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CHARACTERIZING REGIONALISM IN ASIA

A MODERN GLOBAL SUPPLY CHAIN PERSPECTIVE

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ABSTRACT

This paper employs a modern global value chain (GVC) decomposition framework to quantify economic interdependence among Asian economies and between Asia and the rest of the world. It pays special attention to the value-added relationships among three sets of economies: those belonging to both Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and Regional Comprehensive Economic Partnership (RCEP), those belonging to one but not the other, and those belonging to neither. GVC linkages in value-added terms across economies are found to have grown faster than the value-added linkage through final goods trade. For GVC connections, indirect GVC linkages via third economies have been growing faster than the direct linkages. Finally, there is an increased tendency in Asia for both "near selling" of the value added in output and "near sourcing" of value added in inputs.

Keywords: global value chain, decomposition framework, economic regionalism, economic integration, value-added linkages

JEL codes: F10, F15, F63

I. INTRODUCTION

Economic regionalism is making a big splash in the Pacific with the formation of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) in March 2018 and the Regional Comprehensive Economic Partnership (RCEP) in November 2020. The CPTPP agreement is notable for including some provisions that could serve as a model for future World Trade Organization (WTO) negotiations such as on subsidy rules and intellectual property rights protection, while as a regional economic bloc the RCEP covers the biggest number of people. Both blocs potentially allow member economies that already have strong economic relationships to develop these further, including deeper and wider supply chain connections. The two regional agreements have some overlapping but not identical memberships. For example, while Japan, Singapore, and Viet Nam are in both blocs, the People's Republic of China (PRC), the Republic of Korea, and Thailand are in RCEP but not in CPTPP.

While regionalism is progressing in practice, the conceptual frameworks and tools used to measure and track economic interdependence are also making strides in the academic literature. In particular, with the increased prevalence of global value chains (GVCs) or cross-border production networks, the gap is widening between value added exported from one economy to another and the gross export volume between the two economies. Recent decomposition frameworks by Koopman, Wang, and Wei (2014); Wang, Wei, and Zhu (2013); and Wang, Wei, Yu, and Zhu (2022) have built a bridge between value-added accounting and official trade statistics. These new conceptual tools could help capture more accurately the true extent of economic interdependence (or lack thereof) among nations.

This paper employs a modern GVC decomposition framework developed in the recent literature to quantify economic interdependence among Asian economies and between Asia and the rest of the world. Standard trade statistics on bilateral trade do not fully capture upstream/downstream relationship among economies. We apply the framework to the Asian Development Bank (ADB) member economies and pay special attention to the value-added

relationships among three sets of economies: those belonging to both CPTPP and RCEP, those belonging to one but not the other, and those belonging to neither.

The main findings can be summarized as follows. First, economic interdependence in terms of cross-border exchange of value added for supply chain reasons tends to grow faster than that in final goods trade. Second, the value added in indirect GVC trade—value added exported from one economy and absorbed in another by first going through at least one other economy—tends to grow faster than that in direct GVC trade. Third, the strength of the value-added linkage between two economies tends to affect the likelihood that they jointly belong to a common regional bloc in the Pacific. Fourth, we find that the average distance in both value-added absorption and value-added sourcing has declined for economies in Asia and the Pacific, even though there is no secular decline for the world as a whole. Increased emphasis on domestic market and domestic suppliers, and an increased relative importance of the PRC as a market and as a supplier are two important reasons for this pattern.

In the rest of the paper, after discussing the institutional background surrounding the new regionalism in Asia and the Pacific in Section 2, we summarize in Section 3 the modern GVC accounting framework tracing the origins and final absorption of value added, and propose a set of indicators for economic interdependence between economies based on the value-added concepts. In Section 4, we examine empirically whether and how the strength of economic interdependence in value-added terms affects the likelihood that a given pair of economies would jointly belong RCEP or CPTPP. In Section 5, we quantify the extent to which “near sourcing” and “near selling” are taking place in Asia and the Pacific. In Section 6, we conclude.

II. INSTITUTIONAL BACKGROUND: NEW REGIONALISM IN ASIA

The CPTPP agreement, signed on 8 March 2018, involves 11 economies, including Japan, the Republic of Korea, and Australia. The PRC has recently submitted an application to join CPTPP. The RCEP agreement, signed on 15 November 2020, includes the PRC, Japan, the Republic of Korea, and Australia, but does not include the United States (US).

As shown in Table 1, in shares in world gross domestic product (GDP) or population, the RCEP membership is more significant, covering 28.2% of the global GDP (compared to 14.8% for CPTPP) and 29.5% of the population (6.6% for CPTPP). The signing of RCEP marks the establishment of the free trade zone with the largest population.

Table 1: CPTPP, RCEP—Shares in World GDP and Population

	Announcement Date	Membership	In % of the World	
			GDP	Population
CPTPP	8 March 2018	Japan, Canada, Australia, Chile, New Zealand, Singapore, Brunei Darussalam, Malaysia, Viet Nam, Mexico, Peru	14.8	6.6
RCEP	15 November 2020	Australia, Brunei Darussalam, Cambodia, PRC, Indonesia, Japan, Republic of Korea, Lao PDR, Malaysia, Myanmar, New Zealand, Philippines, Singapore, Thailand, Viet Nam	28.2	29.5

CPTPP = Comprehensive and Progressive Agreement for Trans-Pacific Partnership, GDP = gross domestic product, Lao PDR = Lao People's Democratic Republic; PRC = People's Republic of China, RCEP = Regional Comprehensive Economic Partnership.

Note: Those underlined are Asian economies.

Source: GDP and population data are obtained from the World Bank World Development Indicators (https://databank.worldbank.org/source/world-development-indicators).

In a number of ways, CPTPP represents a deeper level of integration among the member economies: greater reduction in import barriers, more provisions on protection of intellectual property rights, more requirements on transparency, stricter rules on government procurement, subsidies, and the conduct of state-owned firms, and liberalization of services sectors. Many of the deeper integration clauses in CPTPP may be especially important to cross-border production sharing. For example, stronger intellectual property rights protection allows some of the knowledge components that used to be produced in-house—or at least by companies in the same

economy—to be located in a regional bloc partner economy. Therefore, production sharing at the upstream or middle stream stages and deeper integration clauses in a regional trade agreement may go together. Table 2 compares the coverage of the topics by clauses in RCEP and CPTPP. This succinct contrast makes it clear that, in general, CPTPP has a more extensive coverage.

Table 2: Comparison of Deeper Integration Clauses Included in RCEP and CPTPP

Topics	RCEP	CPTPP
E-commerce	√	√
Intellectual property	√	√
Competition policy	√	√
Sanitary and phytosanitary measures	√	√
Government procurement	√	√
Dispute resolution		√
Labor		√
Environment		√
Financial services		√
State-owned enterprises and designated monopolies		√
Transparency and anticorruption		√

CPTPP = Comprehensive and Progressive Agreement for Trans-Pacific Partnership, RCEP = Regional Comprehensive Economic Partnership.

Source: Compiled by the authors based on the contents of RCEP and CPTPP agreements.

A comparison of trade liberalization in RCEP and CPTPP is summarized in Table 3. In terms of headline tariff rates on imports, CPTPP appears to demand greater reduction in barriers among member economies than RCEP. In particular, while RCEP eliminates 90% or more tariff lines among members, CPTPP eliminates 95% or more. There can be a transition period (of up to 10 years) for economies to implement these zero tariff rates. The length of the transition period may vary by economy.

In terms of service trade under RCEP, commitments to adopt a negative list have come from Australia, Brunei Darussalam, Indonesia, Japan, the Republic of Korea, Malaysia, and Singapore, whereas the PRC and the remaining eight economies will continue to use a positive list and transition to a negative one within 6 years after the effective date of the treaty. The CPTPP, on the

other hand, has adopted a unified negative list market access system. One may conjecture that the deeper integration of CPTPP is especially important for the viability of cross-border supply chains.

Table 3: Market Access—RCEP Versus CPTPP

	RCEP	CPTPP
Goods trade	Zero tariff rate for > 90% tariff lines	Zero tariff rate for > 95% tariff lines
Services trade	Phased transition to a negative list	Negative list

CPTPP = Comprehensive and Progressive Agreement for Trans-Pacific Partnership, RCEP = Regional Comprehensive Economic Partnership.

Source: Compiled by the authors based on the contents of RCEP and CPTPP agreements.

In the following sections, we study to what extent the existing patterns of economic interdependence—in terms of connections at both the supply chain level and in final goods trade—help us to predict common membership in RCEP and CPTPP. Based on the estimated relationship between membership in these Regional Trade Agreements (RTA) and the degree of economic interdependence, we then study, among all economies currently outside RCEP and CPTPP, which ones likely have the strongest economic incentives to join the regional blocs.

III. CONCEPTUAL BACKGROUND: MODERN VALUE-ADDED BASED MEASURES OF ECONOMIC INTERDEPENDENCE

It is common to use the total trade volume (exports plus imports) between two economies as a measure of their trade linkages. A slight refinement is to separate the trade volume in final goods and trade volume in intermediate goods between them. This helps to gain insight into production linkages beyond the traditional sale of final goods. However, because economy A's parts and components exports to economy B can contain economy B and economy C's value added, the volume of parts and components trade between A and B does not describe accurately the supply chain linkages between the two. It overcounts the linkage by not excluding value added from other third economies. At the same time, some of economy A's parts and components exports to economy C can end up contributing to economy B's production if economy A's parts and

components are used by economy C to produce new intermediate inputs that are supplied to companies in economy B. In other words, the direct trade volume in parts and components between economies A and B can also undercount the true extent of production linkages between A and B by not counting the indirect value-added exports through third economies. For these reasons, an accounting framework is needed for value-added flows between economy pair A and B that traces both direct and indirect routes.

Following the same logic, the raw trade volume in final goods between economies A and B generally overcount their true extent of linkages in final goods because such a volume count does not exclude possible contributions from the value added in intermediate inputs from third economies. The accounting framework for value-added flows should correct this effect as well.

We check whether the true linkages in value-added terms between any two economies help us understand whether they belong to the same regional trade agreements (e.g., RCEP or CPTPP). As the deeper integration of CPTPP is especially relevant for cross-border production sharing arrangements, one hypothesis to test is if the GVC (intermediate input) linkage in value-added terms is especially relevant for predicting whether the economies in a given pair belong to CPTPP. Once we have accounted for economic interdependence in value-added terms, we can check if the raw trade volumes provide additional insight on common membership in RTAs.

We start by defining economic linkages between a pair of economies using the standard trade measures and move on to the measures based on value-added flows. A total of five types of economic linkages between economies are considered.

A. Standard Measures Based on Trade Volumes

Standard measures of economic linkages through trade are based on bilateral trade volumes. We can separate trade in final goods and trade in intermediate (and capital) goods at the 6-digit HS code level according to the Broad Economic Categories (BEC) classification system. We can define the “Standard Final Goods Trade Linkage” between economies *i* and *j* as:

$$SFT\_Link_{ij} = \frac{EXP\_F_{ij}}{\sqrt{EXP\_F_i \times IMP\_F_j}} \times \frac{EXP\_F_{ji}}{\sqrt{EXP\_F_j \times IMP\_F_i}} \times 10^4$$

Where, EXP_F_{ij} is the export from economy *i* to economy *j*, which reflects economy *i*'s supply to economy *j*. Symmetrically, it also reflects economy *j*'s demand for economy *i*. Therefore, to measure the trade in final goods linkage between economies *i* and *j*, we consider both economy *i*'s total final goods exports to the world, EXP_F_i (i.e., economy *i*'s supply to the world) and economy *j*'s total final goods imports from the world, IMP_F_j (i.e., economy *j*'s supply to the world), in the denominator, and take the geometric mean of both ($EXP\_F_i \times IMP\_F_j$) as the denominator. Thus, $\frac{EXP\_F_{ij}}{\sqrt{EXP\_F_i \times IMP\_F_j}}$ represents the trade linkage between two economies as reflected by economy *i*'s final exports to economy *j*. Correspondingly, $\frac{EXP\_F_{ji}}{\sqrt{EXP\_F_j \times IMP\_F_i}}$ represents the trade linkage between two economies as reflected by economy *j*'s final goods exports to economy *i*.

The first term measures simultaneously how important economy *i*'s final goods exports to economy *j* is in economy *i*'s overall exports, and how important the same trade flow is to the total imports of economy *j*. Similarly, the second term measures simultaneously how important economy *j*'s exports to economy *i* is in economy *j*'s total exports and economy *i*'s total imports.

SFT_Link_{ij}, by combining the two terms, measures how important each economy is for the other, both as a source of external demand and a source of external supply. Later on, we examine if a higher value of SFT_Link_{ij} would make the pair more likely to acquire membership in a common regional economic bloc. To facilitate the reading of regression coefficients, we enlarge the value of SFT_Link_{ij} by 10,000 times.

Similarly, the "Standard Intermediate Goods Trade Linkage" between economies *i* and *j* (*SIT_Link*$_{ij}$) is defined as:

$$SIT\_Link_{ij} = \frac{EXP\_I_{ij}}{\sqrt{EXP\_I_i \times IMP\_I_j}} \times \frac{EXP\_I_{ji}}{\sqrt{EXP\_I_j \times IMP\_I_i}} \times 10^4$$

The definition of each item is the same as that of FT_Link_{ij}, the only difference is that the term "trade in final goods" is replaced by "trade in intermediate goods." SIT_Link_{ij} measures how

important economies *i* and *j* are to each other, both as a source of external demand for their intermediate goods production and as a source of external supply for intermediate inputs used in their production.

B. Modern Value-Added Based Measures

The extent of interdependence in value-added terms are rooted in Koopman, Wang, and Wei (2014) which provides a value-added accounting framework for a given economy's total exports. Wang, Wei, and Zhu (2013) generalize the framework from a single economy's exports to trade between a pair of economies, and Wang, Wei, Yu, and Zhu (2022) further extend the framework from decomposition of trade flows to decomposition of production activities.

According to the methodology proposed by Wang, Wei, Yu and Zhu (2022), global economic activities can be classified into three categories, which are value added in Pure Domestic Production Activities (D), Final Goods Trade (VFT), Global Value Chains (GVC), respectively. The last category—value added in GVC trade—can be split further into value added in direct GVC trade and indirect GVC trade.

Consider a world economy with G economies and N sectors. Its economic structure is represented by the following Inter-Economy Input-Output (ICIO) account in Table 4.

Table 4: General Inter-Economy Input–Output Table

Outputs / Inputs		Intermediate use				Final demand				Total output
		1	2	⋯	G	1	2	⋯	G	
Intermediate inputs	1	Z^{11}	Z^{12}	⋯	Z^{1G}	Y^{11}	Y^{12}	⋯	Y^{1G}	X^1
	2	Z^{21}	Z^{22}	⋯	Z^{2G}	Y^{21}	Y^{22}	⋯	Y^{2G}	X^2
	⋮	⋮	⋮	⋱	⋮	⋮	⋮	⋱	⋮	⋮
	G	Z^{G1}	Z^{G2}	⋯	Z^{GG}	Y^{G1}	Y^{G2}	⋯	Y^{GG}	X^G
Value added		Va^1	Va^2	⋯	Va^G					
Total input		$(X^1)'$	$(X^2)'$	⋯	$(X^G)'$					

Source: Authors.

where Z^{sr} is a $N \times N$ matrix of intermediate input flows that are produced in economy s and used in economy r; Y^{sr} is an $N \times 1$ vector giving final products produced in economy s and consumed in economy r; X^s is also an $N \times 1$ vector giving gross outputs in economy s; and VA^s denotes a $1 \times N$ vector of direct value added in economy s. In this ICIO account, the input coefficient matrix can be defined as $A = Z\hat{X}^{-1}$, where $\hat{X}$ denotes a diagonal matrix with the output vector X in its diagonal. The value-added coefficient vector can be defined as $V = Va\hat{X}^{-1}$. Gross outputs X can be split into intermediate and final products, $AX + Y = X$. Rearranging terms, we obtain the classical Leontief (1936) equation, $X = BY$, where $B = (I - A)^{-1}$ is the (global) Leontief inverse matrix.

The gross output production and use balance, or the row balance condition of the ICIO account in Table 1 can be written as:

$$X = AX + Y = A^D X + Y^D + A^F X + Y^F \quad (1)$$

where $A^D = \begin{bmatrix} A^{11} & 0 & \cdots & 0 \\ 0 & A^{22} & \cdots & 0 \\ \vdots & \vdots & \ddots & \vdots \\ 0 & 0 & \cdots & A^{GG} \end{bmatrix}$ is a GN×GN diagonal block matrix of domestic input

coefficient, $A^F$is a GN×GN off-diagonal block matrix of imported input coefficient, $A^F = A - A^D$, $Y = [\sum_r^G Y^{1r} \quad \sum_r^G Y^{2r} \quad \cdots \quad \sum_r^G Y^{Gr}]'$ is a GN×1 vector of final goods and services production, $Y^D = [Y^{11} \quad Y^{22} \quad \ldots \quad Y^{GG}]'$is a GN×1 vector of final goods and service production for domestic consumption, $Y^F = Y - Y^D$ is a GN×1 vector of final products exports and $'$ denotes transpose operation.

Rearranging equation (1) yields

$$\begin{aligned} X &= (I - A^D)^{-1}Y^D + (I - A^D)^{-1}Y^F + (I - A^D)^{-1}A^F X \\ &= LY^D + LY^F + LA^F BY \end{aligned} \tag{2}$$

where $L = (I - A^{\mathrm{D}})^{-1}$is defined as local Leontief inverse, a GN by GN diagonal block matrix. By pre-multiplying with the GN by GN diagonal matrix $\hat{V}$ of direct value-added coefficients, and further converting the three final goods and service production vectors Y^D, Y^F and Y into GN by GN diagonal matrix $\hat{Y}$, $\hat{Y}^D$ and $\hat{Y}^F$, we obtain a decomposition of value added and final products production simultaneously as follows:

$$\begin{aligned} \hat{V}B\hat{Y} &= \hat{V}L\hat{Y}^D + \hat{V}L\hat{Y}^F + \hat{V}LA^F B\hat{Y} \\ &= \hat{V}L\hat{Y}^D + \hat{V}L\hat{Y}^F + \hat{V}LA^F L\hat{Y}^D + \hat{V}LA^F(B\hat{Y} - L\hat{Y}^D) \end{aligned} \tag{3}$$

Each element in the $\hat{V}B\hat{Y}$ matrix represents the value added created in source economy-sector *i* absorbed by consumption in economy-sector *j*. Looking at the matrix along a row yields the distribution of value added created from one economy-sector that is absorbed by final goods consumption in all economy-sectors. This is labeled as “forward value-added decomposition” as it describes the distribution of absorption of the value added from a particular economy sector. Looking at the matrix along a column yields the contribution of value added from all source economy-sectors pairs that is embodied in final goods and services consumption by a particular economy-sector. This is labeled as “backward value-

added decomposition" as it describes an exhaustive tabulation of all the sources of value added for a particular economy sector.

Equation (3) identifies, for each economy-sector, three types of production activities:

(1) D: Value added that is domestically produced and consumed ($\hat{V}L\hat{Y}^D$). This value added does not involve cross border trade. An example is haircut.

(2) VFT: Value added that is embodied in exports of final goods ($\hat{V}L\hat{Y}^F$). This embodied domestic factor content crosses national borders for consumption only. It is similar to "traditional" trade such as "Portuguese wine in exchange for English cloth."

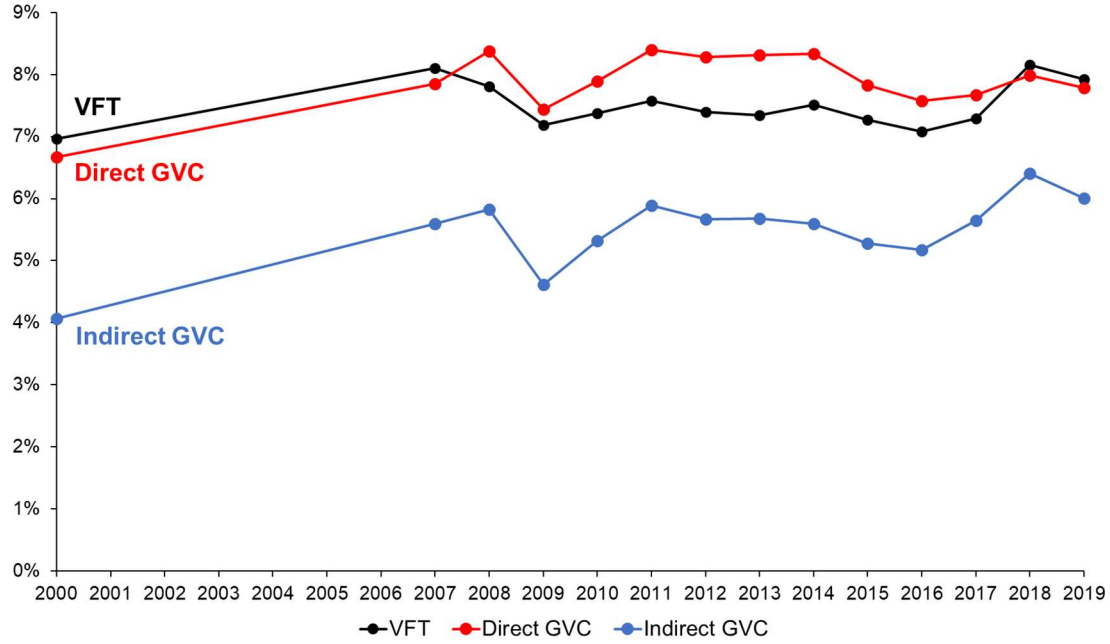
(3) GVC: Value added that is embodied in exports/imports of intermediate goods and services ($\hat{V}LA^FB\hat{Y}$). Based on whether the value added crosses borders once or more than once, this term can be further split into two categories:

(3a) Direct GVC: Simple production sharing activities across economies ($\hat{V}LA^FL\hat{Y}^D$). Domestic or/and foreign value added crosses national border for production only once. An example is value added embodied in PRC steel exports to the US, which are then used in house construction.

(3b) Indirect GVC: Production sharing activities across economies ($\hat{V}LA^F(B\hat{Y} - L\hat{Y}^D)$). Domestic or/and foreign value added, embodied in intermediate exports/imports used by partner economy to produce exports (intermediate or final) sold to other economies. In this case, the factor contents cross border at least twice. One example is the salaries of Apple's US designers that are embodied in iPhones exported from the PRC to the US and bought by American consumers. Another example is Japanese value added, embodied in electronic chips installed in PRC-made toys that are exported to the US.

Among these economic activities, all reflect economic linkages between economies, except for D, which does not involve cross-border production sharing and international trade at all. For concreteness, we report some data patterns using data from an inter-economy input-output databases. (We leave a detailed description of the database to the next section). Of the three types of production activities with cross-border components, the two that involve GVC trade has the fastest growth (Figure 1).

Figure 1: Share of Three Types of Production Activities Involving Trade or Cross-Border Production Sharing in Global GDP



GDP = gross domestic product, GVC = global value chain, VFT = value added in final goods trade.
Source: Computed by the authors based on the methodology in Wang, Wei, Yu, and Zhu (2022).

Table 5 reports the results of the value-added decompositon at the global level or for some typical economies in 2000 and 2017. A few data patterns are worth highlighting. First, the fraction of global GDP that is locally produced and locally consumed has declined by 3.3% from 82.7% in 2000 to 79.4% in 2017. Correspondingly, value added in both final goods trade and GVC trade increased. From 2000 to 2017, the value added in GVC trade as a share of global GDP increased by 2.5 percentage points. In comparison, the value added in final goods trade increased by a smaller amount (0.8 percentage points) during the same period.

Table 5: Four Types of Value-Added Decomposition Terms as a Percentage of Global GDP

Economies	Year	D	VFT	GVC	GVC	
					Direct	Indirect
World	2000	82.7%	6.5%	10.8%	6.8%	4.0%
	2017	79.4%	7.3%	13.3%	7.7%	5.6%
	From 2000 to 2017	**-3.3%**	**0.8%**	**2.5%**	**0.8%**	**1.7%**
Japan	2000	90.0%	4.3%	5.7%	3.5%	2.3%
	2017	85.7%	6.0%	8.3%	4.7%	3.6%
	From 2000 to 2017	**-4.3%**	**1.7%**	**2.6%**	**1.2%**	**1.3%**
Bangladesh	2000	89.4%	8.1%	2.5%	1.4%	1.1%
	2017	87.1%	8.5%	4.4%	2.6%	1.8%
	From 2000 to 2017	**-2.3%**	**0.4%**	**1.9%**	**1.2%**	**0.7%**
Viet Nam	2000	58.5%	21.9%	19.6%	13.0%	6.6%
	2017	44.5%	27.7%	27.8%	17.1%	10.7%
	From 2000 to 2017	**-14.0%**	**5.8%**	**8.2%**	**4.1%**	**4.1%**
PRC	2000	81.4%	9.5%	9.1%	5.8%	3.3%
	2017	83.0%	8.5%	8.5%	4.9%	3.6%
	From 2000 to 2017	**1.6%**	**-1.0%**	**-0.6%**	**-0.9%**	**0.3%**
Indonesia	2000	69.1%	9.5%	21.3%	14.5%	6.8%
	2017	82.5%	4.2%	13.2%	8.5%	4.7%
	From 2000 to 2017	**13.4%**	**-5.3%**	**-8.1%**	**-6.0%**	**-2.1%**

GDP = gross domestic product, GVC = global value chain, PRC = People's Republic of China, VFT = value added in final goods trade.

Source: Computed by the authors based on the methodology in Wang, Wei, Yu, and Zhu (2022).

The value added in GVC trade as a share of global GDP was already bigger than that in final goods trade in 2000 (10.8% versus 6.5%). The gap widened further in 2017 (13.3% versus 7.3%). For value added in GVC trade, value added embedded in the direct intermediate goods exports from one economy to another accounted for 6.8% of global GDP in 2000, which was 70% higher than the share of the value added in indirect GVC trade that went through other economies first. But the indirect GVC trade has grown faster than direct trade. By 2017, the values added in these two types of GVC trade as a share of global GDP were much closer (7.7 for direct GVC trade versus 5.6 for indirect GVC trade). In other words, the production process for a given product is increasingly more likely to involve three or more economies now than 2 decades ago.

In terms of variations across different economies, the changes in the composition of GDP in Bangladesh, Japan, and Viet Nam are similar to the global level. The value added in GVC production activities grows significantly faster than that in final goods trade and pure domestic production activities. The cases of the PRC and Indonesia are even more interesting, as both have maintained exceptionally fast economic growth rates, accompanied by rapid growth in "pure domestic (D)" production activities. The share of value added in GVC and final goods exports in GDP has declined.

Using these measures, we can define a set of indicators describing the extent of economic interdependence in value added between a pair of economies. For an economy pair (*i*,*j*), the indicators should ideally capture the relative importance of one economy to the other both as a source of external demand for its value added produced and as a source of external supply of the value added to be used in production.

For a given economy (*i*,*j*), we define the strength of production sharing linkage in value-added terms as:

$$GVC\_Link_{ij} = \frac{GVC_{ij}}{\sqrt{GVC_{i*} \times GVC_{*j}}} \times \frac{GVC_{ji}}{\sqrt{GVC_{j*} \times GVC_{*i}}} \times 10^4$$

For value-added linkages in GVC trade, we can separate direct and indirect GVC linkages as:

$$Direct\_VC\_Link_{ij} = \frac{SimpGVC_{ij}}{\sqrt{SimpGVC_{i*} \times SimpGVC_{*j}}} \times \frac{SimpGVC_{ji}}{\sqrt{SimpGVC_{j*} \times SimpGVC_{*i}}} \times 10^4$$

$$Indirect\_GVC\_Link_{ij} = \frac{CompGVC_{ij}}{\sqrt{CompGVC_{i*} \times CompGVC_{*j}}} \times \frac{CompGVC_{ji}}{\sqrt{CompGVC_{j*} \times CompGVC_{*i}}} \times 10^4$$

The value-added linkage through trade in final goods, VFT_Link_{ij}, is defined as:

$$VFT\_Link_{ij} = \frac{VFT_{ij}}{\sqrt{VFT_{i*} \times VFT_{*j}}} \times \frac{VFT_{ji}}{\sqrt{VFT_{j*} \times VFT_{*i}}} \times 10^4$$

The economic linkages considered in this paper are summarized in Table 6.

Table 6: Definition of Economic Linkages Between Economies

General Economic Linkage	Type of Economic Linkage	Variable Name
Trade	1. Standard Final Goods Trade	SFT_Link_{ij}
	2. Standard Intermediate Goods Trade	SIT_Link_{ij}
Value Added	3. Global Value Chains (GVCs)	GVC_Link_{ij}
	3.1 Direct GVCs	$Direct\_GVC\_Link_{ij}$
	3.2 Indirect GVCs	$Indirect\_GVC\_Link_{ij}$
	4. Value Added in Final Goods Trade	VFT_Link_{ij}

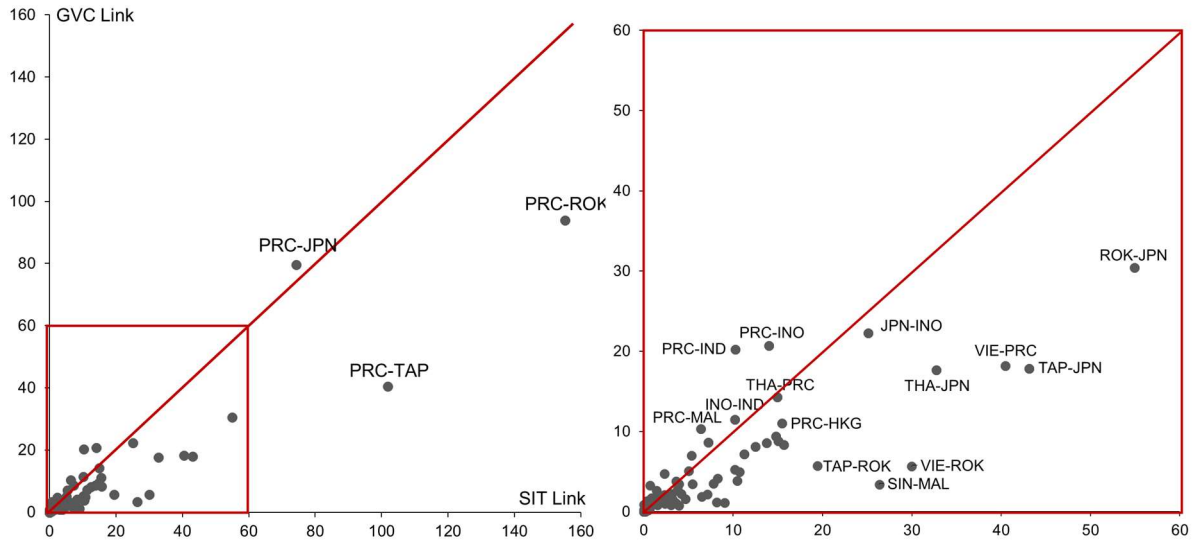
Source: Authors.

Figure 2 plots the GVC linkage in value-added term against the standard trade volume in intermediate inputs.

First, the graph on the left shows three pairs of Asian economies with relatively strong economic linkages (PRC-Republic of Korea, PRC-Taipei,China, and PRC-Japan). However, there are notable differences in the relative strengths of the GVC and Standard Intermediate Trade Linkage (SIT) linkages. For the PRC and the Republic of Korea pair, or the PRC and Taipei,China pair, the value-added linkage is weaker than the trade volume measure. One reason could be that the parts and components from the Republic of Korea (or Taipei,China) to the PRC embed a sizable share of value added from Japan, the US, and other economies. Hence, the standard measure may overpredict their true interdependence in the supply chain. On the other hand, for the PRC-Japan pair, the opposite is true: the value-added linkage is stronger than the standard trade volume linkage. It is possible that some of the Japanese value added eventually absorbed in the PRC is exported by Japan first to other economies (e.g., the Republic of Korea and Taipei,China) where it is embedded in intermediate inputs exports to the PRC.

By zooming in on the red boxed portion reported in the graph on the left, we observe other economy pairs that deviate from the 45-degree line. Among the 276 pairs of the Asian economies included in the sample, the GVC Linkage is greater than the SIT Linkage for 77 pairs. In this case, the standard measure underestimates the true degree of economic interdependence. In the remaining cases, the standard measure overestimates the true interdependence.

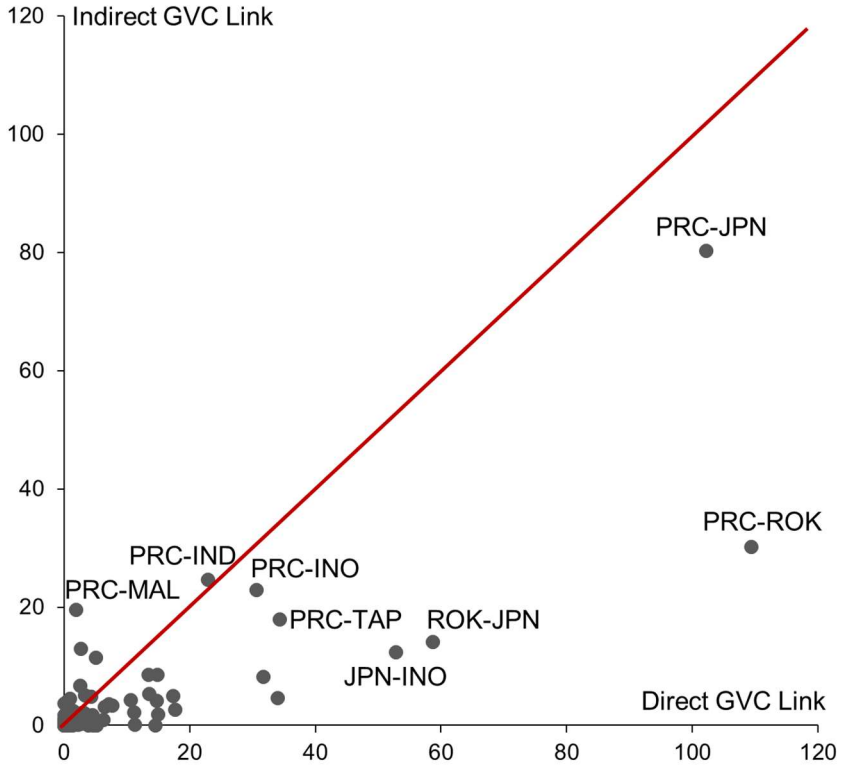
Figure 2: GVC Linkage in Value-Added Terms (GVC Link) Versus Standard Intermediate Trade Linkage (SIT Link)



GVC = global value change; HKG = Hong Kong, China; IND = India; INO = Indonesia; JPN = Japan; MAL = Malaysia; PRC = People's Republic of China; ROK = Republic of Korea; SIN = Singapore; SIT = standard intermediate goods trade; TAP = Taipei,China; THA = Thailand; VIE = Viet Nam.
Source: Computed by the authors based on the methodology in Wang, Wei, Yu, and Zhu (2022).

Figure 3 plots indirect GVC linkages—those involving trade with third economies—against the direct GVC linkages. While the two types are positively correlated, there is a difference in relative size. For example, for the PRC-Japan pair, the direct GVC linkage is stronger, although the indirect linkage is also quantitatively big. On the other hand, for the PRC-Malaysia pair, the indirect linkage is more important than the direct linkage. In other words, the supply chains linking the PRC and Malaysia often involve other economies.

Figure 3: Indirect GVC Linkage Versus Direct GVC Linkage



GVC = global value chain, IND = India, INO = Indonesia, JPN = Japan, MAL = Malaysia, PRC = People's Republic of China, ROK = Republic of Korea, TAP = Taipei,China.

Source: Computed by the authors based on the methodology in Wang, Wei, Yu, and Zhu (2022).

The relative importance of partner economies for a given economy can depend on the type of linkage. Using the PRC as an example, Table 7 reports the ranking of other economies in terms of the relative strength of value added in supply chains versus standard intermediate goods trade, value added in indirect GVC links versus value added in direct GVC links, and value added in final goods trade versus standard final goods trade. Different rankings are obtained. The data patterns show that, to understand economic interdependence between economies, standard measures based on trade volume, rather than value added, and on direct links (not taking into account third-economy channels) could be biased.

Table 7: Economic Interdependence Between the PRC and Other Economies Under Different Measures

Partner	GVC_Link relative to SIT_Link	Partner	IndirectGVC_Link relative to DirectGVC_Link	Partner	VFT_Link relative to SFT_Link
BHU	17.3	BHU	73.7	VIE	1.3
BRU	14.2	BRU	40.8	CAM	1.3
MLD	5.6	MLD	31.3	LAO	1.3
SRI	4.8	SRI	5.7	IND	1.3
NEP	2.7	MAL	5.4	BAN	1.3
BAN	2.5	NEP	4.8	PAK	1.3
KGZ	2.0	BAN	3.3	BHU	1.2
IND	2.0	SIN	2.9	KAZ	1.2
KAZ	1.9	IND	1.6	SRI	1.2
MAL	1.6	KGZ	1.5	HKG	1.2
LAO	1.6	PHI	1.2	INO	1.2
INO	1.5	KAZ	1.1	KGZ	1.2
PHI	1.3	LAO	1.1	JPN	1.1
CAM	1.3	INO	0.9	THA	1.1
JPN	1.1	JPN	0.9	MLD	1.1
PAK	1.1	CAM	0.9	MON	1.1
THA	1.0	VIE	0.8	ROK	1.1
HKG	0.7	THA	0.7	MAL	1.0
SIN	0.7	HKG	0.6	PHI	1.0
ROK	0.6	TAP	0.4	NEP	1.0
MON	0.5	PAK	0.3	TAP	1.0
VIE	0.5	ROK	0.2	BRU	0.9
TAP	0.4	MON	0.0	SIN	0.8

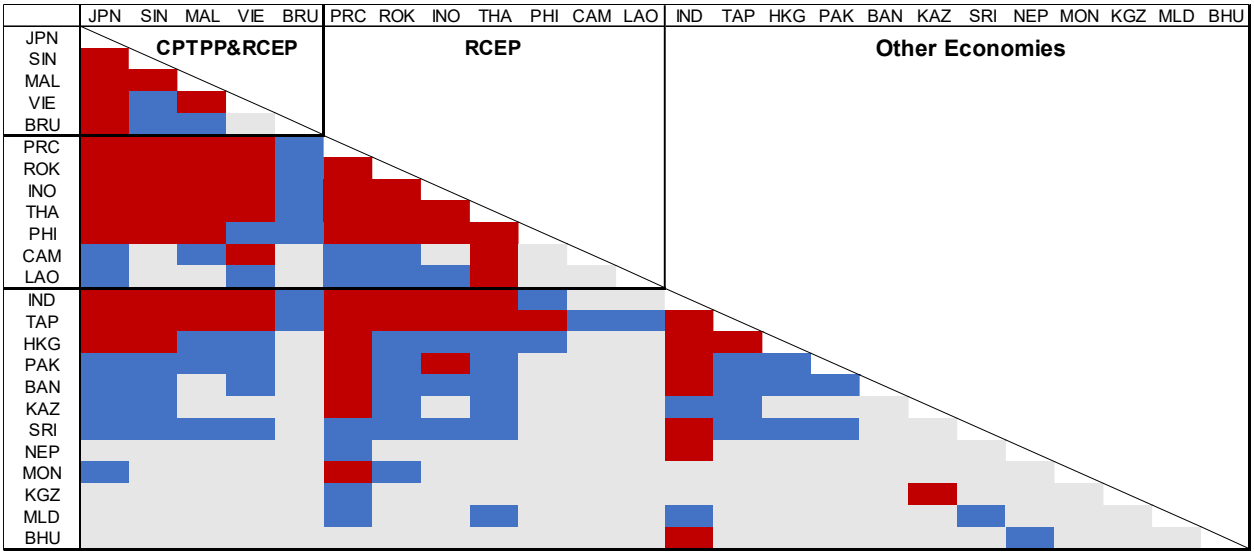
BAN = Bangladesh; BHU = Bhutan; BRU = Brunei Darussalam; CAM = Cambodia; HKG = Hong Kong, China; IND = India; INO = Indonesia; JPN = Japan; KAZ = Kazakhstan; KGZ = Kyrgyz Republic; LAO = Lao People's Democratic Republic; MLD = Maldives; MON = Mongolia; MAL= Malaysia; NEP = Nepal; PAK = Pakistan; PHI = Philippines; PRC = People's Republic of China; ROK = Republic of Korea; SFT = standard final goods trade, SIN = Singapore; SIT = standard intermediate goods trade; SRI = Sri Lanka; THA = Thailand; TAP = Taipei,China; VFT = value added in final goods trade, VIE = Viet Nam.

Source: Computed by the authors based on the methodology in Wang, Wei, Yu, and Zhu (2022).

Based on the value-added linkages, we can map out the relative strength of economic interdependence in a matrix (Figure 4). We sort all Asian economies into three buckets: (i) those that are members of CPTPP (as of Dec 2020); (ii) those that are members of RCEP but not of CPTPP; and (iii) those that are not members of either bloc. Note that all CPTPP members are also RCEP members in our sample.

We use red color to denote the GVC links in the top 1/3 of the sample, blue to denote the links in the next 1/3 of the sample, and gray for the bottom 1/3 of the sample. The pattern of the matrix suggests that the value-added links tend to be the strongest between pairs of CPTPP members, followed by links between pairs of RCEP members. The links among economies that are not of these two blocs tend to be the weakest. There are some exceptions to these general statements. For example, the PRC, Indonesia, the Republic of Korea, the Philippines, and Thailand—all outside CPTPP at the time of writing—also exhibit strong connections in value-added trade with CPTPP economies. We formally investigate these patterns later in the paper.

Figure 4: Strength of GVC Linkage Among Asian Economies



BAN = Bangladesh; BHU = Bhutan; BRU = Brunei Darussalam; CAM = Cambodia; CPTPP = Comprehensive and Progressive Agreement for Trans-Pacific Partnership; GVC = global value chain; HKG = Hong Kong, China; IND = India; INO = Indonesia; JPN = Japan; KAZ = Kazakhstan; KGZ = Kyrgyz Republic; LAO = Lao People's Democratic Republic; MAL = Malaysia; MLD = Maldives; MON = Mongolia; NEP = Nepal; PHI = Philippines; PAK = Pakistan; PRC = People's Republic of China; RCEP = Regional Comprehensive Economic Partnership Agreement; ROK = Republic of Korea; SIN = Singapore; SRI = Sri Lanka; TAP = Taipei,China; THA = Thailand; VIE = Viet Nam.

Notes: We use red color to denote the GVC links in the top 1/3 of the sample, blue to denote the links in the next 1/3 of the sample, and gray for the bottom 1/3 of the sample.

Source: Computed by the authors based on the methodology in Wang, Wei, Yu, and Zhu (2022).

IV. A NEW LOOK AT THE RCEP AND THE CPTPP: THE GVC PERSPECTIVE

A. Data

We compute the various measures of economic linkages, proposed in the previous section, using data from a newly updated database of Multi-Regional Input-Output (MRIO), developed by ADB's Economic Research and Regional Cooperation Department, that covers 63 economies and 35 industries for the years 2000, 2007 to 2019. Our baseline analysis focuses on 24 Asian economies in the database.

Table 8: Asian Economies in the Sample

	Economy	RCEP	RCEP&CPTPP
1	Bangladesh		
2	Bhutan		
3	Brunei Darussalam	YES	YES
4	Cambodia	YES	
5	Hong Kong, China		
6	India		
7	Indonesia	YES	
8	Japan	YES	YES
9	Kazakhstan		
10	Kyrgyz Republic		
11	Republic of Korea	YES	
12	Lao People's Democratic Republic	YES	
13	Malaysia	YES	YES
14	Maldives		
15	Mongolia		
16	Nepal		
17	Pakistan		
18	Philippines	YES	
19	People's Republic of China	YES	
20	Singapore	YES	YES
21	Sri Lanka		
22	Taipei,China		
23	Thailand	YES	
24	Viet Nam	YES	YES

CPTPP = Comprehensive and Progressive Agreement for Trans-Pacific Partnership, RCEP = Regional Comprehensive Economic Partnership.

Source: Compiled by the authors based on the lists of RCEP and CPTPP member economies.

We report in Table 9 the simple average values of the economic linkages between an economy and the other 23 Asian economies. A quick glance at the table suggests that economies in either RCEP or CPTPP tend to have stronger interdependence with other Asian economies than those outside both blocs.

Table 9: Average Strength of Economic Linkages with Other Sample Economies

	Economy	GVC Link	Indirect GVC Link	Direct GVC Link	VA in Final Goods VFT Link	Standard Intermediate Trade SIT Link	Standard Final Goods Trade SFT Link
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
RCEP and CPTPP	JPN	8.88	6.24	10.92	14.28	11.91	13.36
	VIE	1.88	1.41	2.37	2.01	4.90	2.40
	MAL	1.68	1.92	1.52	0.96	2.44	1.25
	SIN	1.28	1.49	1.25	1.91	3.78	2.48
	BRU	0.11	0.08	0.13	0.02	0.10	0.02
RCEP	PRC	14.75	11.37	17.45	19.71	20.33	18.02
	ROK	6.92	3.36	9.72	7.58	12.71	7.47
	INO	3.80	2.08	4.96	2.91	4.00	2.87
	THA	2.71	1.24	4.13	4.33	4.37	4.38
	PHI	1.14	0.77	1.45	2.22	1.64	2.14
	CAM	0.15	0.08	0.31	0.36	0.49	0.33
	LAO	0.15	0.11	0.30	0.19	0.34	0.20
None	TAP	3.35	2.10	4.12	2.96	8.32	3.20
	IND	2.99	2.48	3.73	3.63	2.94	3.31
	HKG	0.84	0.86	0.86	0.68	1.20	0.65
	PAK	0.41	0.22	0.57	0.22	0.38	0.19
	NEP	0.40	0.02	0.93	1.07	0.68	1.04
	KAZ	0.34	0.27	0.60	0.52	0.43	0.48
	MON	0.24	0.04	0.46	0.05	0.45	0.05
	BAN	0.23	0.25	0.20	0.17	0.15	0.15
	SRI	0.20	0.10	0.32	0.60	0.23	0.58
	KGZ	0.19	0.02	0.50	0.44	0.36	0.42
	BHU	0.08	0.01	0.17	0.26	0.12	0.23
	MLD	0.02	0.03	0.01	0.05	0.02	0.06

BAN = Bangladesh; BHU = Bhutan; BRU = Brunei Darussalam; CAM = Cambodia; CPTPP = Comprehensive and Progressive Agreement for Trans-Pacific Partnership; GVC = global value chain; HKG = Hong Kong, China; IND = India; INO = Indonesia; JPN = Japan; KAZ = Kazakhstan; KGZ = Kyrgyz Republic; LAO = Lao People's Democratic Republic; MAL = Malaysia; MLD = Maldives; MON = Mongolia; ; NEP = Nepal; PHI = Philippines; PAK = Pakistan; PRC = People’s Republic of China;

RCEP = Regional Comprehensive Economic Partnership; ROK = Republic of Korea; SFT = standard final goods trade; SIN = Singapore; SIT = standard intermediate goods trade; SRI = Sri Lanka; TAP = Taipei,China; THA = Thailand; VIE = Viet Nam; VFT = final goods trade.

Source: Computed by the authors based on the methodology in Wang, Wei, Yu, and Zhu (2022).

B. Baseline Results: the GVC linkages and memberships in RCEP and CPTPP

1. Model Setup

We now investigate whether the strength of economic linkages between a pair of Asian economies can help predict their joint membership in a common regional trade agreement.

We first use a Probit model to examine how economic interdependence affects joint membership in RCEP:

$$Prob\left(\mathrm{RCEP}_{ij}\middle|\boldsymbol{X}\right) = \phi(\beta_0 + \boldsymbol{\gamma EconLink_{ij}} + \beta_1 RTA_{ij} + \boldsymbol{\delta Controls} + \varepsilon_{ij})$$

$\mathrm{RCEP}_{\mathrm{ij}} = 1$ if both economies *i* and *j* belong to the RCEP. The key regressor(s) is (are) a set of indicators for economic interdependence in value-added terms between the two economies in 2017, before the RCEP's establishment in 2020. See Table 6 for definitions of the indicators.

As discussed earlier, CPTPP represents a deeper level of economic integration in a number of dimensions for member economies, which is more important for cross-border supply chain arrangements than for final goods trade.

As it turns out, in our 24-Asia-economy sample, all CPTPP members (Brunei Darussalam, Japan, Malaysia, Singapore, and Viet Nam) are also RCEP members. As our second specification, we use an Ordered Probit model to summarize the data:

$$Prob\left(\mathrm{Y}_{ij}\middle|\boldsymbol{X}\right) = \phi(\beta_0 + \boldsymbol{\gamma EconLink_{ij}} + \beta_1 RTA_{ij} + \boldsymbol{\delta Controls} + \varepsilon_{ij})$$

Where Y = 2 if both *i* and *j* are members of CPTPP.

Y=1 if both belong to RCEP but at least one is not a member of CPTPP.

Y=0 if at least one of them does not belong to RCEP.

Based on the previous discussion, a higher value of Y indicates a deeper level of economic integration between the two economies. To control for the effect of existing RTAs among members on the construction of RCEP or CPTPP, we include the "existence of other RTAs" between *i* and *j* (RTA_{ij}) as a control variable. As examples, Table 10 reports all RTAs involving the PRC as a member.

Table 10: Regional Trade Agreements in Asia Before 2017

RTA Name	Signatories
ASEAN—PRC	PRC, Brunei Darussalam, Myanmar, Cambodia, Indonesia, Lao PDR, Malaysia, Philippines, Singapore, Viet Nam, Thailand
Asia Pacific Trade Agreement (APTA)	Bangladesh; Sri Lanka; PRC; India; Korea, Republic of; Lao PDR
Australia—PRC	Australia, PRC
PRC—Hong Kong, China	PRC; Hong Kong, China
PRC—Korea, Republic of	PRC; Korea, Republic of
PRC—Macau, China	PRC; Macau, China
PRC—New Zealand	PRC, New Zealand
PRC—Singapore	PRC, Singapore
Pakistan—PRC	PRC, Pakistan

ASEAN = Association of Southeast Asian Nations; Lao PDR = Lao People's Democratic Republic; PRC = People's Republic of China, RTA = regional trade agreement.

Source: Compiled by the authors from publicly available information.

For other control variables, we use the existing literature on bilateral trade as a guide. In particular, we include the standard gravity variables $lnDist_{ij}$, the log of the geographical distance between *i* and *j*; $\ln(GDP_i \times GDP_j)$; $Contig_{ij}$, a dummy for whether *i* and *j* share a land border; $Comlang\_off_{ij}$, a dummy for whether *i* and *j* share a common official language. Descriptive statistics for the key variables are presented in Table 11.

Table 11: Descriptive Statistics

	Variable	Obs	Mean	Std. Dev.	Min	Max
Dependent variable	RCEP	276	0.20	0.40	0	1
	RCEP&CPTPP	276	0.28	0.52	0	2
Value added Based econ. linkage	GVC_Link	276	2.20	8.56	2.5E-04	93.94
	IndirectGVC_Link	276	1.52	5.84	1.0E-04	74.53
	DirectGVC_Link	276	2.79	11.42	5.1E-07	141.48
	VFT_Link	276	2.80	15.69	9.2E-08	218.05
Trade-based Econ. linkage	SIT_Link	276	3.43	13.49	1.4E-06	155.28
	SFT_Link	276	2.72	14.40	1.2E-07	196.30

CPTPP = Comprehensive and Progressive Agreement for Trans-Pacific Partnership, GVC = global value chain, RCEP = Regional Comprehensive Economic Partnership, SFT = standard final goods trade, SIT = standard intermediate goods trade, VFT = value added in final goods trade.

Source: Authors.

2. Baseline Results

We first report pairwise correlations among the various measures of economic interdependence in Table 12. The correlation between value added in direct and indirect GVC trade is 0.78. The correlation between the value-added linkage in final goods trade and indirect GVC trade is 0.89, and is 0.83 for direct GVC trade. This means that across economy pairs, those that develop strong economic interdependence in one area tend also to develop strong connections in the other areas. This economic reality has an econometric consequence: if these measures are included simultaneously in a regression, there is likely a collinearity problem that makes it hard to identify the individual coefficients for them separately. (See Table A1 in the Appendix for details.)

Table 12: Correlation Matrix between Value-Added Terms

	IndirectGVC_Link	DirectGVC_Link	VFT_Link
IndirectGVC_Link	1		
DirectGVC_Link	0.7818	1	
VFT_Link	0.8859	0.8339	1

GVC = global value chain, VFT = value added in final goods trade.

Source: Authors.

For the estimation to be meaningful, we first extract the principal components of the three measures of value-added linkages, and include the principal components as the regressors in our regression. As shown in Table 13, the Kaiser-Meyer-Olkin statistic is 0.741, exceeding the customary threshold of 0.6 that suggests appropriateness of a principal component analysis. The Bartlett test of sphericity easily rejects the null of no intercorrelation at the 0.1% level, again confirming the wisdom of extracting principal components.

Table 13: The KMO and Bartlett Tests for Principal Component Analysis

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	
KMO	0.741
Bartlett test of sphericity *(H0: variables are not intercorrelated)*	
Chi-square	752.378
Degrees of freedom	3
p-value	0.000

KMO = Kaiser-Meyer-Olkin.

Source: Authors.

Table 14 reports the decomposition results of the principal component analysis. As we see, the first principal component can already explain 89% of the overall variance. Adding the second component raises the fraction of the variance explained to 97%, a relatively small increment. In our regression analysis, we include the first two components as measures of value-added linkages.

Table 14: Results of Principal Component Analysis

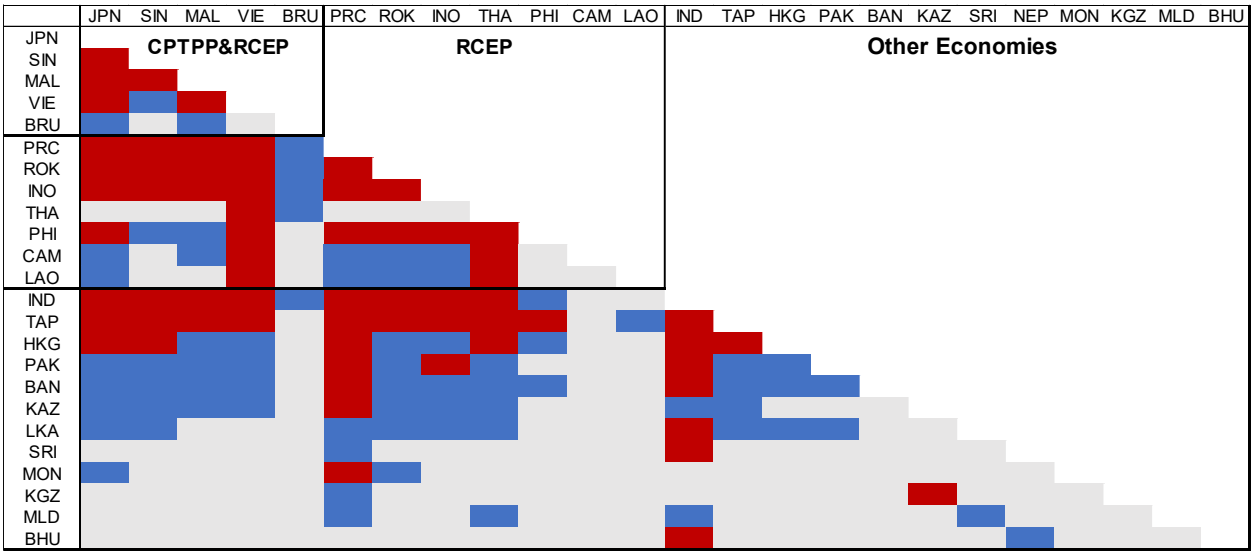
Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.669	2.443	0.890	0.890
Comp2	0.226	0.120	0.075	**0.965**
Comp3	0.106	.	0.035	1.000

Source: Authors.

Using the first principal component of the three value-added linkages as a measure of a given economy pair's economic linkage, we redo the matrix of bilateral economic linkages across the

Asian economies in our sample and report the results in Figure 5. The graph looks almost identical to Figure 4. This is not surprising as the first principal component picks up 89% of the common variance among the three measures.

Figure 5: Strength of Value-Added Linkage
(Represented by the First Principal Component) Among Asian Economies)



BAN = Bangladesh; BHU = Bhutan; BRU = Brunei Darussalam; CAM = Cambodia; HKG = Hong Kong, China; IND = India; INO = Indonesia; JPN = Japan; KAZ = Kazakhstan; KGZ = Kyrgyz Republic; LAO = Lao People's Democratic Republic; MAL = Malaysia; MLD = Maldives; MON = Mongolia; NEP = Nepal; PHI = Philippines; PAK = Pakistan; PRC = People's Republic of China; ROK = Republic of Korea; SIN = Singapore; SRI = Sri Lanka; TAP = Taipei,China; THA = Thailand; VIE = Viet Nam.

Notes: Bilateral value-added linkages (Direct GVC, Indirect GVC and VFT Linkage) were computed by the authors based on the methodology in Wang, Wei, Yu, and Zhu (2022). The first principal component of the three value-added linkages was extracted by the Principal Component. We use red color to denote the value-added links in the top 1/3 of the sample, blue to denote the links in the next 1/3 of the sample, and gray for the bottom 1/3 of the sample.

Source: Authors.

We report the Probit results for RCEP membership in Column 1 of Table 15. The first principal component of the value-added linkages is positive and statistically significant. For the marginal effect, an increase in the first principal component of the value-added linkage by one standard deviation (1.63) would raise the probability that both economies are members of RCEP by 6.9% (=1.63 x 4.21%). While the second principal component is also positive, it is not statistically significant. Furthermore, joint membership in RCEP is more

likely when the two economies are physically closer, or when they join a common RTA prior to 2017.

Table 15: Baseline Results: Value-Added Linkages and Joint Memberships in RCEP/CPTPP

	RCEP (*Probit Model*)	**RCEP&CPTPP (*Ordered Probit Model*)**
	(1)	**(2)**
Value added in trade First PC	0.284*	0.0831**
	(0.147)	(0.0366)
Value added in trade Second PC	0.0991	-0.170
	(0.355)	(0.117)
lnDist	-0.665**	-0.552**
	(0.278)	(0.247)
ln(GDP_o*GDP_d)	0.0774	0.0821
	(0.0575)	(0.0525)
Contig	-0.570	-0.361
	(0.441)	(0.376)
Comrelig	-2.355**	-1.880**
	(1.051)	(0.940)
Comlang	-0.133	-0.0369
	(0.335)	(0.300)
RTA	3.049***	2.647***
	(0.386)	(0.328)
Constant	-0.524	
	(2.213)	
Constant Cut1		1.246
		(1.778)
Constant Cut2		2.843
		(1.778)
Observations	276	276

CPTPP = Comprehensive and Progressive Agreement for Trans-Pacific Partnership, GDP = gross domestic product, RCEP = Regional Comprehensive Economic Partnership, RTA = regional trade agreement.
Note: Standard deviation in parentheses, *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors.

Column 2 reports the ordered Probit results. An increase in the first principal component of the value-added linkage by one standard deviation would raise the probability that both are members of RCEP (but not CPTPP) by 1.3%; it would raise the probability of two RCEP member

economies to be CPTPP members by 0.9%. Similar to the first column, the second principal component is not statistically significant.

We can also ask whether the standard measures of trade linkages have any additional explanatory power beyond that reflected in value-added linkages. However, the standard trade measures and the value-added linkages could be highly correlated with each other. Indeed, Table 16 confirms it to be the case. The correlations between the first principal component of the value-added linkages and the two indicators for trade volume linkages are 0.85 and 0.96, respectively.

Table 16: Correlation Matrix Between Trade Linkages and Principal Components of Value-Added Linkages

	1st Principal Component	2nd Principal Component	SIT_Link	SFT_Link
1st Principal Component	1			
2nd Principal Component	0	1		
SIT_Link	0.8498	0.4214	1	
SFT_Link	0.9633	-0.0706	0.7604	1

SFT = standard final goods trade, SIT = standard intermediate goods trade.

Source: Authors.

To avoid collinearity, we orthogonalize each of the standard trade volume measures. Specifically, we define *SFT_Link** as the residual ε_{ij} from regressing *SFT_Lin*k on the two principal components of the value-added linkages.

$$SFT\_Link_{ij} = \beta_0 + \beta_0 \times FirstPC_{ij} + \beta_1 \times SecondPC_{ij} + \varepsilon_{ij}$$

Similarly, *SIT_Link** is the residual from regressing *SIT_Link* on the two principal components of value-added linkages.

From Table 17, we see that the first principal component of the value-added linkages still has a positive and significant coefficient in both columns (which is not surprising). On the other hand, the two newly added orthogonalized trade volume linkages in final goods trade and intermediate

goods trade do not appear to have additional predictive power for the likelihood that both economies become RCEP members. Stronger intermediate goods trade linkage can provide some additional incentive in the decision to join the CPTPP, while final goods trade linkage does not. In other words, value-added linkages seem to capture almost all relevant information.

Table 17: Additional Impact of Trade Volumes on Membership in RCEP/CPTPP

	RCEP (***Probit Model***)	**RCEP&CPTPP** (***Ordered Probit Model***)
	(1)	**(2)**
Value-added Link 1st Principal Component	0.265***	0.109***
	(0.0917)	(0.0385)
Value-added Link 2nd Principal Component	0.128	-0.156
	(0.271)	(0.114)
SIT_Link*	0.0393	0.0411**
	(0.0265)	(0.0278)
SFT_Link*	0.00306	0.0128
	(0.0276)	(0.0197)
lnDist	-0.647**	-0.477*
	(0.303)	(0.256)
ln(GDP_o*GDP_d)	0.0739	0.0686
	(0.0574)	(0.0517)
Contig	-0.502	-0.311
	(0.459)	(0.385)
Comrelig	-2.158**	-1.726**
	(0.929)	(0.869)
Comlang	-0.276	-0.152
	(0.341)	(0.314)
RTA	3.531***	2.867***
	(0.712)	(0.380)
Constant	-0.983	
	(2.387)	
Constant Cut1		1.507
		(2.004)
Constant Cut2		3.132
		(2.006)
Observations	276	276

CPTPP = Comprehensive and Progressive Agreement for Trans-Pacific Partnership, GDP = gross domestic product, RCEP = Regional Comprehensive Economic Partnership, RTA = regional trade

agreement, SFT = standard final goods trade, SIT = standard intermediate goods trade.
Note: Standard deviation in parentheses, *** p<0.01, ** p<0.05, * p<0.1.
Source: Authors.

V. "NEAR SOURCING" AND "NEAR SELLING"

Two competing forces are operating in global trade and production. On the one hand, a pursuit of an ever larger market and bigger profit is making the absorption of value added from any one economy to be spread over more distant lands. Similarly, a pursuit of efficiency in conjunction with increasing modulation of production leads to buying from supplies from ever more distant lands. This efficiency-driven force tends to raise the average distance of both the absorption of value added and the supply of value added. On the other hand, concerns for supply chain disruption during the recent public health crisis and "over-dependence" on distant economies as outlets for output have caused several economies to try to shorten the distance for both suppliers and markets.

What is the net effect of these two forces in Asia and the Pacific? How much of the rhetoric of reducing the dependence from faraway markets and suppliers has been manifested in the data? Do member economies of either RCEP or CPTPP have an intrinsically greater tendency to reduce their average distance of either value-added absorption or value-added sourcing? Using our measurement framework, we can measure average distance in value added absorption (forward linkages) and average distance of value-added supply (backward linkages) for various economy groupings.

For a given economy *k*, the average distance in value-added absorption ($DistVA\_A_{k,t}$) is defined as the weighted average of the distance to all its partner economy capitals, with the weight of any given partner economy proportional to the share of that partner economy in the total absorption of economy *k*'s GDP.

$$DistVA\_A_{k,t} = \sum_{i=1}^{G} Dist_{k,i} \times \frac{Absorp_{k,i,t}}{GDP_{k,t}}$$

where $Absorp_{k,i,t}$ is the final absorption of economy *k*'s value added in economy *i*. The (final) absorption of economy *k*'s value added in any partner economy is based on the forward value-added decomposition formula in Wang, Wei, and Zhu (2013) as described before. Note that partner economy *i* includes economy *k* itself. In that case, the distance of economy *k* to itself is defined as zero.

The average distance in value-added sourcing for economy *k* ($DistVA\_S_{k,t}$) is defined similarly, as the weighted average of the distance to all partner economy capitals, with the weight of any given partner economy proportional to the share of that partner economy in economy *k*'s backward value-added decomposition.

$$DistVA\_S_{k,t} = \sum_{i=1}^{G} Dist_{k,i} \times \frac{Supl_{k,i,t}}{FinAbsorp_{k,t}}$$

where $Supl_{k,i,t}$ is the total supply of economy *i*'s value added in economy *j*'s final absorption. Value-added sourcing from any partner economy is based on the backward value-added decomposition formula in Wang, Wei, and Zhu (2013).

The average distance in value-added absorption (or sourcing) for a region (say, Asia and the Pacific) is the weighted average of that variable for all economies in that region with the weight proportional to that economy's GDP (or final absorption).

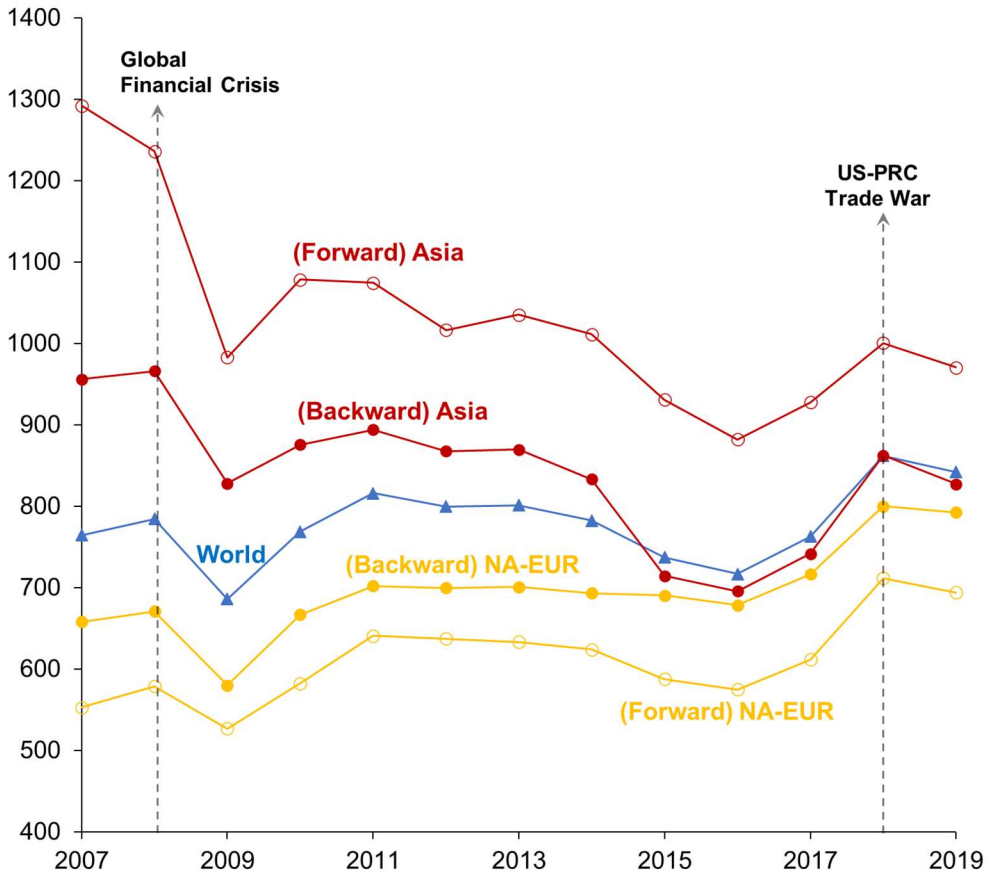
A. The Asia and Pacific Pattern Seems Distinct from Other Regions

We compute separately the average distance in value-added absorption and that in value-added sourcing for the world as a whole as well as for Asia and the Pacific and other regions (Figure 6). For the world as a whole, the average distances for absorption and sourcing are the same. We

can see that the average distance is greater in 2019 than in 2007. In other words, most economies have raised both their global sourcing (value-added supplies) and global sales (value-added absorption). The patterns for North America and Europe are similar to the world as a whole.

In comparison, for Asia, the average distance in 2019 is lower than that in 2007, for both value-added absorption and value-added sourcing. We can identify three episodes of distance contraction: (i) a rapid reduction during the Global Financial Crisis of 2008–2009, and (ii) a slow contraction during 2011-2016, and (iii another reduction in 2019 (which corresponds to the height of former US President Trump's trade war).

Figure 6: Average Distance of Value-Added Flows, 2007–2019



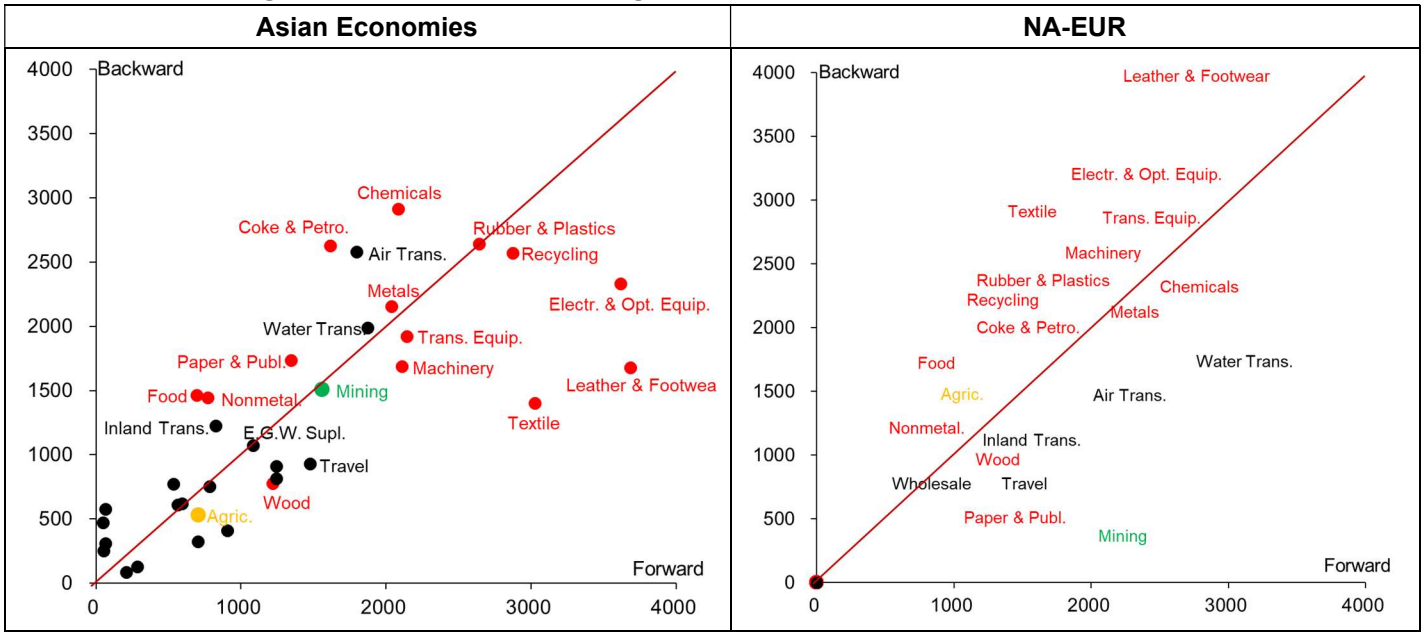
EUR = Europe, NA = North America, PRC = People's Republic of China, US = United States.

Source: Bilateral value-added flows were computed by the authors based on the methodology in Wang, Wei, Yu, and Zhu (2022). Bilateral distance data are obtained from the CEPII GeoDist database (http://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=6).

In addition we note that the average distance on absorption is greater than the average distance for supplies in all years. This means Asian economies' output sales are more global, whereas their value added in the supplies is more regional.

There are interesting differences across sectors. For Asian economies, the value-added absorption for electrical and optimal equipment, leather and footwear, and textile clearly have a greater distance in the sales than in input sourcing. In comparison, the reverse pattern is true for chemicals and coke and petroleum.

Figure 7: Sector-Level Average Distance of Value-Added Flows, 2019



Notes: Sectoral-level bilateral value-added flows were computed by the authors based on the methodology in Wang, Wei, Yu, and Zhu (2022). See Appendix Table A2 for industry classification with full names and abbreviations.

Source: Bilateral distance data are obtained from the CEPII GeoDist database (http://www.cepii.fr/CEPII/en/bdd_modele/presentation.asp?id=6).

For advanced economies in North America and Europe, the sector patterns are different. The average distance for absorption is greater than value added in input sourcing especially in water transportation, air transportation, and mining, whereas the reverse is true in leather and footwear, electrical and optimal equipment.

B. What Is Underlying the Increased "Near Sourcing" and "Near Selling" in Asia?

For each of the economies in Asia and the Pacific in our sample, we compute its average distance in value-added absorption in 2007 and 2019, and the percentage change during the period (reported as Columns 2–4 of Table 18a). In 21 out of 24 (or 88%) cases, we see a shortening of the average distance in value-added absorption. Of those economies, Nepal, the PRC, Indonesia, Bangladesh, and Malaysia lead the way, with each exhibiting a reduction in distance by 40% or more. In other words, "near-selling" is a prominent pattern in the data for the economies in Asia and the Pacific.

At this point, several factors could generate these patterns of increased "near selling" and "near sourcing" in Asia and the Pacific. For example, geopolitical tensions could cause these economies to want to keep value-added sourcing (supply chains) to be either at home or from nearby economies. Concerns for a supply shortage during a public health crisis (such as in response to the coronavirus disease [COVID-19] pandemic) could also motivate the economies to reorient supply chains to be concentrated within national borders. However, a distinct force, the rise of the PRC in the world economy, could also cause other economies in Asia and the Pacific to trade more with these economies relative to trading with economies outside the region. (For economies in Western Hemisphere, Europe, or Africa, the rise of the PRC could lead to a lengthening of their average distance of value-added absorption and sourcing.)

To investigate what is responsible for the change in the average distance in the economies in Asia and the Pacific, we compute, for each economy, percentage change of its value-added absorption in the PRC, home, Asian members of the CPTPP, RCEP members other than the PRC and CPTPP members, the rest of Asia, the US, and the rest of the world. These results are reported in Columns 5–11 in the top half of Table 18. A shaded area denotes an increase in the percentage of value added absorbed in that destination. We see that the reduction in average distance is overwhelmingly driven by two forces: An increase in the percent of value added absorbed at home (14 economies), or the rising importance of the PRC as a location of value-added absorption. Somewhat surprisingly, we do not see any pervasive increase in value-added

absorption in either the rest of RCEP or CPTPP economies. Of course, neither RCEP nor CPTPP had formally become a trading bloc during this period. Perhaps, the future value-added patterns could be affected by the formation of the trading blocs.

Table 18: Structural Changes in the Value-Added Absorption or Sourcing in Asian Economies, 2019 Relative to 2007

(1) Value-Added Absorption

Economy	Ave. Dist. 2007	Ave. Dist. 2019	2019 relative to 2017 (%)	Domestic	PRC	CPTPP (in Asia)	RCEP (exc. CPTPP)	Rest of Asia	US	Rest of World
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
NEP	320.6	164.1	-48.8	3.2%	0.1%	-0.1%	0.0%	-1.4%	-0.3%	-1.4%
PRC	1608.7	865.4	-46.2	10.0%	-	-1.5%	-0.6%	-0.5%	-2.8%	-4.6%
INO	1746.0	985.6	-43.5	7.2%	0.2%	-2.4%	-0.5%	0.3%	-1.8%	-3.1%
BAN	1159.5	675.6	-41.7	5.3%	0.3%	0.0%	-0.1%	-0.5%	-1.9%	-3.1%
MAL	3570.3	2136.3	-40.2	12.6%	1.8%	-1.5%	-1.3%	-0.5%	-4.7%	-6.5%
PHI	1964.9	1182.5	-39.8	8.1%	0.5%	-1.4%	-0.5%	-0.4%	-2.5%	-3.8%
BHU	1128.3	794.4	-29.6	5.7%	0.6%	-0.5%	-0.6%	-2.0%	-0.9%	-2.2%
KAZ	1800.6	1284.0	-28.7	8.4%	0.1%	-0.1%	0.0%	0.2%	-0.7%	-7.8%
CAM	2871.6	2106.5	-26.6	1.3%	1.7%	2.3%	0.6%	0.0%	-6.5%	0.6%
SRI	1289.3	989.3	-23.3	3.1%	0.3%	0.0%	-0.1%	0.0%	-0.5%	-2.8%
PAK	585.5	463.0	-20.9	1.0%	0.5%	0.1%	0.0%	0.2%	-0.8%	-1.0%
IND	711.6	565.4	-20.6	1.7%	-0.1%	0.2%	-0.1%	0.1%	-0.4%	-1.4%
BRU	2985.1	2404.5	-19.4	10.3%	0.7%	-4.5%	-6.1%	5.1%	-2.6%	-3.0%
HKG	1532.4	1292.6	-15.6	1.2%	2.3%	-0.6%	-0.6%	0.1%	-0.9%	-1.5%
MON	1486.9	1289.5	-13.3	-3.8%	7.1%	-0.4%	-0.5%	0.1%	-1.6%	-1.0%
TAP	2289.6	2042.2	-10.8	-0.7%	3.0%	0.0%	0.2%	0.5%	-0.9%	-2.1%
KGZ	760.5	735.7	-3.3	1.5%	-0.9%	0.2%	0.4%	0.1%	0.1%	-1.3%
JPN	805.0	790.0	-1.9	-0.6%	1.0%	0.1%	0.0%	0.1%	0.3%	-0.9%
MLD	2923.7	2872.6	-1.7	-0.3%	2.1%	-0.3%	0.6%	0.4%	0.7%	-3.1%
SIN	3942.5	3910.5	-0.8	-2.9%	4.0%	-0.7%	-0.9%	2.2%	-0.6%	-1.2%
THA	1833.6	1825.2	-0.5	-5.2%	2.0%	1.8%	1.2%	1.4%	-1.0%	-0.2%
ROK	1410.9	1455.1	3.1	-3.6%	3.3%	0.2%	0.3%	0.3%	0.5%	-1.1%
VIE	2962.7	3481.9	17.5	-9.4%	8.9%	-1.7%	-0.5%	0.6%	2.8%	-0.5%
LAO	838.8	1237.8	47.6	-8.2%	2.6%	1.2%	1.2%	0.6%	0.9%	1.6%

(2) Value-Added Sourcing										
Economy	Ave. Dist. 2007	Ave. Dist. 2019	2019 relative to 2007 (%)	Domestic	PRC	CPTPP (in Asia)	RCEP (exc. CPTPP)	Rest of Asia	US	Rest of World
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
BAN	1003.3	651.7	-35.0	3.1%	0.7%	0.1%	1.0%	-1.1%	-0.7%	-3.2%
BHU	1446.3	1024.1	-29.2	4.8%	0.1%	-2.0%	-3.5%	4.0%	0.3%	-3.9%
THA	1763.7	1267.9	-28.1	6.8%	0.9%	-2.9%	-0.3%	-0.7%	-0.5%	-3.2%
PRC	912.0	671.9	-26.3	5.0%	-	-1.4%	-0.7%	-0.9%	-0.2%	-1.8%
INO	1166.4	862.3	-26.1	3.5%	0.7%	-1.7%	0.0%	-0.2%	-0.4%	-1.8%
MAL	2991.5	2240.6	-25.1	6.5%	0.3%	-2.8%	1.0%	-0.1%	-1.9%	-2.9%
IND	925.8	705.2	-23.8	2.3%	0.7%	-0.1%	0.2%	-0.1%	-0.7%	-2.3%
KAZ	1713.5	1308.9	-23.6	10.0%	-0.8%	-1.3%	-0.5%	-0.1%	0.9%	-8.3%
SRI	1307.4	1039.5	-20.5	3.4%	2.1%	-0.7%	-0.3%	-1.5%	-0.2%	-2.7%
CAM	1508.4	1242.4	-17.6	0.2%	6.0%	-1.1%	0.1%	-1.8%	-0.6%	-2.8%
MLD	2984.7	2646.2	-11.3	4.3%	2.4%	-0.7%	0.9%	-1.6%	0.6%	-5.9%
KGZ	1653.9	1505.1	-9.0	-0.9%	5.2%	-1.0%	-0.6%	0.6%	-0.9%	-2.4%
HKG	2217.9	2054.4	-7.4	-2.3%	4.4%	-0.5%	-0.3%	1.1%	-1.4%	-1.1%
TAP	1485.1	1410.3	-5.0	0.3%	1.3%	-1.5%	0.6%	-0.1%	-0.7%	0.0%
PHI	1528.3	1499.5	-1.9	-1.4%	1.9%	-1.2%	1.2%	-0.1%	-0.5%	0.0%
MON	1833.7	1850.1	0.9	-8.3%	8.2%	0.1%	-0.2%	-1.9%	-1.2%	3.4%
VIE	2361.9	2386.2	1.0	-9.1%	8.5%	-1.3%	4.3%	-0.1%	0.1%	-2.4%
PAK	712.0	720.6	1.2	-1.2%	1.8%	0.3%	0.3%	0.2%	-0.3%	-1.1%
ROK	1117.0	1195.1	7.0	-1.9%	1.6%	-0.5%	0.1%	0.0%	-0.1%	0.8%
JPN	605.2	657.0	8.6	-1.5%	0.9%	0.1%	0.2%	0.0%	0.0%	0.3%
SIN	3552.0	4019.9	13.2	-7.6%	2.8%	-0.2%	-0.4%	3.7%	1.4%	0.2%
NEP	739.5	943.3	27.6	-11.8%	2.9%	-0.2%	0.5%	8.3%	0.3%	0.0%
LAO	875.7	1305.6	49.1	-19.1%	9.7%	3.7%	5.5%	0.0%	0.3%	-0.1%
BRU	1537.0	2438.2	58.6	-10.9%	4.2%	0.9%	0.9%	0.2%	5.0%	-0.4%

BAN = Bangladesh; BHU = Bhutan; BRU = Brunei Darussalam; CAM = Cambodia; CPTPP = Comprehensive and Progressive Agreement for Trans-Pacific Partnership; HKG = Hong Kong, China; JPN = Japan; INO = Indonesia; IND = India; KAZ = Kazakhstan; KGZ = Kyrgyz Republic; LAO= Lao People's Democratic Republic; MAL = Malaysia; MLD = Maldives; MON = Mongolia; NEP = Nepal; PHI = Philippines; PAK = Pakistan; PRC = People's Republic of China; RCEP = Regional Comprehensive Economic Partnership; ROK = Republic of Korea; SIN = Singapore; SRI = Sri Lanka; TAP = Taipei,China; THA = Thailand; US = United States; VIE = Viet Nam.

Source: Computed by the authors based on the methodology in Wang, Wei, Yu, and Zhu (2022).

We perform a similar set of calculations of value-added sourcing for each of the economies in Asia and the Pacific in the sample. The results are presented in the bottom half of Table 18. From Columns 2–4, we see that in 15 out of 24 (or 63%) of the cases, there is a reduction in the average distance of value-added sourcing. Again, domestic sourcing and the rising importance of the PRC seems to be common themes among these economies. However, compared to the discussion on value-added absorption, the rise of domestic supply chains is moderately less pronounced.

The increased “near selling” and “near sourcing” in Asia can also be observed at the sectoral level. In Table 19, we document five typical sectors in Asia (see column 1 of the table for the selection criteria) from the perspective of value-added absorption and sourcing, respectively. From Columns 2–4, we see that for 9 out of 10 cases (except for Air Transport), there is a reduction in the average distance of value-added absorption and sourcing. The rising importance of the PRC can be observed in all sample sectors.

Table 19: Structural Changes in Value-Added Absorption and Sourcing for Typical Sectors

Structural Changes in DVA Outflows Sector		Ave. Dist. 2007	Ave. Dist. 2019	2019 relative to 2017 (%)	Domestic	PRC	CPTPP (in Asia)	RCEP (exc. CPTPP)	Rest of Asia	US	Rest of World
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Sectors with the Highest DVA Outflows	Electr. & Opt. Equip.	4444.3	3615.5	-10.0%	-10.0%	19.2%	-0.5%	-0.4%	-0.4%	-2.6%	-5.2%
	Wholesale	1389.3	1242.3	-23.3%	-23.3%	24.3%	0.0%	-0.1%	0.5%	-0.4%	-1.1%
	Renting & Oth. Business Act.	1589.0	1242.2	-26.1%	-26.1%	30.1%	-0.1%	-0.4%	-0.1%	-1.2%	-2.2%
with the Longest Forward VA Distance	Leather & Footware	4796.5	3683.0	-5.7%	-5.7%	19.2%	-0.8%	0.6%	0.1%	-4.2%	-9.3%
with the Largest Contraction in Forward VA Distance	Air Trans.	3447.4	1797.5	11.0%	11.0%	8.8%	-1.0%	-2.3%	-1.4%	-5.5%	-9.7%

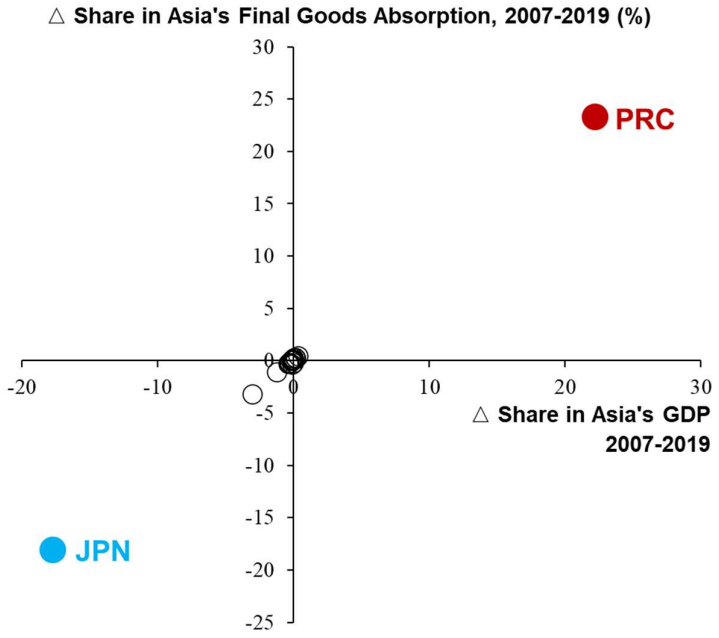
Structural Changes in FVA Inflows Sector		Ave. Dist. 2007	Ave. Dist. 2019	2019 relative to 2017 (%)	Domestic	PRC	CPTPP (in Asia)	RCEP (exc. CPTPP)	Rest of Asia	US	Rest of World
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Sectors with the Highest FVA Inflows	Construction	821.5	578.7	-22.6%	-22.6%	26.5%	-1.0%	-0.5%	-0.4%	-0.4%	-1.6%
	Electr. & Opt. Equip.	2718.4	2332.2	-12.2%	-12.2%	15.5%	-0.1%	1.5%	-0.1%	-1.0%	-3.6%
	Trans. Equip.	2494.0	1923.1	-18.8%	-18.8%	25.9%	-1.9%	-0.7%	-0.4%	-1.7%	-2.4%
with the Longest Backward VA Distance	Chemicals	2441.5	2913.1	-13.0%	-13.0%	7.2%	-0.2%	0.2%	0.1%	1.9%	3.8%
with the Largest Contraction in Backward VA Distance	Machinery	2866.3	1689.2	-7.9%	-7.9%	25.8%	-3.2%	-0.8%	-0.8%	-3.0%	-10.0%

CPTPP = Comprehensive and Progressive Agreement for Trans-Pacific Partnership, DVA = domestic value added, FVA = foreign value added, PRC = People's Republic of China, RCEP = Regional Comprehensive Economic Partnership Agreement, US = United States; VA = value added.

Source: Computed by the authors based on the methodology in Wang, Wei, Yu, and Zhu (2022).

To see why the PRC plays a special role in the increased "near selling" and "near sourcing" for other economies in Asia and the Pacific, we note that the PRC is the fastest growing large economy from 2007 to 2019 (Figure 8). The PRC's share in Asian GDP rose by more than 20 percentage points. This is accompanied by a big decline in Japan's share. With a growing share in world GDP and a fast increase in the import/GDP ratio, it is natural for it be an increasingly important destination of other economies' value-added absorption. During this period, as the PRC is a "world factory" for both intermediate goods as well as final goods, it has also become an ever more important source of value added for other economies' production.

Figure 8: Changes in the Share of Each Economy in Asia's Total GDP and Final Goods Absorption, 2019 Relative to 2007

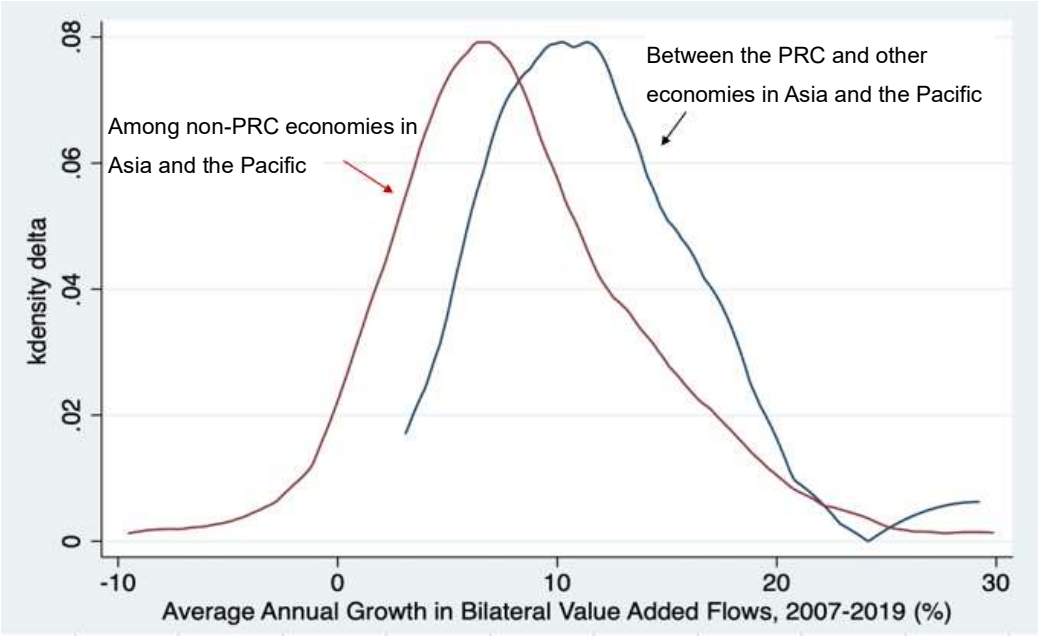


GDP = gross domestic product, JPN = Japan, PRC = People's Republic of China.

Source: Computed by the authors based on the methodology in Wang, Wei, Yu, and Zhu (2022).

Another way to see the role of the PRC in these patterns is to compare the kernel density function of the growth of all bilateral value-added trade between the PRC and other economies in Asia and the Pacific with that among non-PRC economies in Asia and the Pacific (Figure 9). This confirms that trading with the PRC tends to grow substantially faster than trading with other economies.

Figure 9: Kernel Density of the Average Annual Growth in Bilateral Value-Added Flows Among Asian Economies, 2007–2019



PRC = People's Republic of China.

Source: Computed by the authors based on the methodology in Wang, Wei, Yu, and Zhu (2022).

To summarize, the Asia and Pacific region appears to be distinct in displaying an increased tendency to have their value added absorbed in nearby economies and to source their value added from nearby economies. A rising importance of domestic market and domestic supply chain is part of the reason. A rising importance of the PRC both as a destination market and as a source of supplies is another. Perhaps a CPTPP with the PRC as a member could produce further economic integration in terms of additional "near selling" and "near sourcing."

VI. CONCLUSIONS

RCEP and CPTPP are both the newest and also the most ambitious regional economic blocs involving Asian economies, with CPTPP representing a deeper level of integration in a number of areas. This paper shows that a modern GVC perspective brings useful insight in understanding the progress of economic regionalism in Asia. In particular, GVC linkages in value-added terms across economies have grown faster than the value-added linkage through

final goods trade. For GVC connections, indirect GVC linkages via third economies have been growing faster than the direct linkages. Probit and an Ordered Probit regressions suggest that stronger value-added linkage between two economies—as represented by a higher value of the first principal component of the value-added linkages—tends to make it more likely for the pair to have a joint membership in RCEP or CPTPP.

With popular discussion on “just in case” (which emphasizes mitigating risks associated with relying faraway or less friendly markets or suppliers) versus “just in time” (which emphasizes cost minimization), we also assess whether the average distances in both value-added absorption and sourcing have declined. While we find no evidence of a secular decline in these average distances for the world as a whole, we do find evidence of a decline for the economies in Asia and the Pacific from 2007 to 2019. While some of the decline is due to an increased reliance on domestic markets and domestic suppliers, the increasing importance of the PRC—which happens to be located in Asia—as both a market and a supplier has also played a role. Neither RCEP nor CPTPP has played a significant role in the increased “near selling” and “near sourcing” so far. But as these two blocs have just started their formal lives, their role may increase over time.

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APPENDIX

Table A1: Impact of Economic Linkages in Value-Added Terms (Raw Measures) on the Likelihood of Membership in Both RCEP and CPTPP

	RCEP (*Probit Model*)	**RCEP and CPTPP** (*Ordered Probit Model*)
	(1)	(2)
IndirectGVC_Link	0.0371	0.0413
	(0.0423)	(0.0258)
DirectGVC_Link	0.0317	-0.00450
	(0.0220)	(0.0102)
VFT_Link	-0.00663	-0.00202
	(0.0133)	(0.0100)
lnDist	-0.687**	-0.570**
	(0.286)	(0.253)
ln(GDP_o*GDP_d)	0.0654	0.0718
	(0.0568)	(0.0518)
Contig	-0.598	-0.386
	(0.454)	(0.385)
ComRelig	-2.309**	-1.835**
	(1.027)	(0.921)
ComLang	-0.143	-0.0456
	(0.337)	(0.303)
RTA	3.134***	2.646***
	(0.397)	(0.311)
Constant	-0.102	
	(2.315)	
Constant Cut1		0.755
		(2.003)
Constant Cut2		2.356
		(2.000)
Observations	276	276

CPTPP = Comprehensive and Progressive Agreement for Trans-Pacific Partnership, RCEP = Regional Comprehensive Economic Partnership.

Note: Standard deviation in parentheses, *** p<0.01, ** p<0.05, * p<0.1.

Source: Authors.

Table A2: Industry Classifications

	Industry Name	Abbreviation
1	Agriculture, hunting, forestry, and fishing	Agric.
2	Mining and quarrying	Mining
3	Food, beverages, and tobacco	Food
4	Textiles and textile products	Textile
5	Leather, leather products, and footwear	Leather & Footwear
6	Wood and products of wood and cork	Wood
7	Pulp, paper, paper products, printing, and publishing	Paper & Publ.
8	Coke, refined petroleum, and nuclear fuel	Coke & Petro.
9	Chemicals and chemical products	Chemicals
10	Rubber and plastics	Rubber & Plastics
11	Other nonmetallic minerals	Nonmetal.
12	Basic metals and fabricated metal	Metals
13	Machinery, nec	Machinery
14	Electrical and optical equipment	Electr. & Opt. Equip.
15	Transport equipment	Trans. Equip.
16	Manufacturing, nec; recycling	Recycling
17	Electricity, gas, and water supply	E. G. W. Supl
18	Construction	Construction
19	Sale, maintenance, and repair of motor vehicles and motorcycles; retail sale of fuel	Motor Sale
20	Wholesale trade and commission trade, except of motor vehicles and motorcycles	Wholesale
21	Retail trade, except of motor vehicles and motorcycles; repair of household goods	Retail
22	Hotels and restaurants	Hotel & Rest.
23	Inland transport	Inland Trans.
24	Water transport	Water Trans.
25	Air transport	Air Trans.
26	Other supporting and auxiliary transport activities; activities of travel agencies	Travel
27	Post and telecommunications	Post & Tel.
28	Financial intermediation	Fin. Int.
29	Real estate activities	Real Estate
30	Renting of M&Eq and other business activities	Renting
31	Public administration and defense; compulsory social security	Public
32	Education	Edu
33	Health and social work	Health & Soci.
34	Other community, social, and personal services	Oth. Service
35	Private households with employed persons	Private House

Source: Compiled by the authors based on the industry classifications in ADB's Multi-Regional Input-Output (MRIO) tables.

Characterizing Regionalism in Asia

A Modern Global Supply Chain Perspective

This paper employs a modern global value chain decomposition framework to quantify economic interdependence among Asian economies and between Asia and the rest of the world. It shows that global value chain linkages in value-added terms across economies have grown faster than value-added linkages through final goods trade. Stronger value-added linkages between two economies tend to make it more likely for the pair to have a joint membership in the Regional Comprehensive Economic Partnership or Comprehensive and Progressive Agreement for Trans-Pacific Partnership.

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