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International Production Network in the Next Generation and the Role of RCEP

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Abstract: *This paper attempts to discuss the potential role of RCEP from the perspective of two kinds of international division of labor, i.e., machinery international production networks (IPNs) and digital-related services trade. To consider the possible contribution of RCEP to the widening and deepening of IPNs, we first provide an overview of machinery IPNs in ASEAN and East Asia by employing international trade data, a value-added based index for global value chain (GVC) activities using international input–output tables, and a gravity equation exercise. Then, we focus on trade in two global innovator services – information and communication technology (ICT) services and other business services exports – to foresee the future of the new international division of labour and highlights some policy issues. RCEP should be an evolving, living one. In terms of liberalisation and facilitation as well as international rule-making, which cover the whole region, RCEP is expected to revise and upgrade the contents to support the dynamic international division of labour in East Asia. At the same time, RCEP may play an important role in reducing policy risks due to ad hoc trade policies based on political intension and defending the rules-based trading regime for the regional economy.*

Keywords: International Production Network; Digital-Related Service Trade; East Asia; RCEP

JEL Classification: F14; F23

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1. Introduction

The prime purpose of regional trade agreements is to take advantage of the mechanics of the international division of labour and enhance economic dynamism for economic prosperity and an amicable international environment. Thus, to assess the possible contribution of the Regional Comprehensive Economic Partnership (RCEP), it is crucial to understand the present status and future prospects of the international division of labour in this region. This paper reviews two kinds of international division of labour – international production networks (IPNs) and digital-related services trade – and discusses the potential role of RCEP.

First, East Asia – including Northeast Asia and Southeast Asia – has led the world in aggressively using IPNs (Ando and Kimura, 2005) or the second unbundling (Baldwin, 2016). It has also built up 'Factory Asia', the core of which consists of the task-by-task international division of labour, typically in machinery industries. The private economic activities supported by each country's efforts to improve location advantages and connectivity have dictated the evolution of IPNs in the past three decades. The dominance of the electric machinery sector has been particularly enhanced, and East Asia has become the global hub of electronic parts production (Ando and Kimura, 2013). However, the degree of participation in IPNs still widely differs across countries and regions within the Association of Southeast Asian Nations (ASEAN) and East Asia, and ample room remains for widening and deepening IPNs.

In the 2000s, globalisation advanced rapidly particularly by the mid-2000s. The second unbundling was expanded in East Asia, Central and Eastern Europe, and a few Latin American countries. The rest of the developing world, including a number of countries in Latin America and Africa, also enjoyed windfall gains by exporting primary products. However, the global financial crisis (GFC) and the great trade collapse (2008–2009) altered this momentum. The pace of globalisation slowed down, and the world entered the era of 'slowbalization'

(ADB et al., 2021).[1] Nevertheless, in ASEAN and East Asia, globalisation did not end. During the period of slow trade (2011–2016), the growth of machinery IPNs in East Asia did not actually slow down (Obashi and Kimura, 2018). After Mr Trump became the President of the United States (US) in 2017, the US–China trade war and geopolitical tensions weakened the rules-based trading regime. On the other hand, ASEAN and East Asia (other than China) kept trying to take advantage of positive trade and investment diversion effects in the reformulation of East Asian IPNs. With the coronavirus disease (COVID-19) pandemic, the trough of international trade in East Asia due to negative supply and demand shocks was shallower than in the rest of the world, and the recovery of East Asian IPNs was also quicker and stronger than elsewhere, partially reflecting positive demand shocks for work-at-home and stay-at-home related goods (Ando, Kimura, and Obashi, 2021; Ando and Hayakawa, 2021). Although inward-looking sentiment seems to be strong in other parts of the world, particularly in the European Union (EU), the momentum of globalisation is still alive in East Asia, and the development strategies including widening and deepening IPNs continue to be relevant. How much RCEP can contribute to IPNs is one of the prime checkpoints.

Second, a new type of international division of labour appears to be emerging with digital technology. One of the major international transaction modes in the future will be services trade in a wider definition. Digital technology generates digitalised services, which are either newly created or detached from traditional industries as the servicification of some activities. Although conventional services are mostly immobile in nature, digitalised services can be highly mobile through the internet – regardless of domestic or cross-border movements. In addition, digital technology is starting to be applied, by digitalising services, to many industries, including services subsectors. Digitalising services

[1] A term of 'slowbalization' is popularized by *The Economist* to describe the general slowdown in the pace of globalization since around the GFC 2008–2009.

are often provided in modes 1 and 3, i.e., cross-border supply and commercial presence, among the four modes of supply for trade in services defined by the World Trade Organization (WTO) General Agreement on Trade in Services (GATS). Although such international transactions are still in their infancy, they will surely be one of the major forms of international division of labour soon.

The impact of digital technology on manufacturing IPNs is also an important issue in the medium to long term. Although COVID-19 seems to accelerate the use of communication technology (CT) to overcome geographical distance, the following introduction of information technology (IT) may countervail dispersion forces and promote reshoring. The implications of IT and CT for manufacturing IPNs, particularly from the viewpoint of newly developed economies such as ASEAN, may be a bit complicated (Obashi and Kimura, 2021). In any case, whatever the destiny of Factory Asia, we must start thinking of a desirable policy environment for the novel international division of labour in the long term.

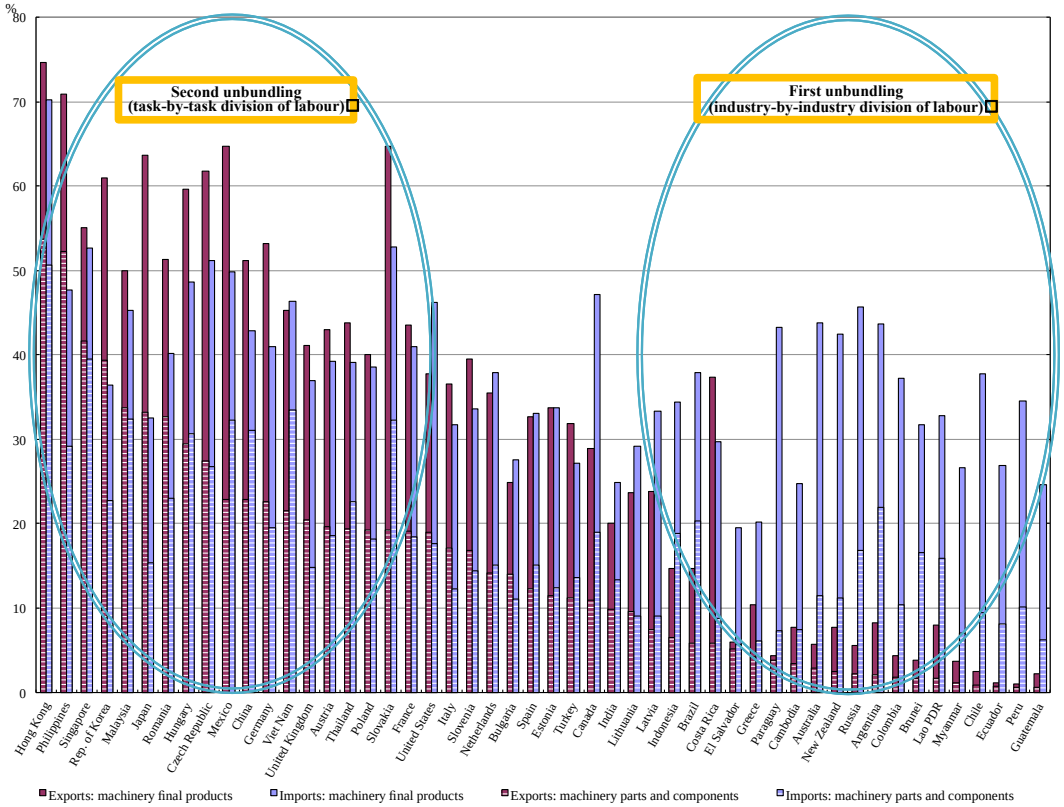
This paper is structured as follows: the next three sections provide an overview of manufacturing (particularly machinery) IPNs in ASEAN and East Asia by employing international trade data, a value-added based index for global value chain (GVC) activities using international input–output tables, and a gravity equation exercise to discuss the possible contribution of RCEP to the widening and deepening of IPNs. Section 5 focuses on trade in two global innovator services – information and communication technology (ICT) services and other business services exports – to foresee the future of the new international division of labour and highlights some policy issues. The last section concludes.

2. Significance of Machinery IPNs: Evidence from Machinery Trade Data

Machinery industries typically consist of multilayered production processes with different technologies and diversified materials – involving many players, domestically and internationally. Thus, machinery industries are at the centre of IPNs, or the second unbundling, and have developed sophisticated supply chains, sometimes even beyond the region. This section uses machinery trade data and investigates the significance of machinery IPNs. Figure 1 presents each country's machinery shares in the total exports and imports of the major countries in the world in 2019, with a distinction between machinery parts and components and machinery final products.[2] Machinery industries (Harmonized System (HS) 84–92) here include general machinery, electric machinery, transport equipment, and precision machinery. To focus on participation in IPNs, the figure arranges countries with higher export shares of machinery parts and components from left to right.

[2] See Kimura and Obashi (2010) for the definition of machinery parts and components for different versions of the HS classification. Machinery final products are regarded as machinery goods other than machinery parts and components.

Figure 1: Machinery Shares in Exports to and Imports from the World, 2019



Source: Ando, Yamanouchi, and Kimura (2021).

Figure 1 provides several interesting findings for countries in the ASEAN+6 area.[3] First, most East Asian countries are actively involved in machinery IPNs. For many East Asian countries, shares of parts and components are high for both exports and imports, suggesting the existence of back-and-forth transactions. In addition, relatively high shares of exports in machinery parts and components indicate export-oriented operations in East Asia. This appears to be the opposite of the typical pattern in Latin America, excluding Mexico; for most Latin American countries, parts shares are low for exports and high for imports, which implies import-substituting operations.

In the early 1990s, most countries with higher export shares of parts and components were developed countries.[4] By 2000, in line with the expansion of

[3] ASEAN+6 refers to the 10 ASEAN Member States (AMS) plus Australia, China, India, Japan, the Republic of Korea (henceforth, Korea), and New Zealand.

[4] For the corresponding figures in the early 1990s, 2000, and 2010, see Ando (2006); Ando

the second unbundling, machinery parts and components trade became more active, and the shares of machinery trade rose in many countries. Reflecting the rapid development of machinery IPNs in East Asia since the 1990s, many East Asian developing countries moved to the left, with high export shares of parts and components in both absolute and relative terms. Now, most countries on the left side are these East Asian developing countries, which actively participate in machinery IPNs, in addition to some developing countries in other regions, such as Mexico and some Central and Eastern Europe countries, which are involved in IPNs in North America and Europe, respectively.

Second, a few East Asian developing countries achieved a drastic change in the 2010s. Unlike many East Asian countries, some countries in the ASEAN+6 area – India, Indonesia, Cambodia, Australia, New Zealand, Brunei, the Lao People's Democratic Republic (Lao PDR), and Myanmar– still have lower export shares of parts and components. While the low shares could be partially due to their abundant natural resources, those countries are not heavily involved in machinery IPNs. Interestingly, however, Cambodia experienced an outstanding change from 2010 to 2019. Cambodia had the lowest share in the corresponding figure for 2010. Although the absolute level is still not high in 2019, it moved to the left and even exceeded Australia and New Zealand. Moreover, Viet Nam was located on the right side in the corresponding picture for 2010, but by 2019, surprisingly, it moved further to the left and became one of the countries with high export shares of parts and components. This indicates that Viet Nam has been rapidly involved in machinery IPNs during the last decade to become one of the core players.

What has happened to machinery IPNs during COVID-19? Since IPNs involve many countries, they are prone to the contagion of shocks through supply chains. Hayakawa and Mukunoki (2021a), for instance, demonstrated the negative supply chain effect, which is the impact of the COVID-19 damage in countries

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and Kimura (2005); and Ando, Yamanouchi, and Kimura (2021), respectively.

supplying machinery parts and components on countries exporting final machinery products. As experienced in past shocks, however, we observe the robust and resilient nature of machinery IPNs, particularly those in East Asia during COVID-19 (Ando and Hayakawa, 2021).[5] Figure 2 shows monthly machinery exports to the world in 2020 and 2021 until August, which are indexed to each month of 2019. Worldwide machinery exports recorded their lowest level in April and May 2020, but returned to reach or even exceed pre-pandemic levels by September 2020 in all three machinery sectors. Such a rapid V-shaped recovery in 2020 suggests the resilience of machinery IPNs in general (Figure 2 (a)).[6] One of the reasons is that the transactions of parts and components within machinery IPNs are unlikely to be disconnected because firms intend to make their supply chains optimal, considering both cost reduction and risk management (Ando, Kimura, and Obashi, 2021).[7] Moreover, the import diversity of inputs mitigated the harmful supply-side effects of COVID-19 – particularly during the early period of February–March 2020 when uncertainty due to COVID-19 suddenly increased – by allowing the flexible adjustment of transactions (Ando and Hayakawa, 2022a). Furthermore, positive demand shocks due to COVID-19-specific demand for certain products related to teleworking, stay-at-home activities, and preventing infection, partially offset negative supply and demand shocks (Ando, Kimura, and Obashi, 2021).

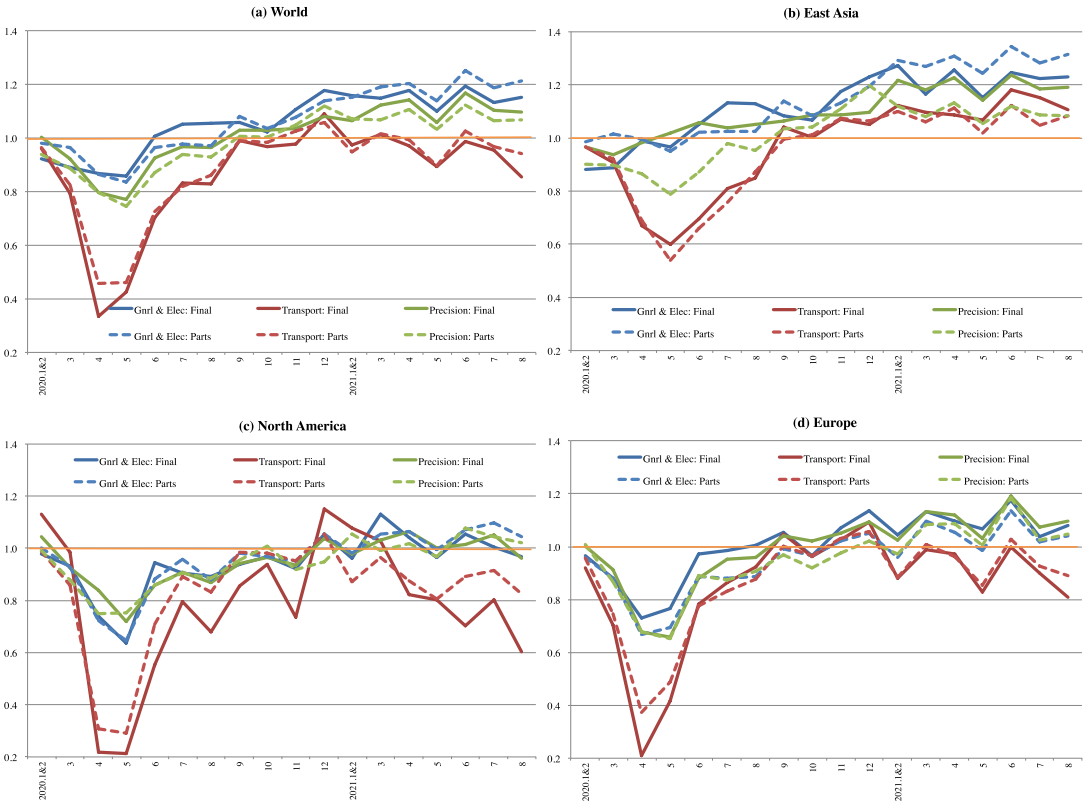
[5] See, for example, Obashi (2010); Ando and Kimura (2012); and Okubo, Kimura, and Teshima (2014) for the features of machinery IPNs in East Asia during the 1997 Asian financial crisis, the 2008–2009 GFC, and the 2011 Great East Japan Earthquake. Miroudot (2020) explained the terms 'robustness' (less likely to be interrupted) and 'resiliency' (more likely to be resumed even if interrupted).

[6] Although all three machinery sectors experienced a V-shaped recovery in 2020, sectoral heterogeneity exists. The transport equipment sector had a more prolonged influence than other machinery sectors, and the negative effects were particularly serious for North America and Europe. For more discussion on IPNs in these two regions, see Ando, Kimura, and Yamanouchi (2022). See also Hayakawa and Mukunoki (2021b) for the heterogenous trade effects of the first shock across industries, including non-machinery sectors.

[7] In their analysis of Japan's machinery trade, Ando, Kimura, and Obashi (2021) decomposed the fall in trade into two intensive margins (quantity effect and price effect) and two extensive margins (entry effect and exit effect) and showed a small exit effect for parts and components.

Figure 2: Comparison of Major Machinery International Production Networks During COVID-19: Machinery Exports to the World

(Each month of 2019 = 1)



ASEAN = Association of Southeast Asian Nations.

Notes: (a) World includes 40 exporting countries; (b) East Asia includes six ASEAN Member States, China, Hong Kong, Taiwan, the Republic of Korea, and Japan; (c) North America includes the United States, Mexico, and Canada; and (d) Europe includes 14 European Union countries, the United Kingdom, and Switzerland. 'Gnrl & Elec', 'Transport', and 'Precision' refer to general and electric machinery, transport equipment, and precision machinery, respectively. 'Final' and 'Parts' indicate final products and parts and components, respectively.

Source: Ando and Hayakawa (2021).

Importantly, the negative impacts were much smaller for machinery IPNs in East Asia (Figure 2 (b)) than those in North America (Figure 2 (c)) and Europe (Figure (d)). In addition, exports of general and electric machinery goods, as well as precision machinery final products, returned to their pre-pandemic levels in

April 2020. The positive demand shock products of these sectors, together with activated e-commerce for their purchases amid COVID-19, must have contributed to such a rapid recovery by partially compensating for the effects of the negative supply and demand shocks.[8] In 2021, machinery IPNs faced several challenges, including a shortage of containers and semiconductors as well as the emergence of the delta variant of COVID-19. Although some sporadic declines are recently observed for specific sectors in several countries, East Asia maintained its machinery exports beyond pre-pandemic levels, at least at the regional level, until August 2021, unlike in other regions.[9]

Although the emergence of COVID-19 became a trigger for increasing concerns about globalisation and IPNs, our findings in this section confirm the significance of machinery IPNs and their robust and resilient nature. At the same time, we observe that the degree of participation in machinery IPNs differs widely across countries and ample room still remains for widening and deepening IPNs. According to Jones and Kierzkowski (1990), countries must satisfy two conditions to participate in IPNs: preparing good location advantages to reduce the production cost *per se* and reducing service link costs to connect remotely located production blocks. As for the reduction in service link costs, trade liberalisation and facilitation are major policy channels. In many East Asian countries, most tariffs in machinery industries have already been removed in practice either on a most favoured nations (MFN) basis, within a framework of bilateral/regional free trade agreements, or through duty-drawback systems on imported parts and components for the production of exported goods. To further activate IPNs in East Asia, facilitated customs clearance and other trade facilitation measures are expected. RCEP could contribute to providing such trade

[8] See Hayakawa, Mukunoki, and Urata (2021) for the role of e-commerce in international trade during COVID-19.

[9] For instance, Japan experienced a drastic decline in exports of transport equipment final products in August and September, probably reflecting the shortage of semiconductors; Indonesia showed a severe decrease in July; and several AMS had drastic declines in August and September in the transport equipment sectors (Ando and Hayakawa, 2021).

facilitation covering the whole region. The liberalisation of network-supporting services and overall foreign direct investment (FDI) is also important. Improving location advantages would mostly require domestic policy efforts, but some parts of rule-making chapters (e.g. intellectual property protection) in RCEP could help to improve the business environment.

3. Features of IPNs Based on GVC Indicators

Although international trade statistics are useful for investigating the transactions of finely disaggregated products, they do not directly consider inter-industry linkages and value-added layers. This section employs the Research Institute for Global Value Chains at the University of International Business and Economics (UIBE) GVC participation indices based on international input–output tables to examine GVC activities from the perspective of value added.[10] This GVC index consists of two types: a forward linkage-based GVC index and a backward linkage-based GVC index. The forward linkage-based GVC index (producer perspective) indicates which types of production and trade are GVC activities, while the backward linkage-based GVC index (consumer perspective) indicates which segments of final goods production and trade belong to GVCs.[11] This GVC index allows us to incorporate GVC activities for domestic use.[12] Conventional measures such as vertical specialisation measures, which are expressed as a percentage of gross exports, could omit a large portion of international production sharing activities, and such a bias could be particularly

[10] UIBE (n.d.), the UIBE GCV Indicators. http://rigvc.uibe.edu.cn/english/D_E/database_database/index.htm.

[11] See Appendix A for the concept of the UIBE GVC index and the country list, and Wang et al. (2017) for a detailed explanation of the index.

[12] As Wang et al. (2017) explains, this index considers 'exporting its domestic value-added in intermediate exports used by a direct importing country to produce products for domestic consumption' and 'using other countries' value added to produce products for domestic use' in addition to conventional channels, 'exporting its domestic value-added in intermediate exports used by a direct importing country to produce products for a third country' and 'using other countries' value added to produce products for its gross exports'.

serious for countries with large domestic markets such as China and India.[13] In addition, this index can be decomposed into simple GVC participation index for single cross-border transactions and complex GVC participation index for transactions that cross borders twice or more times. Therefore, this paper uses these UIBE GVC participation indices in this section.

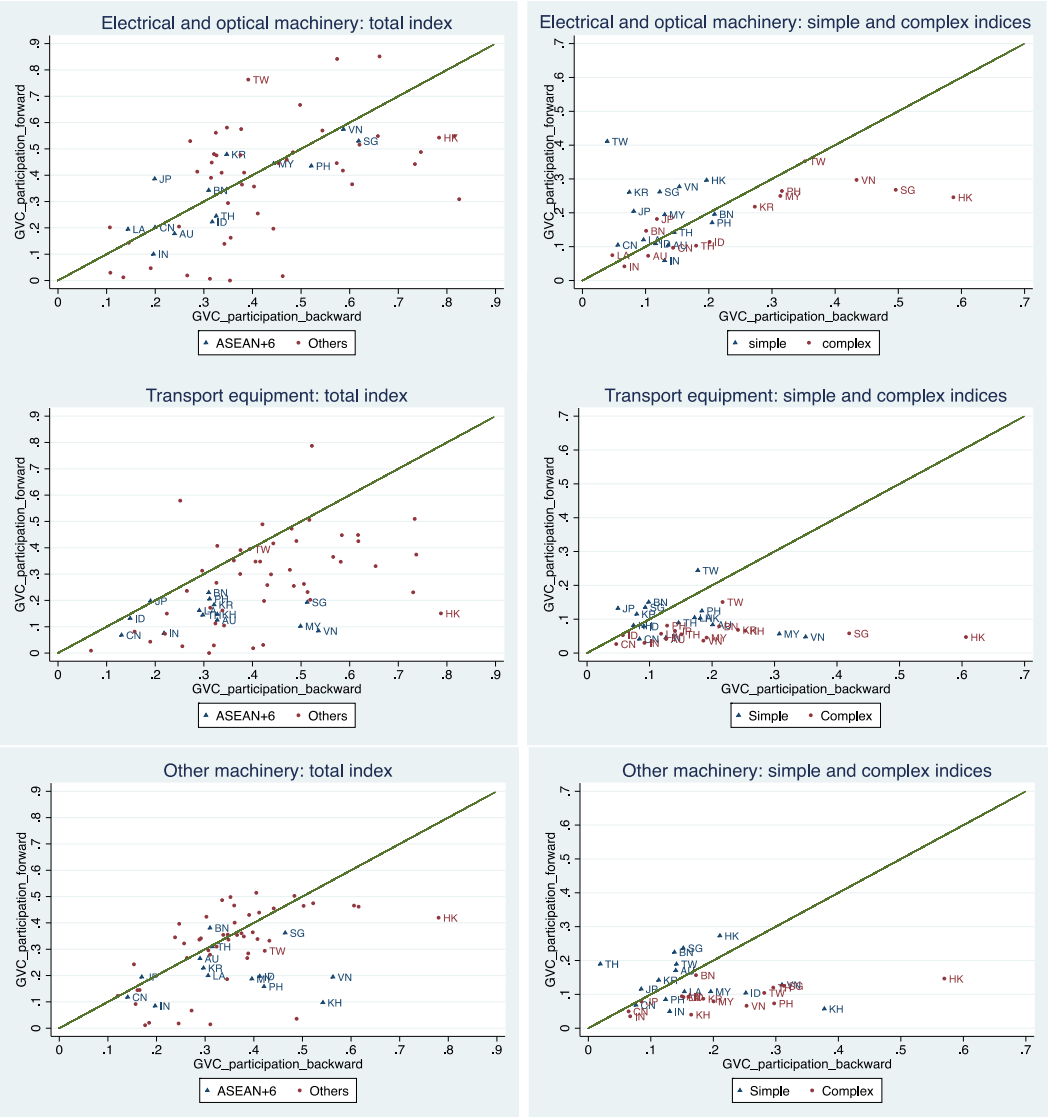
Figure 3 shows (a) the forward linkage-based total GVC participation index and the backward linkage-based total GVC participation index for countries in the ASEAN+6 area and other regions in 2017 in three machinery industries, i.e. electrical and optical machinery, transport equipment, and other machinery.[14] Figure 3 also presents (b) the simple and complex GVC participation indices for ASEAN+6 countries plus Hong Kong and Taiwan, considering their involvement in IPNs. We obtain several interesting findings. First, cross-border transactions in terms of both forward and backward linkages are active in machinery industries, particularly in the electrical and optical equipment industry (Figure 3 (a)). This suggests that many countries in the ASEAN+6 area, at different income levels, are actively engaged in the upstream/downstream production activities of machinery IPNs.[15] In the previous section, we discussed active machinery transactions based on international trade statistics. The similar results based on the value-added statistics confirm that machinery IPNs are active, and many countries in the ASEAN+6 area at various income levels participate in such active IPNs.

[13] See Hummels, Ishii, and Yi (2001) for vertical specialisation measures. Another popular measure of the GVC index is the ratio of value added to gross exports, or VAX ratio, proposed by Johnson and Noguera (2012).

[14] A large number of countries included in 'Others' in Figure 3(a) are Organisation for Economic Co-operation and Development (OECD) members.

[15] For instance, Japan, Korea, and Taiwan have a higher degree of forward participation than backward participation for the electrical and optical machinery industry. This implies that these countries are more actively engaged in upstream production activities in this industry.

Figure 3: GVC Participation Index for Machinery Sectors, 2017



AU = Australia, BN = Brunei, CN = China, HK = Hong Kong (non-RCEP member), ID = Indonesia, IN = India, JP = Japan, KH = Cambodia, KR = Rep. of Korea, LA = Lao PDR, MY = Malaysia, PH = Philippines, SG = Singapore, TH = Thailand, TW = Taiwan (non-RCEP member), VN = Viet Nam.

Notes: The total GVC index is shown for RCEP countries and others (mostly OECD countries), while simple and complex GVC indices are presented only for RCEP countries plus Hong Kong and Taiwan. See Appendix A for the concept of the GVC participation index and the country list. GVC_participation_forward and GVC_participation_backward denote a forward linkage-based GVC index and a backward linkage-based GVC index, respectively.

Source: Authors, based on data available from the UIBE-GVC-indicators.

Second, the electrical and optical machinery industry, in particular, is vigorously involved not only in single cross-border transactions but also in transactions that cross borders multiple times in terms of both forward and backward linkages (Figure 3(b)). The previous section discussed the existence of back-and-forth transactions in machinery industries for most East Asian countries based on trade data. This finding, based on value-added statistics here, confirms that back-and-forth transactions are active in IPNs particularly in this industry.

Third, unlike the electrical and optical machinery industry, the forward linkage index tends to be lower than the backward linkage index for the transport equipment industry (Figure 3 (a)). Moreover, the complex index is quite low for the forward linkage while it is not as low for the backward linkage in this industry for many countries (Figure 3 (b)). This indicates that a large portion of cross-border transactions, particularly transactions that cross borders multiple times, are likely to be downstream production activities, and that back-and-forth transactions are not as active in this industry as in the case of the electrical and optical machinery industry. This finding may arise from the nature of this industry – for instance, this industry tends to prefer forming industrial clusters and using one-way cross-border transactions more heavily.

Our findings in this section, particularly the participation of many countries in the region in IPNs, may emphasise the importance of multilateral agreements, rather than bilateral arrangements, in terms of, for instance, the advantage of cumulative rules of origin, the establishment of stable trading systems, and common trade and investment facilitation measures. As mentioned in the previous section, the extensiveness of import inputs over various countries mitigated the harmful supply-side effects of COVID-19, particularly during the early period of February–March 2020 when the uncertainty due to COVID-19 suddenly increased, probably because it allowed the flexible adjustment of transactions. Encompassing many countries participating in IPNs within a common agreement may help to facilitate the flexible adjustment of transactions, which would mitigate the

possible negative impacts on IPNs of shocks if any. RCEP is expected to contribute to forming a favourable environment for such extensive IPNs throughout East Asia.

4. Evaluation of East Asian Machinery Trade Based on the Gravity Model

This section evaluates the current status and the development in the 2010s of East Asian machinery trade, based on the gap between potential and actual machinery trade values, which are obtained in Ando, Kimura, and Yamanouchi (2022) by using the same methodology applied in Ando, Yamanouchi, and Kimura (2021).[16] Ando, Kimura, and Yamanouchi (2022) first estimated a traditional gravity equation, using data on machinery trade values for 2019 (or 2010). Then, the value of machinery trade predicted by the gravity model was calculated to obtain the ratio of the actual trade value to the predicted value. It indicates the degree of actual machinery trade in terms of the level predicted by the model, considering the economic size and the geographical conditions.

Table 1 shows the actual and predicted values of machinery trade and the gap between them for each country/region of the world. In this table, we observe ASEAN's tight connectivity –particularly amongst AMS and with other East Asian countries – in terms of both exports and imports.[17] Specifically, intra-ASEAN trade and ASEAN trade with China, Japan, and the Republic of Korea (henceforth, Korea) are more than twice the predicted values for both exports and imports.[18] This suggests that ASEAN participates in machinery IPNs

[16] See Ando, Kimura, and Yamanouchi (2022) for the details of methodology and data. Their gap ratio is essentially the same concept as the export potential proposed in Mulabdic and Yasar (2021).

[17] Ando, Kimura, and Yamanouchi (2022) discussed the inter-regional linkage of ASEAN and other East Asian countries, particularly the link with North America and Europe. They emphasised that trade by East Asia, including ASEAN, is still open to the outside of the region, and that AMS are active suppliers not only to the intra-regional countries but also to countries outside the region.

[18] Trade amongst China, Japan, and Korea are not necessarily as large as expected; China's exports to Japan and Korea (64% and 89%), Japan's exports to Korea (90%), and Korea's

in East Asia more actively than the predicted levels explained by the economic size and distance, and plays a central role in IPNs. Moreover, while ASEAN's machinery trade with the world was already above the predicted level in 2010, the gap between the actual and predicted values expanded in the 2010s from 229% to 247% for exports and from 168% to 182% for imports. Besides, in all cases of ASEAN trade with each country/region, actual values exceeded the predicted levels and trade values *per se* increased, although the gap declined slightly in some cases, including intra-ASEAN trade and ASEAN exports to China. These findings also confirm that ASEAN contributes to the development of machinery IPNs and has been playing an important role in IPNs.

exports to Japan (37%) are lower than predicted. In other words, there may be room for strengthening the connectivity amongst these three countries.

Table 1: Actual and Predicted Machinery Trade Values for RCEP and Other Countries

	Exporter (row)/ Importer (column)	Value ($ millions), %	2019 China	Japan	Rep. of Korea	ASEAN	Australia and New Zealand	India	North America	EU	Rest of the world	Total (World)	2010 ASEAN	Total (World)
2019	China	Actual (A)		75,889	58,515	161,657	7,708	37,831	296,546	249,381	476,571	**1,364,100**	70,256	**895,159**
		Predicted (B)		118,568	65,893	72,285	9,463	50,069	163,984	177,079	295,714	**953,054**	40,885	**554,227**
		(A)/(B) (%)		*64*	*89*	*224*	*81*	*76*	*181*	*141*	*161*	***143***	*172*	***162***
	Japan	Actual (A)	81,031		20,245	59,962	2,582	5,817	126,272	64,669	110,199	**470,778**	67,993	**517,380**
		Predicted (B)	74,293		22,386	21,715	3,928	7,176	64,147	60,411	84,697	**338,752**	25,539	**361,491**
		(A)/(B) (%)	*109*		*90*	*276*	*66*	*81*	*197*	*107*	*130*	***139***	*266*	***143***
	Rep. of Korea	Actual (A)	84,679	9,161		54,181	744	6,551	66,569	36,682	77,051	**335,618**	24,744	**298,426**
		Predicted (B)	45,860	24,865		8,639	1,307	2,996	21,772	22,348	35,613	**163,400**	6,059	**111,639**
		(A)/(B) (%)	*185*	*37*		*627*	*57*	*219*	*306*	*164*	*216*	***205***	*408*	***267***
	ASEAN	Actual (A)	83,070	39,456	24,559	122,552	4,107	17,733	117,662	83,934	151,101	**644,176**	98,785	**424,888**
		Predicted (B)	39,799	18,528	6,644	45,225	2,846	8,388	34,797	38,940	65,409	**260,576**	33,993	**185,232**
		(A)/(B) (%)	*209*	*213*	*370*	*271*	*144*	*211*	*338*	*216*	*231*	***247***	*291*	***229***
	Australia and New Zealand	Actual (A)	114	57	66	373	11	45	1,215	930	8,395	**11,206**	297	**13,963**
		Predicted (B)	2,694	1,766	531	1,521	300	540	7,916	5,269	13,322	**33,859**	1,530	**34,305**
		(A)/(B) (%)	*4*	*3*	*12*	*25*	*4*	*8*	*15*	*18*	*63*	***33***	*19*	***41***
	India	Actual (A)	1,971	792	566	9,107	228		13,273	11,687	27,601	**65,224**	5,158	**35,283**
		Predicted (B)	56,238	12,864	4,836	18,953	2,042		32,905	45,745	87,819	**261,402**	15,346	**202,119**
		(A)/(B) (%)	*4*	*6*	*12*	*48*	*11*		*40*	*26*	*31*	***25***	*34*	***17***
	North America	Actual (A)	63,106	28,621	23,338	43,379	5,678	9,328	617,230	161,678	177,220	**1,129,577**	43,134	**839,805**
		Predicted (B)	105,297	65,732	20,088	42,259	15,982	18,806	591,802	291,501	327,579	**1,479,047**	33,137	**1,183,900**
		(A)/(B) (%)	*60*	*44*	*116*	*103*	*36*	*50*	*104*	*55*	*54*	***76***	*130*	***71***
	EU	Actual (A)	144,804	37,144	30,659	64,599	8,846	24,562	286,773	1,517,637	428,107	**2,543,132**	49,995	**2,032,685**
		Predicted (B)	122,616	66,879	22,266	51,213	11,851	27,976	318,751	1,298,753	542,040	**2,462,344**	42,513	**2,018,900**
		(A)/(B) (%)	*118*	*56*	*138*	*126*	*75*	*88*	*90*	*117*	*79*	***103***	*118*	***101***
	Rest of the world	Actual (A)	92,501	22,859	16,508	60,029	8,727	21,201	95,207	180,288	192,063	**689,382**	41,579	**513,239**
		Predicted (B)	137,665	59,758	23,082	55,204	17,478	38,627	227,839	380,672	360,433	**1,300,757**	39,597	**919,016**
		(A)/(B) (%)	*67*	*38*	*72*	*109*	*50*	*55*	*42*	*47*	*53*	***53***	*105*	***56***
	Total (World)	**Actual (A)**	**551,277**	**213,978**	**174,456**	**575,838**	**38,631**	**123,069**	**1,620,747**	**2,306,885**	**1,648,311**	**7,253,193**	**401,941**	**5,570,828**
		Predicted (B)	**584,462**	**368,959**	**165,726**	**317,013**	**65,196**	**154,578**	**1,463,914**	**2,320,719**	**1,812,625**	**7,253,192**	**238,599**	**5,570,828**
		(A)/(B) (%)	***94***	***58***	***105***	***182***	***59***	***80***	***111***	***99***	***91***	***100***	***168***	***100***
2010	ASEAN	Actual (A)	52,845	30,760	13,488	98,785	2,076	9,417	56,587	57,379	103,551	**424,888**		
		Predicted (B)	18,892	19,854	4,628	33,993	2,353	7,120	21,307	28,649	48,436	**185,232**		
		(A)/(B) (%)	*280*	*155*	*291*	*291*	*88*	*132*	*266*	*200*	*214*	***229***		
	Total (World)	**Actual (A)**	**425,128**	**171,618**	**131,730**	**401,941**	**39,297**	**78,614**	**1,081,293**	**1,853,736**	**1,387,471**	**5,570,828**		
		Predicted (B)	**311,111**	**383,335**	**119,882**	**238,599**	**59,113**	**129,370**	**1,041,763**	**1,835,836**	**1,451,819**	**5,570,828**		
		(A)/(B) (%)	***137***	***45***	***110***	***168***	***66***	***61***	***104***	***101***	***96***	***100***		

ASEAN = Association of Southeast Asian Nations, EU = European Union.

Notes: 'Actual (A)' denotes the actual values of specific country/region pairs, 'Predicted (B)' denotes the corresponding predicted values, and '(A)/(B) (%)' denotes the ratio of actual to predicted values in percentage. North America refers to Canada, Mexico, and the United States; EU refers to the 27 EU member countries and the United Kingdom; and 'Rest of the world' refers to 128 countries and regions, including Hong Kong, Macao, and Taiwan. The predicted values for regions are calculated by totalling the member countries' predicted values.

Source: Ando, Kimura, and Yamanouchi (2022).

Conversely, other ASEAN+6 countries – Australia, New Zealand, and India – are not active in machinery trade. ASEAN's export connections with these countries became stronger in the 2010s – from 88% to 144% for Australia and New Zealand and from 132% to 211% for India – but are still weaker than the ASEAN's connections with the world (247%) in 2019. In addition, ASEAN's import connections with these countries are much weaker and even below the

predicted levels (25% and 48%, respectively). The connection of China, Japan, and Korea with these countries is low, with much lower actual values than the predicted ones for all cases of exports and imports except the case of Korea's exports to India. The corresponding gap ratios for imports, in particular, are definitely low at less than 10% for imports by China and Japan and 12% for those by Korea.

With a focus on ASEAN, Table 2 presents the corresponding table for individual AMS. The actual intra-ASEAN trade of the original AMS – particularly Singapore, Malaysia, Thailand, and the Philippines – is about twice or more than twice as high as the predicted values for both exports and imports.[19] Moreover, these countries already had high gap ratios in 2010. This suggests that they have played an important role in intra-ASEAN machinery trade. Interestingly, the gap ratio of Indonesia's exports to ASEAN increased from 118% to 132% in the 2010s, though it is still substantially lower than the gap ratios of other original members' exports to ASEAN.

[19] These countries have higher export shares of parts and components. See Figure 1 and section 2.

Table 2: Actual and Predicted Machinery Trade Values for ASEAN Member States

	Exporter (row)/ Importer (column)	Value ($ millions), %	2019													2010	
			Singapore	Brunei	Malaysia	Thailand	Indonesia	Philippines	Viet Nam	Lao PDR	Cambodia	Myanmar	ASEAN	China, Japan, and Rep. of Korea	Total (World)	ASEAN	Total (World)
2019	Singapore	Actual (A)		393	13,234	3,955	5,543	4,543	3,470	30	338	815	32,321	34,364	156,011	30,816	136,061
		Predicted (B)		128	5,444	678	1,469	274	210	34	59	150	8,446	6,468	34,514	6,514	23,950
		(A)/(B) (%)		*309*	*243*	*583*	*377*	*1,657*	*1,653*	*88*	*572*	*543*	*383*	*531*	*452*	*473*	*568*
	Brunei	Actual (A)	90		55	4	2	0	4	0	0	0	155	42	250	158	200
		Predicted (B)	74		70	25	38	19	10	1	2	6	245	327	1,416	215	1,239
		(A)/(B) (%)	*122*		*79*	*15*	*5*	*1*	*38*	*2*	*0*	*0*	*63*	*13*	*18*	*74*	*16*
	Malaysia	Actual (A)	19,879	110		6,593	1,785	1,609	2,958	8	97	86	33,125	27,355	147,174	24,981	108,725
		Predicted (B)	8,476	188		1,486	2,124	269	214	36	62	161	13,015	6,308	38,377	9,815	29,125
		(A)/(B) (%)	*235*	*59*		*444*	*84*	*598*	*1,384*	*22*	*156*	*54*	*255*	*434*	*383*	*255*	*373*
	Thailand	Actual (A)	3,786	49	4,377		3,574	3,860	4,798	915	1,581	827	23,768	22,145	113,417	19,744	93,810
		Predicted (B)	1,310	82	1,844		1,114	435	513	231	283	538	6,348	11,006	44,997	4,838	31,920
		(A)/(B) (%)	*289*	*59*	*237*		*321*	*888*	*935*	*397*	*559*	*154*	*374*	*201*	*252*	*408*	*294*
	Indonesia	Actual (A)	3,471	40	1,210	2,311		3,226	1,851	21	91	147	12,367	4,551	30,530	8,968	24,441
		Predicted (B)	3,323	150	3,087	1,305		691	455	71	109	171	9,361	16,248	70,177	7,599	56,494
		(A)/(B) (%)	*104*	*26*	*39*	*177*		*467*	*407*	*30*	*83*	*86*	*132*	*28*	*44*	*118*	*43*
	Philippines	Actual (A)	5,852	2	1,497	2,189	473		1,061	0	10	6	11,090	17,663	62,111	11,614	47,019
		Predicted (B)	608	74	383	499	678		239	32	44	65	2,623	9,235	27,307	1,876	17,823
		(A)/(B) (%)	*962*	*3*	*391*	*438*	*70*		*445*	*0*	*23*	*9*	*423*	*191*	*227*	*619*	*264*
	Viet Nam	Actual (A)	1,718	20	1,493	2,535	1,122	1,073		105	295	244	8,606	40,332	131,657	2,197	14,124
		Predicted (B)	492	40	322	623	472	252		225	162	85	2,674	11,129	28,431	1,560	15,145
		(A)/(B) (%)	*349*	*51*	*464*	*407*	*238*	*425*		*47*	*182*	*286*	*322*	*362*	*463*	*141*	*93*
	Lao PDR	Actual (A)	6	0	8	397	4	0	27		1	0	444	82	770	57	61
		Predicted (B)	45	3	30	159	42	19	127		17	19	462	814	2,460	21	104
		(A)/(B) (%)	*13*	*0*	*28*	*250*	*9*	*0*	*21*		*8*	*1*	*96*	*10*	*31*	*267*	*59*
	Cambodia	Actual (A)	8	0	16	202	1	62	47	1		2	341	346	1,403	239	394
		Predicted (B)	91	6	62	225	74	30	107	19		10	624	658	2,906	349	1,571
		(A)/(B) (%)	*9*	*0*	*27*	*90*	*2*	*206*	*44*	*7*		*18*	*55*	*53*	*48*	*68*	*25*
	Myanmar	Actual (A)	133	0	13	113	6	11	60	0	0		336	205	852	11	53
		Predicted (B)	304	19	209	564	153	60	74	30	13		1,426	2,777	9,993	1,204	7,862
		(A)/(B) (%)	*44*	*0*	*6*	*20*	*4*	*19*	*81*	*0*	*1*		*24*	*7*	*9*	*1*	*1*
	ASEAN	Actual (A)	34,944	614	21,904	18,299	12,510	14,385	14,276	1,082	2,412	2,126	122,552	147,085	644,176	98,785	424,888
		Predicted (B)	14,723	690	11,451	5,563	6,163	2,050	1,948	679	752	1,205	45,225	64,971	260,576	33,993	185,232
		(A)/(B) (%)	*237*	*89*	*191*	*329*	*203*	*702*	*733*	*159*	*321*	*177*	*271*	*226*	*247*	*291*	*229*
	China, Japan, and Rep. of Korea	Actual (A)	49,071	427	34,230	41,200	31,174	25,148	86,404	995	2,485	4,664	275,800	329,520	2,170,496	162,993	1,710,965
		Predicted (B)	18,495	1,609	11,602	16,517	20,509	11,853	14,692	1,893	1,236	4,234	102,639	351,865	1,455,207	72,483	1,027,356
		(A)/(B) (%)	*265*	*27*	*295*	*249*	*152*	*212*	*588*	*53*	*201*	*110*	*269*	*94*	*149*	*225*	*167*
	Total (World)	**Actual (A)**	**154,458**	**1,729**	**86,621**	**81,632**	**58,174**	**57,501**	**119,042**	**2,257**	**6,313**	**8,112**	**575,838**	**939,711**	**7,253,192**	**401,941**	**5,570,828**
		Predicted (B)	**72,025**	**5,168**	**47,512**	**50,633**	**65,241**	**27,378**	**28,933**	**4,342**	**4,069**	**11,713**	**317,013**	**1,119,147**	**7,253,192**	**238,599**	**5,570,828**
		(A)/(B) (%)	***214***	***33***	***182***	***161***	***89***	***210***	***411***	***52***	***155***	***69***	***182***	***84***	***100***	***168***	***100***
2010	ASEAN	Actual (A)	33,403	418	21,418	14,133	14,032	8,072	4,859	668	899	882	98,785	97,093	424,888		
		Predicted (B)	10,229	605	9,137	4,210	5,056	1,584	1,264	249	483	1,174	33,993	43,373	185,232		
		(A)/(B) (%)	*327*	*69*	*234*	*336*	*278*	*510*	*384*	*269*	*186*	*75*	291	224	229		
	Total (World)	**Actual (A)**	**133,761**	**1,036**	**80,507**	**66,142**	**49,779**	**36,022**	**28,329**	**1,191**	**1,796**	**3,378**	**401,941**	**728,476**	**5,570,828**		
		Predicted (B)	**47,608**	**4,702**	**38,589**	**38,135**	**56,030**	**20,257**	**18,100**	**1,582**	**2,717**	**10,879**	**238,599**	**814,329**	**5,570,828**		
		(A)/(B) (%)	***281***	***22***	***209***	***173***	***89***	***178***	***157***	***75***	***66***	***31***	***168***	***89***	***100***		

Notes: 'Actual (A)' denotes the actual values of specific country/region pairs, 'Predicted (B)' denotes the corresponding predicted values, and '(A)/(B) (%)' denotes the ratio of actual to predicted values in percentage. The predicted values for regions are calculated by totalling the member countries' predicted values.

Source: Ando, Kimura, and Yamanouchi (2022).

In addition to the original AMS, Viet Nam expanded exports to and imports from ASEAN significantly in the 2010s; the gap ratios increased from 141% in 2010 to 322% in 2019 for exports and from 384% to 733% for imports. This indicates how rapidly Viet Nam became involved in IPNs in the 2010s, turning into one of the core players. On the other hand, exports by the Lao PDR, Cambodia, and Myanmar to AMS were still lower than the predicted values in 2019, though the export values expanded in the 2010s. Since Cambodia and Myanmar significantly increased the corresponding ratios for imports, these countries are just starting to be involved in IPNs in East Asia.

In sum, our results imply that East Asian countries, particularly AMS, have positioned themselves at the centre of machinery IPNs. Some countries in the ASEAN+6 area – such as ASEAN latecomers, Australia, New Zealand, and India – do not have strong ties with other East Asian countries and have not yet participated heavily in machinery IPNs.

Participation in machinery IPNs is at the core of development strategies for fast economic growth. Various trade and investment liberalisation and facilitation measures have contributed to the development of machinery IPNs in East Asia in the past decades. In particular, ASEAN's high-level commitment to machinery IPNs is crucial to Factory Asia. RCEP covers the whole East Asia region, with the ASEAN centrality, for the rules-based trading regime. Further progress in the liberalisation and facilitation of trade and investment, which RCEP is expected to achieve, will promote the participation in IPNs by the Lao PDR, Cambodia, and Myanmar as well as potentially India and South Asian countries in the future. Even for AMS that already participate heavily in IPNs, the strength of country-to-country connections is still uneven. RCEP could be helpful in developing more diversified patterns of IPNs. As mentioned in footnote 18, China, Japan, and Korea are not as closely connected as we expected with each other, after controlling for country size and geographical distance. Although the heightening of geopolitical tensions may not allow these three countries to deepen integration, many important parts and components and intermediate materials are already traded with each other. This means that RCEP-based tariff removals, though limited, as well as the cumulative rules of origin, may benefit the whole East Asia region including ASEAN.

5. Global Innovator Services Trade

To assess the possible contribution of RCEP to trade and investment in East Asia, we need to look at the emergence of new types of the international division of labour. Digital technology has started to transform the mechanics of international trade, which is led by the services sector. The digital economy affects services in two ways. The first way is the expansion of digitalised services. An increasingly large fraction of services is digitalised so that such services can become deliverable online, regardless of whether they are provided domestically or across national borders. An increasingly large portion of the manufacturing sector and other traditional sectors also transform into digitalised services (servicification). The second way is the emergence of digitalising services. This type of services helps to digitalise other industries and services subsectors. Such services are often digitalised services too. Services used to be regarded as not productive, not innovative, mostly non-tradable, and just working as absorbing redundant informal unskilled labour, but this may not be the case from now on. Although manufacturing-led development has been the traditional model for creating jobs and prosperity, some parts of services would be the mainstream of the novel international division of labour.

Since services are increasingly driving economic transformation, Nayyar, Hallward-Driemeier, and Davies (2021) shed light on the services sector and assessed the prospects for services-led development. Their report, which is a recent report published by the World Bank, presented an interesting typology for the services sector based on data for the EU18 and the US. Four groups to be identified are (i) skill-intensive social services (e.g. health and education); (ii) low-skill domestic services (e.g. arts, entertainment, and recreation; retail; personal services; and administrative and support); (iii) low-skill tradable services (e.g. accommodations and food; transportation and storage; and wholesale); and (iv) global innovator services (e.g. information and communication services; professional, scientific, and technical services; and financial and insurance

services) (see Appendix B). Amongst global innovator services, information and communication services and professional, scientific, and technical services are referred to as R&D-intensive services, while financial and insurance services are categorised as capital intensive. In addition, the World Trade Organization (WTO) defines (1) ICT services[20] and (2) other business services[21] as a proxy of intermediate commercial services and regards them as important inputs for manufacturing activities.[22] Note that other business services are basically the same as 'professional, scientific, and technical services' categorised into global innovator services. Thus, this section focuses on exports of these services subsectors, considering that ICT services and other business services are at the core of digitalised and digitalising services and will become one of the important trade channels.

We employ two statistics on trade in services: (i) Trade in Services data by Mode of Supply (TISMOS)[23] and (ii) balance of payment (BOP)-based data from the WTO STATS portal.[24][25] The WTO GATS definition of the four modes of supply is significantly broader than the BOP concept of services trade because the BOP counts only transactions between residents and non-residents as services trade. In other words, the BOP does not cover services transactions between the

[20] For the balance of payment (BOP)-based services statistics, ICT services consist of (i) telecommunications services; (ii) computer services; and (iii) information services, including news agency services.

[21] Other business services on the BOP-based services statistics is composed of (i) R&D services; (ii) professional and management consulting services; and (iii) technical, trade-related, and other business services.

[22] See WTO (n.d.), WTO 'Trade in Value-Added and Global Value Chains' Profiles: Explanatory Notes. https://www.wto.org/english/res_e/statis_e/miwi_e/explanatory_notes_e.pdf (accessed 2 February 2021) for the definition of intermediate commercial services.

[23] For more details on TISMOS, see WTO (n.d.), Trade in Services Data by Mode of Supply (TISMOS). https://www.wto.org/english/res_e/statis_e/trade_datasets_e.htm#TISMOS. (accessed 1 August 2021)

[24] WTO (n.d.), WTO STATS. https://stats.wto.org/.

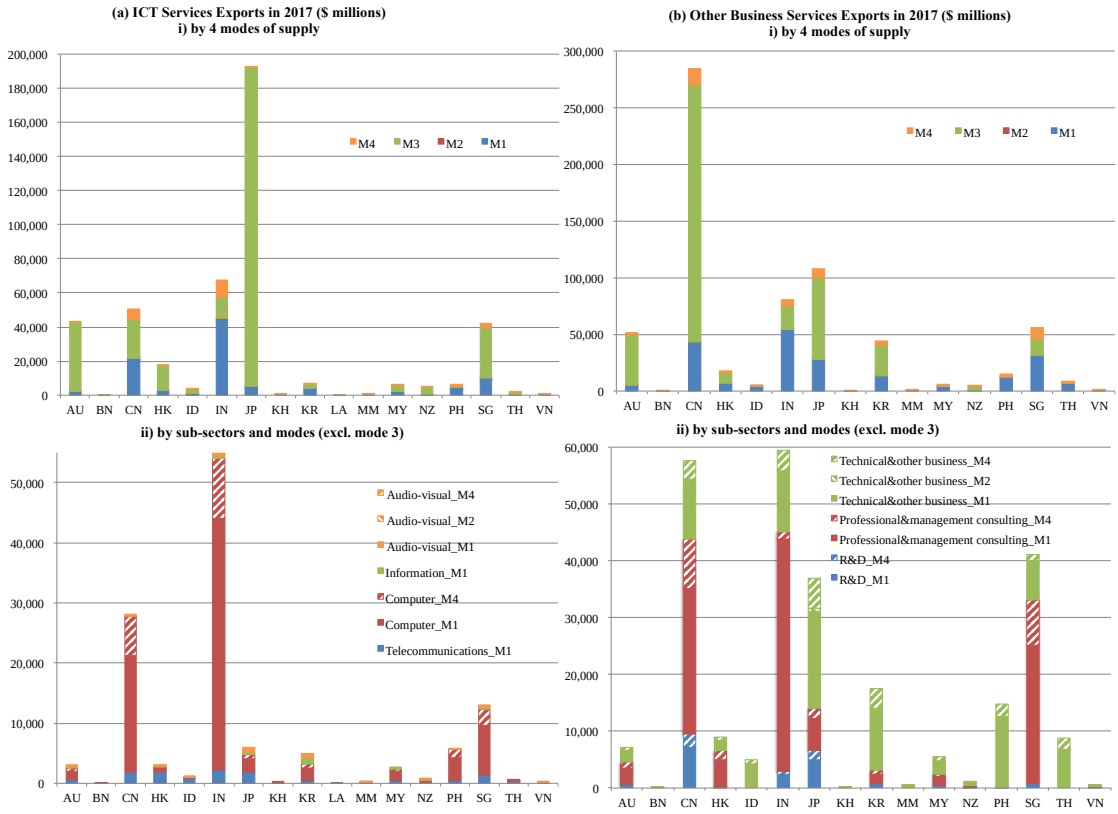
[25] Note that categories of ICT services and other business services are slightly different between TISMOS and the BOP-based statistics. Specifically, the category of ICT services includes audio-visual and related services, while that of other business services does not include trade-related services for data from TISMOS. On the other hand, the category of ICT services does not include audio-visual and related services, while that of other business services includes trade-related services for the BOP-based statistics.

same residents. Thus, BOP statistics are useful to capture services transactions mainly for cross-border supply (mode 1), consumption abroad (mode 2), and the presence of natural persons (mode 4), but do not sufficiently cover services, particularly those via commercial presence (mode 3). In 2019, the WTO provided a new experimental data set, TISMOS, which combines the information available from the BOP statistics and Foreign Affiliates Statistics (FATS) to offer an overall picture of international services trade during 2005–2017 according to the four modes of supply. Thus, TISMOS is useful to capture the overall pattern of services trade, including mode 3 services, while the BOP-based services trade statistics provide more comprehensive information in terms of the coverage of countries, periods, frequency (e.g. quarterly and annually), and sectors/subsectors, in addition to the availability of more recent information.[26]

Figure 4 presents (i) exports by four modes of supply, and (ii) exports by subsectors and modes excluding mode 3 for (a) ICT services and (b) other business services in 2017. Mode 3 is notably large for some countries, and the ranking of these services exports amongst ASEAN+6 countries changes, depending on whether mode 3 is included or not. When mode 3 is considered, Japan is by far the largest exporter, followed by India, China, Singapore, and Australia for ICT services exports, while China is the largest, followed by Japan, India, Singapore, Australia, and Korea for other business services exports.

[26] We need careful utilisation of services trade data; for instance, TISMOS data for mode 3 cannot be decomposed into subsectors, TISMOS data for some subsectors may be missing even if data for the corresponding sector exists, BOP data basically do not cover mode 3 services, and classifications for these two databases are slightly different. Indeed, we need careful treatment of using services trade data in detail, but we believe that the available services trade data must be useful to understand the trend of services trade and to provide interesting insights.

Figure 4: ICT Services and Other Business Services Exports by RCEP Countries in 2017 and Their Decomposition



AU = Australia, BN = Brunei, CN = China, HK = Hong Kong (non-RCEP member), ID = Indonesia, IN = India, JP = Japan, KH = Cambodia, KR = Republic of Korea, LA = Lao PDR, MM = Myanmar, MY = Malaysia, NZ = New Zealand, PH = Philippines, SG = Singapore, TH = Thailand, and VN = Viet Nam, ICT = information and communication technology.

Notes: ICT services include telecommunications, computer, information, and audio-visual and related services. Other business services include R&D, professional&management consulting, and technical&other business services (excluding trade-related services). As data for mode 3 cannot be decomposed into subsectors, mode 3 is not included for figures by subsectors and modes.

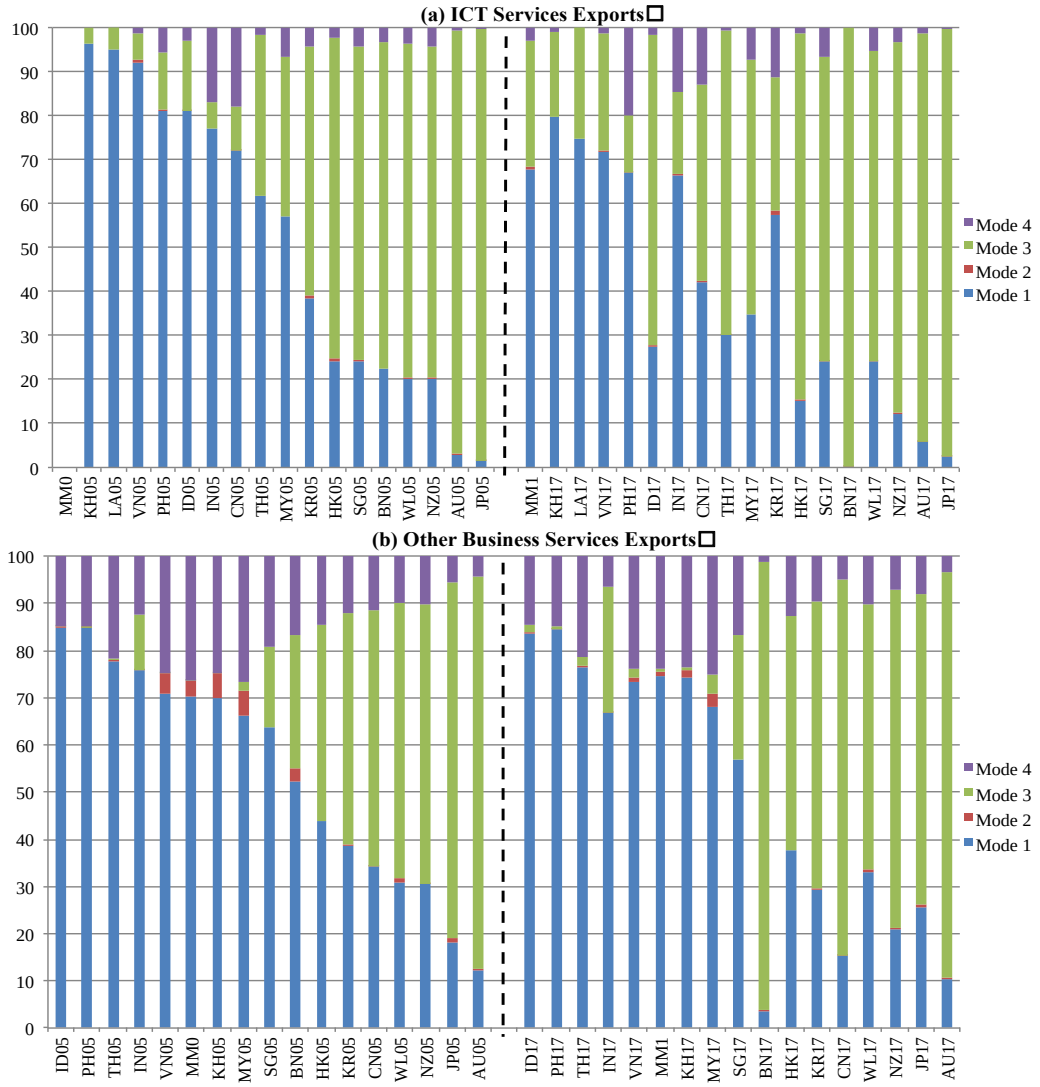
Source: Authors' calculation, based on data available from TISMOS.

As the upper part of Figure 4 (a-i and b-i) suggests, mode composition seems to be different amongst countries. So, let us check the mode composition of these services exports (Figure 5). In this figure, countries are arranged by the order of mode 1 share in 2005 for both 2005 and 2017. As Figure 5 (a) shows, for

ICT services, mode 3 is becoming a more important supply mode of export services in many countries in the ASEAN+6 area. In addition, lower-income countries tend to have larger shares of mode 1, while higher-income countries are likely to have large shares of mode 3 in 2005. In 2017, however, mode composition (or the share of mode 1) is not exactly along the order of income levels. Such a pattern in terms of the relationship between the mode 1 share and income levels in 2005 does not necessarily apply to other business services sectors, but at least mode 3 is the most important supply mode for about half the countries in the region in 2017.[27] These findings indicate that it is important to liberalise market access for incoming FDI in these services sectors, and even developing countries must have a chance to become services exporters quickly by hosting FDI.

[27] There is also a possibility that exporters may substitute between modes, depending on the restrictions in the import markets.

Figure 5: Mode Composition of Services Exports by RCEP Countries, 2005 and 2017



AU = Australia, BN = Brunei, CN = China, HK = Hong Kong (non-RCEP member), ID = Indonesia, IN = India, JP = Japan, KH = Cambodia, KR = Rep. of Korea, LA = Lao PDR, MM = Myanmar, MY = Malaysia, NZ = New Zealand, PH = Philippines, SG = Singapore, TH = Thailand, VN = Viet Nam, WL = world, ICT = information and communication technology, R&D = research and development.

Notes: The left half is for 2005 and the right half is for 2017. Countries are arranged by the order of the mode 1 share in 2005 for each year. ICT services include telecommunications, computer, information, and audio-visual and related services. Other business services include R&D, professional and management consulting, and technical and other business services (excluding trade-related services).

Source: Authors' calculation, based on TISMOS.

Unfortunately, mode 3 cannot be decomposed into subsectors in the TISMOS database. Thus, the lower part of Figure 4 (a-ii and b-ii) decomposes only mode 1, mode 2, and mode 4 of these services into their subsectors. Apparently, most ICT export services are computer services. Now that India has by far the largest, followed by China, Singapore, the Philippines, and Japan, while Japan is by far the largest, followed by India, China, Singapore, and Australia when mode 3 is included as discussed above. Considering the economic size, computer services must be a very important export mode, particularly for India and the Philippines. Importantly, while mode 1 is dominant for ICT services other than mode 3, as expected, a certain amount of ICT services exports is mode 4. This suggests that the movement of professionals is also important to supply these services, so liberalising and facilitating the movement of professionals, in addition to liberalising market access, may be important to activate these services exports.

For other business services, professional and management consulting services are dominant for some countries such as India, Singapore, and China, while technical and other business services are large for others such as Japan, the Philippines, Thailand, Korea, and Thailand. Like ICT services, mode 1 occupies large shares in these services exports, but a certain number of exports is mode 4. Again, this confirms the importance of liberalising and facilitating the movement of professionals in addition to the liberalisation of the market access of these services.

Table 3 presents the latest export trend of these two sectors, based on the BOP-based statistics. During the COVID-19 pandemic, trade in services generally suffered from the negative impacts more severely than trade in goods in 2020.[28] Even amongst ICT services, however, worldwide exports of computer services increased in 2020 by 8%, unlike other ICT subsectors with an export decrease, and are becoming more important than before. When we look at exports of

[28] See Ando and Hayakawa (2022b) for the impacts of COVID-19 on trade in services, using quarterly data from 146 countries in 2019 and 2020.

computer services by individual ASEAN+6 countries that have corresponding data for 2019 and 2020, most of them increased exports in 2020. In addition, in China, India, and the Philippines, computer services have a share of more than 90% in ICT services exports in total.

Table 3: Latest Export Trend of ICT Services and Other Business Services for RCEP Countries

(a) ICT Services Exports

	Value for 2019	Subsector's share			Change in 2020: ratio of 2020 to 2019 value			
	($ millions)	Telecommunications	Computer	Information		Telecommunications	Computer	Information
Australia	3,867	21.7%	66.6%	11.7%	1.00	1.06	1.04	0.68
Brunei	1	n.a.	n.a.	n.a.	7.94			
Myanmar	150	85.9%	8.3%	5.7%	0.40	0.23	1.39	1.50
Cambodia	87	69.2%	30.8%	0.0%	0.95	0.98	0.90	
China	53,785	4.5%	95.5%	0.0%	1.10			
Hong Kong	3,091	65.1%	31.4%	3.5%	n.a.			
India	64,933	4.4%	95.2%	0.5%	1.05	0.96	1.06	0.86
Indonesia	1,321	70.9%	29.1%	0.0%	0.97	0.84	1.28	
Japan	6,975	20.5%	74.9%	4.7%	1.39	0.67	1.62	0.98
Rep. of Korea	6,160	8.4%	46.8%	44.8%	1.07	1.01	1.14	1.02
Lao PDR	33	100.0%	0.0%	0.0%	n.a.			
Malaysia	2,991	23.1%	70.5%	6.4%	1.07	1.23	1.00	1.21
New Zealand	918	n.a.	n.a.	n.a.	1.06			
Philippines	6,098	7.8%	90.9%	1.3%	0.91	0.79	0.94	0.05
Singapore	15,496	11.8%	85.5%	2.7%	0.99	0.89	1.01	0.86
Viet Nam	723	8.7%	66.5%	24.8%	n.a.			
Thailand	586	82.4%	n.a.	n.a.	0.82	0.65		
World	**682,396**	**13.0%**	**80.6%**	**6.4%**	**1.04**	**0.95**	**1.08**	**0.80**

(b) Other Business Services Exports

	Value for 2019	Subsector's share			Change in 2020: ratio of 2020 to 2019 value			
	($ millions)	R&D	Professional and management consulting	Technical, trade-related, and other business		R&D	Professional and management consulting	Technical, trade-related, and other business
Australia	8,428	7.5%	48.5%	44.1%	0.91	1.09	0.92	0.86
Brunei	8	0.0%	12.1%	87.9%	0.66		1.59	0.54
Myanmar	1,476	n.a.	n.a.	n.a.	1.06			
Cambodia	117	0.0%	0.0%	100.0%	1.15			1.15
China	73,247	n.a.	n.a.	n.a.	1.03			
Hong Kong	13,834	1.1%	46.9%	52.0%	n.a.			
India	74,004	6.7%	73.3%	20.0%	1.05	1.04	1.08	0.96
Indonesia	6,592	n.a.	n.a.	n.a.	0.77			
Japan	46,671	16.8%	19.2%	64.0%	0.94	0.83	1.08	0.93
Rep. of Korea	23,364	4.4%	10.7%	84.8%	1.05	0.97	1.11	1.04
Malaysia	7,061	6.6%	43.6%	49.7%	0.91	1.20	0.98	0.81
New Zealand	1,391	8.4%	23.2%	68.3%	0.98	0.93	0.97	0.99
Philippines	17,456	0.4%	0.9%	98.7%	1.01	0.75	0.52	1.02
Singapore	62,778	1.1%	69.9%	29.0%	0.95	0.97	0.97	0.90
Viet Nam	336	0.0%	0.0%	100.0%	n.a.			
Thailand	11,682	0.0%	0.0%	100.0%	1.03			1.03
World	**1,407,901**	**14.2%**	**41.1%**	**44.7%**	**0.95**	**0.96**	**0.97**	**0.93**

BOP = balance of payments, ICT = information and communication technology, n.a. = not applicable.

Notes: Data are on a BOP basis, so mode 3 is not covered. Unlike Figures 4 and 5, ICT services here do not include audio-visual and related services, while other business services include trade-related services. Hong Kong (non-RCEP member) is included here.

Source: Authors' calculation, based on data available from the WTO STATS.

As for other business services, worldwide exports in three subsectors declined slightly in 2020. Interestingly, however, the percentage change in exports in 2020 is larger than the world average for more than half of the ASEAN+6 countries with corresponding data for 2019 and 2020 in all three subsectors, and some countries even increased exports in 2020. This suggests that ASEAN+6 countries may have the potential to become important exporters of these services.

Trade in global innovator services is still in its infancy in East Asia. However, the importance of such a form of international division of labour will increase. Global innovator services provide digitalised services as well as digitalising services for other industries, both of which are important to promote digital transformation of the whole economy, productivity growth, and people's welfare. Trade restrictions are likely to delay the deployment of digital technology by losing the momentum of technology transfer and spillover. Together with the system of data-related policies (Chen et al., 2019), services trade liberalisation, particularly for digitalised and digitalising services, must be promoted in the framework of regional trade agreements such as RCEP. In that sense, India's participation in RCEP would play an important role. As the trade specialisation coefficients calculated for individual countries in the ASEAN+6 area in Ando, Yamanouchi, and Kimura (2021) suggested, India is competitive in ICT services. Although India is not yet a member of RCEP, its participation in RCEP could enhance the significance of RCEP because India has been and would be a big player in digitised services networks in East Asia and the world as the third unbundling.

6. Concluding Remarks

RCEP should be not only a concluded agreement with fixed text but also an evolving, living one. In terms of liberalisation and international rule-making, the current agreement does not yet achieve everything that was originally expected, so we must revise and upgrade its contents to support the dynamic international division of labour in East Asia. At the same time, RCEP may play an important role in reducing policy risks due to ad hoc trade policies based on political intension and defending the rules-based trading regime for the regional economy. To do so, the institutional set-up of the RCEP joint committee, sub-committees, and secretariat, which follows the ASEAN tradition, would become crucial. RCEP must contribute to the effort to maintain economic dynamism in East Asia despite increasing geopolitical tensions.

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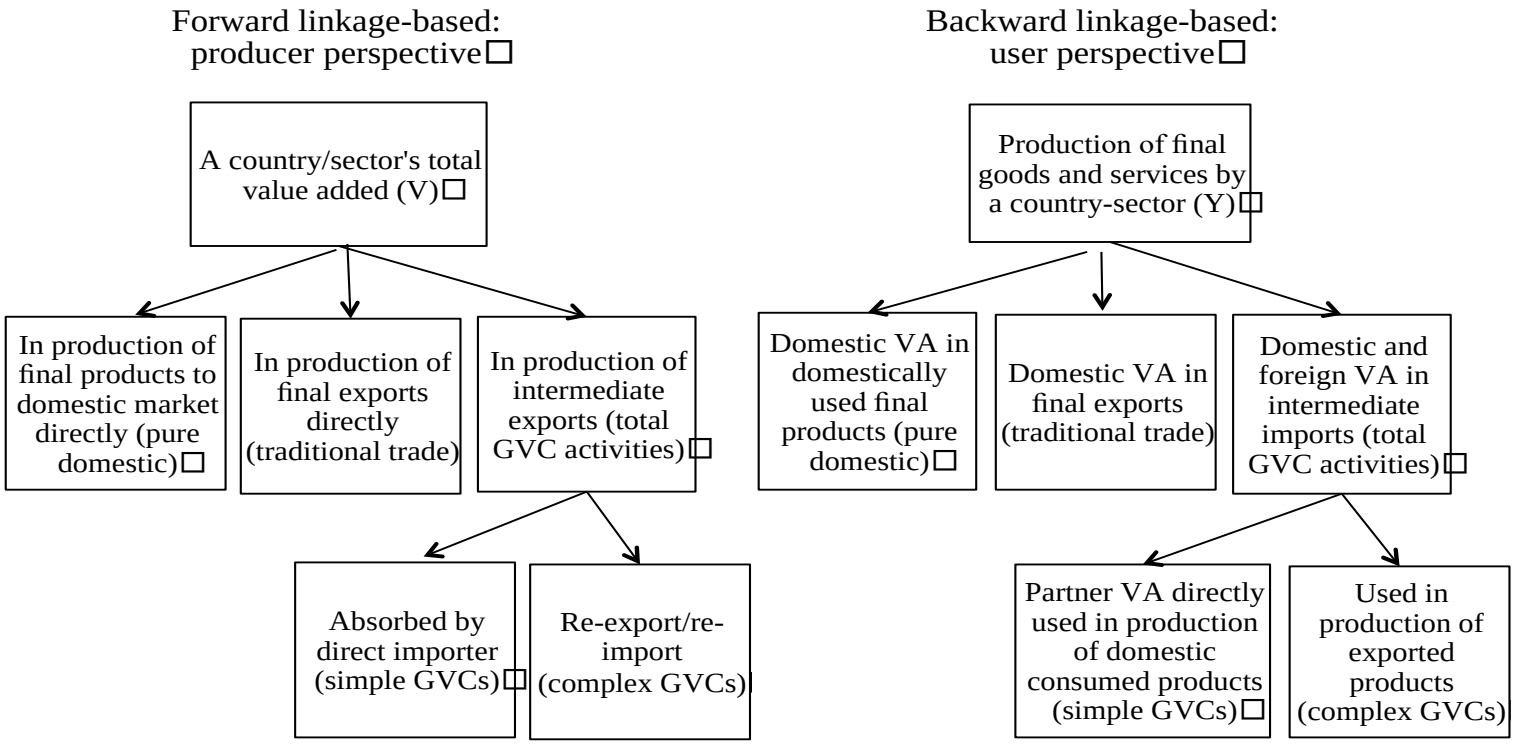
Appendix A: GVC Participation Index – Concept and Country List

Figure A-1. Concept of GVC Participation Index



VA = .value added

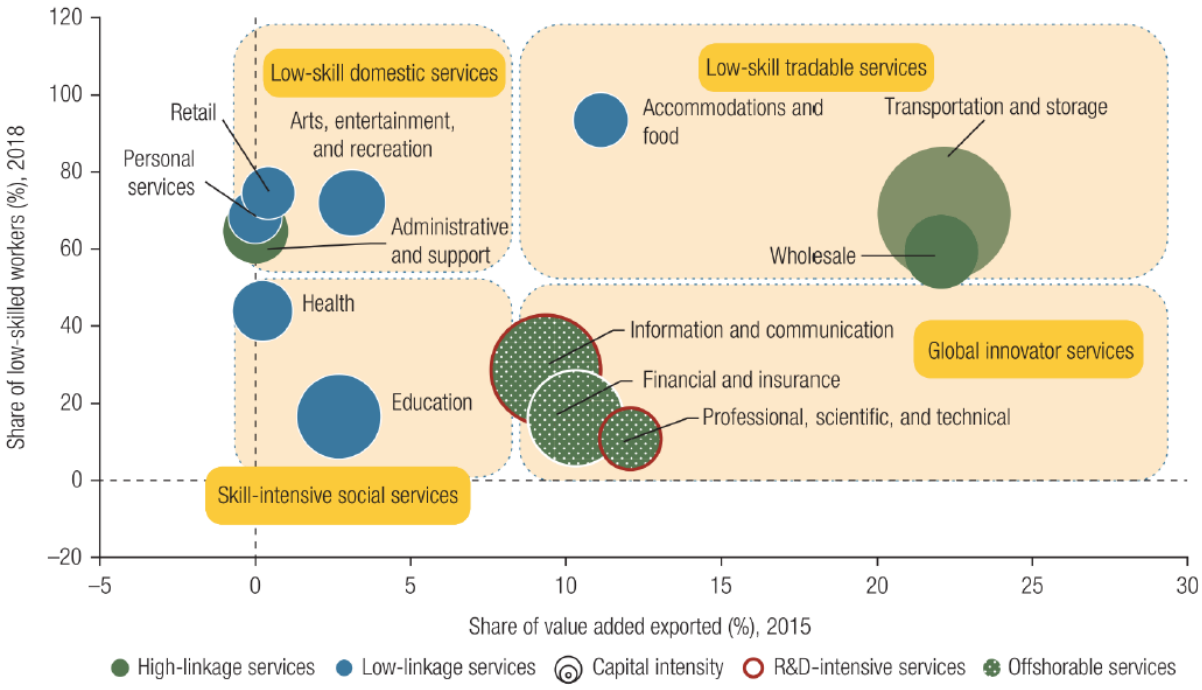
Source: Wang, Wei, Yu, and Zhu (2017).

Table A-1: Country List

Group	Countries
RCEP members	Australia, Brunei, Cambodia, China, India, Indonesia, Japan, Lao PDR, Malaysia, Philippines, Rep. of Korea, Singapore, Thailand, Viet Nam
Others (OECD)	Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Mexico, Netherlands, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States
Others (non-OECD)	Hong Kong, Taiwan, Bangladesh, Bhutan, Bulgaria, Brazil, Croatia, Cyprus, Fiji, Kazakhstan, Kyrgyz Republic, Maldives, Malta, Mongolia, Nepal, Pakistan, Rest of the World, Romania, Russia, Sri Lanka

Source: Authors.

Appendix B: Typology of Services Subsectors Based on Data for the EU-15 and the US



EU = European Union, R&D = research and development, US = United States.

Source: Nayyar, Hallward-Driemeier, and Davies (2021).

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