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## Indian Export Performance as Part of Global Value Chains

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*As the world trade architecture modifies itself to accommodate trade through value chains, any country participating in trade invariably becomes a part of the value chains of various industries. For emerging economies, participation in world trade has become easier as the need to build an efficient industry from scratch is no longer necessary. While countries can now participate in a particular stage of a value chain and expect to grow, the problems of immiserising (heavily export-biased) growth may hamper longer-term development. This paper analyses India's participation in global value chains after identifying its key traded sectors. The analysis shows that, while India's participation in value chains of key traded sectors has increased, it has varied across industries. India's participation has increased in more downstream stages in service sectors and textiles and footwear – and shifted to less value-added segments in some of the primary and manufacturing sectors. The findings are discussed in the context of the recent coming into force of the World Trade Organization multilateral trade facilitation agreement, the policies of the Indian government and India's trade agreement negotiations. The paper concluded by noting a few policy directions to improve India's*

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*participation in higher value-added segments of value chains so that India's participation in world trade can act as a means to its developmental efforts.*

## **Introduction**

Discussions about world trade have been redefined from trade in final products to discussions on the value-added content of trade. Increased possibilities of offshoring or relocating production activities around the globe in the face of declining communication and transport costs have allowed slicing up the production of a single commodity to be spread across the most economically viable countries (Sachs, 1997). India as a participant in world trade is not insulated from this trend. We investigate India's participation in value chains focusing on its exports and unravel changes in stages of value chain participation for key export sectors of India, commenting on implications for India's trade policy.

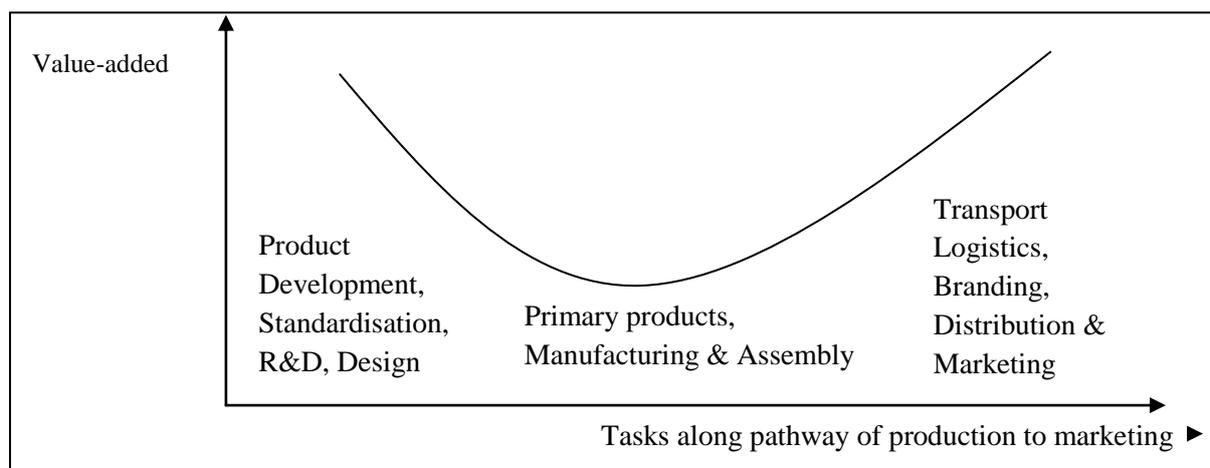
Traded products in the Ricardian world were produced and exported from the country of comparative advantage. Over time, resource-seeking foreign direct investment (FDI) (that is, FDI which sought to exploit lower production costs) led to fragmentation of production across countries (OECD, 2007). Today, a single product may be produced by sourcing components from various firms located across multiple countries, adding value to finally produce the end product.

## **Value Chain and Economic Development**

A standard value chain of most products may be described as follows: The activities of designing the product, developing it and innovation are at the very start of the value chain. Sourcing of primary products is in the upstream stages; manufacturing and assembly of the product are the middle stages of the value chain; and finally transporting, branding and marketing it, distribution and post-sale services are the downstream stages of production (Figure 1). Product development, research and development (R&D) and the final stages of production are the most value-adding stages. Hence, participating in these stages of production through exports yields the greatest gains from trade. For developing economies, participating

in skill-intensive R&D and designing stages is a difficult proposition if the industry itself is not present in the country. However, participation in the production process i.e. upstream participation in the phase of supplying raw materials or semi-processed intermediates is an easier option to reap gains from trade. The Organisation for Economic Co-operation and Development (OECD) analysis has shown that developing countries with the fastest growing global value chain (GVC) participations have a gross domestic product (GDP) per capita growth rate which is two per cent higher than the average.<sup>2</sup> The need for greater integration has been emphasised for efficient functioning and increasing gains from trade for all countries which are a part of value chains (Blanchard, 2015). Our analysis links to the stream of literature which analyses participation of countries in global value chains through international trade of primary products and intermediates or semi-processed goods to further their economic development interests.

**Figure 1: Value-added by different production activities along the value chain of production**



Source: Adapted from (Cheng, Rehman, Seneviratne, & Zhang, 2015)

There are benefits and pitfalls of participating in value chains to facilitate economic development. Amongst the benefits, developing countries do not need to start from scratch and build a whole new industry to kick-start the process of industrialisation. Being able to produce just one stage in the production of a commodity helps the country become a part of the value chain of the product, and this is followed by productivity benefits and technology spillovers (Baldwin & Yan, 2014). For countries which have only primary resources, being able to systematically export the primary products can be beneficial. Most of the least developed

<sup>2</sup> See OECD India Policy Brief: Trade, November 2014 (<https://www.oecd.org/tad/policynotes/india-trade.pdf>).

countries of the world are currently participating in sequential value chains as suppliers of primary products while participation in intermediate, processed production is limited to developed and emerging economies (Taglioni & Winkler, 2016). Amongst the possible drawbacks, excessive exploitation of natural resources for developing economies could lead to environmental hazards; work conditions could also deteriorate and inequality increase as a result of participation in value chains (Gereffi, 2014; Neilson & Pritchard, 2009). Amongst other pitfalls for developing countries is the possibility of greater exposure to global economic shocks which affect the upstream stages through the “bullwhip effect” (Altomonte, et al 2011; Escaith, et al 2010). Finally, there is the possibility of “Dutch Disease” or immiserising growth (whereby relative costs of primary products fall relative to skill-intensive downstream components) as a result of such activities (Sachs, 1997).<sup>3</sup> Indeed as Baldwin (2014) shows, the inequalities of value-added have grown over time between the downstream and upstream stages. Thereby, the ideal path to development through trade would be participating in the upstream stages first, but moving up the value-added curve to participate in downstream stages over time. There are examples of countries moving up the value chain. China has moved up the value chain of technology products and it had a share of 43.7 per cent of high-technology manufactured goods exports from Asia in 2014 (ADB, 2015). Hence, participation in value chains as well as movement downstream is important to facilitate equitable economic development through trade in the changing world trade architecture. China could move up the value chain, thanks to robust institutions and strong property rights; these are pre-requisites in a world where vertical chains operate through multiple contracts among firms, making contract enforceability very important (Dollar, 2017).

Participation in value chains could occur through either backward participation or forward participation or both. Backward participation would imply importing semi-processed or primary products, adding value to produce a consumable or processed product and exporting it for further value addition or final consumption. Forward participation would imply exporting primary products like metal ores or agricultural products, and less processed material, for value addition by the trading partner. A big economy which is resource- and technology-rich in a particular industry may not have high participation in the global value chain of that industry. It

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<sup>3</sup> Dutch Disease refers to the possible de-industrialisation that may occur due to a sudden increased demand for natural resources that a country exports, causing comparatively higher returns for that sector, leading to a temporary strengthening of currency. The name derives from the de-industrialisation which followed Holland's development of North Sea gas fields in the 1960s.

would not need to import raw materials – and it would also be able to add most value by itself. Large, technologically advanced countries, which are rich in resources and technology, may thus actually have lower participation in global value chains but high domestic value-added content in their exports. A small country or countries which are primarily resource-driven in comparison, which have advantage in producing just one segment in the upper or middle streams of the production chain, would have high backward and forward participation leading to a high total participation, but the value-added content in the exports would be low. Participation may also be guided by the tariff and non-tariff barriers which a country's trade policy follows (OECD, WTO & World Bank, 2014). High participation and lower value-added in exports could occur at the same time. In the following sections, we concentrate on India, analyse its exports and proceed to a detailed analysis of India's GVC participation and possible changes in upstream and downstream participation. We begin by describing our method of analysis.

## **GVC Statistics and Methodology**

The OECD-World Trade Organization (WTO) Trade in Value-added (TiVA) statistics have come to be used extensively in the evolving value chain literature. In our study, we seek to examine the following: We identify the sectors which are principal contributors to India's gross export basket. After examining the domestic value-added content in each of India's export sectors, we look at the value chain participation and how India's participation in these sectors has changed relative to the rest of the world. We rank India on the basis of its GVC participation index as reported by OECD-WTO-TiVA. Combining our results from the domestic value-added share of exports and India's ranks in GVC participation across industries, we are able to infer changes in India's domestic value-added share in exports and how it has been impacted by India's changing GVC participation.

The extent of value chain participation and possible movements towards downstream stages are analysed next. This is followed by comparing the situation in India with the world average trends. In doing so, we look at three key indicators:

1. Forward Participation Index (FPI): This is the share of exported goods and services used as imported inputs in producing the importing country's exports (Koopman, et al 2010).
2. Backward Participation Index (BPI): This index measures the value of imported inputs in the overall exports of a country for the particular industry (Koopman, et al 2010).
3. Distance to final demand (DFD): As the name suggests, for a given industry of a country, the index measures the number of stages of production left before the products of the industry reach final consumers. High (low) values would entail greater upstream (downstream) participation (Fally, 2012) and (Antras, et al 2012).

Statistics of the three indicators as well as GVC participation are sourced from OECD TiVA 2013. This part of the analysis, using OECD TiVA 2013 indicators, furnishes data up to 2009. Hence our analysis in this part covers the period from 1995 till 2009.

To analyse if India's growing GVC participation is due to higher backward or forward participation, we construct a ratio of BPI to FPI. This helps us deduce whether India depends on greater foreign inputs for production (higher values of the ratio) or is increasingly becoming a primary input supplier (lower values of the ratio) for each industry. In our inferences we must be mindful that production networks and fragmentation in production have changed across our time frame of analysis. Similar caveats would hold true for a simple look at the DFD indices. Hence, we supplement our results and inferences obtained from the study of ratio of BPI to FPI with a study on possible changes in India's DFD in each industry relative to the world average DFD in the same industry across time.

The DFD measures the proximity of a country's industry in catering to the final demand of consumers. The lower the distance, the more downstream is the participation of the respective industry. However, we should bear in mind that changes in technology may cut down the number of production stages, reducing the distance between the primary supplier and the consumer of the end product. For example, while distance to final demand may have come down in value for a particular country in a particular industry, the changes in the production process of that industry across the world may have reduced the length of the value chain. Thus,

to get a clearer picture of the relative position of a country's industry in the world value chain, we construct a measure whereby we divide the distance to final demand of a said industry of a country by the world average distance to final demand of that industry. This gives us the relative position of the country in the world value chain which we compare across time to derive inferences on how much the country has moved to more downstream stages of production over time. If the measure decreases over time, it would mean that the country's distance to final demand has decreased relative to the world's distance to final demand. And this would mean the country's downstream participation in the industry's value chain has increased. We can use this measure to infer if India's participation in world trade is moving closer to final demand, that is, moving towards more value-added segments of the value chain across various sectors.

We discuss our findings in the context of challenges to participation in value chains for developing countries, the WTO trade facilitation agreement, India's challenges in development and current policy changes to facilitate foreign investment, "Make in India" and laws that sections of the literature recognise to be militating against development of industry.

## **India in Value Chains**

For a developing country like India to maximise gains from exports in a world of trade characterised by value chains, it is ideal to be participating at downstream levels -- or at least show trends of movement towards downstream participation by participating initially in upstream stages. India has been a part of various value chains with growing relevance in the automobile industry and there are studies on local content requirements and conflicts with the European Union and the United States on these issues (Bagwell & Sykes, 2005).

The shares of various sectors in India's gross exports are reflected in Table 1. We find that about 71 per cent of India's exports between 2000 and 2011 were accounted for by six sectors, namely textiles, textile products and footwear (share declined from 16 per cent to five per cent); chemicals and non-metallic mineral products (share increased from 12 per cent to 19 per cent); manufacturing not elsewhere classified (nec) and recycling (shares increased from five per cent to seven per cent); wholesale and retail trade, hotels and restaurants (share decreased from 18

per cent to 13 per cent); transport and storage, post and telecommunications (share increased from 11 per cent to 13 per cent); and business services (share increased from 10 per cent to 14 per cent) . We note here that the manufacturing nec and recycling sector includes gems and jewellery; chemicals and non-metallic mineral products include petroleum refining and nuclear fuel; and business services include information technology (IT) and IT-enabled services as well as consulting and other business services.

**Table 1: Sector Shares in India’s Exports to the World**

<b>Industry</b>	<b>2000</b>	<b>2005</b>	<b>2009</b>	<b>2011</b>
Agriculture, hunting, fishing and forestry	2%	2%	2%	2%
Mining and quarrying	1%	3%	2%	1%
Food products, beverages and tobacco	7%	4%	3%	4%
Textiles, textile products and footwear	16%	8%	6%	5%
Wood, paper, paper products, printing and publishing	1%	1%	0%	0%
Chemicals and non-metallic mineral products	12%	15%	16%	19%
Basic metals and fabricated metal products	5%	6%	5%	5%
Machinery and equipment, nec	2%	2%	2%	2%
Electrical and optical equipment	2%	2%	4%	4%
Transport equipment	2%	3%	4%	4%
Manufacturing nec; recycling	5%	5%	7%	7%
Electricity, gas and water supply	0%	0%	0%	0%
Construction	1%	1%	1%	1%
Wholesale and retail trade; hotels and restaurants	18%	14%	14%	13%
Transport and storage, post and telecommunication	11%	13%	13%	13%
Financial intermediation	1%	1%	1%	1%
Business services	10%	14%	13%	14%
Other services	6%	5%	5%	5%

*Source: Compiled by the author using OECD-TiVA statistics (2015)*

If we look at India’s domestic value-added as a fraction of gross exports between 2000 and 2011 in Table 2, we will see the value-added has dropped from 89 per cent to 76 per cent in the aggregate. This implies greater use of foreign inputs in India’s production in general in spite of India being a large economy rich in labour and other natural resources. For most industries which have received foreign investment, the share of India’s domestic value-added share in exports has fallen. The value-added has dropped from 90 per cent to 80 per cent between 2000 and 2011 in textiles exports; from 80 per cent to 56 per cent for chemicals and non-metallic mineral products; from 82 per cent to 58 per cent for manufacturing nec and recycling; from 89 per cent to 85 per cent for business services; and from 87 per cent to 81 per

cent for transport storage, post and telecommunication. But the value-added has remained more or less stable at 96 per cent for wholesale retail trade, hotels and restaurants. The maximum reduction in domestic content in exports is inferred for chemicals and non-metallic mineral products, manufacturing nec and recycling, followed by basic metals and fabricated metal products. The domestic content remains high for exports in agriculture, fishing, forestry and hunting; mining and quarrying; food products, beverages and tobacco; wholesale retail trade, hotels and restaurants; financial intermediation services; business services and other services. We note amongst these sectors only the following – business services; wholesale retail trade, hotels and restaurants; and transport, storage, post and telecommunications – appear in the top five sectors in India’s gross exports. Hence, for chemicals and non-metallic mineral products as well as manufacturing nec and recycling, which constitute a significant share of India’s exports, the domestic value-added content has declined more than in other sectors over the years.

**Table 2: Domestic Value-added Share of Gross Exports**

<b>Industry</b>	<b>2000</b>	<b>2005</b>	<b>2009</b>	<b>2011</b>
Total	89%	83%	79%	76%
Agriculture, hunting, fishing and forestry	97%	96%	97%	96%
Mining and quarrying	95%	94%	92%	92%
Food products, beverages and tobacco	92%	89%	90%	88%
Textiles, textile products and footwear	90%	85%	84%	80%
Wood, paper, paper products, printing and publishing	85%	80%	77%	75%
Chemicals and non-metallic mineral products	80%	68%	62%	56%
Basic metals and fabricated metal products	75%	69%	64%	60%
Machinery and equipment, nec	81%	73%	70%	67%
Electrical and optical equipment	80%	73%	68%	68%
Transport equipment	81%	77%	69%	68%
Manufacturing nec; recycling	82%	73%	62%	58%
Electricity, gas and water supply	84%	83%	81%	77%
Construction	83%	80%	80%	76%
Wholesale and retail trade; hotels and restaurants	96%	96%	96%	96%
Transport and storage, post and telecommunication	88%	83%	82%	81%
Financial intermediation	97%	95%	95%	94%
Business services	89%	86%	88%	86%
Other services	96%	89%	91%	90%

Source: Compiled by the author using OECD-TiVA statistics (2015)

The decline in the share of domestic value-added in exports is sharper for the manufacturing industries compared to service sectors. This may be due to greater import of raw materials for production of exports from India in these sectors i.e. India must be participating in value chains of these sectors but with a declining contribution in the total exports. The exports may be further used in production elsewhere or be consumed by a final consumer. We examine this in more detail in the value chain participation indicators below.

## GVC Participation

In Table 3, we report India's rank amongst 58 countries in terms of GVC participation (rank 1 has the highest GVC participation index value as reported by the OECD). The changes in India's participation rank for each industry's value chain is analysed.

**Table 3: GVC Participation Index Rank of India (Among 58 countries)**

<b>Industry</b>	<b>1995</b>	<b>2000</b>	<b>2005</b>	<b>2009</b>
Total	57	56	47	45
Agriculture, hunting, fishing and forestry	11	10	13	17
Mining and quarrying	24	22	19	18
Food products, beverages and tobacco	47	42	46	48
Textiles, textile products and footwear	18	13	14	13
Wood, paper, paper products, printing and publishing	40	48	52	52
Chemicals and non-metallic mineral products	28	24	38	40
Basic metals and fabricated metal products	50	43	38	40
Machinery and equipment, nec	50	44	39	38
Electrical and optical equipment	50	51	45	31
Transport equipment	49	50	41	33
Manufacturing nec; recycling	8	6	2	2
Electricity, gas and water supply	23	22	40	46
Construction	39	25	23	26
Wholesale and retail trade; hotels and restaurants	49	40	35	26
Transport and storage, post and telecommunication	52	46	46	41
Financial intermediation	33	27	19	19
Business services	34	12	4	6
Other services	16	2	5	13

Source: Calculated by the author using OECD-TiVA statistics (2013)

India's GVC participation index rank has improved over time, reflecting India's growing participation in global value chains. Amongst the 58 countries, India ranked 57<sup>th</sup> in terms of GVC participation in 1995, but moved up the table to rank 45<sup>th</sup> by 2009. However, if we look at each industry, India's improvement in GVC participation ranking has been possible due to its phenomenal improvement in GVC participation in a few industries such as business services; other services; financial intermediation; transport, storage, post and telecom; wholesale and retail trade, hotels and restaurants; and construction. In the manufacturing sector, the industries where India increased its participation significantly are: manufacturing nec, recycling (where it has always ranked among the top 10 countries in the world); transport equipment; machinery and equipment; basic metals and fabricated metal products; textiles and textile products; and mining and quarrying. The industries where India has fallen behind other countries in terms of GVC participation are agriculture, forestry, fishing and hunting; mining and quarrying; food products, beverages and tobacco; chemicals and non-metallic mineral products; and electricity, gas and water supply. It should be noted that although GVC participation in chemicals and non-metallic mineral products has decreased relative to other countries over time, it remains one of India's top export sectors with declining domestic content in exports.

From the above data, we may infer that sectors like business services, financial intermediation, wholesale retail trade, hotels and restaurants, which stand out in terms of gross exports and domestic value-added in exports, are also sectors where India's participation in GVCs has increased significantly over the years. India's participation in value chains of textile products has also been significant with an improvement in its GVC participation rank accompanied by a reduction in domestic value-added content. These are sectors where India is found to be more gainfully participating in value chains as the domestic value-added share of exports is substantial. However, while India's rank in GVC participation has improved significantly in sectors like manufacturing nec and recycling followed by machinery and equipment, basic metals and fabricated metal products, the domestic value-added in their exports has decreased more than in other sectors. This could be due to higher valued inputs of foreign intermediates, limited value addition and further exporting to other countries. Although participation has increased in these sectors, the benefits in terms of gaining through exports may have been limited. Now if we look at chemical and non-metallic mineral products, one of the top five sectors for India's exports, GVC participation has worsened over time in comparison to other countries; local sourcing in this sector from within the country may have increased with higher

additions in value attributable to increased dependence on foreign inputs (lower domestic value-added). This sector may be more of a low-value primary input supplier thereby participating in less value-added segments of the value chain. India has also shown relatively lower GVC participation compared to other countries in sectors like wood, paper, paper products, printing and publishing; agriculture, fishing, forestry and hunting.

While the above analysis gives us an idea of India's sectoral participation in GVCs, the relative movements upstream and downstream may be inferred from the ratio of BPI to FPI. An increase in BPI to FPI ratio would imply increasing dependence on foreign inputs or lower usage of a country's exports to produce trade partner's exportables. FPI could be low when major exports of a sector are directly consumed as final demand. Hence, a higher value of BPI to FPI ratio would imply relatively greater usage of foreign inputs in production as opposed to domestic exports being used as intermediates thereby implying probable downstream movements. From Table 4, we find that India's production has moved more downstream as reflected by an increase in the BPI to FPI ratio from 0.68 in 1995 to 1.08 in 2009. It also shows that while India was participating more as a source of inputs for its trade partners in 1995, it has now become a significant importer of semi-processed intermediates. The sectors which stand out in terms of increasing foreign inputs more than their exports being used as intermediates elsewhere are: textiles, textile products and footwear; chemicals and non-metallic mineral products; basic metals and fabricated metal products; electrical and optical equipment; wholesale and retail trade, hotels and restaurants; transport and storage, post and telecommunication; financial intermediation; and business services.

**Table 4: Ratio of Backward to Forward Participation, India**

<b>Industry</b>	<b>1995</b>	<b>2000</b>	<b>2005</b>	<b>2009</b>
Total	0.68	0.67	0.84	1.08
Agriculture, hunting, fishing and forestry	0.11	0.09	0.08	0.07
Mining and quarrying	0.11	0.09	0.10	0.12
Food products, beverages and tobacco	5.35	3.44	3.15	3.82
Textiles, textile products and footwear	1.62	1.80	2.25	2.33
Wood, paper, paper products, printing and publishing	1.24	0.85	0.76	0.78
Chemicals and non-metallic mineral products	1.20	1.48	1.22	1.31
Basic metals and fabricated metal products	0.66	0.75	1.04	1.11
Machinery and equipment, nec	1.94	1.26	1.54	1.71
Electrical and optical equipment	0.99	1.10	2.18	2.38
Transport equipment	3.84	2.44	3.29	4.44

Manufacturing nec; recycling	12.21	10.03	8.64	10.08
Electricity, gas and water supply	0.00	0.00	0.00	0.00
Construction	0.00	0.00	0.00	0.00
Wholesale and retail trade; hotels and restaurants	0.15	0.19	0.23	0.35
Transport and storage, post and telecommunication	0.41	0.65	0.36	0.54
Financial intermediation	0.02	0.04	0.07	0.10
Business services	0.10	0.20	0.45	0.60
Other services	0.95	0.73	0.77	0.45

Source: Calculated by the author using OECD-TiVA statistics (2013)

The sectors where India's participation has moved more towards upstream stages are manufacturing nec and recycling; machinery and equipment, nec; wood, paper, paper products, printing and publishing. Amongst these sectors, manufacturing nec and recycling figures amongst the top Indian exports and its GVC participation has increased phenomenally. This is a sector where India has moved substantially upstream in its participation. On the whole, we see India's participation in global value chains has occurred more as an importer of foreign intermediates than as a provider of raw material for most industries. This has been especially the case in service industries. However, for sectors like manufacturing nec and recycling – one of the key areas of GVC participation for India, mostly in the gems and jewellery and apparel industries – India's participation seems to be headed towards more upstream stages.

To compare India with the world in terms of participation in value chains and movements in participation along the value chain, we compare India's industry-wise distance to final demand with the world average distance to final demand for each industry. Table 5 below reports the ratio of India's distance to final demand for the given industry to the average distance to final demand of the rest of the world as reported in OECD TiVA 2013 statistics.

**Table 5: Ratio of India's distance to final demand with world average distance to final demand**

Industry	1995	2000	2005	2009
Total	0.97	0.90	0.93	0.92
Agriculture, hunting, fishing and forestry	0.74	0.72	0.74	0.74
Mining and quarrying	1.12	1.10	1.18	1.18
Food products, beverages and tobacco	0.78	0.82	0.89	0.88
Textiles, textile products and footwear	1.01	0.95	0.93	0.95
Wood, paper, paper products, printing and publishing	0.91	0.90	0.99	0.99

Chemicals and non-metallic mineral products	0.98	0.96	1.00	1.02
Basic metals and fabricated metal products	0.97	0.87	0.88	0.89
Machinery and equipment, nec	0.87	0.93	0.98	0.98
Electrical and optical equipment	0.80	0.82	0.80	0.91
Transport equipment	0.89	0.90	0.89	0.92
Manufacturing nec; recycling	1.02	0.95	1.01	1.16
Electricity, gas and water supply	1.25	1.16	1.15	1.15
Construction	0.88	0.91	0.90	0.85
Wholesale and retail trade; hotels and restaurants	1.09	1.02	1.10	1.09
Transport and storage, post and telecommunication	0.93	0.84	0.93	0.96
Financial intermediation	1.05	1.01	1.10	1.11
Business services	0.97	0.83	0.85	0.79
Other services	0.99	0.95	0.95	0.94

*Source: Calculated by the author using OECD-TiVA statistics (2013)*

We find that India's distance to final demand relative to the world average distance to final demand has decreased over time. This implies that India has moved to more downstream stages of production in the aggregate relative to the rest of the world. However, there are differences in the trends across industries. India has moved closer to the final demand stages in production relative to the world in the following sectors: textiles, textile products and footwear; basic metals and fabricated metal products; and business services; followed by other services; electricity, gas and water supply. The sectors where India has increased its distance to final demand over time relative to the world average include most of the manufacturing sectors i.e. chemicals and non-metallic mineral products; mining and quarrying; food products, beverages and tobacco; machinery and equipment, nec; electrical and optical equipment; and manufacturing nec, and recycling. India's distance to final demand has remained more or less unchanged relative to the world average in sectors such as agriculture, hunting, fishing and forestry; transport equipment; construction; and transport, storage, post and telecommunication.

From our analyses in this section it is possible to conclude that India has grown in world trade as well as GVC participation through the last 20 years. However, the level of participation and domestic content in India's exports has varied across industries. While sectors like chemicals and non-metallic mineral products, manufacturing nec, and recycling have seen their share of India's exports grow, India's domestic content in exports of these sectors has declined at an alarming rate. Our analysis also reveals that greater participation in GVCs in these sectors has been accompanied by India's contribution to less value-added upstream segments of value

chains of these industries. GVC participation has not grown significantly in agriculture, fishing, forestry and hunting; mining and quarrying; food processing, beverages and tobacco; participation has moved to less value-added upstream stages of production in these sectors. For a number of other industries – business services; financial intermediation; other services; wholesale retail trade hotels and restaurants; textiles, textile products and footwear; basic metals and fabricated metal products – India has increased its GVC participation with progressive movements to downstream stages of participation.

## **Discussion**

In our attempt to analyse India's exports to the world from a value addition perspective as a means to address India's development aspirations, we have tracked India's participation in the value chains of different sectors and possible movements to more value-added segments of the value chain. India's participation in world trade has increased significantly over time. However, India's participation in global value chains has started later than many other emerging countries and there are challenges to improve participation as well as in identifying fruitful ways of participation which avoid the probable anti-developmental effects of value chain participation.

It is widely recognised that while participating in value chains may serve as a path to development, a progressive movement towards contributing to the more value-adding downstream stages of production is vital to make participation a sustainable means to development. Sections of the value chain literature have noted India's growing participation in value chains including a downstream movement (WTO, 2014). In our analysis, we delved deeper to identify India's top export industries and followed this up with a study of value chain participation across industries.

From our study we find that in the aggregate, India has increased its participation in value chains of the world, but India has moved downstream mainly in the service sectors and textiles, textile products and footwear if we look at India's top sectors in terms of exports. Amongst manufacturing industries, India's participation has grown significantly in the manufacturing nec and recycling sector which includes jewellery and gem stone polishing activities; machinery and equipment, nec; and wood, paper, paper products, printing and publishing. India

has moved to more upstream activities in producing semi-processed intermediates which are further used for production in other countries. We try to discuss India's problems in participating more productively in manufacturing value chains and look for possible solutions in the context of the WTO trade facilitation agreement as well as India's domestic reforms.

Like most emerging economies, India faces quite a few challenges in participating in value chains. At a general level, developing economies would need to develop domestic infrastructure and competitiveness in certain segments of value chains and initiate regional integration in the neighbourhood as most value chains are regional (Sturgeon & Memedovic, 2011) (OECD, 2015) (OECD & WTO, 2015a) (OECD & World Bank Group, 2015). Amongst other challenges is the need to meet quality standards which might change from time to time. This becomes increasingly difficult for smaller firms due to the escalating fixed costs involved in it. As Flento & Ponte (2017) argue, the trade policy of intended developing economies must therefore be "nimble" to adjust with changing configurations of value chains.

In order to facilitate easier participation of countries into the value chains, the Bali and Nairobi ministerial conferences of the WTO led to two specific positive outcomes, namely trade facilitation and duty-free and quota-free market access and rules of origin. However, some of the key bottlenecks of developing economies in joining value chains – for example, the need for connectivity to ports and for better roads and electricity grids (which are the physical infrastructure aspects) – are not part of the trade facilitation agreement (Portugal-Perez & Wilson, 2012). Hence aid for trade debates may need to increasingly focus on such problems for a healthier participation of developing economies in value chains.

Looking at India's own problems on the domestic front, India's archaic labour laws have had a demotivating influence on the growth of the manufacturing sector where gainful participation in value chains has not occurred. Specifically, the Factories Act and the Industrial Disputes Act are legislations which are considered to be more labour-friendly, making retrenchment of workers or production expansion an arduous process for the entrepreneurs. Thus, there is an incentive to operate out of smaller firms in the informal sector rather than grow into bigger manufacturing houses to enjoy the benefits of operating on a larger scale. This makes it more and more difficult to deliver on changing quality standards which require significant investment, which is possible for businesses operating on a larger scale. From our analysis, India's gainful integration into value chains has been lacking in most of the manufacturing

industries. The Indian government has taken initiatives like “Make in India”, supplemented with progressively easier FDI regulations as well as single-window clearances for a number of factors for entrepreneurs which facilitate manufacturing in India and thereby India’s ability to be a part of the value chains. However, there has been limited action on credible amendment of labour laws with few states amending the laws with minor incremental benefits for entrepreneurs.

Amongst other challenges in India which hamper gainful production are the problems of connectivity and availability of electricity. Energy-efficient production has become the norm worldwide. But India’s electricity generation per capita is amongst the lowest among emerging economies (Mukherjee, 2016). The government of India is currently working on plans for extensive electrification of the country. Bottlenecks in connectivity to ports are a further hurdle. As India thinks of becoming a manufacturing hub, the need to build efficient transport systems has to be recognised and addressed.

In order to move to more value-added segments, India would need to enhance the skills of its workforce. India currently has a large body of semi-skilled and unskilled workers. While a large workforce is an asset in itself, bringing the down labour costs of production, the lack of skills makes the workers unemployable for high-skilled value addition required in the more downstream value-intensive stages of the value chain. This is particularly true of the transport equipment and electrical and optical equipment sectors. Investment in skill generation, particularly with an eye on tradable goods and skill-intensive parts and components, is the need of the hour. India could well utilise its trade and investment policies and agreements to usher investments in the education and skill generation sector.

Coming to trade agreements to facilitate regional integration to participate in value chains, in the Asian region India has free trade agreements (FTAs) with the Association of Southeast Asian Nations (ASEAN), South Korea, Singapore and Malaysia currently in operation. However, India’s stringent rules of origin (ROO) requirements militate against possibilities of greater integration in sectors like transport equipment where India has potential, but the production network is highly fragmented. Hence ROO requirements of 35-40 per cent, which are the standard requirement in most of India’s FTAs, are difficult to meet. On an average, Indian FTAs have a utilisation rate of five per cent to 15 per cent. Given India’s proximity to the ASEAN region and the “Act East” policy, it may be fruitful to try and integrate with the

region, which is a vibrant manufacturing hub for the global economy. India could choose to integrate better with the region, especially in sectors like machinery and equipment nec; basic metals and fabricated metal products; and electrical and optical equipment and transport equipment, where India currently has low participation and the East and South-east Asian regions have significant participation. Appropriate utilisation of the India-ASEAN FTA with probable re-negotiations of a region-based ROO in place of a country-based ROO may actually help India participate in value chains better. Additionally, local content requirements in such industries should be rationalised for the short to medium term so as not to totally compromise local potential but also not sacrifice opportunities to gain greater learning advantages from importing intermediates in the short term. The issue of appropriate design on ROOs would need focused research for arriving at proper policy directions on this front.

In the aftermath of the Trans-Pacific Partnership, the Regional Comprehensive Economic Partnership (RCEP) and the beginning of implementation of the WTO trade facilitation agreement may not only act as a launching pad for India to participate in regional value chains; these may also lead to more fruitful participation in sectors where India already has a significant value chain presence. However, there is a need to focus on upskilling the labour force, ensuring employer-friendly labour laws, and reviewing the rules of origin and local content considerations. These would be key to fruitful longer-term GVC participation.

## **Conclusion**

Changing the focus of trade studies from gross trade to trade in value-added redefines a country's comparative advantages in terms of participation in value chains and the stages of the value chain where it participates. In this paper, we analyse India's participation in value chains and relative performance in moving to more value-added downstream segments of the value chain.

Six sectors accounted for 70 per cent of Indian exports from 2000 till 2011. We find that the domestic value-added in exports of most sectors has decreased systematically over the same period. This implies greater Indian involvement in the value chains of these sectors with higher

foreign inputs. Most sectors where India's exports have grown the most are also sectors where India has participated more in GVCs.

In order to infer if India participates in the more value-added downstream segments of production or is moving more upstream whereby it would end up as mostly a low value primary goods exporter, we analyse further, using three key metrics, namely: Forward Participation and Backward Participation indices and the Distance to Final Demand. Our conclusions vary across the sectors studied. We find that India has been moving to more value-added downstream segments of the value chain for sectors like business services (software, consulting, legal and professional services); textiles, textile products and footwear; basic metals and fabricated metal products; followed by other services; and electricity, gas and water supply. On the other hand, India appears to be moving more upstream (ending up as a primary good exporter) in sectors like manufacturing nec and recycling (including gems and jewellery); chemicals and non-metallic mineral products; machinery and equipment, nec; transport equipment; and electrical and optical equipment.

These results are important in understanding the dynamic nature of India's trade potential and have implications for trade policy and development. The WTO agreement on multilateral trade facilitation (resulting from the Bali and Nairobi rounds) has started being implemented. It encourages value chain participation of all countries through trade facilitation (although it does not address connectivity and infrastructure challenges which are at the root of the problems inhibiting gainful participation of developing economies including India) and duty- and quota-free access and rules of origin. There is need for quicker port clearances and better road and railways infrastructure connecting ports to sourcing destinations in India. China is a shining example of infrastructure development to facilitate trade. The current Indian government has been developing road infrastructure at an increasing pace and this should facilitate further trade participation. However, efforts need to be made to participate in more downstream segments and encourage the generation of higher skilled, innovation-driven end products in these industries. India's growing participation in value chains in most industries and movement towards downstream stages of the value chain are encouraging developments. However, given the development challenges India faces, it is important to increase such participation in downstream segments of sectors which have high employment potential. Downstream participation in most industries requires greater technical skills of the workforce, easier access

to ports, and energy-efficient production technology amongst other trade and investment facilitating measures.

The Indian government has implemented a number of initiatives like “Make in India”, FDI deregulations, and single window clearances for approvals for businesses. While these can improve conditions of doing business, India is yet to address problems caused by its labour friendly laws which have traditionally discouraged growth of large manufacturing facilities which could thrive on scale advantages. This is also responsible for India’s large informal sector. Additionally, contract enforceability issues plague the possibility of efficient GVC operations between India and any other country as GVCs normally function under the guarantee of quick enforceability of contracts. On the international trade policy front, while the WTO has tried to facilitate trade as a champion of multilateralism, significant regional integration has occurred through regional trade agreements. The RCEP is an agreement which India should carefully negotiate to improve its chances of integrating with the Asian value chains. Although India has signed a number of trade agreements, the utilisation rate of these agreements remains poor. India’s trade deals are often criticised for being conservative about ROO requirements. Compared to other countries, India requires a greater percentage of the value of imported product to be originating from the exporting partner. This does not facilitate value chain participation in a scenario where value chains of most products get continuously fragmented, resulting in lower levels of value-added attributable to any single country. Given India’s proximity to the ASEAN region and East Asia, and their significant presence in sectors like transport equipment, electrical and optical equipment, India may want to prioritise participating in these value chains with some reconsiderations about ROO requirements from the region as a whole rather than a single country. This – along with a careful design of lower local content requirements in the medium term for foreign investors who choose to invest and produce in India – would help India learn and produce imports for production more efficiently and, thereby, participate more gainfully in the production process going forward.

In sum, India’s participation in global value chains has increased. In the sectors accounting for the bulk of India’s exports, India’s GVC participation has increased over the decade of 2000 with most service sectors moving more downstream in their participation i.e. to higher value-added segments of the value chain. It is in India’s best interests to grow downstream participation in manufacturing sectors which could be facilitated by better port infrastructure, amending labour laws, improving road and railway linkages to ports, and encouraging

development of a more skilled labour force for production and innovation in most of the industries. Adherence to the WTO's multilateral trade facilitation, re-thinking ROO requirements at the level of regions (rather than countries), and careful negotiations on local content requirements for most of the industries in the manufacturing sector in trade deals like the RCEP and India-ASEAN FTA in the medium term would help India participate more fruitfully in value chains with a view to further economic development.

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