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Introduction

Producers and industries across the Northeast and Southeast Asia are connected through intricate supply chains and production networks. These have evolved over the last four-five decades through gradual fragmentation of production and its strategic relocation across the region. The relocations have been influenced by country characteristics impacting cost of production such as availability of natural resources, cheap labour with skills for executing specific functions in value chains, diversification and broad-baseness of local industries and technological capacities of host locations. Over time, strategic relocation influenced by these country characteristics has led to growth of cross-country supply chains in line with vertical specializations. These chains comprise the entire range of activities involved in production from beginning to end including conceptualization and marketing.

The growth of regional supply chains and production networks in Asia is also evident from the sharp increase in intra-industry trade that now accounts for more than half of Asia's total trade. Both industrially mature (e.g. Japan, South Korea, Singapore, Taiwan, Hong Kong) and emerging market Asian economies (e.g. China, Thailand, Vietnam, Philippines, Indonesia, Malaysia) are engaged in significant intra-industry trade between themselves. China has benefitted significantly by plugging deep in regional supply chains and intra-industry trade. Its emergence as the world's leading exporter of manufactured goods underlines its widespread presence in these chains through a unique relationship with the rest of the region wherein it is a major importer of intermediates from most regional economies and exporter of final products to third country extra-regional markets. India, in contrast, has a much-limited presence in regional supply chains. Like China, it also runs trade deficits with most regional economies; but it imports both intermediates and finished products as a market for final demand, and is less of an assembling and processing hub like China. The low presence of Indian firms in regional supply chains hinders their prospects of obtaining greater access in both regional and global markets.

India is currently negotiating the Regional Comprehensive Economic Partnership (RCEP), which includes the ten-member ASEAN economies, and regional countries with whom the ASEAN has bilateral FTAs, i.e. Australia, China, India, Japan, New Zealand and South Korea. The RCEP accounts for 33.6 per cent of the global GDP (PPP), and 20.7 per cent and 20.9 per cent of global goods and services trades. It is economically almost as significant as the other major trade and investment agreement coming up in the Asia-Pacific – the Trans Pacific Partnership (TPP) – being negotiated by economies from both sides of the Pacific including several RCEP members. With the RCEP poised to become an overarching RTA in Asia, India needs to examine its possibilities in the regional supply chains in the context of the RCEP.

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This study examines the characteristics of regional supply chains for a group of industries and discerns the roles of different RCEP members in these chains including that of India's. The analysis uses secondary data from the Trade in Value Added (TIVA) database of the OECD and the WTO. It is divided in five sections. Section 1 notes the forward and backward participations of the RCEP economies in global value chains (GVCs) and groups them in distinct categories defined by the degrees of participations. Section 2 studies the characteristics of the value chains for different industries involving the RCEP members in terms of the domestic and foreign value added in final exports and sourcing relationships between the RCEP economies. Section 3 records the competitiveness of various RCEP members in different industries. Section 4 notes India's specific connections with the rest of the RCEP members through value chains in different industries and identifies sectors where Indian industries have possibilities for deeper integration within the RCEP framework. Finally, Section 5 focuses on some specific negotiating issues at the RCEP from the Indian perspective on regional supply chains.

Section 1: *RCEP Members: Participation in GVCs*

A country's participation in GVCs can be assessed from the use of its goods and services as imported inputs in exports of other countries (*forward participation*) and by the use of imported inputs in its own exports (*backward participation*). Participation indices for the OECD and select non-OECD economies show relatively greater tendencies on part of smaller open economies to source more imported inputs for their exports. Relevant examples include Luxembourg, Ireland, Hungary, South Korea, Singapore, Taiwan and Chile². While backward participation is the key driver of GVC participation for these countries, forward participation, i.e. supplying goods for use in third country exports is a bigger driver for relatively larger, more industrially diversified or natural resource exporting countries like the US, Germany, Japan, EU, Australia, Russia, Indonesia and Russia.

Table 1 shows the forward participation indices of the RCEP members during 1995-2009. The indices show increases for most countries, reflecting greater use of their domestic products as third country exports, except Cambodia and China. It is important to note that for the period 1995 to 2009, the year 2009 needs to be considered exceptional due to the economic downturn inflicted by the global financial crisis. This is evident from the drop in forward participation indices of several countries between 2008 and 2009 (e.g. Australia, New Zealand, Brunei, Philippines and Vietnam; Table 1).

The average forward participation of the RCEP group has increased from 16.1 percent to 24.5 percent during 1995-2008. Countries with more than average downstream participations include Australia, Japan, Korea, Indonesia, Brunei, Malaysia and Philippines. For many of these countries, higher forward participation and integration in GVCs primarily as suppliers of inputs to third country exports is driven by their comparative advantage in resource-intensive exports, such as coal, oil and refined petroleum products, as well as agriculture and

² See Backer and Mirodout (2013) for a more detailed discussion.

food products. For Japan and Korea, diversified domestic industrial bases contribute to proficiencies in supply of intermediates to other countries. Semiconductors and computer products and accessories are key determinants of forward participation for Philippines as well as Malaysia (other than natural resources). China, Cambodia, Vietnam and Thailand, on the other hand, show much lower forward participation rates. They are less proficient in supplying intermediates to exports of other countries as several other members of the RCEP. Their presence in GVCs is more from backward participation i.e. use of imported inputs in their own exports. This highlights their importance in contributing at GVCs largely at the downstream ends through processing and assembling.

Table 1: Forward Participation Indices of RCEP Members³

	1995	2000	2005	2008	2009
Australia	21.8	26.1	31.4	35.1	31.3
Japan	22.4	26.1	29.6	30.7	33.0
Korea	14.2	19.1	26.2	25.0	24.4
New Zealand	13.3	15.4	14.8	19.5	15.7
China	13.9	13.8	12.2	14.4	13.4
India	14.2	19.1	23.3	22.3	20.3
Indonesia	18.8	23.7	31.4	31.8	29.3
Brunei Darussalam	19.3	29.9	38.6	43.0	32.2
Cambodia	17.7	8.7	4.8	4.8	6.3
Malaysia	15.2	19.6	27.2	29.6	27.7
Philippines	16.6	17.3	28.7	31.1	28.3
Singapore	13.8	18.6	22.4	20.9	20.7
Thailand	12.0	14.3	17.4	18.7	18.3
Vietnam	12.6	18.1	17.8	16.5	14.7
Average	16.1	19.3	23.3	24.5	22.5

Source: OECD WTO TIVA Database

³ The OECD WTO TIVA database does not provide data for Laos and Myanmar, two other RCEP members. They are, therefore, not included in any of the empirical analysis in this paper.

As a group, the RCEP countries show a greater average backward participation index than forward participation; measured for 2008, the backward participation index for RCEP is 30.6 compared with 24.5 for the forward index (Tables 2 and 1). Backward participation in GVCs has traditionally been higher for the RCEP as revealed by the comparative indices over time. China, Cambodia, Korea, Malaysia, Philippines, Singapore, Thailand and Vietnam have higher than average backward participation rates; Australia, Japan, New Zealand, India, Indonesia and Brunei have lower than average rates. For most of the latter, backward participation rates have either increased at slow pace (e.g. Australia, Japan and New Zealand) or have shown opposite trends (e.g. Indonesia and Brunei). India, though, appears an exception with a fairly sharp increase in its backward linkages (Table 2).

Table 2: Backward Participation Indices of RCEP Members

	1995	2000	2005	2008	2009
Australia	11.8	13.5	13.0	13.9	12.5
Japan	6.8	9.9	13.8	19.4	14.8
Korea	23.7	32.9	37.7	43.4	40.6
New Zealand	17.4	20.2	19.6	21.4	18.4
China	11.9	18.8	36.4	33.3	32.6
India	9.6	12.8	19.5	23.7	21.9
Indonesia	14.7	19.3	17.8	17.4	14.4
Brunei Darussalam	18.4	10.4	6.7	8.8	11.6
Cambodia	26.0	34.6	37.9	36.1	34.1
Malaysia	40.3	43.0	41.5	38.1	37.9
Philippines	30.9	45.9	45.6	41.7	38.4
Singapore	46.7	50.7	52.3	53.4	49.9
Thailand	29.8	34.8	38.5	37.8	34.5
Vietnam	24.4	29.6	35.0	39.8	36.6
Average	22.3	26.9	29.7	30.6	28.4

Source: OECD WTO TIVA Database

Based on the participation indices, the RCEP countries can be divided into the following categories.

Table 3: RCEP: Country Classification in terms of GVC Participation

Forward Participation (FP) Backward Participation (BP)	High	Low
High	Korea, Malaysia, Philippines	China, Cambodia, Singapore, Thailand, Vietnam
Low	Australia, Japan, Indonesia, Brunei,	New Zealand, India

High FP, High BP: The three RCEP members – Korea, Malaysia and Philippines - with both high FP and BP are among the members with highest overall participations in GVCs. All three economies have overall GVC participation indices higher than 60 (Figure 1). It is also interesting to note that for all these three economies, backward participation is the relatively higher determinant of entry in GVCs (Figure 2). Clearly, while they themselves are major suppliers of inputs to third country exports, they are also significant users of imported inputs in their own exports. All three economies have diversified industrial bases with Korea enjoying greater proficiency in scale-based technology-intensive manufacturing like steel, automobiles and consumer durables. Malaysia and Philippines have also developed strong capacities in relatively less technology-intensive, but nonetheless fairly skill-intensive production of parts, components and accessories. All three economies are engaged in high intra-industry trade at different levels of the GVCs they participate in, through complex exchanges of raw materials, intermediates and final products at various stages of processing and further value addition.

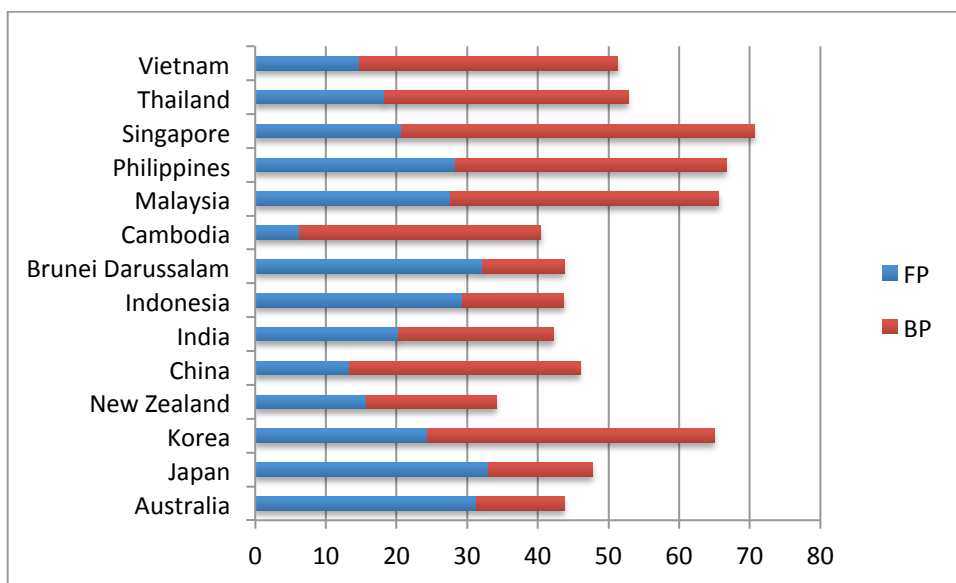
High FP, Low BP: Australia, Brunei, Indonesia and Japan comprise a group within the RCEP that participates in GVCs more as a supplier of inputs for other country exports. For Australia, Brunei and Indonesia, resource exports such as crude oil, coal and minerals are critical for moving into GVCs. Japan, though, is different in that it supplies mostly manufacturing intermediates produced by its diverse domestic industrial base. Considerable parts of these intermediates are supplied to various Japanese assembling and manufacturing facilities located in the region, including China.

Low FP, High BP: China, Singapore, Thailand, Vietnam, and now Cambodia, leverage their positions in GVCs as economies that make extensive use of imported inputs and intermediates. For both China and Singapore, backward participation is the more critical driver of their presences in GVCs (Figure 2). This displays their significances as processing and assembling centres for final product exports. For Singapore, which has the largest presence in GVCs among the RCEP countries and also the highest BP, high re-exports reflecting large movements of products coming in and going out after experiencing small incremental value additions, contributes to high BP. China, on the other hand, benefits from a diverse spread of manufacturing facilities maintained by foreign investments that engage in extensive assembling and processing of various hi-tech products out of intermediate imports from the neighbourhood. Thailand and Vietnam’s relatively high participation in GVCs is

again driven by their ability to process and assemble efficiently. Now Cambodia is also beginning to move into GVCs through similar capacities.

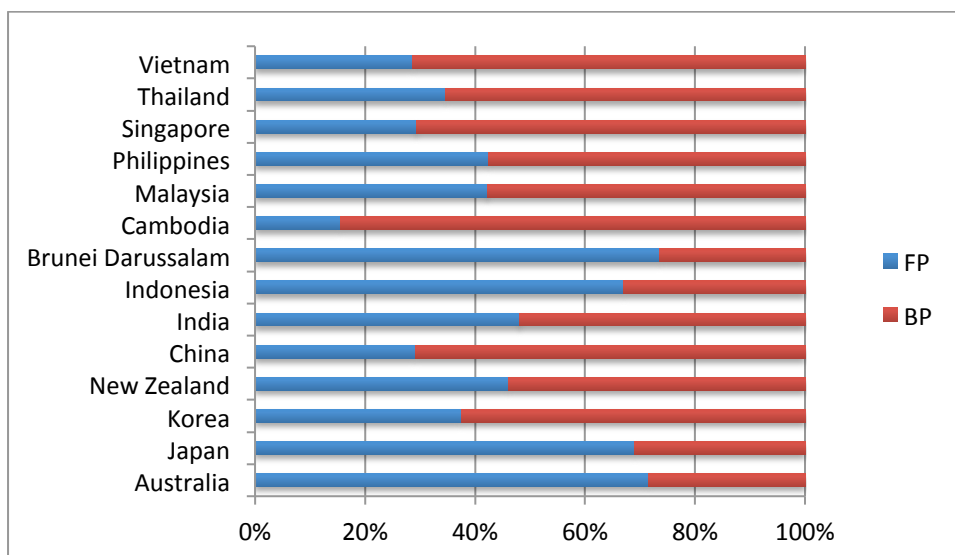
Low FP, Low BP: New Zealand and India are interesting as economies that have neither forward, nor backward participations, as the key drivers of their presence in GVCs. India has greater GVC participation than New Zealand with higher forward and backward rates. It has a much more diversified industrial base with its GVC participation being driven mostly by petroleum, automobile and jewelry for backward links and ores & minerals and textiles for forward links. During the period 1995-2009, its backward participation has shown a slightly greater increase than the forward rate and this could be due to its progressively higher imports of crude oil and gold.

Figure 1: RCEP - Forward and Backward GVC Participation Indices



Source: OECD WTO TIVA database

Figure 2: RCEP – Relative Shares of Forward and Backward Participations



Source: OECD WTO TIVA database

The relative participation indices throw some interesting insights on the Chinese economy. Though its backward participation rate exceeds forward participation, the former is less than those of the major Southeast Asian economies, and the latter is one of the lowest in the RCEP. Thus while China is structurally comparable to the specializations in processing of upstream imported inputs as noticed in several Southeast Asian economies, it is also at the same time deploying much greater domestic resources in its final exports than these economies, as discussed later. The simultaneous proficiency in downstream processing of imported inputs and use of diverse domestic intermediates in final exports from different industries is clearly a function of its economic size. Large economic sizes are significant in explaining this characteristic for India, Indonesia, Japan and Australia too, which are using much less of imported inputs in upstream processing, and are primarily relying on domestic inputs, reflecting the larger indigenous availability of the latter along with substantive presence of other industries abetting their utilization for significant parts in the supply chains.

Section 2: Regional Value Chains: Industry Characteristics

The OECD-WTO TIVA database provides disaggregated details on sources of value added by different countries in their gross exports of various industries. Before studying these details, however, it is useful to identify the value added by East Asia and Southeast Asia (i.e. ASEAN) as regions in global exports from various industries (Table 3).

According to the TIVA database, East Asia includes Japan, Korea, China, Chinese Taipei and Hong Kong. The latter two are not included in the RCEP. The shares of East Asia reflected in Table 3 exclude Chinese Taipei and Hong Kong. On the other hand, Australia, New Zealand and India are also not included in the OECD-WTO TIVA's classification of East Asia and ASEAN; these three countries are included in the category 'rest of the world'. The shares in Table 4 are computed accordingly.

Table 4: East Asia and Southeast Asia's shares (%) in Total Value Added of Gross Exports of Source Industries

	East Asia	ASEAN	East and Southeast Asia (ASEAN)
1. Agriculture, hunting, forestry and fishing	22.0	7.8	29.8
2. Mining & Quarrying	2.6	2.0	4.6
3. Food products, beverages & tobacco	15.8	3.7	19.5
4. Textiles, textile products, leather & footwear	13.2	2.9	16.1
5. Wood, paper, paper products, printing & publishing	4.9	0.9	5.8
6. Chemicals and non-metallic mineral products	4.4	1.5	5.9
7. Basic metals & fabricated metal	3.8	0.3	4.1

products			
8. Machinery & equipment	4.5	0.7	5.2
9. Electrical & optical equipment	13.6	3.7	17.3
10. Transport equipment	1.5	0.1	1.6
11. Manufacturing nec; recycling	25.9	1.0	26.9
12. Electricity, gas and water supply	3.4	0.5	3.9
13. Construction	1.4	0.3	1.7
14. Wholesale and retail trade; hotels & restaurants	4.3	1.1	5.4
15. Transport & storage; post and telecommunications	3.4	1.1	4.5
16. Financial intermediation	4.7	0.9	5.6
17. Business services	1.2	0.3	1.5
18. Other services	1.7	0.3	2.0

Source: Computed from the OECD-WTO Trade in Value Added (TIVA) Database; Note: Data are for the year 2009.

As a region, East Asia adds greater value to global exports than Southeast Asia (Table 4). ‘Agriculture, hunting, forestry and fishing’, and ‘manufacturing nec, recycling’ are the two industries reflecting highest value addition by East Asia, followed by food products, beverages and tobacco, textiles, and electrical and optical equipment. Agriculture also reports the highest value addition for Southeast Asia. But unlike East Asia, Southeast Asia adds limited value in manufacturing nec, recycling. Food products, electrical and optical equipment, textiles, and mining & quarrying are the other industries where it has relatively higher value additions in exports. Among services, financial intermediation, wholesale and retail trade, and transport and storage, are the relatively greater value added sectors for both regions.

From a value chain perspective, value addition to exports can be decomposed into domestic and foreign sources of value added. Foreign value added, reflecting backward participation from the perspective of the host country (and forward participation from the perspective of the source country) involves direct use of imported inputs in performing specific tasks in the value chains for final exports. Domestic value added can be further decomposed into: direct domestic value addition by domestic producers, value added from re-processing of inputs of other domestic industries and value added from use of re-imported inputs originally exported to third countries. As far as the last category is concerned, there is an overlap with backward participation. It is instructive to take closer looks at these different sources of value added for the exports of RCEP members in different industries for identifying their specific GVC participations in these industries and mutual inter-linkages through use of imports in exports and vice-versa.

Agriculture

Agriculture, hunting, forestry and fishing shows high final value added by both East and Southeast Asia. In terms of direct domestic value added, which reflects the 'exclusive' contribution of the domestic industry in final exports, Indonesia shows highest value added (77.2 percent) followed by Philippines (69.5 percent), Thailand (63.3 percent), China (58.2 percent), South Korea (55.1 percent) and Cambodia (54.2 percent) (Annex 1). Japan (50.1 percent), Malaysia (43.4 percent) and Singapore (46.7 percent) have direct domestic value added shares of fifty percent or less in their gross agricultural exports. For all the three major East Asian economies (China, Japan and South Korea), the shares of other sources of value added are at least forty percent or more with intermediates produced by other domestic industries contributing significantly to total domestic value added. These shares are significant for Southeast Asian economies like Malaysia, Singapore, Thailand and Vietnam as well. Several RCEP members – Malaysia, New Zealand, Korea, China, Japan, Australia and India – have domestic industry comprising the greater parts of their value chains. China's value chains are particularly long and elaborate at the domestic end, involving several stages, and underscoring considerable diversification, in form of production of inputs used by other countries; India, in contrast, is more involved in producing items meant for final consumption⁴.

Except Indonesia and Thailand, the other Southeast Asian economies show relatively higher foreign value added in their agriculture and forestry exports with shares of foreign value added in gross exports being more than 20 percent for Brunei, Cambodia, Malaysia, Singapore and Vietnam. Agriculture value chains, therefore, are distinctly cross-border in the region with most Southeast Asian economies sourcing upstream inputs for further processing. Cambodia, for example, notwithstanding domestic value added of more than 50 percent, sources extensively from the region particularly Vietnam, Malaysia and China. Brunei, the RCEP economy with highest foreign value added in agriculture exports, has New Zealand, Vietnam and Malaysia as its major source of imports (Annex 12).

Backward linkages are relatively less for the East Asian economies in agriculture export value chains, which could be due to their own large endowments of primary agricultural products and diversified domestic industrial bases aiding processing, particularly in China, which dominates exports in this category. For other RCEP economies like Australia and New Zealand, the direct domestic value added as share of exports are 58.8 percent and 42.2 percent respectively. While intermediates from other domestic industries add value to final agriculture exports in both, New Zealand's share of foreign value added in total exports is relatively more with Australia, Malaysia and Vietnam being its major sources of foreign value added (Annex 12). India's value added structure for agricultural exports also shows marginal contribution from foreign sources, among which, Vietnam and Malaysia are the two major sources. India, along with Indonesia, Thailand and Philippines appear to be specializing more in 'primary' agricultural exports rather than 'processed' items with Malaysia, Singapore, Vietnam and Cambodia displaying opposite tendencies. At the same

⁴ Backer and Mirodout (2013)

time, imports from India do not figure as a major source of foreign value added in agricultural exports of other RCEP members, reflecting its lower forward participation compared with Vietnam and Malaysia. The latter are obviously participating in the agricultural value chains in the region both through their forward and backward participations spread across both upstream and downstream functions.

Mining & Quarrying

Some RCEP countries figure among the leading global mining and & quarrying exporters of the world. Australia is the world's 4th largest mining exporter, followed by Indonesia and Malaysia at 9th and 10th positions respectively. Vietnam, India, China and Brunei occupy the 16th-19th ranks. For some of these economies, particularly Australia and Indonesia, direct domestic value added has the largest contribution in exports with shares of 82.3 percent and 63.3 percent respectively (Annex 2). Malaysia's share of direct domestic value added, while being less than those of Australia and Indonesia, is still higher than value added from domestic intermediates and foreign sources. Nonetheless, the share of foreign value added in its mining exports is the second highest among the RCEP after China pointing to its relatively high backward participation in mining value chains. Australia, Indonesia, Vietnam, Brunei and China are the major sources of its foreign value added from within the RCEP in this regard (Annex 12). China, which has the highest share of foreign value added in mining exports in the RCEP, sources largely from Vietnam, Malaysia, Australia, Cambodia and New Zealand. India, which has a high domestic value added share of 77.4 per cent and foreign value added share of only around 6 percent in its exports, is sourcing whatever little it is from mostly from Vietnam, Malaysia and Australia.

The mining & quarrying industry includes mining of coal and lignite, extraction of crude petroleum and natural gas, mining of uranium and thorium ores, metal ores, mining of chemical and fertilizer minerals and extraction of salt. Mineral rich countries with well-developed refining and processing capacities dominate the mining value chains. Australia and Indonesia's dominance of regional mining value chains is hardly surprising given their abundant endowments of mineral resources. China, on the other hand, imports mineral resources like copper and coal due to high domestic demand and has significant proficiency in smelting activities. It enjoys near global monopoly in production and processing of rare earth minerals. While China accounts for 95 percent of global production of rare earth elements, Australia and India also hold rare earth deposits, and account for almost the entire residual global production. India depends heavily on import of crude oil and coal, but has substantive refining capacities. The combination of natural endowment of minerals and refining capacities underpins the extent by which producers from different countries are able to contribute to the upstream and downstream segments of value chains with the latter entailing relatively more high-end technology-intensive participations.

Food products, beverages and tobacco

The role of domestic intermediates as a major source of value addition in exports of RCEP economies is particularly significant in the food products, beverages and tobacco industry. The characteristic highlights the integration of other domestic industries like agriculture and chemicals with production of final food product and beverage exports. These inter-industry integrations also tend to increase the lengths of food value chains (Annex 13).

The major RCEP member exporters for this industry are China, Thailand, Vietnam, Australia, Indonesia and New Zealand. For all these economies, except Vietnam, domestic intermediates from other industries contribute more than 50 percent of the gross values of exports with the shares ranging from 51.0-57.0 percent (Annex 3). Vietnam's exports of food and beverages show much greater proportion of foreign value added. Indeed, at 36.0 percent, foreign value added is the largest source of value in Vietnam's gross food product exports underscoring the relatively low availability of processed intermediates in the domestic economy for contributing substantively to final product exports, in the ways they do in China, Thailand and Australia. Similar contributions of foreign value added, which could again be due to relatively lower contributions of indirect inputs from complementing domestic industries and could reflect limited capacities, is seen for Brunei and Cambodia too. China, Australia, Malaysia and Thailand are the major sources of foreign value added in Vietnam's food product exports from among the RCEP; these countries, along with New Zealand, are important foreign value sources for Cambodia and Brunei too (Annex 12). Singapore embodies the highest foreign value added content in its exports with Vietnam, Malaysia, China, Australia and Indonesia being its major sources.

The lengths of food product chains show considerable variations among the RCEP members. Korea, Malaysia, Singapore, China and Vietnam are among economies with longest food chains reflecting the fragmentations in manufacture of food products, particularly through extensive involvements of SMEs. For all these economies, except Singapore, and particularly for China, food chains are longest at the domestic end, which explains the crucial roles of domestic industries in their export value added. India, too, like China, Malaysia, Philippines and New Zealand, has the domestic end of the food chain much longer than the international part. India's food product exports derive considerable value from domestic intermediates; the share of domestic intermediates in gross exports at 69 percent is the highest among the RCEP members. The limited backward participation reflected by the small share of foreign value added is confined to regional sourcing from China, Vietnam and Thailand. It is evident that India and most of the RCEP economies are contributing significantly to food product chains domestically beginning from the upstream and then going up by several levels. Singapore, Vietnam and Cambodia are exceptions with greater roles in downstream processing⁵.

⁵ Backer and Miroudot (2013).

Textiles, textile products, leather and footwear

The RCEP members include the world's major developing country suppliers to the global apparel market: China, India, Vietnam, Indonesia, Malaysia and Cambodia. China is by far the largest supplier accounting for 37 percent of total apparel exports in 2011, while the remaining five RCEP members between them accounted for around 11 percent of total global apparel exports⁶. Except Cambodia, the other five RCEP members, along with Thailand, have also experienced the fastest rates of growth in their textile exports. Textile exports are showing declining growth trends for Philippines, Singapore and South Korea⁷.

China, India, Indonesia, Thailand and Vietnam are also major exporters of leather footwear, while China and India are noted to have significant exports of light and heavy leather produced from bovine and sheep and goat hides⁸. It is clear that many of the RCEP members have individually and collectively integrated into global value chains in different segments of the textiles, apparels, leather products and footwear in various capacities.

While aggregate decomposition of sources of value added into direct domestic, domestic intermediate and foreign groups would not reveal their specific significances in different sub-segments of manufacturing activities that this product group comprises (Annex 4), it is nonetheless possible to draw some broad inferences. Cambodia and Vietnam display high backward linkages with around 62 percent of foreign value added in their gross exports for this category. China, Korea and Thailand are the major sources of foreign value added for both countries. Cambodian textile exports also add considerable foreign value from imports from Vietnam and partly from India, while Vietnam's exports do so from imports from Malaysia and Indonesia (Annex 12). Both countries are major exporters of textile products and apparels with varied specializations in the more labour-intensive and relatively less knowledge-intensive functions in the apparels value chain that are popularly referred to as CMT (cutting, making (sewing) and trimming) functions. Neither country is scale-based producers of yarn and fabric and sources these upstream inputs externally. The same observation describes the nature of Vietnam's presence in the leather footwear value chains where it relies on sourcing finished leather for manufacturing labour-intensive shoe uppers. For China and India, the foreign value added content as a proportion of gross exports is decidedly low for this industry, at around 20 and 18 percent respectively, while it is around 25 percent for Indonesia and Thailand and around 37 percent for Malaysia (Annex 4). China and India figure among each other's major sources of foreign value added, from the region as they do for the other mentioned countries. Indeed, India is among the top five sources of foreign value added from within the RCEP in final textile and leather exports for several of its members including Australia, Korea, New Zealand, Brunei, Cambodia, China, Philippines and Thailand.

For both China and India, domestic intermediates from other industries add more than 50 percent of the value of gross exports, underpinning the linkages, which their textiles sectors,

⁶ OECD (2013).

⁷ OECD (2013)

⁸ For greater details on raw hides and skins production and their global trade, see FAO (2013).

particularly yarn and fabrics, have with agriculture (for natural fibres like cotton and wool) and chemical industries (synthetic fibres like nylon). Similar linkages are noticed for leather products too in vegetable tanning and production of finished leather. In some RCEP members like South Korea and Japan, apparel firms have substantially upgraded themselves by taking on product designs and branding and marketing functions and graduating to both ODM (original design manufacturer) and OBM (original brand manufacturer) roles⁹. These firms have outsourced several relatively labour-intensive and lower-end functions to other developing countries in the region. Chinese and Indian firms, though, are yet to outsource these functions as substantively.

India's comparative constraint in responding to high global demand for apparels has been its relatively limited scale given that manufacture of textile products and readymade garments has traditionally been reserved for its small-scale manufacturers. As of now, while India does figure among major developing country suppliers of global apparel, it faces major competition from other RCEP members like Vietnam, Indonesia, Malaysia and Cambodia with China already far ahead.

Wood, Paper, Printing and Publishing

China leads the rest of the RCEP members in its gross exports of wood and paper and is one of the major exporters of the world in this category. Malaysia, Indonesia, Japan, Thailand, Korea, New Zealand and South Africa are also significant exporters of wood and paper. Though the maximum value in its gross exports are from domestic intermediates (42.5 percent), China's foreign value added is substantial at 34.8 percent (Annex 5). Globally, China's exports from this industry show the highest foreign value added, which is higher than the EU and US that are bigger exporters of items from this industry than China, underpinning the very high backward participation of China in this industry. Among the RCEP, China's biggest source of foreign value added are those countries that are major final goods exporters for this industry, i.e. Malaysia, Vietnam, Indonesia, Thailand and Korea (Annex 12). RCEP countries with higher foreign value added than China in their final exports from this industry include Vietnam (42.2 percent), Singapore (40.5 percent) and Cambodia (37.3 percent). These are, however, less significant final product exporters and are largely involved in the upstream parts of the value chains. They are sourcing mostly from among each other and Malaysia, Indonesia and China (Annex 12).

The wood, paper and printing industry comprises a series of diverse activities including sawing and milling of wood, manufacture of finished wood products along with cork and straw, paper and paper products including pulp, paperboard and corrugated paper, publishing and printing services and reproduction of media products including music, motion picture and video and software¹⁰. The diverse amalgamation explains why various countries from the RCEP display specific export proficiencies characterized by diverse degrees of forward and backward participation in the GVCs for this category. Malaysia and Indonesia enjoy

⁹ As in 2 above.

¹⁰ The industry includes ISIC Rev 3.1 code 2230, which is reproduction of recorded media. <https://unstats.un.org/unsd/cr/registry/regcs.asp?Cl=17&Lg=1&Co=2230>

upstream advantages on account of their large indigenous productions of wood and paper. Indeed, this is one of the industries where Malaysia shows much less foreign value added and higher value addition from domestic intermediates to its exports pointing to the role of its processing segments in complementing early upstream activities. Thailand and Singapore, on the other hand, are more involved in the downstream functions particularly in service-based activities for publishing and recording. India's involvement in the value chains for exports from this industry are almost completely upstream with its foreign value added being lower than 15 percent.

Chemicals and non-metallic mineral products

The industry includes a wide range of basic and applied chemical products such as basic chemicals, fertilizer and nitrogen compounds, plastics, pesticides, paints and varnishes, pharmaceuticals and medicinal chemicals, soaps and detergents, perfumes and toilet preparations, man-made fibres, glass and glass products, clay, ceramic, cement and lime. The items vary significantly in their factor-intensities of production, ranging from moderate to high capital and technology intensities. As such, from an aggregate perspective and the contributions of domestic and foreign value added sources to gross exports, it is difficult to identify the specific participations of countries in discrete tasks of value chains. Nonetheless, some overall insights can be obtained.

China and Japan are among the top ten global exporters for the industry with China occupying the 4th position and Japan the 8th. Korea, Singapore and Malaysia are the other RCEP countries figuring among the top twenty global exporters of chemicals and non-metallic minerals. China and Japan's prominent positions as exporters in the industry are understandable given their large and diversified domestic industrial bases. An important point of distinction though is the relatively larger volume of value added from direct and indirect domestic sources by Japan, compared with China. Foreign value added as a proportion of gross exports is as high as 41 percent for China. This follows 61 percent for Korea and 56 percent for Singapore, among the top chemical exporters from the RCEP, and is far higher than 21 percent for Japan (Annex 6).

Large imports of chemical intermediates from Japan by China, Korea and Singapore for further processing underline their high backward linkages as well significant importance as downstream processors for final exports. Indeed, for China, it is also important to note the fairly significant role of re-imported domestic value added in gross exports. Around 5 percent of the final value of gross exports (Annex 6) is from this source underlining its backward linkages with the chemical value chain both through processing of imported intermediates and through re-imports. China's major sources of foreign value added are Korea, Singapore, Japan, Malaysia and Thailand, while it itself, along with Singapore, Japan, Malaysia and Thailand again, are the major sources of foreign value added for Korea.

The high density of intra-industry trade in chemicals between the Northeast Asian RCEP countries – China, Japan and Korea – with some Southeast Asian economies like Singapore, Malaysia and Thailand is evident from China, Japan, Korea and Malaysia being the major

sources of imported foreign value added in Singapore's chemical exports. (Annex 12). India reflects much lower foreign value added than all these economies, though, China, Korea and Japan are among its major sources of foreign value added, as are Singapore and Malaysia.

Basic metals and fabricated metal products

Basic metal and fabricated product exports are dominated by China, Japan, Korea and Australia. These four RCEP economies figure among the top ten global exporters of this category and are at 3rd, 5th, 9th and 11th positions respectively. While India does not figure among the top twenty global exporters of basic metals, it is, nonetheless, a higher exporter than the other Southeast Asian members of the RCEP.

The characteristics of basic metals and fabricated products industry explain why the mentioned economies dominate its exports. Main products of the industry include basic metals such as iron and steel, ferrous and non-ferrous metals like gold, silver, platinum, metal casting and metal structures (e.g. doors, windows, frames, shutters, metal containers, boilers, radiators, steam generators and nuclear reactors). Countries with abundant endowments of metal ores, well-developed casting and forging capacities, and the technology and scale necessary for producing large numbers of industrial boilers, generators and nuclear reactors are naturally proficient in exports from this industry. In all these respects, China, Japan, Korea, Australia, and also India, have relatively greater domestic capacities than the rest of the RCEP members.

Like chemicals, Japan has a low foreign value added content of 19.5 percent in metal and metal product exports, followed by India and Australia with 22.2 percent and 22.8 percent respectively (Annex 7). The backward participations of these countries in the metal product supply chains are therefore relatively less. The largest source of value additions for these three countries in final product exports is from indirect use of domestic intermediates produced by other industries, which points to the presence of domestic inter-industry supply chains. Australia has proficiency in supply of precious metals like gold and silver and adds considerable value from its domestic capacities in smelting and electrolytic refining. Smelting, refining, forging and casting capacities are also extensively noticeable in India, including in small and medium enterprises. Japan has significant capacities in generators, turbines, boilers and nuclear reactors, where little foreign value addition is expected, given the high technological content and strict product specifications of the Japanese industry. For China and Korea, the foreign value added content and backward participation is relatively higher, at 34.9 percent and 43.5 percent respectively (Annex 7). Japan, Malaysia, Thailand and Singapore are major sources of imports contributing to final metal product exports from China and Korea, while both are similar sources of imports for each other.

Transport equipment

Japan, Korea and China are the leading global exporters of transport equipment among the RCEP. India, Singapore and Thailand also have substantive exports of transport equipment, though not as much as the three Northeast Asian countries, which are among the world's top ten exporters from this industry. For all these three economies, sources of value added to

gross exports reveal largest contributions from intermediates produced by other domestic industries: the shares being 58.1 percent, 38.5 percent and 44.5 percent for Japan, Korea and China respectively (Annex 8). Japan has the lowest share of 14.1 percent in foreign value added while the shares for Korea and China are 36.5 percent and 33.5 percent respectively. Between the three, the direct domestic industry contribution of value added is the largest for Japan (27.3 percent), while they are a little less for Korea (24.7 percent) and China (21.4 percent) (Annex 8).

For India, the value added structure is somewhat identical to the above three economies given the highest contribution of domestic intermediates (49.1 percent), followed by direct domestic industry value added (27.1 percent) and foreign value added (23.6 percent) (Annex 8). Foreign value added and backward participation is much higher for Thailand, Singapore and Vietnam at 44.8 percent, 44.1 percent and 57.3 percent respectively. For all these economies, the corresponding contributions of domestic intermediates are much less (20.0 percent, 18.5 percent, 15.9 percent), while the direct domestic industry contributions are relatively higher (34.9 percent, 36.9 percent, 24.6 percent). China, Korea, Japan, Malaysia, Singapore and Thailand themselves, are variously the major sources of foreign value added for these three economies (Annex 12). The higher foreign value added points to Thailand, Singapore and Vietnam being locations focused on some specific activities in the value chains where imported raw materials and upstream inputs are further reprocessed and re-exported by the domestic equipment manufacturing industry. In contrast, in Japan, as well as in China, Korea and India, the domestic sourcing at different levels of the supply chain appears much more; the lengths of the supply chains are also longer at the domestic end.

Transport equipment covers an exhaustive range of items pertaining to all segments of the upstream and downstream sections of the automobile industry value chain. These include manufacture of motor vehicles (including passenger cars, commercial vehicles, buses, vehicle engines), manufacture of bodies (coachwork) for all vehicles along with their outfitting, and diverse parts and accessories for motor vehicles. Given that the sources of value added for exports are not available at a disaggregated level, it is difficult to pinpoint the stages at which value additions are more, or less, by different countries. However, this is an industry where the length of the value chain is one of the largest at the domestic level and it is also one of those manufacturing groups where the foreign end of the value chain is relatively larger than the rest of the industries (Annex 13) pointing to the complex nature of production fragmentation.

Given these nuances, and the existing structure of automobile industries in different RCEP members, it is clear that major OEMs play decisive roles in splitting the chain into location-specific activities. In India, for example, as also in China, the presence of OEMs has been accompanied by the growth of large ancillary component manufacturing clusters enabling domestic sourcing of several inputs. At the same time, imported intermediates are also being sourced from production facilities in Southeast Asian countries for final assembling. The growth of such large ancillary component clusters is much less, at least in size and variety, in Thailand, Singapore and Vietnam, where the roles are largely confined to processing of imported inputs, a lot of which are further exported: needless to say, much of this intra-

industry trade takes place among affiliates of the OEMs, significantly dominated by the Japanese and Korean brands. It is also interesting that a significant part of the intra-industry trade in auto parts and components takes place between the Southeast Asian members of the RCEP, where the latter export to their neighbours items in which they are competitive, and import components where they are not, a feature noticed in transport equipment as well as electronics trade¹¹.

Electrical Equipment

China, Japan, Korea and Thailand are among the top ten global exporters of electrical equipment. Singapore, Malaysia, Philippines and India are among the top twenty. Among the top four exporters, China, Korea and Thailand show substantive proportions of foreign value added in their gross exports: these shares are 42.6 percent, 46.6 percent and 54.8 percent respectively (Annex 8). Japan is a major source of foreign value added for all three countries, while China and Korea are major import sources for Thailand as much as they are for each other. China and Korea are sourcing from India too while Thailand has Indonesia and Australia among its major source locations from within the RCEP (Annex 12). Japan, like in several other industries mentioned earlier, has a much lower share of 17.8 percent in foreign value added to gross exports. Almost 50 percent of the value addition to gross exports from Japan is from domestic intermediates reflecting the considerable value drawn from within the country as opposed to relatively lower shares of 37.1 percent and 30.9 percent for domestic intermediates in China and Korea (Annex 9). Apart from Thailand, Singapore, Philippines and Malaysia have substantively large shares of foreign value added ranging from 50-60 percent. Japan, Korea and China are among the major sources of foreign value added for these countries. India has a much lower share of 22 percent of foreign value added and lesser backward participation.

These country-specific industry characteristics reflect the differences between broad-based industrial capacities acquired in electrical equipment manufacturing by Japan on one hand and the rest of the regional economies on the other. Electrical machinery includes a broad gamut of items such as electrical motors, transformers, generators, insulated wires and cables, batteries, lamps and lighting equipment. The length of the value chain (Annex 13) for the industry is relatively long at the domestic end. But the higher content of foreign value added in exports of most countries point to relatively less value addition at different stages of the domestic chains, except by Japan and India. The disaggregated profile of sources of value added among countries also reflects the broader characteristic of most major Asian economies, except Japan, of being bulk importers of intermediate goods. For India, though, this sector is probably one where the imported intermediates are largely low-value in nature, compared with the other Asian members of the RCEP. A considerable part of value addition

¹¹ Philippines, for example, is an exporter of lead acid batteries to Malaysia with respect to whom it has greater trade competitiveness as measured by net trade ratio (NTR); but for the rest of Southeast Asia it is primarily an importer of the same item given its lower NTR and competitiveness (Rossellon and Meddala, 2011). Similarly, while Philippines exports ICs to several countries of Southeast Asia because of greater competitiveness, in other segments, while exporting some, it also imports considerable amounts of the same products due to the relative variations in bilateral competitiveness.

in India's exports is taking place from its domestic intermediates underlying complex fragmentation.

Manufacturing n.e.c, recycling

As a region, East Asia's high share of value added in the global exports from this industry is almost entirely due to China and partly Japan. China is the world's largest exporter for this industry and only 30.3 percent of the total value addition in its gross exports is from direct domestic value added. Japan and South Korea have relatively larger shares of 32.6 percent and 37.6 percent of direct domestic value added (Annex 10). Within Southeast Asia, Philippines and Indonesia have the largest shares of 40.0 percent and 39.9 percent respectively in direct domestic value added (Annex 9). For Cambodia, Singapore and Vietnam, the shares are between 27-20 percent; while they are more than 30 percent for Thailand and Malaysia. India, incidentally, is one of the largest exporters of items from this industry; its share of domestic value added in gross exports is only 26.3 percent, which is even lower than that of China's. Indeed, India shows the largest share of foreign value added in the world for this industry underpinning the significant backward participation it has in exports from this industry.

The manufacturing n.e.c and recycling industry includes a diverse variety of manufactured items ranging from manufacture of furniture, jewelry, musical instruments, sports goods and toys, brooms and brushes and recycling of metal and non-metal waste and scrap (Annex 14). The items produced vary in their capital and technology intensities and include many products that are labour-intensive and low on requirement of sophisticated skills. This is also an industry where East Asia and Southeast Asia figure in fairly extensive geographically dispersed production networks, some of which are inter-regional, and occasionally intra-regional as well.

From the RCEP perspective, its members that are significant exporters from this industry – China, India, Japan, Thailand, Indonesia, Korea and Singapore – all have fairly significant shares of foreign value added in gross exports and backward participations in value chains. Singapore has the highest foreign value added share (51.0 percent), followed by India (49.1 percent), Thailand (35.2 percent), Korea (25.5 percent), China (24.1 percent), Japan (14.3 percent) and Indonesia (13.9 percent) (Annex 10). The relatively higher foreign value added shares reflect natures of specializations and degrees of diversifications by domestic industries in different countries, which are also often indicators of the abilities of different segments of domestic industries to contribute to final products in other segments, either through supply of intermediates or processing. The fact that several RCEP economies have foreign value added as the source of more than one third of the value of their exports for this industry underscores the fairly extensive backward participations for these economies, as well as the region, in the GVCs for this industry. For Cambodia, Malaysia and Singapore, the three economies with largest foreign value added, the major sourcing's are from China, Thailand and India. Indeed, India is one of the major sources of foreign value added in exports from this industry for all the other RCEP members (Annex 12). It's being one of the major sources of foreign value added, as well as its own exports from this industry having considerable foreign value, points

to India's significant backward and forward participation links with the region in exports from this industry.

India's specific specialization in the manufacturing n.e.c group is in processing and finishing of gems and jewelry with the industry importing sizeable rough uncut diamonds and un-designed gold from the EU (e.g. Belgium), Russia and the Middle East (e.g. UAE). India is the world's largest diamond processing hub and accounts for almost 60 percent of the final value of the global processed diamond output¹². The processed diamonds and other jewelry largely move to markets on India's west, i.e. Europe, North America and the Middle East. In this sense, India's jewelry value chain mostly bypasses the RCEP territory. China, Japan, and Thailand, in contrast, specialize in manufacture of sports goods and toys, games, furniture, brooms and brushes and recycling of waste and scrap, between themselves. In all these activities, their diversified domestic industrial capacities contribute significantly. For China and Japan, the largest source of value addition is from domestic intermediates of other industries, which is sizeable in Thailand and Indonesia too. The countries are also engaged in considerable intra-regional trade, where final products from the region's largest exporters, China and Japan, are often targeted at other regional markets, from where, in the first place, primary and intermediate imports would have originated.

The existing value chains, however, display distinct locational characteristics varying between products. For China specifically, in a category like production of sports goods and toys, the sourcing of parts and components from the ASEAN countries is much less than what it is for machinery and transport equipment. Its final goods exports of machinery to ASEAN are also more than those of sports goods and toys. For machineries, both in terms of sourcing of parts and components, as well as import of final products, China's reliance on Japan and Korea is much more than that on ASEAN pointing to the strong presence of China-Japan-Korea value chains, which are relatively less pronounced for sports goods and toys and miscellaneous manufacturing¹³. An important issue to be noted in this regard is whether China's sourcing demand has led to greater competition between the East Asian economies and the Southeast Asian countries; to an extent the China-ASEAN FTA might have partially influenced the sourcing from Southeast Asia thus leading to some condensation of value chains between China and Southeast Asia.

Machinery and equipment

The industry comprises production of general and special purpose machineries and domestic appliances. As expected, China, Japan and Korea are among the largest global exporters of machineries with China occupying the 3rd position, and Japan and Korea the 6th and 10th positions respectively. Malaysia and Singapore are among the top twenty global machinery exporters, while India and Indonesia are among the top thirty.

¹² 'India Russia to share data on diamond trade', *The Times of India*, 10 April 2014; <http://timesofindia.indiatimes.com/business/india-business/India-Russia-to-share-data-on-diamond-trade/articleshow/33565433.cms> (Accessed on 13 April 2014).

¹³ Yamashita and Kohpaiboon (2011)

In terms of sources of value added, China has around 40 percent contribution from other domestic intermediates and 36.8 percent from foreign value added (Annex 11). These shares, particularly for foreign value added, are lesser for Korea (31.8 percent) and Japan (11.5 percent). Malaysia, Japan and Korea are the major sources of foreign value added for China (Annex 12). Malaysia and Singapore have significant shares of foreign value added at 55.6 percent and 56.5 percent respectively. They are sourcing largely from China, Japan and Korea. India and Indonesia, both, have lower shares of foreign value added at 22.9 percent and 38.7 percent. These contrasting proportions of foreign value added and difference in the degree of backward participation reflect the greater importance of China, Malaysia and Singapore as processing centres in the regional supply chains of machineries. All three countries rely considerably on Japan for sourcing intermediates for later stage processing.

The machinery and equipment industry reflects the extensive intra-industry trade between several RCEP members, popularly referred to as parts & components trade, in key industries like automobiles and electronics. The dense supply chains facilitating intra-industry trade in these industries are largely run by lead firms from Japan and Korea, and also from Taiwan and Hong Kong, which though are outside the RCEP. The intra-industry trade is particularly intense in the semiconductor and electronics segments where Southeast Asian RCEP members like Philippines, Malaysia, and Thailand, are found trading vigorously at different levels of the value chains depending on their specific competitive advantages. While much of the contributions of these countries are at the relatively lower end in production semiconductors, office and telecom equipment and consumer electronics, China, over the years, has emerged as the largest processing centre in the region for the global electronic and computer brands, and other hi-tech exports, such as those of the Apple, Samsung, Toshiba and Fujitsu.

Section 3: *Competitiveness Indicators*

The OECD WTO TIVA database estimates revealed comparative advantages (RCAs) of various countries in different manufacturing industries on the basis of their value added in gross exports. These RCAs are computed for overall gross exports and more specifically for domestic value added embodied in gross exports (Tables 5 and 6).

There is a general perception that India is largely uncompetitive with respect to most of the other members of the RCEP in manufacturing. While this is not entirely incorrect, there are some sectors where India has RCAs > 1 , reflecting overall global competitiveness in those exports. These include textile products, leather & footwear and manufacturing nec, recycling. In the latter, for gross exports, India's RCA of 6.9 is the highest among all the RCEP countries. Another industry where India shows relatively high RCA of 0.9 is in basic metals and fabricated metal product exports.

RCEP members with across-the-board global competitiveness (RCAs >1) in four industries out of the nine reported here include Japan (basic metals, machinery & equipment, electrical equipment and transport equipment), Indonesia (food products, textiles, wood and paper products, and chemicals and non-metallic minerals) Malaysia (wood and paper products,

chemicals and non-metallic minerals, machinery & equipment, electrical & optical equipment) and Thailand (food products, textile products, electrical and optical equipment and manufacturing nec, recycling). China, Cambodia and Vietnam have global comparative advantages in three industries, while India is joined by Australia, Korea, New Zealand and Singapore in being globally competitive in two industries (Table 5).

Table 5: Revealed Comparative Advantage in Gross Exports of Manufacturing Goods

	Food	Textiles Leather	Wood Paper	Chemical, Non-metal minerals	Basic metal	Machinery & equipment nec	Electrical & optical equipment	Transport equipment	Manufact uring nec; recycling
Australia	3.1	0.3	0.7	0.7	3.8	0.7	0.2	0.4	0.5
Japan	0.1	0.1	0.2	0.7	1.1	1.2	1.4	1.9	0.9
Korea	0.2	0.5	0.2	0.8	0.9	0.8	1.7	1.6	0.2
New Zealand	6.6	1.0	3.2	0.5	0.9	0.3	0.2	0.2	0.4
Brunei	0.3	13.4	0.1	0.1	0.0	..	0.1	0.0	0.3
Cambodi a	3.9	6.4	1.4	0.2	0.3	0.3	0.3	0.1	0.8
China	0.3	2.6	0.5	0.5	0.8	0.8	1.8	0.3	1.6
India	0.6	1.9	0.3	0.7	0.9	0.4	0.8	0.5	6.9
Indonesia	2.8	1.9	1.5	1.2	0.7	0.6	0.5	0.3	0.9
Malaysia	0.7	0.5	1.2	1.2	0.4	1.6	1.8	0.1	0.2
Philippin es	0.1	0.8	0.1	0.1	0.1	0.1	4.2	0.2	0.1
Singapor e	0.2	0.1	0.2	1.9	0.3	0.8	1.7	0.4	0.2
Thailand	2.1	1.8	0.5	0.6	0.5	0.2	1.9	0.3	1.5
Vietnam	4.3	6.6	1.4	0.2	0.2	0.2	0.3	0.1	0.8

Source: OECD WTO TIVA Database

Reflections on RCAs computed on the basis of domestic value added in gross exports (Table 6) shows variations in industrial competitiveness vis-à-vis those earlier noticed for gross exports, for two countries. These are India and Philippines. According to RCAs for domestic value added embodied, India is globally competitive in three industries – textiles, electrical equipment and manufacturing nec (Table 6), as opposed to two industries earlier (Table 5). Furthermore, Philippines is now noticed to be globally competitive in textiles too, in addition to electrical equipment mentioned earlier (Tables 5 & 6). In textiles and textile products,

Brunei shows the highest global competitiveness followed by Vietnam, Cambodia, China, India, Thailand, Indonesia and Philippines. In electrical equipment, Philippines has the highest competitiveness, followed by China, Korea, Singapore, Malaysia, Thailand and Japan. Finally, in manufacturing nec, India again shows the highest competitiveness, followed by China and Thailand.

Table 6: Revealed Comparative Advantage based on domestic value added embodied in gross exports

	Food	Textile Leather	Wood Paper	Chemical, Non- metal minerals	Basic metal	Machinery & equipment nec	Electrical & optical equipment	Transport equipment	Manufactu ring nec; recycling
Australia	3.0	0.3	0.6	0.7	3.6	0.6	0.2	0.4	0.5
Japan	0.1	0.1	0.1	0.7	1.0	1.2	1.5	2.0	0.9
Korea	0.2	0.6	0.2	0.6	0.9	0.9	1.8	1.9	0.2
New Zealand	6.0	0.9	2.9	0.4	0.9	0.3	0.2	0.1	0.4
Brunei Darussala m	0.3	12.4	0.1	0.2	0.0	..	0.1	0.0	0.3
Cambodi a	4.7	4.7	1.6	0.2	0.2	0.2	0.3	0.1	0.7
China	0.3	3.0	0.5	0.5	0.8	0.8	1.8	0.3	1.8
India	0.7	2.1	0.4	0.8	0.9	0.4	1.0	0.5	4.7
Indonesia	2.8	1.6	1.4	1.3	0.7	0.4	0.5	0.3	0.9
Malaysia	0.9	0.5	1.6	1.5	0.3	1.2	1.6	0.1	0.2
Philippin es	0.2	1.0	0.1	0.1	0.1	0.2	4.3	0.3	0.1
Singapor e	0.2	0.0	0.3	2.1	0.3	0.8	1.7	0.5	0.2
Thailand	2.6	2.0	0.4	0.7	0.5	0.2	1.5	0.3	1.6
Vietnam	5.1	4.8	1.5	0.2	0.2	0.2	0.2	0.1	0.6

Source: OECD WTO TIVA Database

The RCA analysis has the disadvantage of being a static measure. The current analyses are also based on the structure of value chains analyzed till 2009. Nonetheless, some larger insights about country competitiveness are possible to be inferred. In manufacturing nec, for example, India's distinct competitive advantage is a result of its prowess in exports of jewelry and related articles, as well as in scrap waste and recycling. It is noticeable that India's RCA

measured in domestic value added embodied in exports (Table 6) is lower than that estimated from gross exports (Table 5), underscoring the importance of backward participation and foreign value added in gross exports. Taiwan and Hongkong are large exporters of manufacturing nec and recycling and none of them are part of the RCEP. It is important for India to explore the possibilities of integrating into supply chains for manufacturing nec in the RCEP, both for targeting final markets within the RCEP, as well as accessing other final markets through the RCEP. Manufacturing nec has a fairly long supply chain running through domestic economies (Annex 13) and India holds an advantage in this regard. While lack of RCAs at disaggregated industry levels (4 digit code) for domestic value added embodied in exports constrains further detailed insights in identifying specific products where India can be competitive, it is likely that India might have competitive advantages in segments other than jewelry, such as manufacture of furniture and sports goods.

Textiles and textile products also contains opportunities for Indian producers. The RCA analysis reinforces India's competitiveness in this respect. But while India is globally competitive in this industry, it is relatively less competitive than China, Cambodia and Vietnam. India's advantages are mainly in production of fibre and partially in fabric and finished products; at the relatively downstream end of the supply chains involving CMT operations, Indian producers are less competitive than some other RCEP members.

Though electrical equipment is another industry where the RCA analysis points to India's global competitiveness, such competitiveness is unlikely to give it much space within the RCEP, as several other RCEP members have greater competitiveness. But as mentioned in the earlier discussion on sources of value added for this industry, India does have a rather elaborate domestic value chain compared with several other relatively high export members, within whom the intra-industry trade is high, and who also have greater skills in processing intermediates, particularly in electronics and computers. This is probably one of the reasons why India is not globally competitive in this industry if measured by RCA computed from gross exports as the major exporters have much higher foreign value added in their exports arising from intra-industry trade. Nonetheless, the prospects of India figuring prominently in supply chains of electrical and electronic products, including even in relatively low value added operations like manufacturing semiconductors appears limited, given its narrow presence in the electrical intra-industry parts and components trade in the region.

Section 4: India in Regional Value Chains: Presence and Opportunities

As mentioned earlier, India's participation in various GVCs is relatively limited compared with the rest of the RCEP economies. The limited participation is reflected in both its forward and backward participation rates being among the lowest in the RCEP. Nonetheless, there are industries where it has become embedded in the supply chains over time. This section looks at some of these industries and tries to identify India's further possibilities in regional supply chains that run through the RCEP countries. Before that, however, it is important to take a look at India's sources of foreign value added from within the RCEP as well as identify those

RCEP countries and industries that are sourcing significantly from India. These would help in obtaining greater insights on India's backward and forward participations.

Table 7: Industry-wise Foreign Value Added in India's Exports from RCEP (%)

Aggregate Domestic Value Added											
	Agri	Mg.	Food	Text	Wood	Chem	Metal	Trans	Elect	Manu nec	Mach
	97.0	93.8	86.5	82.1	85.2	72.7	77.8	76.4	77.2	50.9	77.1
Foreign Value Added - RCEP											
Australia	0.1	0.3	0.4	0.6	0.6	1.1	1.9	1.6	1.7	1.5	2.0
Japan	0.1	0.2	0.3	0.6	0.3	0.2	0.4	0.8	0.8	2.7	0.4
Korea	0.1	0.1	0.2	0.5	0.3	0.5	0.4	0.7	0.6	1.8	0.6
New Zealand	0.0	0.0	0.1	0.1	0.2	0.0	0.0	0.1	0.0	0.1	0.1
Brunei Darussalam	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.0
Cambodia	0	0	0	0	0	0	0	0	0	0	0
China	0.1	0.3	0.5	1.5	0.6	0.9	0.7	1.4	1.3	6.3	1.1
Indonesia	0.1	0.1	2.0	0.3	0.5	0.7	0.3	0.3	0.3	0.7	0.3
Malaysia	0.0	0.1	0.3	0.2	0.4	0.2	0.2	0.2	0.3	1.0	0.2
Philippines	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.0
Singapore	0.1	0.1	0.0	0.3	0.2	0.3	0.2	0.4	0.4	0.9	0.3
Thailand	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.3	0.2	1.0	0.2
Viet Nam	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.2	0.1
Total	0.7	1.3	3.9	4.4	3.4	4.2	4.3	6.0	5.8	16.5	5.3
Foreign Value Added –Non RCEP											
Total	2.3	4.9	9.6	13.5	11.4	23.1	17.9	17.6	17.0	32.6	17.6

Source: Computed from the OECD-WTO TIVA Database. Note: Totals might not add up due to rounding off of decimal points.

As can be seen from Table 7 and pointed out variously earlier, India's share of foreign value added is highest in its exports of manufacturing nec, recycling. Again, as explained earlier, this industry includes several sub-categories including jewelry, furniture, musical instruments, sports goods, and metal and scrap recycling. This is the industry where India's backward participation rate is globally the highest. Out of the total foreign value added in its exports, around 16.5 per cent is contributed by the RCEP members with the highest being from China, Japan, Korea and Australia (Table 7). Various industries from these countries add value to Indian exports of manufacturing nec: China, which is the largest contributor of foreign value added does so most through electrical machinery and chemicals, followed by basic metals, wood and textile. Japan's value added in Indian exports, while noticeable in electrical machinery, chemicals and basic metals, is more in products from manufacturing nec itself. Korean imports adding foreign value are mostly in transport equipment, while Australia's are in mining and metals¹⁴.

Other than manufacturing nec, India's foreign value added is relatively high (measured as more than 20 percent of its gross exports) in its final exports of chemicals, basic metals and fabricated products, transport equipment, electrical equipment and machinery. Australia is a major source of foreign value added for India's final exports in all these industries with specific contributions from its mining and metal exports such as copper, coking coal, lignite, petroleum oils and LNG that are among India's major imports from Australia. China is yet another major source of foreign value added in India's final exports for industries mentioned above, as well as in textiles; the value comes from, among others, imports of a large and diverse variety of organic chemicals, polyester fabric, different spun yarn, woven fabric, laminated leather cloth, embroidery machines, telephone and telegraphic equipment, IT software discs and other electrical machinery and apparatus. Organic chemicals, paints, washing preparations for leather and textiles are some of the major Indian imports from Japan adding value to its final exports, along with plastic, rubber, filament yarn, unwrought gold and steel coils. Korea's major contributions are seen from its exports of transport equipment, along with chemical and electrical products. Indonesia is a significant source of foreign value added in India's agriculture and food product exports. This is primarily through its food and agriculture exports, such as refined palmolein, crude palm oil, vegetable fats and cashew nuts. Malaysia, Thailand and Singapore, while not being the most major sources of foreign value added for Indian exports, nonetheless have sourcing value across India's final exports from different industries¹⁵.

Despite its limited forward participation, India is still a selective source of foreign value addition for final exports of various RCEP members. It is one of the major sources of foreign value added from among the RCEP in Australia's final exports of mining, basic metals, machinery, transport equipment, electrical equipment and manufacturing nec. The latter, as

¹⁴ Computed from disaggregated data obtained from the OECD-WTO TIVA database.

¹⁵ The various imports from different source countries are obtained from 8-digit tariff data provided in Export-Import Data Bank of the Ministry of Commerce, Government of India.

mentioned earlier, is the industry where India's linkages with global value chains and the intra-industry trade are maximum. This is seen from India's being a major source of foreign value added for final exports from this industry for all other RCEP members. Mining is another industry where apart from Australia, India is a major source of foreign value added for final exports from New Zealand, Cambodia, China and Indonesia. So is it for textile exports from Australia, Korea, New Zealand, Brunei, Cambodia, China, Philippines and Thailand. Its imports are sourced for final exports of wood and paper products by Japan, New Zealand and Cambodia. Such forward participations, though, are hardly noticed for chemical exports from other RCEP countries, and only selectively in final exports of metals, electrical equipment and machinery from the region (Annexure 12).

The rest of the section focuses on some specific industries where India has the potential for integrating deeper with the GVCs through the RCEP.

Mining

As the earlier analysis reveals, mining and quarrying is an industry where Indian producers have established their presence in regional value chains. Much of their forward participation in these chains is at the upstream end through export of raw materials like metal ores. However, processed final exports like refined petroleum products (e.g. diesel and motor spirit) are also being used at the downstream end for producing final exports in different industries by other countries of the region. On the other hand, backward participation of India is limited in this industry with maximum value addition coming from directly from the domestic industry.

Greater Indian investments in the RCEP region in mining industry can provide potential opportunities to India for integrating deeper into regional value chains. Indian businesses are already investing in Australia and Indonesia in mining of coal, mineral and metal ores. The Adani Group's US\$16 billion coal mining project in Queensland, Australia, is likely to produce 60 million tons of coal annually¹⁶. Once functional, the project will position the Adani Group as a major regional supplier of upstream resources in the Asia-Pacific energy value chains. There are also considerable possibilities of similar investments in Myanmar. The advantage of such investments will be to have access to raw minerals at the upstream stage for re-export to India for processing and further export to other RCEP members like Malaysia, Brunei and even Myanmar and Indonesia. An important point to note in this regard is that volume of endowments of mineral resources in the RCEP members are not necessarily commensurate with their downstream refining and processing facilities; India has an advantage in this regard, particularly in downstream functions for refined petroleum products and should aim to capitalize it.

Food products

The RCA analysis on competitiveness does not reflect substantive comparative advantages for India in food product exports. India is structurally similar to most other RCEP economies

¹⁶ 'Adani Gets Aussie Nod for \$16B Carmichael Project', *The Economic Times*, Delhi, 26 July 2014.

in having long food chains with larger domestic ends and high value addition from domestic intermediates. The similarity also points to the possibility of India specializing in upstream inputs like China and Malaysia. Such specialisations, particularly in breeding of animals and growth of fruits and vegetables, can create selective opportunities in regional food product chains. The success, though, would depend considerably on the comparative advantage of India's intermediate exports as well as their ability to comply with the RCEP quality standards.

Textiles & Leather

India is now the world's second largest textile exporter after China¹⁷. There is little doubt over its presence in textile GVCs and global markets. But clear assessment of comparative advantages in both upstream and downstream segments of textile value chains is important for India in determining its future prospects. In the first, pertaining to production of yarn and fabric, India is helped by its agricultural endowments and the lower technological intensity of spinning and yarn producing functions. India's large outputs of raw cotton, jute and silk, where it is either the world's largest or among the largest producers, gives it a decisive advantage in access to textile raw materials. Several countries in the region are currently sourcing both natural and synthetic fibre from India. This sourcing includes raw cotton, cotton yarn and fabric, and synthetic yarn and fabric¹⁸. India's large loom and spindle capacities consolidate its advantages in the upper end of the value chain. But even at the upstream end, India faces competition as a supplier of textile material from South Asia and Southeast Asia¹⁹. There is equally strong competition in more downstream stages of fabric production and product transformation in garment and finished textile products knitted and crocheted, home furnishings, clothing accessories and even upholstery and tapestry, from other RCEP countries. In this regard, inability to increase efficiency can adversely affect subcontracting opportunities for Indian SMEs.

Competitive advantages at the middle stages of the textile supply chains can increase from greater technological efficiencies achieved through effective integration with domestic chemical industries in processing synthetic yarn. In apparels, however, Vietnam and Cambodia are already more efficient in labour-intensive CMT functions. India can benefit from periodic spurts in final demand from occasional problems in its competitor countries affecting their competitiveness. These include political movements by garment workers in Cambodia demanding higher wages leading to a partial withdrawal of global consumer demand and similar effect of higher cost of export credit in Vietnam²⁰. But on the whole, efficiency disadvantages will be difficult for Indian producers to obliterate. The situation is largely similar for India in leather exports and footwear where possibilities are more in

¹⁷ 'India overtakes Germany and Italy, is new World no 2 in textile exports', Times of India, 3 June 2014; <http://timesofindia.indiatimes.com/business/india-business/India-overtakes-Germany-and-Italy-is-new-world-No-2-in-textile-exports/articleshow/35973054.cms> Accessed on 7 October 2014.

¹⁸ The imports are not confined to the RCEP members like China and Thailand, but include a major non-RCEP regional garment exporter like Sri Lanka as well.

¹⁹ Indeed, India itself, along with China, is a major importer of textile materials from Sri Lanka.

²⁰ <http://www.sify.com/finance/indias-textiles-apparel-exports-to-rise-by-10-percent-this-year-news-industry-oj3qS1jfiJfdh.html>

upstream production and export of finished leather, given the country's natural endowments, and less in labour-intensive footwear and other finished products.

The challenge for India in textiles and apparel is two-fold. The first is to improve its own competitiveness in the pre-assembly stages of fabric making. The second is to explore whether it can provide product designs to lead retailers who can pass them onto other producers in other locations for integrating designs into assembling. These challenges apply to possibilities in leather and footwear chains as well. As of now, most major global retailers present in India are sourcing indigenously for selling in the domestic market. This needs to be complemented by retail sourcing for regional markets too.

The potential for moving on to higher end downstream functions by expanding ODM capacities appear limited till global retail firms based in India decide to utilize local capacities in product designing. However, garment manufacturers already supplying to the US and EU retailers, can be encouraged to work on design capacities for reaching the higher ends of the value chains. The RCEP agreement can also be utilized by Indian garment firms for establishing joint venture fabric production facilities, which can help in meeting the domestic value added requirement of the ROOs (Rules of Origin) and help in expanding scale.

Chemicals

India's integration possibilities in the regional chemical value chains exist in specific products and categories. Foremost among these is pharmaceutical. Access to cheap medicines is an imperative for several RCEP members, including an OECD country like Australia, which is distinctly uncomfortable with the upcoming IP rules in the TPP (Trans Pacific Partnership) likely to erode its flexibility in administered pricing in the national pharmaceutical benefit scheme (PBS). Access to low-cost generic formulations would be of great benefit to Australia, as well as other countries in the region negotiating the TPP such as Malaysia and Vietnam.

Indian pharmaceutical firms and contract manufacturers can explore possibilities within the RCEP in two ways. First, by accessing cheap raw materials and bulk drugs from other RCEP members. One of the biggest sources of these inputs is China where raw materials are cheaper due to large endowments of basic medicinal raw material like natural herbs. This is an area where tie-ups can help Indian contract manufacturers and there are existing examples of Indian manufacturers like Hikal sourcing raw materials from China²¹. Pharmaceutical raw material extractive industries from India, along with the active pharmaceutical ingredient (API) manufacturers, particularly for off-patent drugs, can also export intermediates to manufacturers in Australia and Korea, provided they comply with GMP (Good Manufacturing Practice) norms prevailing in the region. Thailand is another country where Indian API manufacturers can supply to the domestic drug manufacturers, as the Thai

²¹ 'The Changing Dynamics of Pharma Outsourcing in Asia: Are you readjusting your sights?', PriceWaterhouseCoopers, <https://www.pwc.be/en/pharma/The-changing-dynamics-of-pharma-outsourcing-in-Asia.pdf> (Accessed on 2 March 2014)

domestic pharma industry does not specialize in APIs. Similar possibilities, both for raw materials and APIs, exist for the Indonesian and Philippines markets as well.

The ability of Indian contract research organisations to conduct clinical trials for pharmaceutical formulations is well noted. In recent times, however, unhappiness over India's domestic IP regulations, has been constraining several global pharmaceuticals from carrying out clinical trials in India. A country like Thailand again with the ambition of becoming a regional medical hub can be useful for India in this regard. Thailand lacks adequate well-skilled medical specialists and scientists for carrying out clinical trials. Indian contract research firms can consider the possibility of collaborating with their Thai counterparts for sending the Indian professionals to help the latter in carrying out the trials.

Finally, in a chemical segment that overlaps with the textiles and garment industries, India has possibilities for competing effectively in the RCEP supply chains as a producer of man-made fibres (artificial or synthetic filament staple fibres and yarn). As the world's second largest producer of man-made fibres like rayon and nylon that can be used in a wide variety of non-fibre end products and also in the synthetic apparel industries, India enjoys a distinct competitive advantage. But the advantage often stops short of translating into distinct competitiveness given the labour and logistic cost disadvantages of India vis-a-vis China, Cambodia and Vietnam.

Metals and metal products

India's presence in the regional value chains in this industry is mainly through its large export of ores, primarily to China, and exports of semi-finished steel to other countries of the region. These upstream presences are expected to continue unless constrained by domestic factors affecting mining of metal ores. The largest integration opportunities, at this point in time, appear from ore and semi-finished steel exports to China, and also to Australia, as mentioned earlier. Furthermore, Australia's metal exports have imports from India as one of the major sources of foreign value added, which could be due to iron ores, as well as iron & steel, bars and angles, brass and aluminum.

The Natsteel Holdings of the Tata group is present in seven countries of the Asia-Pacific, all of which are members of the RCEP (Australia, China, Malaysia, Philippines, Thailand, Singapore and Vietnam). Headquartered in Singapore, Natsteel has implemented energy-saving technologies like electric arc furnace and has a large turnover of value added products with substantive downstream operations²². The presence and further growth of the Natsteel can produce spin-offs for other Indian local companies that are vendors of the parent firm.

Transport Equipment

Auto component manufacturing is an industry where India has already been able to position itself in the regional supply chains. This has happened due to the location of affiliates of various OEM lead firms and assemblers in India and the elaborate hierarchical network of

²² <http://www.tatasteel.com/investors/annual-report-2012-13/annual-report-2012-13.pdf> Accessed on 5 March 2014.

suppliers they have developed. Between RCEP economies, though, its presence in GVCs is lower than that of Japan, Korea, Thailand, China and Philippines. Japan, Korea and China are well ahead in manufacturing intermediates at home that are fairly upstream in use and exported to other countries, as well as in handling downstream functions including assembling and design. In this respect, India has fewer lead suppliers based in the country as compared with Japan, Korea and China at this point in time. Presence of more such suppliers will increase the volume of domestic sourcing at home apart from enabling technology diffusion.

Gems and Jewelry

Till now, India's jewelry exports in the region have been focusing mostly on the traditional gold jewelry. However, this can be supplemented by greater focus on fashion jewelry as well as diamonds. India's strength of being the world's largest diamond jewelry processing hub should be utilized for pushing its producers deeper in regional value chains. The key to exploitation of the advantage is in tying up with regional jewelry retailers and supermarkets. Similar tie-ups can be explored for semi-precious and fashion and costume jewelry. Gold and unprocessed semi-precious stones from the region (e.g. pearl and jade from Myanmar and Vietnam) can also be procured from the region for further downstream processing in India and onward exports as high-end fashion items, either to the Western markets, or even back to the region. Indian jewelry would have a major market in the Indian diaspora in the region. This market, which till now has been mostly confined to traditional jewelry, can be expanded to include more contemporary fashion lines. However, for these to happen, two prerequisites are important: a) Restrictions should be taken off on import of gold and b) Indian diamond processing firms must develop additional abilities to design according to specifications of regional retailers. Utilizing the presence of regional gem and jewelry retail outlets like the Gemopolis in Thailand – a diamond and gem and jewelry processing hub where some Indian diamond processors are already located – is also important for pushing deeper in regional jewelry chains.

Section 5: Negotiating Perspectives and Issues

The ASEAN economies would prefer to negotiate the RCEP on a bottom-up basis from the existing ASEAN+1 agreements. This would help in retaining the centrality of the ASEAN in the new negotiating framework. For India, and the other +1 partners, a bottom-up approach could be preferable from the perspective of introducing greater harmony and balance among the existing bilateral and regional agreements. But the incentives for integration into such a template will depend on how far it (i.e. the RCEP) can facilitate their greater integration with the rest of the world. By themselves, Australia, China, Japan and Korea are large economies and have been acting as hubs in several hub and spoke regional structures; India too has similar ambitions. These perspectives will influence the RCEP negotiations. The visualization of country-specific value chain gains from the RCEP will also be influenced by these views.

From the supply chain perspective, there are two views that India need to keep in mind regarding the RCEP. Indian producers can look at the RCEP as a geographical zone of

preferential market access for integrating into supply chains that begin and end within the region. These chains are likely to increase over time as higher regional per capita incomes and shifting consumer preferences make regional markets greater destinations for final demand. China's focus on higher consumption and final product imports would be a critical determinant in this regard. At the same time, Indian producers can also visualize becoming parts of regional production networks connecting to supply chains and markets beyond the RCEP. This would enable Indian producers to work on forward and backward linkages outside the RCEP while using the latter as a hub for cross-regional chains. South Asian markets and other Asia-Pacific markets outside the RCEP, including the US and EU markets, are linked through cross regional supply chains running through the RCEP. India would be better off not looking at the RCEP as only the domain of new final demand markets, but more as a region connecting it preferentially to other final markets through its own networks.

An important point to note with respect to India's opportunities through value chains in the RCEP domain is whether it visualizes more possibilities through forward participation or backward. India is at an interesting crossroads in this regard. Industry-specific opportunities would emphasize efforts in both directions and that should probably be the optimal strategy. At its current stage of industrial and manufacturing development where India is, it would be counterproductive to emulate examples of other economies top-down. The optimal approach would probably be to ensure that India becomes an efficient producer of intermediates and semi-finished items on much larger scales than it is now, along with strengthening assembling and processing skills; these would enable competitive entries at both upstream and downstream openings.

Potential supply chain integration opportunities, whether visualized with respect to the RCEP, or through the RCEP with respect to the rest of the world, must take note of the important role of transnational business corporations. The largest chunks of intra-industry trade and supply chain management in the region can be attributed to operations of MNCs and their affiliates. The roles of MNCs and the characteristics of the supply chains managed by them can be distinguished into two distinct groups. The first, typical of technology-intensive supply chains like in automobiles and electronics are managed by lead assemblers, such as Toyota, Honda, or Samsung. The second represents retail brands such as the Marks & Spencer, Tommy Hilfiger, or Gucci, which focus more on marketing and logistics as opposed to assembling, and coordinates discrete parts of supply chains in garments, processed food and household consumption articles. Major retailers, including supermarkets usually work with producers at different stages of the value chains by closely monitoring consumer specifications.

For chains of the first kind, intra-industry trade across specific geographic locations are managed by the lead assemblers through elaborate networks of local partners and subsidiaries. Honda, for example, has operations in Indonesia, Malaysia, Philippines and Thailand – all members of the RCEP – with each of its plants in these countries

manufacturing discrete components for use in eventual assembling²³. The integration of all these countries in the Honda supply chain (including Thailand, which is a major production base) has been helped by investment policies allowing majority (or wholly) foreign equity participations in domestic component manufacturing industries. There has also been progressive reduction in tariffs on auto parts and components enabling growth of intra-industry trade. In the absence of such policies, RCEP members could hardly have figured in supply chains of major global assemblers and their affiliates. On the other hand, entry in supply chains run and managed by major global retail brands (e.g. garments, processed food) cannot create adequate opportunities for RCEP member country producers, unless the retailers can set up domestic operations and source indigenously. This would require offering extensive market access commitments in mode 3 for distribution services.

From an Indian perspective, greater market access commitments for FDI in multi-brand retail assume considerable significance in this respect. With majority foreign equity in domestic retail operations now permitted in several Indian states, India, while still not in a position to extend horizontal commitments, can offer sector-specific commitment with certain market access limitations. The minimum threshold requirement for domestic sourcing by foreign retailers is also an important issue in this regard. The point to note is if other RCEP members make it mandatory for foreign retailers to source minimum proportions of their requirements domestically, then market access gets limited for products of other members including Indian producers, as these, otherwise, could have been sourced more by retailers from within the RCEP territory. National treatment limitations imposed through restrictive sourcing policies for foreign retailers can affect India's entry prospects in regional value chains if other RCEP members respond through similar defensive measures in their territories.

Growth of regional value chains and intra-industry trade reflects the intricate connection between trade and investment. Asian supply chains in automobiles and electronics would not have flourished without congruence between tariffs and investment policies. RCEP negotiations need to be approached in this light. Investment negotiations should be taken as priority at the RCEP since the tariff reductions (including zero tariffs) on a wide range of inputs and intermediates can motivate MNCs to conceptualize substantive value chains, in part or whole, through the RCEP, by dispersing production facilities through their subsidiaries and affiliates. From an Indian perspective, the harmonization of tariff levels with the rest of the ASEAN and ASEAN+1 members in the RCEP can make it an equally attractive location as the other members as far as border measures are concerned. Many MNCs, which hitherto considered India a less efficient place for sourcing materials and intermediates due to its higher tariffs compared with some of the ASEAN members, might review their decisions henceforth. Favorable investment policies can help in consolidation of the advantage for India.

²³ The plants in Malaysia, Philippines, Indonesia and Thailand produce drive shafts, intake valves, engine parts and body parts respectively. (Rosellon and Meddala, 2011)

The discussion on RCAs and competitiveness has pointed to India's comparative advantages in manufacturing and recycling, both in terms of gross exports as well as with respect to domestic value added. As mentioned earlier, the industries comprising this product group include furniture, jewelry, musical instruments, sports goods, games and toys, brooms and brushes, and recycling of metal and non-metal waste and scrap. India is the second largest exporter from this category in the RCEP after China. Its proficiency in this category is largely a result of its comparative advantages in production of precious jewelry articles for final demand markets in the EU, US and the Middle East. It is important for India to search for final demand markets in the RCEP for its jewelry products. The priority should figure prominently in the RCEP negotiations. The objective in this regard should be to provide Indian jewelry manufacturers access to major regional and global retailers sourcing jewelry products. It is difficult to say whether such an objective can be achieved through any specific negotiating instrument. But lowering of tariffs on finished precious jewelry articles and harmonization of technical standards on these products in different RCEP markets can help.

Textiles and textile products, leather and footwear, and food products, are categories where deeper integration opportunities in regional value chains are noted for Indian producers. The prospects of such integration, apart from competitiveness in production, depend considerably upon the rules of origin (ROO) for obtaining benefits of preferential tariffs. Liberal ROOs can be particularly beneficial for both yarn and fabric producers as these will enable downstream assemblers to procure easily from Indian producers. The same applies for finished leather producers as well as exporters of primary and semi-processed food products. Liberal ROOs should ideally have either the regional value content (RVC), or change in tariff classification (CTC) condition, and avoid simultaneous satisfaction of both as in the India-ASEAN FTA. Furthermore, lower thresholds of RVCs will also help, as that will enable Indian fabric producers to occasionally source cheaper raw material from outside the RCEP, and downstream importers of Indian fabric to continue obtaining cumulation benefits. Liberal ROOs can also help in extending India's presence in petroleum product value chains in the region. Given India's presence in the downstream segment of petroleum product value chains, eyeing greater petroleum product exports to RCEP members like Malaysia and Indonesia is possible, if liberal ROOs allow India to import crude oil from third countries and process it domestically for exports within RCEP.

As the RCEP negotiations mature, greater exploitation of competitive advantages of indigenous producers in specific value chain functions of different industries will be a key objective of all negotiating partners. Value chains running through the RCEP will become more robust and expansive if the negotiating members are able to implement trade facilitation measures effectively. Improving trade facilitation has arguably become easier following the decision adopted at the Bali Ministerial of the WTO in December 2013. The challenge at the RCEP will be to adopt some specific trade facilitation measures, which have been uneven across the existing ASEAN+1 FTAs, such as information and communication technology (ICT), e-commerce, and transparency of laws and regulations. Among the ASEAN+1 FTAs, while the ASEAN-Australia-New Zealand FTA has specific provisions on these issues, the ASEAN-China and ASEAN-India FTAs are more general. Indian producers and businesses

will benefit from the advantages of paperless e-trading, harmonized customs procedures and clarity on rules and regulations in RCEP members; this is a reciprocal process and India should aim to respond positively in the matter.

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Annex 1: Agriculture, Hunting, Forestry and Fishing

Country	Direct Domestic Value Added (%)	Indirect Domestic Content of Value Added (%)	Foreign Value Added (%)
Australia	0.586	0.329	0.083
Japan	0.502	0.412	0.085
Korea	0.552	0.286	0.162
New Zealand	0.422	0.429	0.149
Brunei Darussalam	0.277	0.358	0.365
Cambodia	0.542	0.256	0.202
China	0.582	0.369	0.048
India	0.803	0.167	0.030
Indonesia	0.773	0.180	0.047
Malaysia	0.434	0.355	0.209
Philippines	0.695	0.228	0.077
Singapore	0.468	0.190	0.341
Thailand	0.634	0.252	0.114
Vietnam	0.526	0.229	0.244

Source: Computed from OECD WTO TIVA Database

Annex 2: Mining and Quarrying

Country	Direct Domestic Value Added (%)	Indirect Domestic Content of Value Added (%)	Foreign Value Added (%)
Australia	0.633	0.277	0.089
Japan	0.303	0.579	0.117

Korea	0.663	0.200	0.135
New Zealand	0.496	0.403	0.100
Brunei Darussalam	0.797	0.115	0.087
Cambodia	0.722	0.145	0.133
China	0.393	0.324	0.280
India	0.774	0.164	0.062
Indonesia	0.823	0.136	0.041
Malaysia	0.438	0.300	0.261
Philippines	0.598	0.272	0.130
Thailand	0.703	0.190	0.107
Vietnam	0.722	0.130	0.148

Source: Computed from OECD WTO TIVA Database

Note: Data not available for Singapore

Annex 3: Food Products, Beverages & Tobacco

Country	Direct Domestic Value Added (%)	Indirect Domestic Content of Value Added (%)	Foreign Value Added (%)
Australia	0.320	0.570	0.109
Japan	0.388	0.514	0.097
Korea	0.184	0.529	0.286
New Zealand	0.284	0.548	0.167
Brunei Darussalam	0.365	0.182	0.453
Cambodia	0.312	0.357	0.330
China	0.235	0.511	0.251
India	0.166	0.699	0.135
Indonesia	0.358	0.556	0.086

Malaysia	0.263	0.483	0.252
Philippines	0.370	0.541	0.088
Singapore	0.242	0.244	0.511
Thailand	0.322	0.522	0.155
Vietnam	0.294	0.346	0.360

Source: Computed from OECD WTO TIVA Database

Annex 4: Textiles, textile products, leather & footwear

Country	Direct Domestic Value Added (%)	Indirect Domestic Content of Value Added (%)	Foreign Value Added (%)
Australia	0.418	0.443	0.137
Japan	0.369	0.490	0.139
Korea	0.301	0.377	0.319
New Zealand	0.380	0.377	0.242
Brunei Darussalam	0.397	0.235	0.368
Cambodia	0.228	0.149	0.623
China	0.201	0.588	0.207
India	0.277	0.543	0.179
Indonesia	0.384	0.370	0.243
Malaysia	0.374	0.244	0.379
Philippines	0.405	0.301	0.294
Singapore	0.322	0.132	0.543
Thailand	0.364	0.379	0.256
Vietnam	0.195	0.177	0.626

Source: Computed from OECD WTO TIVA Database

Annex 5: Wood, Paper, Paper products, Printing & Publishing

Country	Direct Domestic Value Added (%)	Indirect Domestic Content of Value Added (%)	Foreign Value Added (%)
Australia	0.449	0.438	0.110
Japan	0.418	0.494	0.86
Korea	0.390	0.377	0.231
New Zealand	0.371	0.457	0.171
Brunei Darussalam	0.466	0.2	0.333
Cambodia	0.288	0.337	0.373
China	0.220	0.425	0.348
India	0.374	0.477	0.147
Indonesia	0.402	0.442	0.153
Malaysia	0.400	0.379	0.218
Philippines	0.402	0.401	0.196
Singapore	0.416	0.175	0.405
Thailand	0.425	0.252	0.321
Vietnam	0.268	0.308	0.422

Source: Computed from OECD WTO TIVA Database

Annex 6: Chemicals & Non-metallic Mineral Products

Country	Direct Domestic Value Added (%)	Indirect Domestic Content of Value Added (%)	Foreign Value Added (%)
Australia	0.306	0.497	0.195
Japan	0.297	0.491	0.211

Korea	0.162	0.228	0.608
New Zealand	0.316	0.371	0.312
Brunei Darussalam	0.378	0.341	0.281
Cambodia	0.346	0.141	0.514
China	0.205	0.380	0.409
India	0.249	0.477	0.273
Indonesia	0.454	0.396	0.149
Malaysia	0.234	0.425	0.339
Philippines	0.312	0.330	0.357
Singapore	0.254	0.187	0.557
Thailand	0.366	0.303	0.330
Vietnam	0.323	0.158	0.518

Source: Computed from OECD WTO TIVA Database

Annex 7: Basic Metals & Fabricated Metal Products

Country	Direct Domestic Value Added (%)	Indirect Domestic Content of Value Added (%)	Foreign Value Added (%)
Australia	0.310	0.459	0.228
Japan	0.254	0.549	0.195
Korea	0.193	0.370	0.435
New Zealand	0.346	0.429	0.224
Brunei Darussalam	0.308	0.154	0.538
Cambodia	0.227	0.120	0.653
China	0.215	0.431	0.349
India	0.243	0.534	0.222
Indonesia	0.319	0.517	0.163

Malaysia	0.389	0.118	0.491
Philippines	0.314	0.300	0.385
Singapore	0.322	0.167	0.508
Thailand	0.422	0.205	0.373
Vietnam	0.207	0.155	0.637

Source: Computed from OECD WTO TIVA Database

Annex 8: Transport Equipment

Country	Direct Domestic Value Added (%)	Indirect Domestic Content of Value Added (%)	Foreign Value Added (%)
Australia	0.322	0.475	0.201
Japan	0.273	0.581	0.141
Korea	0.247	0.385	0.365
New Zealand	0.340	0.313	0.347
Brunei Darussalam	0.409	0.227	0.364
Cambodia	0.318	0.128	0.555
China	0.214	0.444	0.335
India	0.271	0.491	0.236
Indonesia	0.421	0.407	0.171
Malaysia	0.315	0.209	0.474
Philippines	0.245	0.410	0.344
Singapore	0.369	0.185	0.444
Thailand	0.349	0.200	0.449
Vietnam	0.267	0.159	0.573

Source: Computed from OECD WTO TIVA Database

Annex 9: Electrical and Optical Equipment

Country	Direct Domestic Value Added (%)	Indirect Domestic Content of Value Added (%)	Foreign Value Added (%)
Australia	0.490	0.319	0.189
Japan	0.323	0.492	0.178
Korea	0.214	0.309	0.466
New Zealand	0.346	0.383	0.270
Brunei Darussalam	0.360	0.220	0.420
Cambodia	0.262	0.099	0.639
China	0.181	0.371	0.426
India	0.309	0.469	0.222
Indonesia	0.384	0.339	0.275
Malaysia	0.358	0.073	0.561
Philippines	0.309	0.183	0.504
Singapore	0.265	0.115	0.612
Thailand	0.313	0.135	0.549
Vietnam	0.234	0.129	0.636

Source: Computed from OECD WTO TIVA Database

Annex 10: Manufacturing n.e.c, recycling

Country	Direct Domestic Value Added (%)	Indirect Domestic Content of Value Added (%)	Foreign Value Added (%)
Australia	0.367	0.440	0.191
Japan	0.326	0.528	0.143
Korea	0.376	0.366	0.256

New Zealand	0.408	0.385	0.206
Brunei Darussalam	0.480	0.227	0.307
Cambodia	0.271	0.136	0.593
China	0.303	0.450	0.241
India	0.263	0.244	0.491
Indonesia	0.399	0.460	0.139
Malaysia	0.365	0.184	0.448
Philippines	0.400	0.377	0.223
Singapore	0.205	0.282	0.510
Thailand	0.383	0.263	0.352
Vietnam	0.245	0.171	0.584

Source: Computed from OECD WTO TIVA Database

Annex 11: Machinery & Equipment

Country	Direct Domestic Value Added (%)	Indirect Domestic Content of Value Added (%)	Foreign Value Added (%)
Australia	0.347	0.408	0.242
Japan	0.391	0.491	0.115
Korea	0.253	0.427	0.318
New Zealand	0.413	0.373	0.213
Cambodia	0.334	0.099	0.567
China	0.224	0.400	0.368
India	0.290	0.480	0.229
Indonesia	0.329	0.281	0.387
Malaysia	0.371	0.065	0.557
Philippines	0.304	0.344	0.352
Singapore	0.304	0.129	0.565

Thailand	0.333	0.225	0.440
Vietnam	0.311	0.133	0.555

Source: Computed from OECD WTO TIVA Database

Note: Data not available for Brunei.

Annex 12: Industry-wise Major Sources of Foreign Value Added in Exports of RCEP Countries

	Agr	Mng	Food	Tex	WP	Chem	BM	Mach	Elec	Trans	Mfg,n
Aus	NZ, Viet, Mal, Chn, Thai	Mal, Chn, Viet, Ind, Indo	Chn, NZ, Thai, Indo, Viet	Chn, Thai, Kor, Viet, Ind	Chn, NZ, Mal, Thai, Viet	Chn, Kor, Jap, Sing, Mal	Chn, Jap, Kor, Ind, Thai	Chn, Jap, Kor, Sing, Ind	Chn, Kor, Jap, Thai, Ind	Kor, Jap, Chn, Ind, Thai	Chn, Ind, Thai, Jap, Kor
Jap	Viet, Mal, Aus, Thai, NZ	Aus, Mal, Viet, Chn, Indo	Thai, Chn, Viet, Aus, NZ	Chn, Viet, Thai, Kor, Indo	Chn, Mal, Thai, Ind, Viet	Chn, Kor, Sing, Mal, Thai	Chn, Kor, Thai, Mal, Sing	Chn, Mal, Kor, Sing, Indo	Chn, Kor, Thai, Mal, Sing	Kor, Chn, Thai, Sing, Indo	Chn, Ind, Thai, Viet, Kor
Kor	Viet, Mal, Aus, Chn, NZ	Mal, Aus, Chn, Viet, Indo	Chn, Viet, Thai, Aus, NZ	Chn, Viet, Indo, Thai, Ind	Chn, Mal, Viet, Indo, Thai	Chn, Sing, Mal, Jap, Thai	Chn, Jap, Aus, Mal, Thai	Chn, Mal, Jap, Sing, Indo	Chn, Sing, Thai, Jap, Phil	Chn, Jap, Thai, Ind, Sing	Chn, Ind, Thai, Jap, Viet
NZ	Aus Mal Viet Chn Kor	Aus Mal Chn Viet Ind	Chn Aus Sing Thai Kor	Chn Viet Kor Thai Ind	Chn Ind Aus Mal Kor	Chn Sing Aus Kor Jap	Aus Chn Jap Kor Ind	Chn Aus Jap Kor Mal	Chn Kor Jap Sing Phil	Kor Jap Chn Aus Sing	Chn Ind Jap Aus Thai
Bru	NZ Viet Mal Aus Indo	Aus Indo Mal Chn Viet	NZ Aus Indo Thai Chn	Chn Indo Kor Viet Ind	Indo Chn NZ Jap Kor	Kor Jap Indo Chn NZ	Jap Aus Kor Chn Indo	Jap Chn Kor aus mal	Chn Jap Kor Thai Ind	Jap Kor Chn Ind Aus	Ind Jap Chn Thai Indo
Cam	Viet Mal Chn Aus Thai	Viet Mal Aus Chn Ind	Viet Thai Chn Mal Kor	Chn Viet Thai Kor Ind	Viet Chn Thai Mal Ind	Sing Chn Thai Mal Kor	Sing Chn Aus Jap Kor	Sing Chn Jap Mal Kor	Chn Sing Thai Kor Jap	Sing Chn Kor Jap Ind	Chn Thai Ind Sing Viet
Chn	Viet Mal Aus Cam NZ	Mal Aus Viet Indo Ind	Viet Thai Aus NZ Kor	Viet Kor Thai Indo Ind	Mal Viet Indo Thai Kor	Kor Sing Jap Mal Thaia	Kor Jap Aus Sing Mal	Mal Jap Kor Sing Indo	Kor Jap Thai Sing Mal	Kor Jap Thai Sing Ind	Ind Jap Thai Viet Kor
Ind	Viet Mal Aus Chn NZ	Mal Aus Chn Viet Indo	Chn Viet Thai Indo Mal	Chn Viet Kor Thai Indo	Chn Viet Mal Indo Sing	Chn Sing Kor Mal Jap	Chn Kor Jap Mal Sing	Chn Sing Mal Kor Jap	Chn Sing Kor Mal Jap	Chn Kor Jap Sing Thaia	Chn Thai Jap Sing Indo
Indo	Mal Viet Aus Chn NZ	Aus Mal Viet Chn Ind	Chn Ind Mal Viet Thai	Chn Viet Kor Thai Mal	Chn Mal Thai Kor Ger	Kor Chn Sing Jap Mal	Chn Jap Kor Aus Sing	Chn Jap Sing Kor Mal	Chn Jap Kor Sing Mal	Jap Kor Chn Thai Sing	Chn Ind Jap Thai Sing
Mal	Viet Aus NZ Thai CHn	Aus Indo Viet Bru Chn	Chn Sing Viet Thai Aus	Chn Viet Thai Indo Kor	Chn Indo Sing Thia Viet	Sing Chn Kor Jpa Indo	Aus Chn Jap Kor Sing	Chn Sing Jap Kor Thai	Chn Thai Sing Kor Phil	Jap Kor Chn Sing Thai	Chn Ind Thai jap Sing
Phil	Viet Mal Aus	Mal Aus	Viet Thai	Chn Viet	Chn Mal	Chn Sing	Chn Kor	Chn Mal	Chn Kor	Jap Kor	Chn Ind

	Thai NZ	Viet Chn Indo	Chn Mal Kor	Thai Kor Ind	Viet Indo Thai	Kor Jap mal	Jap Thai Aus	Jap Kor Sing	Sing Thai Jap	Thai Sing Indi	Jap Thai Viet
Sing	Mal Viet Aus NZ Cam	Mal Aus Viet Bru Indo	Viet Mal Chn Aus Indo	Chn Viet Indo Thai mal	Chn Mal Indo Viet Thai a	Chn Mal Kor Indo Jap	Aus Chn Jap Kor Indo	Chn Mal Indo Jap Kor	Chn Kor Thia Phil Mal	Jap Kor Chn Indo Thaia	Ind Chn Thai Jap Indo
Thai	Viet Mal Aus Cam Chn	Aus Mal Viet Chn Indo	Chn Viet Mal Aus Indo	Chn Viet Mal Indo Ind	Chn Mal Viet Indo Sing	Chn Sing Mal Jap Kor	Aus Chn Jap Kor Mal	Chn Mal Jap Sing Aus	Chn Kor Mal Jap Sing	Jap Chn Kor Indo Aus	Chn Ind Jap Viet Aus
Viet	Mal Cam Aus NZ Chn	Aus Mal Chn Indo Cam	Chn Aus Mal Thia Cam	Chn Kor Mal Thai Indo	Chn Mal Indo Kor Cam	Sing Mal Chn Kor Jap	Aus Chn Jap Kor Mal	Chn Jap Kor Sing Mal	Chn Thai Jap Phil	Jap Kor Chn Thai Sing	Chn Ind Jap Thai Kor

Note: 1. Agr: Agriculture, hunting, forestry & fishing; Mng: Mining & Quarrying; Food: Food products, beverages and tobacco; Tex: Textiles, textile products, leather and footwear; WP: Wood, paper, paper products, printing & publishing; Chem: Chemicals; Basmet: Basic metals and fabricated metal products; Mach: Machinery & Equipment, nec; Elec: Electrical & Optical Equipment; Trans: Transport Equipment; Mfg, n: Manufacturing nec, recycling 2. Aus –Australia, Bru – Burnei Darussalam, Cam – Cambodia, Chn – China, Ind –India, Indo – Indonesia, Jap –Japan, Kor –Korea, Mal – Malaysia, NZ – New Zealand, Phil – Philippines, Sing –Singapore, Thai – Thailand, Viet – Vietnam. Source: Computed from OECD WTO TIVA Database

Annex 13: Length of Value Chains as measured by Index of Number of Production Stages

Industry	Domestic	International
Agriculture	1.7	0.2
Mining & Quarrying	1.4	0.1
Food products and beverages	2.1	0.3
Textiles, leather & footwear	2.2	0.4
Wood, paper & paper products	1.9	0.3
Chemicals & non-metallic mineral products	1.9	0.5
Basic metals & fabricated metal products	2.1	0.5
Machinery & equipment nec	2.1	0.4
Electrical & optical equipment	1.9	0.6
Transport equipment	2.2	0.6
Manufacturing nec, recycling	2.0	0.4
Electricity, gas & water supply	1.8	0.3
Construction	2.0	0.3
Wholesale & retail trade; hotels & restaurants	1.6	0.1
Transport & storage; post & telecommunications	1.7	0.2
Financial intermediation	1.6	0.1
Business services	1.4	0.1
Other services	1.5	0.1

Source: OECD WTO TIVA Database

Annex 14: Disaggregated Classification of Industries for Manufacturing, n.e.c and Recycling²⁴.

The group includes ISIC category 36 (manufacturing n.e.c) and 37 (recycling).

Category 36 includes

- a) ISIC Rev 3.1 Code 3610, which is manufacture of furniture. It includes manufacture of chairs and seats for offices, workrooms, hotels, restaurants, public and domestic premises, theatres, cinemas, transport equipment, sofas, sofa beds and sofa sets, garden chairs and seats, special furniture for shops, counters, display cases, shelves, office furniture, furniture for churches, schools, restaurants, kitchen furniture, furniture for bedrooms, living rooms, gardens etc. and cabinets for sewing machines, televisions etc. It also includes restoring of furniture, finishing such as upholstery of chairs and seats, finishing of furniture such as spraying, painting, French polishing and upholstering, manufacture of mattress supports, mattresses, mattresses fitted with springs or stuffed or internally fitted with a supporting material, uncovered cellular rubber or plastic mattresses.
- b) ISIC Rev 3.1 Code 3691 that refers to manufacture of jewelry and related articles and includes manufacture of coins, including coins for use as legal tender, whether or not of precious metal, production of worked pearls, precious and semi-precious stones in the worked state, including working of industrial quality stones and synthetic or reconstructed precious or semi-precious stones, working of diamonds, manufacture of jewellery of precious metal or of base metals clad with precious metals, or precious or semi-precious stones, or of combinations of precious metal and precious or semi-precious stones or of other materials, manufacture of goldsmiths' articles of precious metals or of base metals clad with precious metals: dinnerware, flatware, hollowware, toilet articles, office or desk articles, articles for religious use etc. and manufacture of technical or laboratory articles of precious metal (except instruments and parts thereof): crucibles, spatulas, electroplating anodes etc.
- c) ISIC Rev 3.1 Code 3692 that includes manufacture of musical instruments like stringed instruments, keyboard stringed instruments, including automatic pianos, keyboard pipe organs, including harmoniums and similar keyboard instruments with free metal reeds, accordions and similar instruments, including mouth organs, wind instruments, percussion musical instruments, musical instruments, the sound of which is produced electronically, musical boxes, fairground organs, calliopes etc., instrument parts and accessories, metronomes, tuning forks, pitch pipes, cards, discs and rolls for automatic mechanical instruments etc.
- d) ISIC Rev 3.1 Code 3693 that includes manufacture of sports goods including articles and equipment for sports, outdoor and indoor games, of any material: hard, soft and inflatable balls, rackets, bats and clubs, skis, bindings and poles, sailboards, requisites for sport fishing, including landing nets, requisites for hunting, mountain climbing etc., leather sports gloves and sports headgear, ice skates, roller skates etc., bows and crossbows, gymnasium, fitness centre or athletic equipment.
- e) ISIC Rev 3.1 Code 3694 that includes manufacture of games and toys and manufacture of dolls and doll garments and accessories, toy animals, wheeled toys designed to be ridden, including tricycles, toy musical instruments, articles for funfair,

²⁴ United Nations Statistics Division, Detailed Structure and Explanatory Notes, <https://unstats.un.org/unsd/cr/registry/regcs.asp?Cl=17&Lg=1&Co=D> Accessed on 16 February 2014.

table or parlour games, playing cards, pin-tables, coin-operated games, billiards, special tables for casino games, automatic bowling alley equipment etc.; electronic games: video game consoles, chess etc; reduced-size ("scale") models and similar recreational models, electrical trains, construction sets etc; manufacture of puzzles etc.

- f) ISIC Rev 3.1 Code 3699 that includes manufacture of brooms and brushes, including brushes constituting parts of machines, hand-operated mechanical floor sweepers, mops and feather dusters, paint brushes, paint pads and rollers, squeegees and other brushes, brooms, mops etc.; shoe and clothes brushes; pens and pencils of all kinds whether or not mechanical; pencil leads; date, sealing or numbering stamps, hand-operated devices for printing, or embossing labels, hand printing sets, prepared typewriter ribbons and inked pads; baby carriages; umbrellas, sun-umbrellas, walking sticks, seat-sticks, whips, riding crops, buttons, press-fasteners, snap-fasteners, press-studs, slide fasteners; cigarette lighters and matches; articles of personal use: smoking pipes, combs, hair slides, scent sprays, vacuum flasks and other vacuum vessels for personal or household use, wigs, false beards, eyebrows; roundabouts, swings, shooting galleries and other fairground amusements; linoleum and hard non-plastic surface floor coverings; imitation jewellery; miscellaneous articles: candles, tapers and the like, artificial flowers, fruit and foliage, jokes and novelties, hand sieves and hand riddles; tailors' dummies, burial caskets etc.; taxidermy activities.

Category 37 includes

- a) ISIC Rev 3.1 Code 3710 that covers recycling of metal waste and scrap and includes processing of metal waste and scrap and of metal articles into secondary raw material. Examples of mechanical or chemical transformation processes are mechanical crushing of metal waste such as used cars, washing machines, bikes etc. with subsequent sorting and separation, mechanical reduction of large iron pieces such as railway wagons, shredding of metal waste, end-of-life vehicles etc; other methods of mechanical treatment as cutting, pressing to reduce the volume, ship-breaking.
- b) ISIC Rev 3.1 Code 3720 that covers recycling of non-metal waste and scrap and includes processing of non-metal waste and scrap and of non-metal articles into secondary raw material. Examples of transformation processes are reclaiming of rubber such as used tires to produce secondary raw material, sorting and pelleting of plastics to produce secondary raw material for tubes, flower pots, pallets and the like; processing (cleaning, melting, grinding) of plastic or rubber waste to granulates; reclaiming of chemicals from chemical waste; crushing, cleaning and sorting of glass; crushing, cleaning and sorting of other waste such as demolition waste to obtain secondary raw material; mechanical crushing and grinding of waste from the construction and demolition of buildings (including wood), asphalt; processing of used cooking oils and fats into secondary raw materials for pet food or feed for farm animals; processing of other food, beverage and tobacco waste and residual substances into secondary raw material; reclaiming metals out of photographic waste, e.g. fixer solution or photographic films and paper.