and Notteboom (2017) found that a 10 percent increase in trade costs, which include transportation costs, can reduce trade volume by 20 percent. Moreover, quality of transport infrastructure can account for 50 percent of transport cost variations. Hence, focusing efforts on improving access to infrastructure alone may not be sufficient to tackle this chokepoint; rather, similar emphasis has to be placed on ensuring its quality.

[12] Data from https://untfsurvey.org/ [accessed 14 July 2019].

Despite its importance, the quality of transportation infrastructure is not very high, even in the top performing economies (Table 3). The 2018 LPI report shows that only 37 percent of respondents considered rail infrastructure quality to be high[13]. Also quality of physical transportation infrastructure is rated lower than quality of information and communications technology (ICT) infrastructure in almost all quintiles. In particular, the quality of roads and rail is considered less favourable than that of other types of infrastructure.

Table 3. Respondents rating the quality of each infrastructure type "high" or "very high," by LPI quintile (percent of respondents)

LPI quintile	Ports	Airports	Roads	Rail	Warehousing and transloading	ICT
Bottom quintile	26	30	17	17	21	34
Fourth quintile	23	13	10	9	23	44
Third quintile	33	39	20	12	27	48
Second quintile	57	41	37	11	37	52
Top quintile	63	67	57	37	62	75

Source: World Bank Logistics Performance Index 2018 report.
Note: The quintiles are based on LPI performance. Hence, top quintile refers to the highest performance group; similarly the bottom quintile refers to the poorest performing group.

As previously established, quality of transport infrastructure and services is a major concern in international trade. The 2017 APEC Leader's Statement[14] noted the importance of pursuing sustainable infrastructural development that is higher in terms of both quantity and quality. A useful tool to pursue development of quality infrastructure, in this case transport services, is the APEC Guidebook on Quality of Infrastructure Development and Investment. Based on the Guidebook, two transport infrastructure related studies on the Philippine's and Viet Nam's road sectors have been conducted[15]. These studies are part of the "Peer Review and Capacity Building on APEC Infrastructure Development and Investment" initiative. A third review on Indonesia's road and water sectors is currently ongoing. The peer reviews intend to evaluate and analyse relevant laws, regulations and guidelines related to infrastructure projects in the region. They also consider the importance of 'quality of infrastructure' and identify opportunities for capacity building activities. Across the economies reviewed, similar gaps have been identified in areas relating to risk-sharing and allocating mechanisms. The need for economies to create appropriate public-private partnership (PPP) laws that are not only competitive but also well-suited to their specific conditions have also been recognised.

[13] World Bank. 2018a.

[14] https://www.apec.org/Meeting-Papers/Leaders-Declarations/2017/2017_aelm [accessed 10 July 2019].

[15] APEC PSU. 2018.

Other considerable work in the area include actions under the APEC Connectivity Blueprint's physical connectivity pillar which focuses on physical infrastructural development of transportation and ICT, among others. The Blueprint aims to improve the investment climate to enhance infrastructure financing, adopt comprehensive assessment processes that evaluate quality, and enhance the adoption of good practices.

Given these initiatives and APEC economies' commitment towards improving access to quality infrastructure, data on APEC economies have shown positive improvements since 2016. The LPI quality of trade and transport infrastructure for APEC economies indicated a slight improvement of 0.4 percent while OECD's score dropped by 1.9 percent. Substantial improvements can also be seen in the UNCTAD shipping connectivity index which has increased by 5.2 percent since 2016.

Despite these improvements, financing gaps often pose challenges in pursuing infrastructural development. Private investments can go a long way towards bridging them, hence the use of PPP is recommended to ensure the delivery of quality infrastructure and infrastructure services[16]. Nevertheless, developing economies tend to face challenges in attracting private investments through PPPs. According to McKinsey[17], only 7.5 percent of infrastructure in developing economies is accounted for by PPPs while this value can be as high as 15 percent in industrialised economies.

APEC has several initiatives that focus on PPP issues, for example, the Investment Experts' Group published a Guidebook on PPP Frameworks in the APEC Region to provide a general overview of the processes and requirements to initiate a PPP project[18]. Furthermore, a self-funded project to improve cooperation and regulatory coherence among government agencies, trade associations and private companies to enhance PPPs was undertaken in 2018[19]. APEC economies' performances across all aspects measuring transparency in the PPP cycle except for 'publishing PPP procurement notice online' have been better than the world average[20] (Figure 1). In particular, APEC economies have performed much better than the global average, for the following items: (a) Standardised PPP contract; (b) Online PPP contract publication; and (c) Online PPP construction information publication. Improvement in the TI corruption index, although marginal, shows that APEC economies have been able to at least maintain their standing.

[16] World Bank. 2018b.

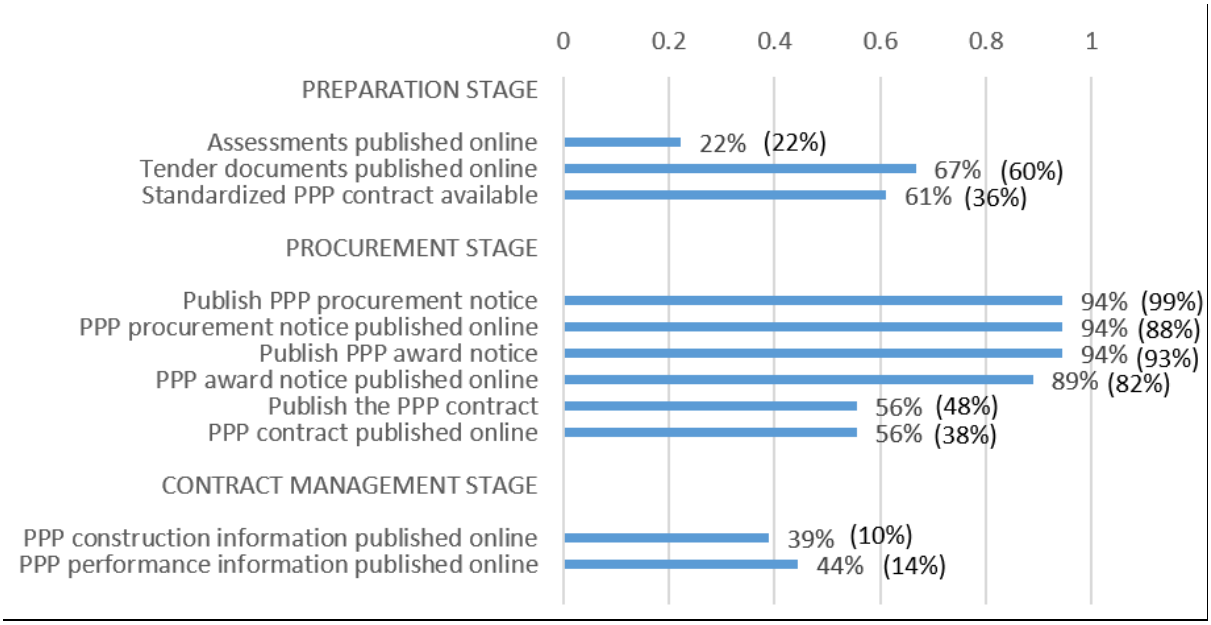
[17] McKinsey Global Institute, "Bridging Global Infrastructure Gaps" (McKinsey & Company, 2016).

[18] http://publications.apec.org/Publications/2015/07/Guidebook-on-PPP-Frameworks-in-the-APEC-Region

[19] https://aimp2.apec.org/sites/PDB/Lists/Proposals/DispForm.aspx?ID=2090

[20] Based on 135 economies as reported in the Procuring Infrastructure Public-Private Partnerships Report 2018.

Figure 1: Transparency in the PPP project cycle among APEC economies



Source: World Bank Procuring Infrastructure Public-Private Partnerships Report 2018 and APEC PSU calculations. Data for Brunei Darussalam; Hong Kong, China; and Chinese Taipei are unavailable.
Note: Averages based on 135 economies provided in brackets next to the APEC figures.

APEC's infrastructure needs are expected to rise sharply over the next decade. Between 2010 and 2015, the region's infrastructure needs reached USD 1.3 trillion per annum and are expected to rise to USD 2.5 trillion per annum by 2030. The largest investment needs are within the transport (road and rail), energy and telecommunication sectors. Transport infrastructure needs, in particular, are predicted to rise by 25 percent by 2030. Moreover, infrastructure gaps are not uniform across APEC economies. Large variations are noted, ranging from a low of USD 7.5 million to a high of USD 102 billion in 2017[21]. Key drivers contributing to the region's increasing infrastructure needs include population growth, ageing population, increasing connectivity needs, and lack of crisis-ready and ageing infrastructure[22]. Hence, greater investments and structural reforms to mobilise both public and private capital in the region are necessary. The small but positive changes in all indicators in this chokepoint indicate that APEC economies are heading in the right direction, however, they may need to speed up reforms in order to adequately meet the high future needs.

D. CHOKEPOINT 3: Unreliable Logistics Services and High Logistical Costs

Table 4. List of external indicators under Chokepoint 3

No.	Indicators	APEC average 2015/16	APEC average 2017/18 or latest	% of improvement (% of change)	General remarks
3.1	LPI Overall Index	3.4	3.4	-0.6%	Slightly worsened

[21] Ibid.

[22] https://www.apec.org/Publications/2018/11/2018-APEC-Economic-Policy-Report [accessed 10 July 2019].

No.	Indicators	APEC average 2015/16	APEC average 2017/18 or latest	% of improvement (% of change)	General remarks
3.2	DHL Connectedness Index	61.1	61.5	+0.5%	Slight improvement
3.3	LPI ease of arranging competitively priced shipments	3.3	3.2	-1.9%	Worsened
3.4	LPI competence and quality of logistics services	3.3	3.4	+0.3%	Slight improvement
3.5	LPI ability to track and trace consignments	3.5	3.4	-1.1%	Worsened
3.6	LPI timeliness of shipments in reaching destinations within the scheduled or expected delivery time	3.7	3.7	-0.9%	Worsened
3.7	LPI shipments meeting quality criteria (%)	79.3%	83.9%	+5.7%	Strong improvement
3.8	LPI lead time to import (days)	3.4 days	3.3 days	-3.6%	Significant improvement
3.9	LPI lead time to export (days)	2.4 days	2.3 days	-2.8%	Significant improvement

Source: World Bank LPI 2016 and 2018 reports; and DHL Global Connectedness Index 2018 database.
Note: The raw figures for LPI Overall Index are 3.38 for 2015/16 and 3.36 for 2017/18, and LPI timeliness of shipments in reaching destinations within the scheduled or expected delivery time for 2015/16 is 3.74.

The third chokepoint addresses logistics services with the objective of promoting innovation and competition in the logistics sector. This chokepoint discusses the inefficiencies brought about by unreliable logistics services and high logistical costs. Indicators included within this chokepoint are from the World Bank LPI and DHL Connectedness Index. The indicators will be used to assess the time, cost and efficiencies involved in the logistics of trading as well as global connectedness.

Apart from transportation costs, logistical costs may also include administrative and inventory costs, termed as other logistical costs. The WTO observed that other logistical costs may account for a higher percent of sales compared to transport costs; other logistical costs hence account for a substantial portion of total logistical costs[23]. The 2018 LPI report[24] highlighted that the cross-cutting nature of logistics as a policy area means "that logistics is not just about connecting infrastructure but encompasses regulation of services, sustainability, and resilience, or trade facilitation" (page iii). The reliability of the supply chain is hence also strongly correlated to the performance of logistical services other than transportation.

[23] World Bank, 2015.

[24] World Bank. 2018a.

Predictability of the supply chain is especially important as global value chains attempt to improve their competitiveness by adopting just-in-time production practices. These practices call for certain and undisruptive lead times. Moreover, in today's highly interconnected supply chains, a tiny delay in one link can have large costly implications elsewhere along the supply chain. Measures taken by APEC economies to improve efficiency have enabled reductions in import and export lead times by 3.6 percent and 2.8 percent, respectively since 2016. These reductions contribute to ensuring efficient and predictable logistical services for competitive trade.

A recently growing concern in the area of logistics is the lack of logistics skills. The 2018 LPI report[25] flagged it as one of the eight important characteristics that will impact the future of logistics. A 2016 report by PwC also emphasised that the lack of a digital culture and training are the biggest challenges faced by transportation and logistics businesses[26]. The lack of logistics skills is of particular concern since more and more respondents claimed to prefer quality over speed of delivery and are willing to pay a premium for it. In such instances, logistics skills are important to drive improvements in quality of delivery. Since logistics is a labour intensive occupation, training and retention of staff is important. Developing economies however, lag in this area due to low training budgets and lack of vocational schools. Furthermore, retention of staff is an issue because of the inferior status of the occupation. Short supply of logistics-related labour is expected to be a general problem across both developing and industrialised economies over the next five years[27].

The lack of logistics skills may also prevent the progress of innovation in the logistics sector which may in turn hinder competition and efficiency. Manyika et al. (2017)[28] showed that there is a 60 percent automation potential in transportation and warehousing, putting a large number of jobs at risk. While it may take decades for automation's complete effect on trade activities to play out, changes at the micro level may be felt more quickly, for example, by a worker whose activities are automated or a company whose industry is disrupted by competitors using automation.

McKinnon, et. al. (2017, p. xvii) highlighted the following public interventions that may leverage logistics competence[29]:

- Wider access to training through public provision or financial support
- Education and curricula reform
- Stronger public private dialogue and multi-stakeholder collaboration
- Better regulation of freight and logistics services
- Setting and harmonising competence standards
- Linking investment in human capital with the development of logistics and freight infrastructure

[25] World Bank. 2018a.

[26] PwC. 2016.

[27] McKinnon, Alan, Christoph Flöthmann, Kai Hoberg, and Christina Busch. 2017.

[28] Manyika et al. 2017.

[29] McKinnon, Alan, Christoph Flöthmann, Kai Hoberg, and Christina Busch. 2017.

The APEC Occupational Standards Framework has considerably promoted training in the logistics sector by developing occupational standards and aligning training to the needs of the industry. Improvements have also been noted in the external indicators. There was a 0.3 percent increase in the competence and quality of logistics services score in the APEC region. Additionally, percentage of shipments meeting quality criteria increased by 5.7 percent.

The global connectedness of APEC economies in terms of international flows of products and services, capital, information, and people as measured by the DHL Connectedness Index has registered an improvement of 0.5 percent since 2016. On the other hand, the overall logistics performance index for APEC has reduced slightly by 0.6 percent. Thirteen APEC economies noted reductions in their logistics performance indices between the range of 0.04 points and 0.34 points. Much of this may be due to inefficiencies in handling shipments as can be interpreted from the indicators that measure the ability to track consignments, meet delivery schedules and arrange competitively priced shipments. All these three indicators have declined by 1.1 percent, 0.9 percent and 1.9 percent, respectively. These decreases are however not exclusive to APEC and have been noted for OECD economies as well. The reductions in the OECD averages were larger at 2.9 precent, 2.3 percent and 3.3 percent, respectively.

Logistics performances may further worsen due to poor resilience of supply chains to cyberattacks. Significant disruptions to global physical supply chains were reported after a cyberattack in mid-2017[30]. Moreover, a risks perception survey conducted by the World Economic Forum noted that 80 percent of respondents expect cyberattack (disruption to operations and infrastructure) risks to rise in 2019[31]. Disruptions to supply chains due to environmental factors have also been a growing concern[32]. Consequently, supply chain resilience has been identified as a megatrend and policy concern in the 2018 LPI report. Several APEC working groups like the Emergency Preparedness Working Group and the Transportation Working Group have hosted multiple workshops to promote and discuss measures for better resilience of the supply chain[33].

APEC's performance in providing efficient and price-competitive logistics services is mixed. While the lead times to import and export have improved, the efficiency of handling shipments has declined. This decline was mirrored by the OECD but on a larger extent, despite registering improvements between 2014 and 2016. These trends lead to the consideration that perhaps external threats to supply chain resilience may have significant impacts. Work on supply chain resilience within APEC could provide opportunities to better understand the risks involved and subsequently enable formation of fitting policies.

[30] World Bank. 2018a. See also: https://www.supplychaindigital.com/scm/cyber-attacks-supply-chains-significantly-2017

[31] WEF. 2019.

[32] World Bank LPI. 2018.

[33] https://aimp2.apec.org/sites/PDB/Lists/Concept%20Notes/DispForm.aspx?ID=220; https://aimp2.apec.org/sites/PDB/Lists/Proposals/DispForm.aspx?ID=1758; https://aimp2.apec.org/sites/PDB/Lists/Proposals/DispForm.aspx?ID=2096.

E. CHOKEPOINT 4: Limited Regulatory Cooperation and Best Practices

Table 5. List of external indicators under Chokepoint 4

No.	Indicators	APEC average 2015/16	APEC average 2017/18 or latest	% of improvement (% of change)	General remarks
4.1	TFI on information availability	1.7	1.5	-9.6%	Worsened
4.2	TFI on involvement of trade community	1.5	1.5	+1.0%	Slight improvement
4.3	TFI on Internal border agency cooperation	1.6	1.2	-23.2%	Worsened
4.4	TFI on External border agency cooperation	1.5	1.2	-17.7%	Worsened

Source: OECD Trade Facilitation Indicators database.
Note: The raw figure for TFI on involvement of trade community for 2015/16 is 1.49.

The fourth chokepoint particularly focusses on cross-economy cooperation issues like regulations and information sharing with the objective of promoting better regulatory coordination and cooperation among trade authorities and with private stakeholders. All the indicators in this chokepoint are from the OECD Trade Facilitation Indicators (TFI). The indicators look at four areas of cooperation, namely, information availability, trade community involvement and internal and external border agency cooperation. The OECD considers measures within these indictors to contribute significantly towards improving trade flows[34].

Information availability relays to the easy access of information that will make customs procedures simpler and faster. This may include information on import and export procedures, summary guides, penalties for non-compliance and legislations, among others. While some of this information is readily available online, information on penalties and judicial decisions are usually not[35]. APEC economies have not fared very well in this area since 2016. In the previous assessment[36], the score had improved by 14.6 percent between 2012 and 2015, however, a drop of 9.6 percent was registered in 2017. APEC economies had a higher score than OECD economies back in 2015 but the opposite is true now. When interoperability of single window systems is improved, sharing of information through cloud platforms will allow improvements in this measure.

Internal border agency cooperation is particularly useful in reducing lead times. Cooperation among border agencies that allows consolidation of documentation and inspections in a single location reduce clearance times significantly[37]. External border agency cooperation on the other hand enables easier exchange of information, greater facilitation of customs agreements and smoother joint operations, among others. Both inter- and intra-border agency cooperation

[34] Moïsé, E., T. Orliac and P. Minor. 2011.

[35] Ibid.

[36] https://www.apec.org/Publications/2017/11/Review-of-External-Indicators-for-SCFAP-II [accessed 10 July 2019].

[37] Moïsé, E., T. Orliac and P. Minor. 2011.

improvements can lead up to 2.4 percent reduction in trade costs[38]. However, APEC economies have not performed well on both these indicators particularly in the internal border agency cooperation aspect where it noted a 23.2 percent reduction since 2016. Only Korea and Peru reported improvements. As for external border agency cooperation, the average APEC score declined by 17.7 percent. All economies except for Peru; the Philippines; and Singapore noted reductions in their external border agency cooperation values.

The last indicator to consider is the level of involvement in the trade community. The more information and power is shared among stakeholders, the higher the score. In international trade, the relevant stakeholders may include large and small traders, customs brokers, logistics staff, citizens and others. Of these stakeholders, citizens usually feel the least involved in the trade community, however, OECD asserts that this should not be viewed as a lack of transparency but rather as a lack of interest[39]. This is the only indicator within this chokepoint that has noted an improvement, albeit a small one.

On the whole, APEC economies' performance within this chokepoint has worsened. In contrast, OECD's performance has been more mixed. It has achieved better scores on access to information availability, specifically a 9 percent improvement during the period. Moreover, its work on adopting best practices principles on stakeholder engagement and developing collaborative guidelines have enabled the same increase in the involvement in trade community indicator. However, its performance with respect to internal and external agency cooperation has worsened as has APEC's. Adoption of new technologies and improved efforts to harmonise legislations and procedures can go a long way in improving trade facilitation. APEC provides a convenient platform to address this chokepoint by facilitating discussions on regulatory concerns and also sharing best practices.

F. CHOKEPOINT 5: Underdeveloped Policy and Regulatory Infrastructure for E-commerce

Table 6. List of external indicators under Chokepoint 5

No.	Indicators	APEC average 2015/16	APEC average 2017/18 or latest	% of improvement (% of change)	General remarks
5.1	UPU Integrated Index for Postal Development	56.9	55.8	-2.0%	Worsened
5.2	UNCTAD Availability of legal and regulatory framework	All APEC economies are equipped with the basic legal and regulatory frameworks.			
5.3	UNCTAD B2C E-Commerce Index	71.3 (2016)	73.7 (2017)	3.4%	Significant improvement

Source: UPU Integrated Index for Postal Development 2016 and 2018; UNCTAD Global Cyberlaw Tracker database; and UNCTAD B2C E-Commerce Index 2017 and 2018.

[38] https://www.wto.org/english/news_e/brief_tradefa_e.htm [accessed 10 July 2019].

[39] Moïsé, E., T. Orliac and P. Minor. 2011.

E-commerce is growing at an unprecedented rate worldwide, as such, there is an urgent need to develop policies and infrastructure to support this massive growth. The fifth and last chokepoint addresses this issue by evaluating the status of policy and regulatory infrastructure for e-commerce in the region with the objective to streamline procedures, and improve supply-chain visibility and collaboration in e-commerce. Within this chokepoint, there are three measures which use indicators from Universal Postal Union (UPU) and UNCTAD.

E-commerce is growing significantly and accounts for a large part of total retail sales. In 2017, e-commerce driven retail sales totalled USD 2.3 trillion and accounted for 10.2 percent of total retail sales[40]. Given the recent global e-commerce trends which noted an increase of 24.8 percent between 2016 and 2017[41], an increasing number of consumers in the region are expected to purchase goods and services online. Almost 40 percent of adults in APEC economies used the internet to buy something in 2017[42].

The improved ability of small and large businesses to sell in global markets have resulted from the wide reach of internet services, increasing mobile phone ownerships and availability of more payment options. Based on data from the International Telecommunication Union (ITU), between 2010 and 2017, the APEC average for people using the internet increased by 47.8 percent, hence providing greater e-commerce opportunities. In the 2018 Chair's Era Kone Statement, efforts to take the internet to remote areas to improve participation in the digital economy were encouraged. Based on these trends, the percent of people having internet connectivity is expected to increase in due time. As for ownership of credit cards, World Bank data show that the average for the region has grown by 41.7 percent over the past six years since 2011. There has also been a significant change in the provision of secure servers to carry out safe online transactions. The number of secure internet servers per million people averaged at 423 in 2010 but as of 2018 this number had reached 14,541. This registers a growth of 3,337.9 percent, slightly higher than the 3,212.6 percent growth the world average experienced during the same period.

Another important e-commerce trend is the growth of mobile commerce which according to eMarketer (2018) now accounts for 58.9 percent of all e-commerce spending. Contributions by mobile commerce within e-commerce are expected to jump up by 14 percentage points by 2021. Data limitations prevent the creation of an APEC average, however, analysis of nine APEC economies shows that domestic growth in mobile money accounts ranged between 7 percent and 604.8 percent between 2014 and 2017.

As e-commerce booms, there is a need for reliable and resilient delivery systems. An integrated postal system would support this increasing demand for e-commerce. The UPU Integrated Index for Postal Development measures the performance of postal development across four aspects — reliability, reach, relevance and resilience[43]. APEC economies' performance in this regard has dropped by 2 percent, posing challenges in ensuring access to well-equipped infrastructure to support the growing e-commerce in the region. Of the 19 APEC economies for which there is data, 12 economies experienced decreases in their postal development index.

[40] eMarketer. 2018.

[41] Ibid.

[42] World Bank Global Findex database.

[43] UPU. 2018.

The reductions in the index varied greatly with the smallest decrease being 0.04 points and the largest being 9.53 points. However, since postal services no longer just deliver letters but may also provide financial, e-government and healthcare services, their role in the global economy has become increasingly pertinent. These services are supported by a global network of over 677,000 post offices and 5.32 million staff and infrastructure.

Several APEC economies have adapted their postal service systems to accommodate new market demands. For example, New Zealand Post facilitates e-commerce by providing collection and drop off services in their domestic network of 240 locations as well as other logistics services for sellers that include warehousing, packing and shipping[44]. There are also good business opportunities to be realised from e-commerce by improving postal services as shown by the e-commerce giant Alibaba's investment in Singapore Post (SingPost), which reported that over half its revenue was e-commerce related in 2018 (UNCTAD, 2018). Alibaba not only invested SGD 312.5 million in SingPost in 2014, it also subscribed for a 34 percent stake (SGD 86.2 million) in Quantium Solutions International, SingPost's e-commerce logistics unit in 2016[45].

The adaptation of postal service systems will provide e-commerce opportunities for smaller businesses. The more integrated and efficient the postal system, the more affordable it will be for MSMEs to expand their businesses to a global pool of clientele[46], hence providing significant benefits to many APEC economies. Thailand Post has launched an online shopping portal and e-wallet to leverage its postal reliability (UNCTAD 2018). It invested THB 10 million in the shopping portal to help local communities sell their products in a digital marketplace. Thailand Post is expecting about 12,000 stock-keeping units of locally made products and THB 200 million (US$6.2 million) in sales revenue through the website within a year[47].

The UPU report also highlighted the significant role the postal sector played in enabling a quicker recovery in the aftermath of natural disasters in Chile; Japan; and the United States. Hence, improvements in the UPU Integrated Index for Postal Development will improve not only access to e-commerce opportunities, but also access to the numerous services a post office now provides. In general, APEC provides opportunities for improvement within this area by providing a platform to share best practices, wherein less experienced economies could gain from others' success stories in improving postal infrastructure and services.

APEC economies have made strong improvements with respect to the legal and regulatory aspects of conducting e-commerce. All APEC economies with available data (Table 7) are now well-equipped with the necessary basic legal frameworks related to cybercrime, consumer protection when making online purchases, regulating recognition of electronic transactions, and data protection and privacy legislations. Globally, 79 percent of economies have e-

[44] UNCTAD B2C E-commerce Index 2018, p.5.

[45] https://www.straitstimes.com/business/alibaba-can-proceed-with-raising-singpost-stake [accessed 1 August 2019].

[46] Donohoe, Paul. 2013.

[47] https://www.retailnews.asia/thailand-post-to-launch-e-commerce-service-offering-local-products/ [accessed 1 August 2019].

transactions laws; 52 percent of economies have consumer protection laws; 58 percent of economies have privacy laws; and 72 percent of economies have cybercrime laws[48].

Table 7. Adoption of e-commerce legislation in APEC economies (number of existing regulation)

Economy	E-transaction	Cybercrime	Consumer Protection	Data protection and privacy
Australia	1	5	1	1
Brunei Darussalam	1	3	3	NA
Canada	2	2	1	1
Chile	2	2	1	1
China	1	1	2	1
Indonesia	1	1	1	1
Japan	1	1	NA	1
Korea	2	4	1	1
Malaysia	4	3	2	1
Mexico	4	1	1	1
New Zealand	1	1	2	1
Peru	1	1	1	1
The Philippines	1	1	1	1
Russia	2	1	NA	1
Singapore	1	1	1	1
Thailand	1	1	5	1
United States	1	2	1	1
Viet Nam	1	1	1	1

Source: UNCTAD Global Cyberlaw Tracker database.
Note: There is no data for Hong Kong, China; Papua New Guinea; and Chinese Taipei.

The UNCTAD B2C e-commerce index assesses the preparedness of an economy to support B2C online transactions (e.g. internet connectivity, e-payment access and delivery). In addition to reliable postal delivery, this index analyses the number of people with internet connections, financial accounts and secure internet servers. An overall strong improvement of 3.4 percent was noted for APEC economies. As shown in Table 8, the progress of the individual B2C e-commerce index component is the strongest for share of individuals using the internet and having financial accounts. Less progress is recorded for the UPU postal reliability score. The UNCTAD 2018 report noted that there were significant fluctuations in the scores in 2017 due to the growing parcel volumes from increased online shopping. There is a need for further adjustments and capacity building among postal operators to handle the increasing load. Kommerskollegium (2012) highlighted that customs procedures are faced with a tremendous challenge when handling large number of shipments with small consignments. This may put an additional burden and serve as a barrier for SMEs in accessing certain markets.

Table 8. Components of UNCTAD B2C e-commerce index in APEC, 2016-2017

UNCTAD B2C e-commerce index components	Progress between 2016-2017
Share of individuals using the Internet	5.6%
Share of individuals with an account (15+)	4.7%

[48] Source: https://unctad.org/en/Pages/DTL/STI_and_ICTs/ICT4D-Legislation/eCom-Global-Legislation.aspx [accessed 25 September 2019].

Secure Internet servers per 1 million people (normalised)	2.2%
UPU postal reliability score	0.8%
Index value	3.4%

Source: UNCTAD B2C E-Commerce Index 2017 and 2018.

The negative performance of APEC economies in the UPU index call for more efforts within APEC to improve postal services and infrastructure. Several APEC initiatives are already in place to enhance infrastructure and regulations for e-commerce. Viet Nam hosted a workshop on e-commerce regulatory infrastructure in 2018. The APEC Internet and Digital Economy Roadmap also aims to address constraints and improve e-commerce facilitation[49]. To improve transparency of regulations, a survey was conducted in 2018 to collect information on domestic measures and policies aimed at promoting e-commerce across APEC economies. The findings of this survey were published on the APEC Trade Repository (at website: http://tr.apec.org/)[50].

However, in addition to improving infrastructure and regulations, APEC economies face new challenges posed by data localisation requirements. Governments may want to regulate data to ensure better data privacy and security, address domestic security concerns, and enable the local economy to gain from jobs and innovation that the digital economy brings. However, from a business perspective, data localisation may be less beneficial. Confining data within an economy can negatively impact businesses that use the internet, either for production, delivery or payment. Bauer et al. (2014) estimated substantial drops in GDP in the range of 0.1 and 1.7 percent across the seven economies studied.

G. CONCLUSION

APEC's commitment to the second phase of the Supply-Chain Connectivity Framework Action Plan 2017-2020 (SCFAP-II) is apparent from the numerous projects and initiatives that have been undertaken to address each chokepoint. The number of initiatives under each chokepoint varies. The 2018 stock-take shows that while chokepoint 3 had three relevant initiatives listed under it, chokepoint 1 had 15 initiatives. These initiatives ranged from surveys and studies to workshops and capacity building projects.

APEC's performance based on the review of relevant external indicators shows clear signs of progress, despite a few remaining gaps. Results have been rather mixed since the 2017 review[51] of the indicators. Performances under the first and second chokepoints addressing development of border management and clearance, and accessibility of quality transportation infrastructure and services, have been overall positive. The results of indicators within chokepoint 3, which addresses the performance of logistics services, are rather mixed with only minimal changes, positive or negative. Similarly, chokepoint 5 on e-commerce facilitation has shown improvements in two of the three relevant indicators. However, on average, APEC economies have performed quite poorly on chokepoint 4. Majority of the indicators measuring regulatory cooperation have recorded substantial drops in performance.

[49] https://www.apec.org/-/media/Files/Groups/ECSG/17_csom_006.pdf [accessed 10 July 2019].

[50] [accessed 10 July 2019].

[51] https://www.apec.org/Publications/2017/11/Review-of-External-Indicators-for-SCFAP-II [accessed 10 July 2019].

To provide an overall analysis of the relative performance of APEC economies, Appendix A presents APEC economies' global ranking on selected key indicators. The colour scheme identifies economies that have achieved higher, lower, or the same ranking in 2018 (or the year with latest available data) as compared to 2016.

Significant improvement is observed in the rankings of APEC economies for LPI, as 11 of the 21 economies have moved higher up in the ranks. However, there are only two APEC economies in the top ten of LPI 2018 as compared to three in LPI 2016.

In terms of the Ease of Doing Business Index, APEC's relative performance is mixed, with nine economies having higher rankings and two economies retaining their positions in 2018. The two economies that have retained their ranks are also among the top 10 economies with the highest scores in the Ease of Doing Business Index worldwide.

Measurements related to connectivity, specifically the UNCTAD Liner Shipping Connectivity Index, show improvements with eight economies attaining higher ranks and another eight economies maintaining their standing. On the other hand, APEC's performance is less impressive for the DHL Connectedness Index. In this case, only six APEC economies have managed to improve their rankings.

Strong performance is seen in the UNCTAD B2C e-commerce index. Fourteen APEC economies have improved their rankings, while three economies have slipped from their ranks in the previous year.

Last but not least, the review of APEC's progress in SCFAP-II has identified a number of key policy issues and challenges to improve supply chain connectivity. They are as follows:

1. **Adoption of automation**
   Supply chain visibility and efficiency can be largely improved by automating customs and other border management processes. This can be seen from the significant decreases in time and money spent on automated processes involving customs checks, and exchange of documents on single window systems, among others. World Bank data have shown that full-time automated processing systems for customs agencies have shorter export border compliance time: less than 50 hours – compared with spending almost 100 hours where such automated systems were not being applied. The future Tuas mega port plan in Singapore includes a fleet of automated guided vehicles along with automated yard cranes and quay cranes in efforts to grow the industry's added-value to SGD 4.5 billion and create over 5,000 jobs by 2025[52]. However, digitising of procedures across the supply chain is faced with its own set of challenges like lack of digital infrastructure, harmonisation of procedures and documents, and mechanisms for data security.

[52] https://www.straitstimes.com/business/economy/port-will-tap-tech-data-to-optimise-ops [accessed 15 July 2019].

2. **Harmonisation of regulations, standards and legislation**
   Harmonisation of regulations and standards reduces the amount of time spent on checks at the border. As previously mentioned, the harmonisation of sanitary and phytosanitary certifications will quicken inspection processes. The lack of harmonisation of procedures not only lengthens the time spent at the border but also prevents economies from implementing an interoperable single window system. E-commerce legislation harmonisation in certain key areas such as cybercrime, consumer protection and electronic signatures would also strengthen the regional economic integration process[53].

3. **Lack of logistics skills**
   The lack of relevant training to logistics staff is another important challenge faced by businesses along the supply chain. On an operational level, logistics is a relatively labour intensive industry and hence the performance of logistics workers is very important to maintain the quality of service. However, there is a lack of supply of qualified logistics workers which makes achieving cheap and reliable logistics services challenging.

4. **Financial constraints**
   Lack of funds to develop necessary infrastructure and train logistics-related labour pose constraints to achieving smooth supply chain functions. While the use of PPP to fund infrastructural development is recommended, some projects may be less easy to finance or implement depending on the monetary, social or political risks involved[54]. Retaining workers after training can also be difficult given the low status and earnings of logistics-related jobs.

5. **Resilience of supply chains**
   Lastly, domestic and global supply chains have been hindered by natural disasters and cyberattacks. Damages caused to physical infrastructure by tsunamis and volcanic eruptions and to digital infrastructure through cybercrime have become an increasing concern among respondents of the LPI survey. A lot of work has to be done by firms to improve their cyber security and in general make their supply chains more resilient to similar threats.

[53] https://asean.org/storage/2019/01/UNCTAD-Review-of-e-Commerce-Legislation-Harmonisation-in-ASEAN-2013.pdf [accessed 10 July 2019].

[54] https://ppp.worldbank.org/public-private-partnership/overview/ppp-objectives [accessed 10 July 2019].

H. GLOSSARY

AEO	Authorised Economic Operators
APEC	Asia Pacific Economic Cooperation
APMEN	Asia Pacific Model E-Port Network
B2C	Business-to-Consumer
CTI	APEC Committee on Trade and Investment
DB	Doing Business Report developed by the World Bank
DHL	Deutsche Post AG
DTF	Distance to Frontier
ITU	International Telecommunication Union
LPI	The Logistics Performance Index developed by the World Bank
OECD	Organisation for Economic Co-operation and Development
PPP	Public-Private Partnership
SCFAP-II	Supply-Chain Connectivity Framework Action Plan II
TFI	Trade Facilitation Indicator developed by Organisation on Economic Co-operation and Development
TI	Transparency International
UNCTAD	United Nations Conference on Trade and Development
UPU	Universal Postal Union
WEF	World Economic Forum

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Appendix A. Ranking on selected key indicators, by APEC economy

Economy	Logistics Performance Index		Ease of Doing Business		UNCTAD Liner Shipping Connectivity Index		DHL Connectedness Index		B2C E-Commerce Index	
	2018 or latest	2015/16	2018 or latest	2015/16	2018 or latest	2015/16	2018 or latest	2015/16	2018 or latest	2015/16
AUS	18	19	18	15	47	48	33	32	11	14
BD	80	70	55	80	127	142	79	77	…	…
CDA	20	14	22	21	37	33	37	36	14	15
CHL	34	46	56	50	44	44	51	49	50	54
PRC	26	27	46	79	1	1	61	62	63	65
HKC	12	9	4	5	6	6	18	15	15	16
INA	46	63	73	81	35	35	111	105	90	101
JPN	5	12	39	31	16	13	42	40	24	8
ROK	25	24	5	3	3	3	16	18	21	5
MAS	41	32	15	24	4	4	12	12	34	39
MEX	51	54	54	44	33	34	68	74	95	90
NZ	15	37	1	1	53	45	38	37	9	10
PNG	148	105	108	106	93	89	157	162	…	…
PE	83	69	68	61	38	40	69	66	94	94
PHL	60	71	124	123	57	59	52	55	92	96
RUS	75	99	31	34	41	37	54	54	42	43
SGP	7	5	2	2	2	2	2	2	2	18
CT	27	25	13	14	12	14	24	21	…	…
THA	32	45	27	47	25	36	25	25	43	49
USA	14	10	8	6	5	5	30	31	13	26
VN	39	64	69	72	18	19	39	38	69	74

Source: [accessed 10 July 2019]
https://lpi.worldbank.org/international/global (LPI 2016 and LPI 2018 data);
https://www.doingbusiness.org/en/rankings (DB 2017 and DB 2019; using DB17-19 methodology);
https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=92;
https://www.dpdhl.com/en/media-relations/specials/global-connectedness-index.html; and
UNCTAD B2C e-commerce index 2017 (based on 2016 data) and 2018 (based on 2017 data).
As a common practice, a report published in a particular year may use data from the previous year.
Legend: [green] higher ranking; [red] lower ranking; [yellow] no change