



# Chapter 5

## Digital Connectivity

**Lurong Chen**

*Senior Economist, ERIA*


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## Introduction

Digitalisation is transforming the global economy. Various factors have laid a solid foundation for economic digitalisation, such as high-speed Internet, the use of smartphones, the facilitation of online payments, changes in consumer behaviour, and service sector liberalisation. Digitalisation is disruptive to the traditional ways of doing business by introducing new digital tools, such as artificial intelligence (AI), cloud computing, big data, and machine learning, to the market (Chen and Kimura, 2019). For instance, digitalisation tends to lower market entry barriers and enable companies to tap into foreign markets that would otherwise be too difficult or too costly to access. This could be realised not only by reducing transaction and delivery costs, but more importantly, through greater international diffusion of information that allows firms to explore new markets globally.

In the literature, Baldwin (2016) has explained the economic logic of the way digitalisation – the development of information and communication technology (ICT) – could lead to a new pattern of globalisation (the 'third unbundling') characterised by a new type of international division of labour, which would create strategies for national development. Therefore, digital connectivity will significantly affect a nation's overall economic performance. Based on this, Kimura (2018) proposed a policy framework mapping the stages of technological progress and the possible choices of development strategies. Kimura and Chen (2018) applied this policy framework to an analysis of the development strategy of Indonesia's economy. Their findings show that for large countries such as Indonesia, given the existence of development gaps within the country, digitalisation could expand the policy space and allow policymakers to adopt diversified strategies to promote economic development. For regions with significant diversity, this sheds lights on regional development patterns.

In this regard, digitalisation will have important implications for Asia's development. The next Asian growth miracle could be born with the region's transformation to the new digital era, whose new ideas, technologies, mindset, tools, and businesses are changing the way people live, work, and study. For instance, the Association of Southeast Asian Nations (ASEAN) and East Asia has the world's fastest-growing online market, with an internet user base of more than 350 million and an overall market size of \$72 billion in 2018. Google and Temasek (2019) projected that the regional e-commerce market would keep growing at an average rate of 25%–35% per year in the next 5–10 years. From 2017 to 2025, the market size of online business will increase by a factor of five (Statista, 2019). In ASEAN, the annual growth of e-commerce revenue relative to regional gross domestic product (GDP) growth is projected to be twice as much as the ratio of global e-commerce revenue growth to world GDP growth.



The ASEAN Economic Community (AEC) Blueprint 2025 (ASEAN, 2015) and ASEAN Socio-Cultural Community Blueprint 2025 (ASEAN, 2016) highlighted the importance of incorporating economic digitalisation in ASEAN's development. To realise the potential of fast growth, many tasks must be completed. A fundamental task for ASEAN is to improve digital connectivity, which, as the International Telecommunication Union (ITU) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) (2019) argued, requires 'efforts to promote the benefits of online participation while mitigating the potential downsides' (ITU and UNESCO, 2019: ix).

For many developing countries, infrastructure remains one of the main barriers to the development of the digital economy. During the coronavirus disease (COVID-19) pandemic, when many countries implemented social distancing or lockdown measures to limit mobility and prevent the spread of the virus, digital solutions provided an effective backup to government policies and actions. In many areas, online solutions proved to be an efficient substitute for offline practices – from doing business online to working and studying from home.

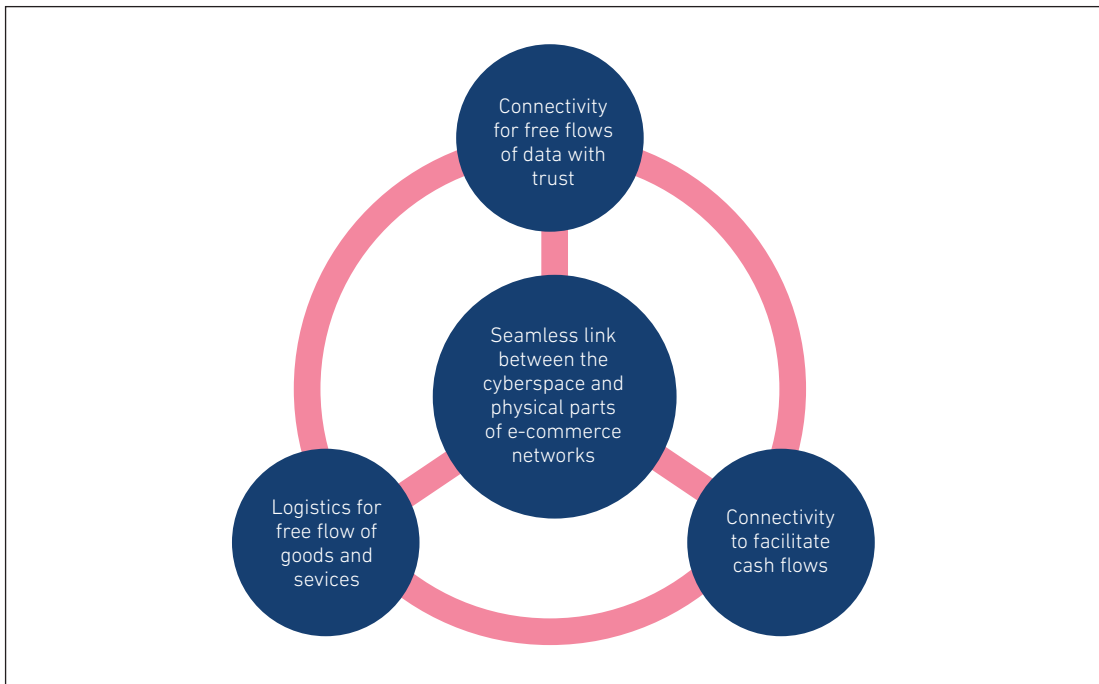
Let us take the growth of e-commerce as an example. Since 2015, e-commerce markets in ASEAN have grown at a compound annual growth rate of 20%. During the COVID-19 pandemic, the world's total e-commerce revenue was estimated to have increased 25% from 2019 to 2020, while that of ASEAN increased by more than 40%. In ASEAN, nearly 40 million new e-commerce users entered the market in 2020. Online services boomed quickly in the region. The online food delivery market was estimated to grow by more than one-third from 2019 to 2020, driven mainly by the Platform-to-Customer commerce.

As more offline activities switched online, the importance of digital connectivity was highlighted. For that reason, digital connectivity is a vital element of the Comprehensive Asia Development Plan 3.0. This chapter provides insights into digital connectivity by (i) examining the general development status of digital connectivity in the region, showing both the progress and the weaknesses; and (ii) discussing the importance of rules and regulations in facilitating digital connectivity, especially the vitality of free flow of data with trust within the region.

# The Status of Digital Connectivity in ASEAN

According to Chen (2017, 2019), when considering digital connectivity, one needs to think of the following four types of links: (i) data connectivity, (ii) logistics, (iii) financial connectivity, and (iv) seamless links between the cyberspace and the physical parts of the network (Figure 5.1).

**Figure 5.1 A Framework of Digital Connectivity**



Source: Chen (2020: Figure 3).

First, the development of e-commerce demands more stable and affordable internet connections at higher speeds. Second, the digital society is a combination of physical space and cyberspace. For instance, while e-commerce allows people to do business online, logistics are still needed to deliver the traded products. Therefore, logistics is still a compulsory part of digital connectivity. In addition, obstacles posed by poor quality roads, incomplete road and railway networks, inadequate ports, and energy supply issues will hinder the development of the digital economy. Third, the financial sector will play an unreplaceable role in the resource allocation of the digital economy, even in a cashless society. Fourth, when thinking of digital connectivity as an integrated ecosystem, there is a need to link up different parts of the network and smoothen its overall function.

## Data Connectivity

Compared with the world average, the general quality of regional internet infrastructure in ASEAN appears to be satisfactory. However, wide development gaps exist in ICT-related infrastructure across and within countries. For instance, the entry-level broadband connection in Singapore is much faster than that of the CLM countries – Cambodia, the Lao People’s Democratic Republic (Lao PDR), and Myanmar. The average internet connection speeds in the region range from 20.3 megabits per second (Mbps) in Singapore, ranked seventh globally, to 5.5 Mbps in the Philippines, ranked 100th. The peak internet connection speed in the region ranges from over 180 Mbps in Singapore, the world’s number 1, to 42 Mbps in the Philippines, number 97. In many countries, getting connected to the internet in rural areas or remote villages is not as easy as in urban areas. More insights can be gained from the following five aspects: (i) network coverage, (ii) speed of internet connection, (iii) affordability, (iv) content, and (v) cybersecurity.

### Network coverage

According to World Bank (2019) data, the internet penetration in ASEAN Member States (AMS), measured as the number of internet users as a percentage of the total population, ranges from 22% in the Lao PDR to 81% in Singapore (Table 5.1), indicating gaps in internet access across countries. A large number of people/households in ASEAN, especially in the less developed countries, still do not have internet access.

**Table 5.1 Internet Coverage**

Country	Internet penetration (users as percentage of population)	Fixed-line subscriber penetration (per 100 inhabitants)	Mobile subscriber penetration (per 100 inhabitants)	Mobile connections (% of population)	
				3G	4G
Brunei	94.9	9.6	126.6	92.7	90.0
Cambodia	34.0	0.8	126.3	83.9	57.5
Indonesia	32.3	2.3	173.8	93.8	90.4
Lao PDR	25.5	0.4	54.1	78.0	9.0
Malaysia	80.1	8.5	133.9	96.2	92.0
Myanmar	30.7	0.2	89.8	90.5	75.1
Philippines	60.1	3.2	110.4	93.0	80.0
Singapore	84.4	25.8	148.2	100.0	100.0
Thailand	52.9	11.9	176.0	98.0	98.0
Viet Nam	49.6	10.8	125.6	95.0	95.0

Source: Author. Raw data from World Bank (n.d.), <https://databank.worldbank.org/source/world-development-indicators> (accessed 17 March 2020).

ASEAN's fixed-line broadband subscriptions are generally low. Even in Singapore, the number of subscriptions per 100 inhabitants to fixed-line broadband is lower than that of the Republic of Korea (42) or Japan (32). More people access the internet using their mobile phones, thanks to technological progress in wireless connections. In AMS, the 3G/4G network has already covered most of the population. With mobile phones supporting 3G technology (the minimum technical requirement for mobile internet use), more than 60% of people in the CLM can access the internet.<sup>1</sup> Despite this, however, some gaps in network construction remain. While most countries already have a 4G network with universal or almost universal coverage, i.e. 100% in Singapore and 98% in Thailand, the CLM countries will need to catch up more quickly with the construction of the 4G network.

An issue related to network coverage is electricity access. The coverage of internet access in a country is limited by the lower value of either network coverage or electricity access. The urban–rural gaps in electricity access seem even wider than those of internet access (Table 5.2). In Cambodia, although all urban residents have access to electricity, 80% of the population lives in rural areas where less than two-fifths have electricity access. A similarly wide urban–rural gap exists in Myanmar, which also needs to increase its urban electricity access. In these countries, including the Lao PDR, an urgent task is to resolve electricity supply problems in rural areas.

**Table 5.2 Electricity Access**

Country	Urban coverage (% of urban population)	Rural coverage (% of rural population)	Share of rural population
Brunei	100.0	100.0	22.5
Cambodia	100.0	36.5	79.1
Indonesia	100.0	94.8	45.5
Lao PDR	97.4	80.3	60.3
Malaysia	100.0	100.0	24.6
Myanmar	89.5	39.8	65.4
Philippines	96.9	86.3	55.7
Singapore	100.0	0.0	0.0
Thailand	99.9	100.0	48.5
Viet Nam	100.0	100.0	65.8

Source: Author. Raw data from ITU (2019).

<sup>1</sup> Based on the value of the 'mobile subscriber penetration (100%)' indicator (GSMA, 2019).

## Speed of network connection

In addition to coverage, the quality of the network connection is an important factor of digital connectivity. To end users, good quality means faster, more stable, and more secure connection. Table 5.3 compares the network quality across AMS based on the bandwidth capacity and the average speed of the internet connection. This reveals large gaps in the countries' bandwidth capacity.

**Table 5.3 Internet Connection Speed**

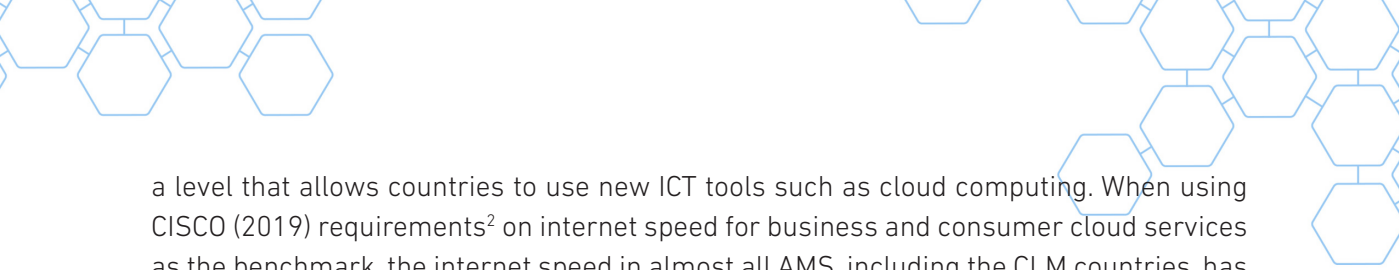
Country	Bandwidth capacity		Fixed-line connection		Mobile connection	
	Total bandwidth (Gbps) <sup>a</sup>	Per internet user (Kbps)	Average upload speed (Mbps)	Average download speed (Mbps)	Average upload speed (Mbps)	Average download speed (Mbps)
Brunei	~44	~108.2	n.a.	n.a.	n.a.	n.a.
Cambodia	102 ~ 174	19 ~ 32	16.4	13.0	8.6	7.4
Indonesia	1,784 ~ 2,072	21 ~ 25	9.9	15.6	8.4	9.5
Lao PDR	~32.2	~18.4	n.a.	n.a.	n.a.	n.a.
Malaysia	1,078 ~ 1,424	43 ~ 56	15.2	21.9	9.1	16.7
Myanmar	83 ~ 92	6 ~ 7	9.6	8.8	14.4	22.7
Philippines	1,101 ~ 2,534	19 ~ 44	15.7	15.2	6.5	11.7
Singapore	4,522 ~ 4,544	954 ~ 959	170.9	132.2	31.7	76.0
Thailand	1,764 ~ 4,364	48 ~ 120	25.3	48.8	9.9	15.4
Viet Nam	4,038 ~ 6,100	91 ~ 137	31.9	29.5	7.7	14.3

Gbps = billion (giga) bits per second, Kbps = thousand (kilo) bits per second, Mbps = million (mega) bits per second, n.a. = data not available.

<sup>a</sup> Total bandwidth is calculated by per internet bandwidth per user multiple by the total number of internet users.

Source: Author. Based on EIU (2019), ITU (2019), and World Bank (2019).

While users in Singapore can get bandwidth of almost 1 million bits per second, the maximum quota for users in Myanmar is 6,200 bits per second. Accordingly, fixed-line connections in Singapore are 15–16 times faster than in Myanmar. When using the same phone to download information from the internet, the speed in Singapore is 10 times as fast as in Cambodia. Except for Singapore, the average speed of internet connections in ASEAN is slower than in China. Despite this, one should not deny the fast ICT development in the region. Nevertheless, the overall network speed already reaches



a level that allows countries to use new ICT tools such as cloud computing. When using CISCO (2019) requirements<sup>2</sup> on internet speed for business and consumer cloud services as the benchmark, the internet speed in almost all AMS, including the CLM countries, has met the minimum requirements for advanced cloud applications (apps).

### **Affordability of internet access**

In ASEAN, smartphones and mobile apps have been widely used to access the internet. Both the price of the device and the cost of mobile data use have been driven down dramatically. The selling price of mobile phones does not vary significantly across countries. According to the International Data Corporation, the global average selling price of smartphones was about \$235 (Statista, 2019). Buying a smartphone seems to be less burdensome for consumers in Singapore or Brunei since it only costs 5%–10% of their average monthly income. However, it is still a significant purchase for consumers in Cambodia or Myanmar, where the price of purchasing a new smartphone is equivalent to 2 months' income for most people.

The cost of internet access with a mobile connection has been dramatically driven down in recent years. Less developed countries in the region – the CLM countries – have made substantial improvements in the past 5 years. According to GSMA (2019), using a mobile connection to access the internet in Myanmar is now more affordable than in many other AMS. Region-wise, the gap across countries has been narrowed.

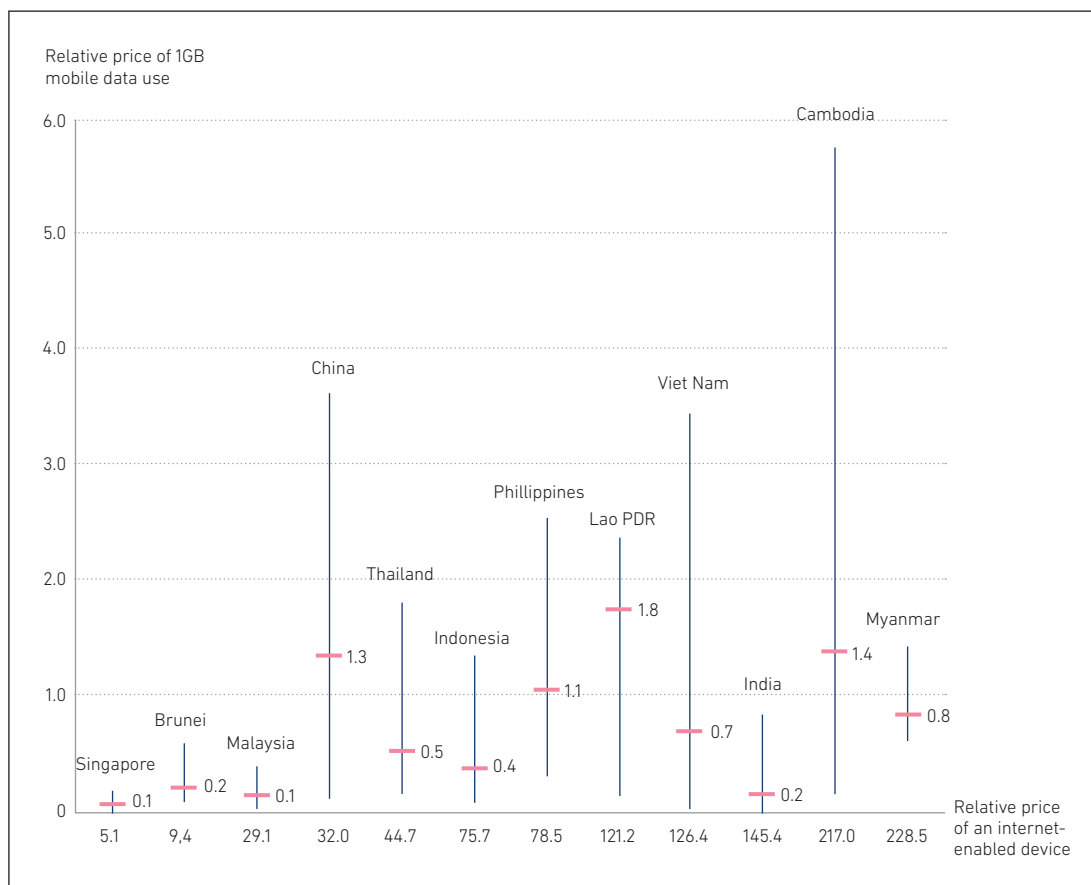
Figure 5.2 reveals more details on the price of 1 gigabyte (GB) of mobile data use relative to the country's monthly gross national income (GNI) per capita (indicated by the vertical axis) and the relative price of an android internet-enabled device (indicated by the horizontal axis). In countries like Malaysia or Singapore, the price of 1 GB of mobile data use is equivalent to only 0.01%–0.03% of monthly GNI per capita, while the cost of using the same amount of data in Cambodia, the Lao PDR, the Philippines, or Viet Nam is much higher. It is particularly expensive to access the internet via mobile phones in rural areas, partly because of the backlog in network building.

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<sup>2</sup> CISCO (2019) categorised the internet speed requirements for business and consumer cloud services into (i) basic cloud apps (the low level), (ii) intermediate cloud apps (the middle level), and (iii) advanced cloud apps (the high level). For advanced cloud apps, the network download and upload speeds need to be higher than 2.5 Mbps and 1.0 Mbps, respectively, and the network latency must be less than 100 milliseconds (ms).



**Figure 5.2 Relative Price of Smartphones and Mobile Data**



Source: Chen (2020: Figure 5).

## Content and services

To many users, access to the internet is indeed access to online resources. Very often, it is not the raw data or resources but the information that will be most useful. In this regard, online content and services are the determining factor of the quality of the internet. The outcome of the EIU (2019) survey provide some insights into the development of countries' e-finance, e-health, and e-commerce content (Table 5.4).

**Table 5.4 Internet Content – Qualitative Rating and Score**

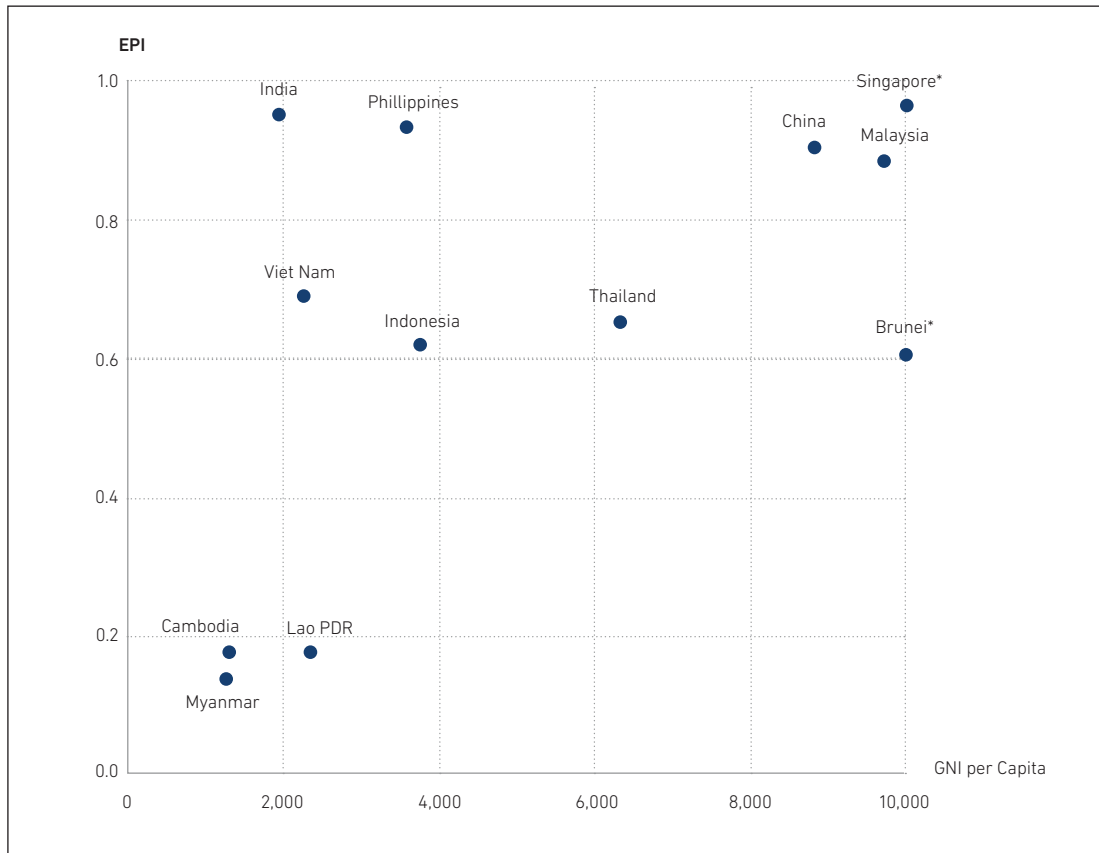
Country	Basic information in the local language (0–2, 2 = best)	E-finance content (0–2, 2 = best)	E-health content (0–3, 3 = best)	E-commerce content (0–100, 100 = best)
Cambodia	2	2	2	29
Indonesia	2	1	2	36
Malaysia	2	2	3	77
Myanmar	2	2	3	23
Philippines	2	2	2	40
Singapore	2	2	3	90
Thailand	2	2	3	68
Viet Nam	2	2	3	50

Source: EIU (2019).

The results of the survey show that basic information in the local language already exists in all countries. As for e-finance, there is not a significant difference across countries. Qualitatively, all obtain the highest rating of two (best) except Indonesia, which is rated one. In terms of e-health, five countries (Malaysia, Myanmar, Singapore, Thailand, and Viet Nam) obtain higher ratings than the others. As for e-commerce, Cambodia and Myanmar seem to lag, while Singapore and Malaysia have rich online content compared with other AMS.

Regarding e-government, the scores of the United Nations E-Participation Index show that the CLM countries still lag in promoting online public services and citizen engagement (Figure 5.3). The CLM countries' average E-Participation Index score is 0.15, lower than the world average value (0.57) and that of the other AMS (0.77). Therefore, it is rather urgent for the CLM countries to narrow the gap in providing information to their citizens, interacting with stakeholders, and engaging in decision-making processes (United Nations, 2019).

**Figure 5.3 E-Participation**



EPI = E-Participation Index, GNI = gross national income.

Notes: GNI per capita of Brunei = \$30,057; GNI per capita of Singapore = \$55,662.

Source: Author. Raw data from United Nations (2019) and World Bank (2019).

## Security and reliability

Cybersecurity is also an important measure of digital connectivity. OECD (2012) pointed out that along with the development of the internet, the level of organisation and sophistication of cyberthreats has been increasing significantly. Possible cyberthreats include theft (of identity, personal data, and secrets); infringement of intellectual property rights; denial of service; leaks of private information; and the disruption of critical infrastructure.

Table 5.5 shows Asian emerging economies' scores and global rankings in the Global Cybersecurity Index and the National Cyber Security Index. The Global Cybersecurity Index indicates the level of cybersecurity commitment of countries with regard to legal measures, technical measures, organisational measures, capacity building, and cooperation. The National Cyber Security Index measures countries' preparedness to prevent cyberthreats and manage cyber incidents based on the security implemented by the central government on the aspects of legislation in force, established units, cooperation formats, and outcomes and products.

**Table 5.5 Cybersecurity – Preparedness and Commitments**

Country	NCSI		GCI		
	Score	Ranking (/100)	Score	Ranking (/175)	Level of commitment
Brunei	38.96	54	0.62	64	Medium
Cambodia	n.a.	n.a.	0.16	131	Low
Indonesia	19.48	83	0.78	41	High
Lao PDR	16.88	86	0.19	120	Low
Malaysia	72.73	11	0.89	8	High
Myanmar	n.a.	n.a.	0.17	128	Low
Philippines	31.17	63	0.64	58	Medium
Singapore	57.14	32	0.89	6	High
Thailand	n.a.	n.a.	0.79	35	High
Viet Nam	n.a.	n.a.	0.69	50	High

GCI = Global Cybersecurity Index, n.a. = not applicable, NCSI = National Cyber Security Index.

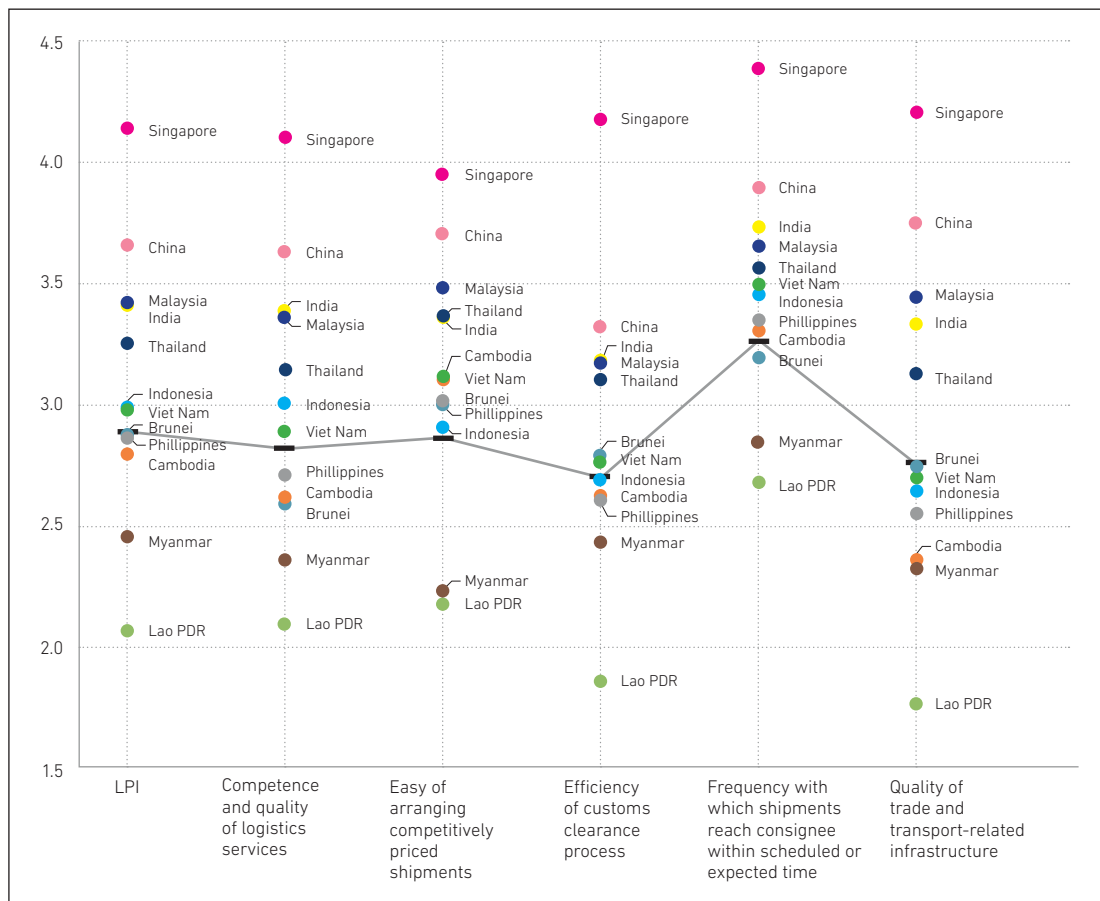
Source: Author. Based on ITU (2019) and e-Governance Academy (2019).

Based on the available data, Malaysia, Singapore, and India seem to be better prepared for cyberthreats than the other AMS. Most of the countries show a high level of commitment to implementing cybersecurity measures but again, the CLM countries are lagging. From a regional perspective, the unbalanced development of cybersecurity would hinder data flows region-wise and increase the cost and risk of doing business online. The improvement of national capabilities in the adoption and integration of cybersecurity will require efforts in law enforcement, education, intra-state cooperation, and public-private partnerships.

## Logistics

The issue of logistics has long been a bottleneck in the economic development of emerging Asia. Using the World Bank's Logistics Performance Index, Figure 5.4 shows that the scores of the CLM countries and the Philippines are lower than the world average, while Singapore has the highest score worldwide. Except for the Lao PDR and Myanmar, AMS have made significant progress regarding the ease of arranging competitively priced shipments and the frequency with which shipments reach consignees within a scheduled or expected time.

**Figure 5.4 Logistics Performance**



LPI = Logistics Performance Index.

Source: Chen (2020: Figure 7).

According to a survey conducted by the World Economic Forum (2016), Singapore and Malaysia are amongst the countries with the highest quality of overall infrastructure, while others are either at or below the world average. Large gaps persist in logistics infrastructure across countries. As for the region, development still faces obstacles from poor quality of roads, incomplete road and railway networks, inadequate ports, and low service capability (Table 5.6).

**Table 5.6 Quality of Logistics Infrastructure**

Country	Overall infrastructure	Roads	Railways	Air transport	Ports
Brunei	4.14 (67)	4.70 (41)	2.07 (88)	4.08 (84)	3.67 (87)
Cambodia	3.43 (95)	3.38 (93)	1.62 (98)	3.85 (99)	3.85 (76)
Indonesia	3.79 (80)	3.86 (75)	3.82 (39)	4.52 (62)	3.91 (75)
Lao PDR	3.74 (81)	3.42 (91)	n.a.	3.77 (100)	2.01 (132)
Malaysia	5.48 (19)	5.46 (20)	5.06 (15)	5.70 (20)	5.44 (17)
Myanmar	2.42 (135)	2.33 (136)	1.79 (96)	2.62 (132)	2.62 (123)
Philippines	3.04 (112)	3.07 (107)	1.97 (89)	3.25 (116)	2.92 (113)
Singapore	6.39 (2)	6.28 (2)	5.74 (5)	6.85 (1)	6.66 (2)
Thailand	4.03 (72)	4.21 (60)	2.52 (77)	4.95 (42)	4.18 (65)
Viet Nam	3.63 (85)	3.47 (89)	3.15 (52)	4.06 (86)	3.84 (77)
China	4.55 (43)	4.77 (39)	5.07 (14)	4.81 (49)	4.59 (43)
India	4.45 (51)	4.43 (51)	4.48 (23)	4.49 (63)	4.53 (48)
World	4.06	4.05	3.38	4.41	4.04

n.a. = data not available.

Source: Author. Raw data from World Economic Forum (2016).

Relatively speaking, more problems exist in (i) the competence and quality of logistics services, (ii) the efficiency of customs clearance process, and (iii) the quality of trade and transport-related infrastructure. That is, compared with physical infrastructure, Asian countries need to pay more attention to developing the software of infrastructure – services. As Chen (2017, 2019) pointed out, in the digital economy, improving services is at least as important as building infrastructure in many aspects – from speed and accuracy to transparency and reliability. As consumers become more demanding of information on logistics services, facilitating online business requires not only the establishment of logistics facilities – such as mega e-fulfilment centres, parcel sorting centres (hubs), local parcel distribution centres for last-mile supply chains, local city logistics depots, and returns centres – but also service development, which is key to improving the efficiency of the regional distribution networks.

## Financial Connectivity

Financial inclusiveness should also be considered in digital connectivity. According to the World Bank (2019), by the end of 2017, a significant number of adults aged 15 and above still do not have a bank account. Moreover, like other aspects of connectivity, wide gaps persist in countries' readiness to adopt and use digital payments. Table 5.7 shows the values of the Asia-Pacific Economic Cooperation (APEC) Fintech E-payment Readiness Index of AMS as well as their scores in each sub-index based on available data.<sup>3</sup> Singapore is the best positioned in e-payment development, with a value of 59.6, while Viet Nam scores 22.9 at the other end. The wide dispersion of e-payment readiness exists mainly in the regulatory and policy environment and in innovative products and services.

**Table 5.7 E-payment Readiness**

Cluster	Country	ERI	Sub-indices			
			Regulatory and policy environment	Infra-structure	Demand	Innovative products and services
Cluster 1: Advanced e-payment ecosystems	Singapore	59.6	93.9	59.7	37.9	57.4
Cluster 2: Transitioning e-payment ecosystems	Malaysia	44.5	80.7	41.6	27.4	38.2
	Brunei	37.2	46.6	42.4	37.4	19.6
Cluster 3: Nascent e-payment ecosystems	Thailand	29.7	33.1	37.5	23.8	23.5
	Indonesia	28.8	43.4	29.2	17.8	29.9
	Philippines	26.4	32.8	31.4	20.5	21.2
	Viet Nam	22.9	28	28.3	20	14
(Degree of dispersion)		12.8	25.8	10.9	8.3	14.7

ERI = E-payment readiness indicator.

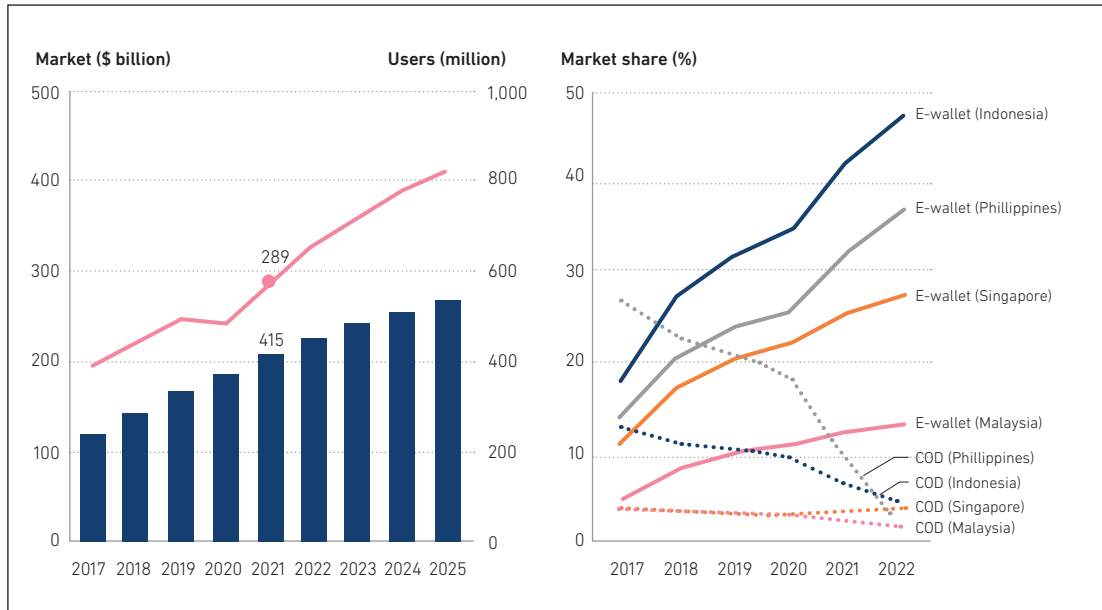
Source: RMIT and TRPC (2015).

Online transactions – payments for either online or offline business – is one of the most dynamic areas of the digital transformation. They can be made via various payment methods (credit cards, direct debit, invoices, or online payment providers such as PayPal and Alipay). As Figure 5.5 shows, both the size and the number of users of online transactions have grown over time. The COVID-19 pandemic has not interrupted this tendency despite the economic shocks it has caused. The online transactions market in

<sup>3</sup> No data available for Cambodia, the Lao PDR, and Myanmar.

ASEAN was projected to reach \$290 billion by the end of 2021, with more than 400 million users (www.statista.com). The COVID-19 pandemic has caused a stark contrast through the boom in e-wallets and the rapid shrinking of cash on delivery, especially in populous countries like Indonesia and the Philippines.

**Figure 5.5 ASEAN Online Transactions**



ASEAN = Association of Southeast Asian Nations, CoD = cash on delivery.

Source: Author.

Internet financial innovations come with opportunities and challenges. In general, financial technology or fintech tends to be a market changer and creates new opportunities for leapfrogging development. The process of digital adoption in finance can be market-driven and self-enforced. Secure and reliable e-payment systems will increase financial inclusiveness and make digitalisation more beneficial to middle- and low-income households. Policy efforts at the regional level, such as establishing industrial standards and harmonising regulations, could help the economy realise economies of scale and support the market development (Chen, 2019; Kimura et al., 2019).



## Integrating Connectivity

Seamless links between the virtual and physical parts of the digital ecosystem are critical to the functioning of the digital economy. The establishment of international rules and regulations could enhance market drivers and strengthen connectivity. This calls for multilayer cooperation, including public–private partnership, inter-institutional cooperation, subregional cooperation, and coordination amongst different government departments.

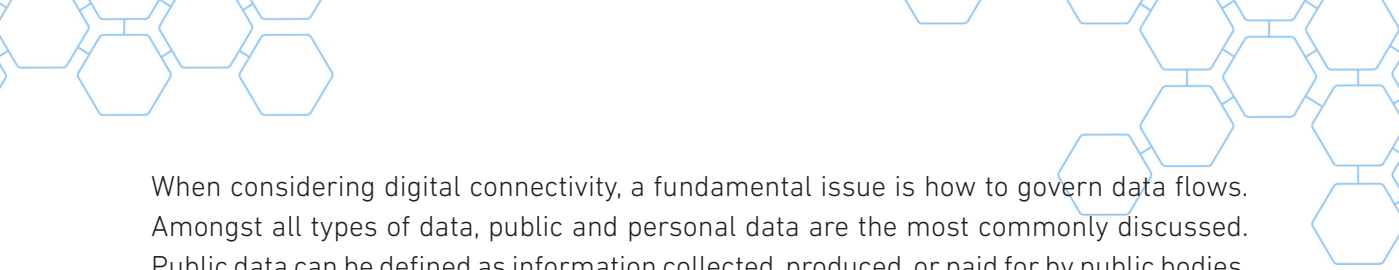
At the national level, many AMS have published strategic plans for digitalisation and have established special ministerial units to regulate its development (Chen, 2020). At the regional level, ASEAN leaders signed the e-ASEAN Framework Agreement in 2000 and announced the strategic goal to promote a productive ASEAN ‘e-space’ by (i) enhancing ICT sector competitiveness, (ii) reducing the digital divide within and amongst individual AMS, (iii) promoting partnership between the public and private sectors, and (iv) liberalising trade and investment in ICT goods and services (ASEAN, 2000: Article 3). The AEC Blueprint 2025 further highlights ICT development as ‘a key driver in ASEAN’s economic and social transformation’ (ASEAN, 2015: Articles C2, C3, and D1). The ASEAN Digital Integration Framework and the ASEAN Agreement on Electronic Commerce<sup>4</sup> were signed in October and November 2018, respectively. In October 2019, during the 18th AEC meeting, ministers ratified the completion of the ASEAN Digital Integration Framework Action Plan, 2019–2025.<sup>5</sup>

## Free Flow of Data with Trust

While internet service is the backbone of digital connectivity, free cross-border data flow is the basis and cornerstone of the digital economy. So far, AMS have no common position on regulating cross-border data flow, and are proceeding at different speeds in domestic rule setting. By the end of 2020, Indonesia, Malaysia, the Philippines, and Singapore have passed new laws; Thailand is considering such rules; and Brunei and the CLM countries have no personal data protection laws or regulations.

<sup>4</sup> The ASEAN Agreement on Electronic Commerce covers a wide range of topics and has 19 articles.

<sup>5</sup> The ASEAN Digital Integration Framework Action Plan emphasises (i) trade facilitation, (ii) data protection for digital trade, (iii) digital payments, (iv) a digital workforce, and (v) digital entrepreneurship.



When considering digital connectivity, a fundamental issue is how to govern data flows. Amongst all types of data, public and personal data are the most commonly discussed. Public data can be defined as information collected, produced, or paid for by public bodies. In principle, public data should be open to the public for free access. However, in certain circumstances, government officials have the right to limit access to data that is private or that should be kept secret for national security reasons. Definitions of personal data differ based on national laws. The three most representative opinions are:

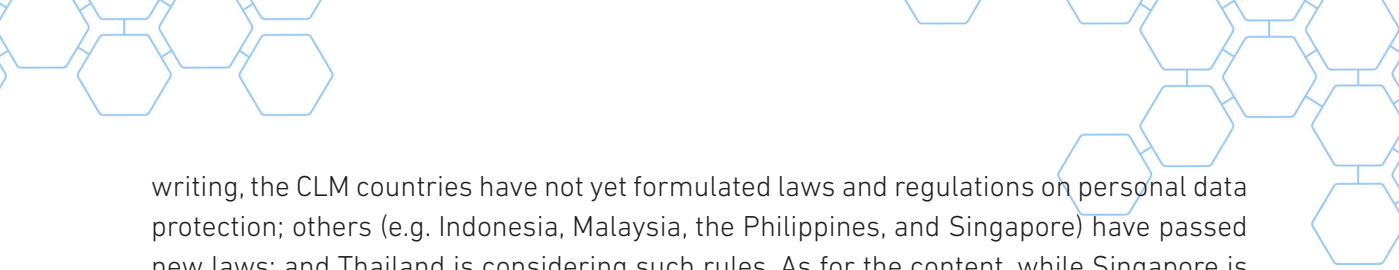
- (i) The European Union (EU) defines personal data as any information that relates to an identified or identifiable living individual. Personal data may be directly linked to a person, or indirectly linked to a person.
- (ii) The United States (US) considers personal information data that can reasonably be used to contact or distinguish a person, including Internet Protocol (IP) addresses and device identifiers.
- (iii) China sees data as a strategic resource that must be protected in the interest of national security and social stability.<sup>6</sup>

Although AMS have not yet agreed on a common definition of personal data, the 2018 ASEAN Agreement on Electronic Commerce uses 'personal information' (instead of 'personal data') in the final text, where it defines personal information as 'any information, including data, about an identified or identifiable individual' (ASEAN, 2018: 4). The scope of the definition seems to be wider than that of either the EU or the US. All AMS have agreed to work on eliminating or minimising barriers to data flow to facilitate cross-border e-commerce, given the importance of data safety as part of legitimate public policy objectives. This is in line with what countries agreed in the ASEAN Digital Integration Framework, one of whose six priority areas – protect data while supporting digital trade and innovation – requires governments and industry to 'ensure that data is protected and secured' (ASEAN, 2012: 1). This means that AMS have reached a consensus on supporting free flow of data in principle, and they seem to prioritise data safety, trust, and security in practice.

The policy regime of data governance is underdeveloped and fragmented across countries; and a fundamental problem is that the logic of economic justification for policies is not well established (Kimura et al., 2019). In ASEAN, the positions of the 10 Member States are so different that the 2018 ASEAN Agreement on Electronic Commerce had to leave it open for AMS to choose how to regulate the use of computing facilities and ensure the safety of communications. Countries' paces in domestic rule setting differ widely. At the time of

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<sup>6</sup> This explains why China applies regulations such as the 'Measures for Security Assessment of Cross-border Transfer of Personal Information and Important Data' and 'Guidelines for Data Cross-Border Transfer Security Assessment' to any company that is a network operator engaged in domestic operations.



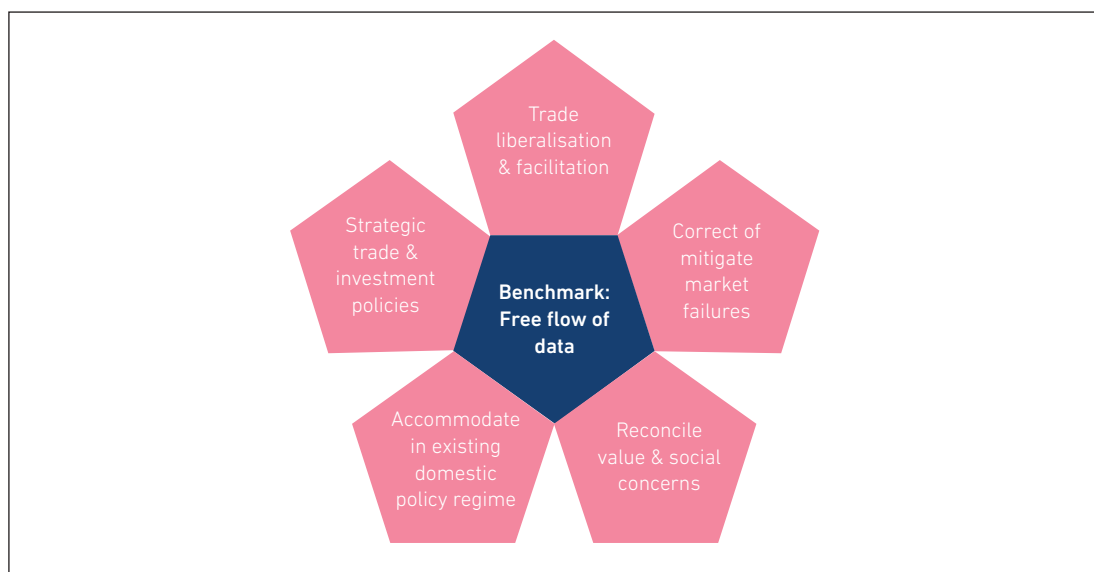
writing, the CLM countries have not yet formulated laws and regulations on personal data protection; others (e.g. Indonesia, Malaysia, the Philippines, and Singapore) have passed new laws; and Thailand is considering such rules. As for the content, while Singapore is strongly against data localisation, many others (e.g. Brunei, Indonesia, Malaysia, and Viet Nam) have adopted or are considering laws that require data generated locally on their citizens and residents to be kept within their geographical boundaries and to remain subject to domestic law. Some de facto requirements on data localisation are already in place in these countries. For instance, the cybersecurity law that came into effect in Viet Nam in early 2019 allows the government to regulate the data processing methods of technology companies that operate in the country and to restrict the internet connections of users who post 'prohibited' content.

Reaching consensus on data governance to facilitate ASEAN digital connectivity is difficult, but not impossible. Cross-border data flows and cross-border flows of goods and services share some common features: (i) both are produced in one place but sent to be used in others, (ii) both are subject to regulations at and beyond borders, and (iii) the two flows are closely related and mutually encourage each other. For that reason, the policy regime on free trade in goods could be a good reference for that of free flow of data.

## Policy Framework

Kimura et al. (2019) proposed a policy framework in which free flow of data with trust is the benchmark, supported by five 'pillars' of policy instruments (Figure 5.6). First, policies for trade liberalisation and facilitation. In addition to tariff elimination, more efforts on the removal of non-tariff measures, service liberalisation, and trade facilitation will be needed to facilitate international trade in the digital era.

**Figure 5.6 Policy Framework for Free Flow of Data with Trust**



Source: Author. Based on Kimura et al. (2019).

Second, policies to correct or mitigate market failure. In the data-driven economy, potential market failures may come from network externalities, economies of scale, information asymmetry, or any combination of these conditions.<sup>7</sup> To correct the consequent market distortion, we will need policy efforts – especially in competition policy, consumer protection, and intellectual property rights protection. All these will require international cooperation in rule setting plus domestic efforts in enforcement.

Third, digitalisation will have extensive impacts on society, especially when massive data are moving across national borders with the internet of things. To avoid regulatory segmentation, the establishment and implementation of international norms on related issues need to reconcile values and social concerns with economic efficiency, especially from the aspect of data privacy protection and cybersecurity.

Fourth, data governance requires international as well as domestic policy efforts to accommodate data flows and data-related affairs. Challenges in this area are related not only to the incorporation of new technologies (e.g. AI and fintech) in the economy and society, but also to policy that balances market efficiency and fairness, such as firms' information disclosure and due process in government access to privacy or industry

<sup>7</sup> For example, when the world's giant digital platformers apply big data and AI, they could exercise market power, exploit users, and monopolise innovation capability by generating network externalities or economies of scale.

data. When considering taxation on the digital economy, harmonised nexus and profit allocation concepts should be applied to ensure fair competition between online and offline businesses as well as non-discriminatory and national treatment of both domestic and international market players.

Fifth, as Kimura and Chen (2018) pointed out, the digital economy provides a novel framework for inclusive growth, and strategic trade and investment policies should allow developing countries to leapfrog to a new paradigm of globalisation ('the third unbundling'). Each AMS should have the space to develop national strategic policies to nurture their own industries in new data-related business; and the related rules and regulations should not lead to any hidden forms of protectionism. In this regard, Mill's criterion<sup>8</sup> and Bastable's criterion,<sup>9</sup> which have been applied to justify the infant industry protection argument in free trade, could be very useful references.

### International Rule Setting for Data Flows

Globally, there are multiple approaches to data connectivity. Multilateralism is the best option for rule setting. Some related terms can be seen in the existing World Trade Organization (WTO) agreements.<sup>10</sup> However, a multilateral agreement on governing cross-border data flows is not yet in place. Asian countries are active in pushing forward WTO talks on digital trade. At the initiative of Australia, Japan, and Singapore, 70 WTO members launched the E-Commerce Joint Statement Initiative at the 11th WTO Ministerial Conference in Buenos Aires in December 2017 and 76 WTO members agreed to start e-commerce talks on 25 January 2018.

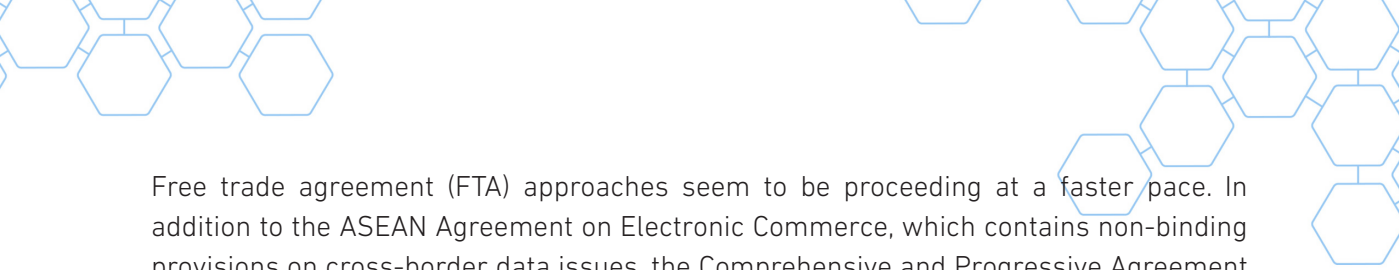
Multilateral trade talks are progressing slowly because of significant differences amongst WTO members. For instance, while the EU and Singapore focus on establishing an e-commerce enabling environment, other countries (e.g. Japan, Brazil, and the US) want more extensive discussions on the enabling environment for various flows related to digital trade. As for the goals of the talks, some countries want clear rules governing the exchange of data, while others think about how to facilitate data-driven growth, and still others are more focused on bolstering e-commerce.

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<sup>8</sup> Mill's criterion is that protection should be temporary, and the protected industry should be able to become self-sufficient within or after the period of protection.

<sup>9</sup> Bastable's criterion is that the total benefits of protecting one particular industry should outweigh the net costs to society.

<sup>10</sup> These include the General Agreement on Tariffs and Trade (GATT), the General Agreement on Trade in Services (GATS), the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), the Agreement on Technical Barriers to Trade, and the Information Technology Agreement (ITA and ITA2).



Free trade agreement (FTA) approaches seem to be proceeding at a faster pace. In addition to the ASEAN Agreement on Electronic Commerce, which contains non-binding provisions on cross-border data issues, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP), EU-Japan Economic Partnership Agreement, and Singapore-EU FTA all include binding provisions on cross-border data flows. The CPTPP makes the free flow of data a default and requires member states to establish rules to protect the privacy of individuals and firms. It bans data localisation (requirements that data be produced or stored on local servers) and prohibits forced sharing of source code. In the EU-Japan Economic Partnership Agreement, both sides agreed to recognise each other's data protection systems as 'equivalent', which allows data to flow safely between the EU and Japan. In the Singapore-EU FTA, cross-border data flow is treated as part of cross-border services. Each party has made commitments on protecting privacy and personal data, including individual records and accounts, with appropriate safeguard measures. Most recently, in January 2020, Singapore, Chile, and New Zealand concluded the Digital Economy Partnership Agreement, aiming for best practice to support and promote digital trade.<sup>11</sup>

All the FTAs mentioned above contain exceptions that allow governments to achieve legitimate domestic policy objectives, including rules to protect public morals, public order, public health, public safety, and privacy related to data processing and dissemination. However, governments can only take advantage of the exceptions if they are necessary, performed in the least trade-distorting manner possible, and do not impose greater restrictions on the transfer of information than what is needed to achieve the respective government's objectives.

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<sup>11</sup> The Digital Economy Partnership Agreement text drew heavily on the e-commerce chapter of the CPTPP.

## Concluding Remarks

Digital infrastructure – both hardware and software – is the key to connectivity. In terms of digital connectivity, the region needs to make substantial efforts on (i) improving connectivity infrastructure in both the physical world and cyberspace, (ii) rule setting to support a development-friendly ecosystem for digitalisation, and (iii) combining countries' national strategies and regional collaboration to eliminate institutional barriers.

Given the wide development gaps amongst AMS, it is critical to support latecomers to catch up faster. In this regard, the issue of capacity building needs particular attention. Digital infrastructure obstacles may come from capacity and resource limits – either capital or technology or both. The public sector may still need to take the lead to initiate and drive the increase in the supply of public goods in both quantity and quality. Private sector involvement will be equally important to make the development sustainable.

Regarding the establishment of a regulatory system to support the development of the digital economy, the most critical step is to realise free flow of data with trust. Since restrictions on data flows could harm international trade in a similar way to trade protectionism, ASEAN needs to eliminate this threat to free trade and collaborate in promoting digital adoption to sustain regional development. The related rules and regulations should cover traditional trade issues (e.g. tariffs and non-tariff measures, trade facilitation, consumer protection, and intellectual property rights) as well as new issues (e.g. cross-border information flow, privacy protection, data localisation, and source code disclosure).

The ongoing Regional Comprehensive Economic Partnership (RCEP) negotiations touch upon a wide range of issues related to digital connectivity. Reaching agreements on these issues will require countries to balance the interests of the economy, society, and national security, as well as the long-term gains and short-term costs. This, again, calls for collaboration amongst governments and private sector involvement.

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