EXPORT-IMPORT BANK OF INDIA

WORKING PAPER NO. 92

GLOBAL VALUE CHAIN INTEGRATION: ENHANCING INDIA'S EXPORTS

EXIM Bank's Working Paper Series is an attempt to disseminate the findings of research studies carried out in the Bank. The results of research studies can interest exporters, policy makers, industrialists, export promotion agencies as well as researchers. However, views expressed do not necessarily reflect those of the Bank. While reasonable care has been taken to ensure authenticity of information and data, EXIM Bank accepts no responsibility for authenticity, accuracy or completeness of such items.

October 2019

CONTENTS

Research & Analysis Group:

Mr. Rahul Mazumdar, Assistant General Manager
Mr. Mayank Khurana, Deputy Manager

LIST OF EXHIBITS

LIST OF FIGURES

LIST OF TABLES

LIST OF BOXES

LIST OF ANNEXURES

EXECUTIVE SUMMARY

Introduction

As Indiaaspires to become a US$ 5 trillion economy by 2024-25, it would requireshifting its gears and accelerate and sustain a real GDP growth rate of atleast 8% going forward. With respect to this, it is imperative for India to focus beyond its domestic constituents and look towards global trade.

However, while there are several possible approaches that could be introduced to enhance India's exports, greater integration into the global value chains (GVCs) and focus on higher technology-intensive exports is but important.

World over trade is witnessing changes as countries participate in the GVCs. For emerging economies such as India to reap the benefits of trade, it should participate in the GVCs. Though India's participation in GVCs in consistently increasing but its participation is quite low vis-à-vis various other developing countries.

There is a need for India to focus on expanding production capacity as it moves up the value chain, while creating an enabling environment to account for a sizeable share in major leading global exports. Achieving this will not only come through getting integrated in the manufacturing space but also providing equal thrust to the services sector, the importance of which is increasingly being realized in the value chains.

Merchandise exports from India witnessed a consistent increase from 2001 onwards and continued its upward trend. During 2001 and 2008, it registered an AAGR of 22.6% during 2001 to 2008. However, from 2012 to 2016, India's exports witnessed growth only during two intervening years. Exports stood at US$ 260.3 billion as in 2016 – significantly lower than the level of US$ 301.5 billion in 2011. The recent years, however, displayed a recovery with exports growing at 13.6% and 9.2% during 2017 and 2018, respectively.

As far as trade deficit is concerned, it declined from US$ 199.4 billion in 2012 to US$ 96.4 billion in 2016, reflecting a greater decline in imports by the country, before rising back to US$ 184.5 billion in 2018. In fact, while India's share in global exports remained in the range of 1.6% -1.7% during the period 2011-2016, its share in global imports declined from 2.6% in 2012 to 2.2% in 2016. The import share of India in the global imports, however, reached back to its 2012 level in 2018.

Trade Scenario in Tech-Based Exports

In 2018, India's share in the world exports was recorded at 1.7%, with a global rank of 18. China remained the world's largest exporter with a share of 18%. Given the headroom for growth in the medium term, India should aim at raising its share in world exports to at least 5%. However, with a vision of this scale, India needs to focus on technology intensive exports with a special thrust on high-tech sector, as this sector could generate a high revenue, other than getting the exports integrated into the GVCs, within the manufacturing space. The value added by manufacturing sector as a percent of GDP in India, has remained stagnant and has recorded an average of 15.9% in the last 60 years. During 2008-2017, India's technology export witnessed a decent transition. The share of resource-based exports reduced from 45% in 2008 to 37% in 2017, while the shares of low and mid-tech-intensive exports increased by 2% (from 27.5% in 2008 to 29.5% in 2017) and 5% (19.6% in 2008 to 24.7% in 2017), respectively, during the last decade.

As far as high-tech exports are concerned, the share of this segment in India's exports has increased from 7.7% in 2008 to 9.2% in 2017. This increase in share can majorly be attributed to the growing imports of pharmaceutical products in the world market in recent years, which also constitutes the major share in high-tech exports from India.

High-tech exports which are considered to be one of the vital category of exports, given the dynamics of global economy, includes products with high R&D intensity, such as aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery. Globally, high-tech exports were valued at US$ 3280 billion in 2017 having grown from US$ 2566 billion in 2008, thereby registering an average annual growth rate of 3.1% during 2008-2017. With respect to the products, major exported commodities included transistors valves etc. (23.3%); telecommunication equipment and parts (15.2%); medicaments (10.7%); automatic data processing equipment (10.6%); and parts for office machines (6.3%).

China is the world's largest high-tech exporter, whereas India is ranked at a distant 23 in terms of high-tech exports. Further, while the share of high-tech exports in total world's manufacturing exports was almost 24% in 2017, the same for India in India's total manufacturing exports was just 9.2%. It may be observed that while both the total manufacturing exports and the high-tech exports from India reflect a rising trend, the AAGR of total manufacturing exports is 6.5% for the period 2008-2017, as compared to export of high-tech products which stood at 8.5%, and overall exports at 6.7%. Indian high-tech exports are concentrated towards pharmaceutical sector and are mainly driven by higher demand in the regions such as North America and Europe. There has been some notable increase in the share of medicaments in high-tech exports during 2008-2017- from 39% in 2008 to over 52% in 2017. It may also be observed that most products witnessed a decline in share amongst high-tech exports in 2017, as compared to 2008.

Mid-tech process industries like passenger vehicles and parts, commercial vehicles, motorcycles and parts, synthetic fibers, chemicals and paints, fertilizers, plastics, iron, pipes/ tubes are some of the products that constitute mid-tech space. Mid-tech exports from India have witnessed the highest AAGR of 9.1% during 2008 and 2017, as compared to the other three categories analysed in this chapter. Within the mid-tech exports, the automotive industry dominates the basket with a share of almost 11%.The Low-tech exports are classified into two categories, namely - textile/fashion cluster like textile fabrics, clothing, headgear, footwear, leather manufactures, and travel goods and other low-tech exports like-pottery, simple metal parts/structures, furniture, jewellery, toys, plastic products. Low-tech exports from India were registered at US$ 73.8 billion in 2017. This has grown from a level

of US$ 42.8 billion in 2008, thereby recording an AAGR of 6.7%, during this period. Jewellery, textile, footwear and apparels are some of the major low-tech commodities which are exported by India.

As far as resource-based exports are concerned it reached a level of US$ 91.8 billion in 2017 as compared to US$ 70.6 billion in 2008, recording an AAGR of 5.7%, during this period. It may also be observed that resource-based exports are being dominated mainly by two commodity groups namely, 'petroleum products' (share of 38% in 2017) and 'pearls and precious stones' (28%).

GVC: India's Locus Standi

Manufacturing in the 21st century is a lot more globalized with production, trade, and investment being increasingly organized within the GVCs, where different stages of production are located across different economies of the world. The value chain starts with designing, development and innovation in the product which are the upstream stages of production. It then moves to the middle stage where the product is manufactured and assembled. Finally, downstream stages include transportation, marketing, sales, and after sales services. Participation in product development, research and development, and the final stages of production leads to significant gains from trade as these stages make high value addition.

Participation in value chains to facilitate economic development has benefits and pitfalls. 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, followed by productivity benefits and technology spill overs. On the flip side, they are often stuck at low value addition stages and exploit their natural resources for expansion.

From the view of development, there are several positive aspects of GVCs. First, firms can take the benefit of their comparative advantage in a specific production process, instead of establishing the whole course of production capacity and thereby, participating in the global production network. Second, more employment opportunities are created once participation in GVCs is initiated. For instance, jobs are being created in developing economies from iPhone assembly in China, BPO operations in India, and automobile and auto part production in Thailand, Turkey, and China. Third, GVCs also provide the opportunity for technology transfer or spill over to developing countries through local learning.

A conclusion based on just exports could be misleading about a country's participation. This is because, a country might have a high export figure, but it may have a low value addition to exports (high dependence of a country on imports of intermediates for exports).

Using foreign value-added content of gross exports as a parameter to measure the extent of participation in GVCs through backward linkages, it is observed that India's integration in GVCs is low (16.1%), as India's foreign value-added content of gross exports in the recent times has reached below the OECD average (19.3%). In fact, countries such as Vietnam (43.6%) have more than double foreign value-added content of exports than that of India, as these economies majorly import intermediates from other countries. In comparison to ASEAN nations, India's foreign value-added content in gross exports has always remained lower than the average of ASEAN countries.

Further, GVC participation could be measured as a sum of forward and backward linkages. An analysis of GVC participation for select economies reveals that in the cases of economies such as the US, Japan, and the UK, forward linkages are much stronger than backward linkages, indicating net value-added gains from linking into GVCs. Countries like Luxembourg, Slovak Republic, Hungary, Chinese Taipei, Vietnam, Malaysia, Mexico have very high backward linkages indicating the fact that these economies are highly dependent on imports for their exports. For India, while the backward linkage in 2016 was 19.1%, the forward linkage was 14.9%. It is important to note that economies

such as Saudi Arabia, Norway, Kazakhstan, amongst others have high forward linkages, as their main exports are natural resources (crude oil) and as a result, a high portion of domestic value added is being used in other countries' exports.

The Study also calculates a ratio of forward to backward linkages to estimate the balance between forward and backward linkages. A ratio greater than one implies that a country's 'domestic value added embodied in foreign exports as a share of gross exports' is higher than its 'foreign value-added content as a share of gross exports'. However, in the case of India, this ratio remains less than one which implies that India is a net importer of intermediates. Interestingly, none of the top 20 countries in terms of GVC participation has a ratio greater than one, implying that the major participants in GVCs have stronger backward linkages than forward linkages.

India in Manufacturing GVC: Key Industry-wise Analysis

Using the 'foreign value-added content of gross exports' as a measure for integration into GVCs through backward linkages, the industry-wise analysis shows that foreign value-added content in exports of almost every sector in India has gone down in recent years. Granular analysis shows, foreign value-added content of transportation and storage has gone down from 19.4% in 2005 to 13.8% in 2016, information and communication (from 9.8% to 6.3%) and overall business services (from 11% to 7.9%). Sectors with the most foreign value-added content of exports (backward linkages) are namely in industries such as 'computers, electronic and electrical equipment' (31.1%), 'basic metals and fabricated metal products' (29.6%); 'chemicals and non-metallic mineral products' (28.1%), etc.

Further, globally, economies are playing an increasingly important role in getting connected to the final consumers in the other nations. The role of foreign final demand in a country's domestic production can be enquired through the indicator 'Domestic value-added content in foreign final demand'. The indicator illustrates the full upstream impact of final demand in foreign markets to domestic output. For example, in the case of chemical and pharmaceutical industry, the domestic value-added content in foreign final demand has gone up by 6.2 percentage points from 32.6% in 2005 to 38.8% in 2016 because of high foreign demand. Other industries such as 'textiles, wearing apparel, leather and related products' (33.5%); 'chemicals and pharmaceutical products (38.8%)', amongst others are also highly motivated by final demand abroad. It may be noted that overall 26.9% of India's domestic value added in manufacturing exports is driven by consumption abroad.

Analysis of domestic value-added share of exports by industries also reveals substantial variance. Industries related to use of natural resources, agriculture and retail trade have higher domestic value added in gross exports whereas manufacturing industries have in general lower domestic value added

content in gross exports. Increased participation into GVCs leads to considerable fall in domestic value-added share in exports as countries increasingly engage in trade in intermediates. However, in case of India, domestic value added as a share of gross exports has increased from 81.2% in 2005 to 83.9% in 2016, overall. This is indicative of India's growing domestic value-added content in its exports. Major increase in the shares is observed for 'coke and refined petroleum products' (54.7% to 58.8%)'; 'computer, electronic and optical products' (64% to 67.8%); 'transportation and storage' (80.6% to 86.2%); amongst others.

Services: India's Stronghold in Value Chains

Manufacturing today involves much more than the pure production of goods. It increasingly includes services related activities such as business services, logistics, communication services, computing services, etc. Additionally, services add value to products through design development, marketing, etc. and ensure the competitiveness in manufacturing.
While foreign services value-added share in gross exports (both goods and services) for India was 5.7%, the domestic services value-added share in gross exports during the same year was 46.4%, in 2016. The services sector is very crucial for manufacturing competitiveness, and hence plays a significant role in GVCs. In 2016, services value added contributed to 25.1% of manufacturing exports (17.9% domestic and 7.2% foreign) with the highest share for 'Basic metals and fabricated metal products' at 30.9%, under the manufacturing sector. In fact, the share of DSVA in the manufacturing exports has increased from 16% in 2005 to 17.9% in 2016, while during the same period, the share of the FSVA has almost remained the same (7.4% in 2005 to 7.2% in 2016). It may be noted that Luxembourg, Malta, Ireland, Vietnam and Hungary have a very high share of FSVA content in exports while economies such as the USA, India, Australia and Germany have a higher share of DSVA content in exports.

How to Integrate into GVCs?

The Study attempts to identify various viable strategies which can help India in increasing its participation in the GVCs and eventually, increase its footprint into global production network, and provides select prescriptions herein.

Technological Upgradation

In the context of India, there is evidence of India transiting from resource and low-tech based exports towards mid to hi-tech based exports. However, despite its moderate achievement in transfer of manufacturing to the hi-tech, India needs to revisit its research and development (R&D)spending. R&D forms the backbone of GVCs. Developing economies are generally considered to be spending less than 1% of GDP on the R&D, while the developed economies generally spend over 2% of GDP in R&D activities. China, however, is considered to be an exception in this regard. China's spending on R&D as a percent of GDP which was 0.56% in 1996, lower than that of India (0.65%), leaped to 2.06% in the following two decades (as in 2015). India's spending on the R&D, however, remains miniscule, and remained stable in the last two decades and was recorded at 0.62% in 2015.

One of the most important aspects of the policy environment for R&D is protection of intellectual property rights. With respect to this, it is important to assess the International Property Rights Index (IPRI) provided by the Property Rights Alliance. In the 2018, India's score was recorded at 5.63, while the economies such as Japan (8.23); UK (8.14); and USA (8.12) recorded a higher score. China's score on the same parameter was 5.90. Economies such as Brazil, Chile, Malaysia, and South Africa rank higher than India on this parameter.

Overall, presently, India's participation is limited in the GVCs. In order to make Indian enterprises competitive and thus, integrate with the value chains, it is imperative to accord priority to R&D efforts and encourage firms to specialize in activities such as product design and development.

Trade Agreements

Trade agreements play a crucial role in the global production network as countries get duty free access or special status to major markets. The positive impact of deep agreements on GVC integration is driven by value-added trade in intermediates rather than in final goods and services. Adding a policy area to a PTA (Preferential Trade Agreement) increases domestic value added of intermediates (forward GVC linkages) and foreign value added of intermediates (backward GVC linkages) by 0.48% and 0.38%, respectively.

India may also need to take a relook at the existing FTAs and explore the possibility of re-negotiating them. India may analyse the low extent of the utilization of tariff preferences when it comes to India's FTAs. While the global utilization of preferences is as high as 70% to 80%, in the case of India it stands at around 5%-25%. This again is dependent on selection of trade partners and the depth of tariff concessions secured from them.Recently the USA did something similar with the NAFTA, despite the bloc being the most successful such initiative globally.

India should also explore the possibility of putting in place an FTA with the BIMSTEC bloc to boost its intra-regional trade which was negotiated first in 2004. While trade agreements are one side of the coin, the other side is the utilization of these agreements by the exporters. A low utilization rate beats the very purpose of the trade agreements. With respect to this challenge, the government may consider establishing an extensive and well-equipped architecture for building skills and awareness among economic operators to make efficient use of international trade opportunities.

Focus on Service Sector

Liberalizing trade in services can provide new pathways for developing countries to utilize their comparative advantage in global supply chains. According to WTO's 'Trade in Services data by mode of supply (TISMOS)', during 2005 to 2017, almost 50% of the global exports of the services are in the Mode 3 category which 'establishment of commercial presence abroad', followed by Mode 1 category. In India's case, Mode 1 category accounts for over 70% of the services exports, which is essentially the cross-border supply of services-provided by phone, fax, or electronic means, including body-shopping.

India lags in terms of openness of the services sector for the foreign entrants. According to the OECD database, India stands high on the services trade restrictiveness index (STRI) for a significant number

of industries. Any strategy for services exports should take into consideration the value addition contributed by the services sector on India's exports, and tracing India's movement up the value chain ladder.

There is a growing need to focus on services reforms in order to make Indian manufacturer more competitive. A well-developed and competitive services sector will enable India to get more involved into the fragmented global production network. It may be noted that the most technologically advanced countries have seen their DVA in exports decline in recent years as they make proportionally more use of imported inputs. These economies also tend to have large shares of services in their value added exports. This rising service share reflects two factors: first, there is growing service content embodied in manufactured products; second, as value chains become more fragmented, services such as finance, telecom, and transport are increasingly important in managing value chains.

Attracting FDI

Attracting FDI is probably the fastest way to integrate into desired GVCs. Foreign subsidiaries bring with them capital, technologies and managerial skills that may be superior to those available domestically. Most importantly, they bring knowledge about the production process in GVCs of interest, their way of operation, their structures and governance and their markets. It is also a way to quickly increase the DVA produced in an industry (in absolute terms) by inviting FDI in segments of the chain that are currently not undertaken domestically.

The OECD calculates direct investment restrictiveness index for economies and for sectors. It is observed from the FDI restrictiveness index for the advanced economies that make up the OECD that they are open in virtually all sectors. Emerging markets, on the other hand, tend to be open in attracting investment in manufacturing, but still somewhat closed in attracting investment in services, such as telecom and finance. In India's case it is seen that amongst the BRICS nations, India has the second most investment restrictiveness in the primary sector, third most in investment restrictiveness in the manufacturing space, and third most in investment restrictiveness in the tertiary space, for the year 2018.

India needs to build appropriate environment to attract foreign investors. It is also important to broaden the scope of incentives and instruments to include domestic firms as this will induce them to enter desired value chains, rather than just offering incentives to foreign players.

Focus on Infrastructure

Access to reliable physical and "soft" infrastructure (notably logistics and telecommunications) is crucial for attracting GVC activities. As value chains are often regional in nature, international partnerships for infrastructure development can be particularly beneficial.
Delays in transportation can significantly disrupt the production of the final product. Logistical and transport infrastructure can help reduce inventory and handling costs as well as reduce delivery times. In fact, a World Bank study, showed a clear relationship emerges between better logistics performance and deeper involvement in GVCs when the Logistics Performance Index is plotted against a centrality indicator of each country's role in GVCs. It indicated that no countries with poor logistics performance are central to GVCs. For countries that want to get more involved in GVCs, trade facilitation and infrastructure are obvious places to start.

An integrated focus on infrastructure will not only enhance the competitiveness of domestic manufacturer but also attract foreign investment thereby initiating both forward and backward linkages. Additionally, a well-developed infrastructure like roads, ports, building logistics network and improvement in information and communication technology can increase access to foreign markets.

CHAPTER

1

INDIA'S INTERNATIONAL TRADE: A CURSORY GLANCE

Introduction

The Economic Survey of 2018-19 emphasizes India's aspiration to become a US$ 5 trillion economy by 2024-25. To achieve the vision of an economy of US$ 5 trillion, India needs to shift its gears to accelerate and sustain a real GDP growth rate of 8%[1].

In terms of growth, India's GDP increased at an average of 7.5% in the last 5 years, that is, during 2014-15 to 2018-19, while since 2009-10 (the period post the global financial crisis), GDP has grown by an average of 7.1% per annum. IMF estimates India's GDP to grow 7.0% in 2018-19, and 7.2% in 2019-20, as compared to 6.8% in 2017-18[2]. However, RBI has recently revised its GDP estimates for the financial year 2019-20 to 6.9%

As regards trade, India's share in global merchandise exports stood at 1.7% in 2018 which was an increase from 0.7% in 2001, and 1.4% in 2009. Services exports which have been one of India's key sources of foreign exchange held a 3.5% share in global services exports in 2018. This has increased from 1.2% in 2001 and 2.6% in 2009.

The merchandise exports were recorded at US$ 323.1 billion in 2018, a growth of 8.8% over 2017. The services exports, in the last decade, that is, during 2009 to 2018, have grown from US$ 92.9 billion to US$ 205.1 billion, thereby registering an AAGR of 9.5%. In fact, the services exports grew at a rate of 14.5% and 10.7% in 2017 and 2018, respectively.

Further, one of the critical drivers for the growth of any economy is FDI and India has performed well in this area. According to Department for Promotion of Industry and Internal Trade (DPIIT)[3], India's Foreign Direct Investment (FDI) equity inflows reached US$ 420.1 billion during April 2000 to March 2019, with maximum contribution from services (17.7%), computer software and hardware (8.9%), telecommunications (7.8%), construction development (6%), and trading (5.5%).

In recent years, a major push to India's growth has been provided by the services sector. India's participation in the global production network is consistently increasing and as a result, services sector is playing a vital role in the global value chains (GVCs) by increasing competitiveness of the manufacturing sector. As of 2018, India's services exports account for 38% of the overall exports from India. In the subsequent years, India's growth story is expected to exhibit positive trends, given its growing consumer base, young and vibrant population, and increasing investments.

[1] Economic Survey, 2018-19
[2] World Economic Outlook, July 2019
[3] Previous name was Department for Industrial Policy and Promotion (DIPP)

Overall Merchandise Trade Scenario in India

Merchandise exports from India witnessed a consistent increase from 2001 onwards and continued its upward trend (registering an AAGR of 22.6% during 2001 to 2008). However, from 2012 to 2016, India's exports witnessed a growth only during two intervening years. Exports stood at US$ 260.3 billion in 2016 – significantly lower than the level of US$ 301.5 billion in 2011. The recent years, however, displayed a phenomenal recovery with exports growing at 13.6% and 9.2% in 2017 and 2018, respectively.

Alongside, India's trade deficit also declined from US$ 199.4 billion in 2012 to US$ 96.4 billion in 2016, reflecting a greater decline in imports by the country, before rising back to US$ 184.5 billion in 2018. In fact, while India's share in global exports remained in the range of 1.6% -1.7% during the period 2011-2016, its share in global imports declined from 2.6% in 2012 to 2.2% in 2016. The import share of India in the global imports, however, reached back to its 2012 level in 2018.

An impressive performance was recorded in India's merchandise exports in the last decade, which contributed to 1.7% of world exports in 2018, up from 1.4% in 2009. India's exports stood at US$ 176.8 million in 2009 and have grown by almost 83%, since then.

In 2018, the growth registered by exports from India over 2017 was 8.8%. This growth was mainly on account of product groups like petroleum products (growth of 35%), machinery, mechanical appliances, nuclear reactors, boilers, parts thereof (22%); electrical machinery and equipment (34%); pharmaceutical products (11%); organic chemicals (31%); and motor vehicle and cars (12%). On the other hand, sectors such as 'iron and steel' and 'pearls and precious stones' witnessed a decline of (-) 15% and (-) 6%, respectively, in 2018. It may also be noted that over 60% of India's exports were captured by ten product groups at HS-2-digit level, in 2018.

However, it is important to evaluate India's oil-based trade, given its dependence on the same in terms of both imports (crude oil) and exports (petroleum products.). An analysis of the oil trade by India reveals that India's dependence on the oil-based trade has decreased to some extent in the recent years. The share of 'Mineral fuels and oils' (HS- 27) in India's exports fell from 18.8% in 2011 to 10.7% in 2016, before rising back to 12.1% in 2017 and 15% in 2018. A similar picture is observed in the imports, where the share of 'Mineral fuels and oils' in the total imports of India fell from 34% in 2011 to 25% in 2016 and climbed back to 27.7% and 33.2% in 2017 and 2018, respectively.

Table 1: Major Products Exported from India in US$ Billion

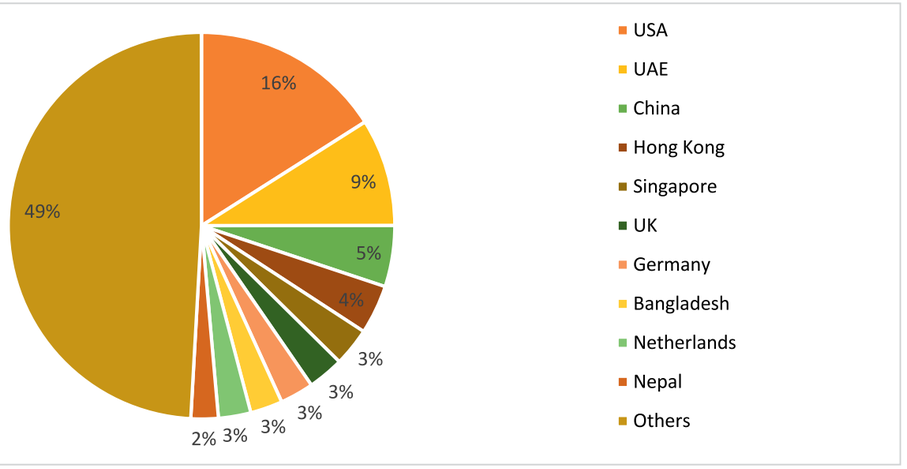
Sector	2014	2015	2016	2017	2018	Share in 2018	AAGR (2014-18)
Mineral fuels and oils	62.3	31.4	27.7	35.9	48.3	14.9%	0.7%
Natural and precious or semi-precious stones	40.7	38.5	42.3	42.6	40.1	12.4%	-0.2%
Machinery and mechanical appliances	13.6	13.2	13.6	16.7	20.4	6.3%	11.3%
Vehicles other than railway	14.5	14.1	15.0	16.2	18.2	5.6%	6.1%
Organic chemicals	12.0	11.3	11.3	13.6	17.7	5.5%	11.2%
Pharmaceutical products	11.7	12.5	13.0	12.9	14.3	4.4%	5.3%
Electrical machinery and equipment	9.0	7.9	8.2	8.8	11.8	3.6%	8.2%
Iron and steel	9.1	6.3	6.4	11.7	10.0	3.1%	9.6%
Cotton	8.9	7.5	6.3	6.9	8.1	2.5%	-1.0%
Articles of apparel and clothing accessories, not knitted or crocheted	9.1	9.3	9.1	9.0	8.1	2.5%	-2.6%
Top 10	**190.9**	**152.0**	**152.9**	**174.3**	**197.0**	**60.8%**	**1.8%**
Others	**126.7**	**112.3**	**107.5**	**121.6**	**126.0**	**39.1%**	**0.3%**
Total	**317.5**	**264.4**	**260.3**	**295.8**	**323.1**	**100.0%**	**1.1%**

Source: Data accessed from ITC Trade Map in September 2019; EXIM Bank Research

At a narrower level of exports, at HS-6 digit level, it is observed that about 35% of overall exports can be attributed to top 10 items exported by India in 2018. A closer observation helps in analyzing the range of products, India is exporting. It may be inferred that, though petroleum products, gems and jewellery, amongst others were dominant sectors in Indian exports (Table 1), within these sectors, contribution by individual items was significantly skewed. For instance, minerals and mineral fuels (HS-27) represented almost 15% of total exports from India; however, within this segment, mineral oils and preparations (HS-271019) by itself accounted for about 10% of total exports. Similarly, within the broad category, pearls and precious stones (HS-71), which captures 12% share of total exports, diamonds (HS-710239) alone accounted for 7.5% share of total exports, reflecting the narrow base of Indian exports.

Further, a destination wise analysis reveals that the top 10 destinations contribute to almost 50% of India's total exports (Figure 1). The USA tops the list with a share of 16%, followed by the UAE at 9%, and China at 5%. With respect to the USA, India primarily exported gems and jewellery (share of 20.3% in 2018), pharmaceutical products (9.7%), and machinery and mechanical appliances (7.2%). Gems and jewellery, and mineral fuels and oils contribute to more than half of India's exports to the UAE. While for China, mineral fuels and oils, organic chemicals, cotton-based products etc. are major exported items.

Figure 1: Major Export Destinations for India: 2018



Source: Data accessed from ITC Trade Map in September 2019; EXIM Bank Research

Whilst India's share in the world exports is 1.7%, its share in the world imports was recorded at 2.6% in 2018, making India, the 10th largest importer in the world. India's overall merchandise imports crossed the US$ 500 billion mark for the first time in 2018, exhibiting a growth rate of 14% over 2017 imports.

During 2009 to 2018, the imports by India have increased by almost 1.9 times. An analysis of top imported products shows that mineral fuels and oils are a major contributor to Indian imports with a share of 33%, followed by 'natural, precious or semi-precious stones' (13%), and 'electrical machinery and equipment' (10%), thereby, top three sectors contributing to more than 56% of India's imports in 2018 (Table 2).

Further, in 2018, India's increased imports were on account of high growth in imports of 'mineral fuels and oils' (growth of 37% in 2018 over 2017), 'organic chemicals' (26%), 'machinery and mechanical appliances' (20%), and 'electrical machinery and equipment' (12%). However, sectors such as 'natural and precious or semi-precious stones', and 'vegetable fats and oils' witnessed decline.

Table 2: Major products imported by India (US$ Billion)

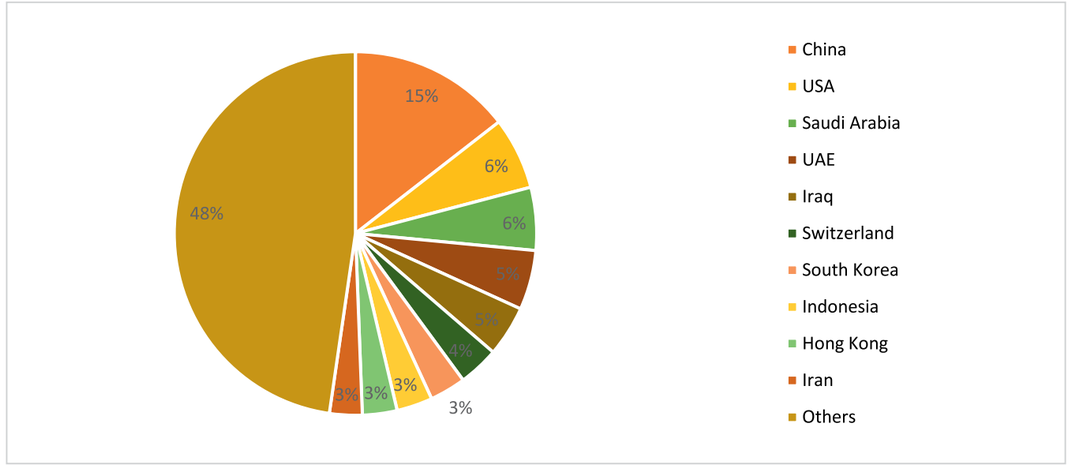
Sector	2014	2015	2016	2017	2018	Share in 2018	AAGR (2014-18)
Mineral fuels and oils	176.9	104.6	89.3	123.0	168.6	33.2%	4.8%
Natural, precious or semi-precious stones	59.8	59.6	48.1	74.4	65.0	12.8%	5.6%
Electrical machinery and equipment	31.9	35.9	37.0	46.9	52.4	10.3%	13.5%
Machinery and mechanical appliances	31.2	32.0	32.5	36.0	43.2	8.5%	8.8%
Organic chemicals	18.2	15.9	14.8	18.0	22.6	4.4%	6.8%
Plastics and articles thereof	11.8	11.3	11.4	13.0	15.2	3.0%	6.9%
Iron and steel	11.3	11.7	8.7	10.0	12.0	2.4%	3.1%
Animal or vegetable fats and oils	10.6	10.5	10.5	11.9	10.2	2.0%	-0.7%
Optical, photographic, cinematographic instruments	7.1	7.2	7.2	8.4	9.5	1.9%	7.8%
Inorganic chemicals	5.0	5.1	4.8	5.6	7.3	1.4%	10.6%
Top 10	**363.8**	**293.8**	**264.3**	**347.2**	**406**	**79.9%**	**4.8%**
Others	**95.4**	**96.8**	**92.3**	**96.9**	**101.7**	**20.1%**	**1.7%**
Total	**459.4**	**390.7**	**356.7**	**444.1**	**507.6**	**100.0%**	**3.8%**

Source: Data accessed from ITC Trade Map in September 2019; EXIM Bank Research

At a HS-6 digit level, it is noted that in 2018, 'petroleum oils and oils obtained from bituminous minerals, crude' (HS-270900) is the largest contributor in overall imports with a share of 22.6%, followed by gold (HS-710812) with a share of 6.2%. It is vital to note that the top ten items at HS 6-digit level constitute over 45% of overall imports, which again shows that Indian imports are concentrated towards a select few items.

Additionally, an analysis of the major import sources for India reveals that, in 2018, China (15%) was the largest import source for India, followed by USA (6%), Saudi Arabia (6%), UAE (5%), and Iraq (5%) (Figure 2). The top ten countries are responsible for more than half of India's overall imports. Almost one-third of India's imports from China are of 'electrical machinery and equipment'. This is followed by 'machinery and mechanical appliances' (19%), 'organic chemicals' (12%), 'plastic and articles' (4%), and 'iron and steel' from China (2%).

Figure 2: Major Import Sources for India, 2018



Source: Data accessed from ITC Trade Map in September 2019; EXIM Bank Research

Trade Balance

In 2018, India registered a trade deficit of US$ 184.5 billion, up from US$ 89.6 billion in 2009, that is, almost twice in ten years. Interestingly, India maintains a trade surplus with the USA, the UK, and the UAE, amongst others. However, it has a high trade deficit with China, which was recorded at over US$ 57 billion in 2018, up from US$ 20 billion in 2009.

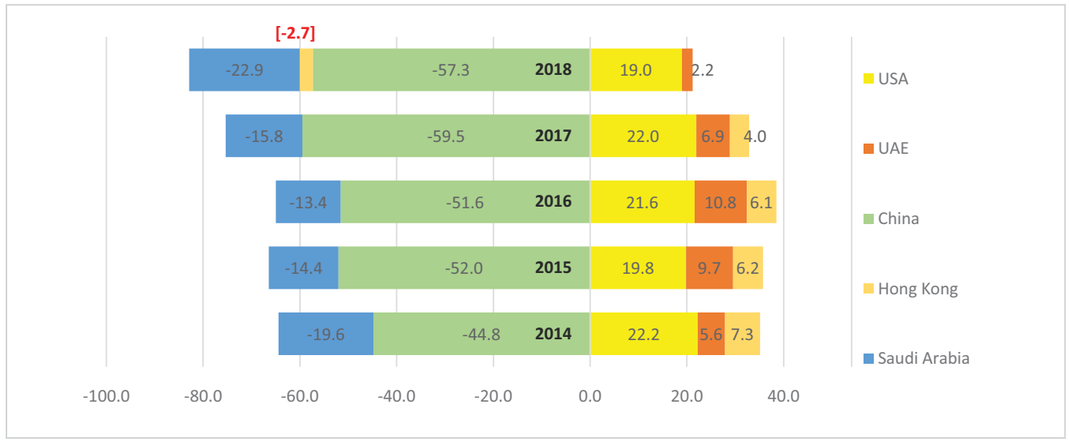
Whilst, India has consistently maintained a trade deficit between 2009-2018, the deficit in 2018 is the worst since 2012. India's overall imports from world have registered an AAGR of 8.7% during 2009 to 2018, the same from China grew at an average annual rate of 11.1%. In fact, in the last 5 years, that is, during 2014-18, India's imports from China registered an AAGR of 6.4% vis-à-vis 3.8% from the world.

In 2018, India's deficit with China reduced by over US$ 2 billion. While, it is beneficial for India to reduce its dependence on Chinese imports, it is also interesting to observe India's trade with the Hong Kong region, which is a special administrative region (SAR) of China. The analysis reveals that while India was maintaining a trade surplus with Hong Kong until 2017, in 2018, Hong Kong featured in the list of trade deficit partners of India (Yellow patch in Figure 3).

A granular analysis reveals that China could be routing its exports through Hong Kong.

Various products such as electrical machinery and equipment; machinery and mechanical appliances; optical, photographic, cinematographic instruments; iron and steel etc. have either observed decreasing imports from China or a very nominal increase in 2018 vis-à-vis 2017. However, the same products imported from Hong Kong exhibited unprecedented growth rates (Table 3).

Figure 3: India's Trade Balance with major trade partners, 2014-2018 (in US$ billion)



Source: Data accessed from ITC Trade Map in September 2019; EXIM Bank Research

Table 3: Recent growth in imports from China and Hong Kong (2017 and 2018)

Industry	Growth in imports from China		Growth in imports from Hong Kong	
	2018 vis-à-vis 2017	2017 vis-à-vis 2016	2018 vis-à-vis 2017	2017 vis-à-vis 2016
Electrical machinery and equipment	-15.2%	31.2%	453.8%	26.6%
Machinery and mechanical appliances	6.6%	19.4%	702.7%	13.6%
Optical, photographic, cinematographic, medical instruments	0.8%	21.8%	223.8%	2.0%
Iron and Steel	-0.9%	-16.6%	110.8%	58.6%
Total	**2.5%**	**19%**	**44.5%**	**54.6%**

Source: Data accessed from ITC Trade Map on 29th May 2019; EXIM Bank Research

Objective of the Study

While there are several approaches that should be introduced to enhance exports from India, greater integration in the global value chains (GVCs) and focus on higher technology-intensive exports are vital. Moreover, value chains account for nearly 80% of global trade[4]. Clearly, there is a case for enmeshing India's production in these value chains.

[4] GVCs and Development: Investment and Value Added Trade in the Global Economy, UNCTAD, 2013
https://unctad.org/en/PublicationsLibrary/diae2013d1_en.pdf

World over trade is witnessing changes as countries participate in the GVCs. For emerging economies such as India to reap the benefits of trade, it should participate in the GVCs. Though India's participation in GVCs in consistently increasing but its participation is quite low vis-à-vis various other developing countries. There are several reasons which have led to lower presence of India in the GVCs. Structural deficiencies such as inadequate infrastructure, labour market rigidities and regulations are some of the factors that have affected India's participation in the value chains. Moreover, India's exports have largely concentrated on products which account for a relatively small share of global imports.

A GVC is a chain of separate but inter-linked and coordinated activities, which can be undertaken within a single firm or be divided among multiple firms in different geographical locations to bring out a product or a service from conception to complete production and delivery to final consumers.

There is a need for India to focus on expanding production capacity as it moves up the value chain, while creating an enabling environment to account for a sizeable share in major leading global exports[5].

Presently, Indian exports are more centered towards the resource and low to mid tech items. The Study investigates trends in India's tech-based exports, and its participation in the GVCs. The Study also attempts to list some focus sectors for Indian exports to make a transition to high value exports. The objective of the study has been to stress upon the fact that India could improve its exports not by just producing finished products but also by being part of the value chain process of such products. This could help India to increase its export share beyond 2%, globally. The Study concludes by providing a few suggestive prescriptions for augmenting India's share in the GVCs.

[5] GVC Development Report 2017, WTO
https://www.wto.org/english/res_e/publications_e/gvcd_report_17_e.htm

CHAPTER

TECH-BASED EXPORTS: INDIA'S SCENARIO

Given the multiple positive spillovers of the sector, manufacturing remains one of the most important areas for any economy to focus on. Further, technology-oriented manufacturing not only provides impetus to enhance revenue generation (through exports) but also has the potential to have a multiplier effect on job creation[6].

Countries relying on exports of primary commodities face constraints in the long run development process. Negative trends in terms of trade, uncertainty arising from price variability consequently leads to fluctuating export earnings. As economies develop, there is an ideal shift from resource-based exports to low-tech exports to medium and then gradually to high-tech intensive exports.

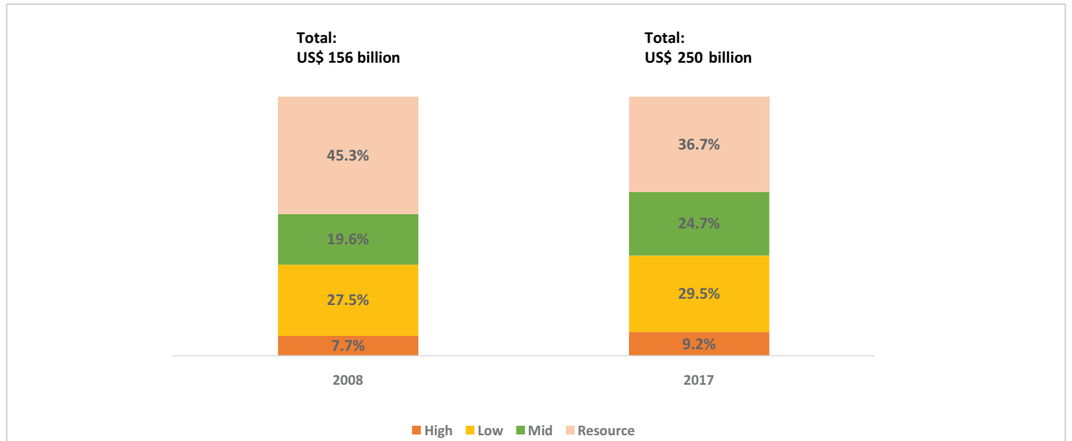
Whilst India's exports crossed the US$ 300 billion mark again in 2018 (first time in 2011) and export growth has been remarkable in the last two years (13.6% in 2017 and 9.2% in 2018), its share in world exports is yet to explore its full potential. In 2018, India's share in the world exports was recorded at 1.7%, with a global rank of 18. China remained the world's largest exporter with a share of 18%. Given the scope for improvement, in the medium term, India should aim at raising its share in world exports to at least 5%[7]. However, with a vision of this scale, India needs to focus on technology intensive exports with a special thrust on high-tech sector, as this sector could generate a high revenue, other than getting the exports integrated into the GVCs, within the manufacturing space.

The value added by manufacturing sector as a percent of GDP in India, has remained stagnant and has recorded an average of 15.9% in the last 60 years. The highest share was registered in the year 1996 at 17.9%, while in 2018, it stood at 15%[8]. Additionally, the value addition by manufacturing as a percent of India's GDP has consistently declined since 2009, barring the year 2015 and 2018, when it marginally improved over its previous year.

This chapter of the Study attempts to assess the current scenario of the manufacturing exports from India, on the basis of technology. This is done by using the technological classification of trade in terms of high, medium, low and resource-based items. The United Nations Industrial Development Organization (UNIDO), in its industrial development report, 2013[9], classified 68 product groups as resource-based, 44 product groups as low-tech exports, 73 product groups as mid-tech exports, and 17 product groups as high-tech exports, at the Standard International Trade Classification (SITC) 3-digit level. The list of these products is provided in the Annexure.

It may be noted that the chapter focuses on manufacturing exports and the sum of the above mentioned four categories is the total of manufacturing exports. Exports of primary products such as dairy products, vegetables, tea, coffee, amongst others, have not been considered under the manufacturing sector[10].

Figure 4: Tech-based manufacturing exports from India: 2008 and 2017



Source: UN COMTRADE; EXIM Bank Research

It is apparent that during 2008-2017, Indian export sector has witnessed a decent transition, in terms of technology mix. The share of resource-based exports has reduced from 45% in 2008 to 37% in 2017, while the shares of low and mid-tech-intensive exports have increased by 2 and 5 percentage points, respectively, during the last decade (Figure 4).

As far as the high-tech exports are concerned, the share of this segment in India's exports has increased from 7.7% in 2008 to 9.2% in 2017. This increase in share can majorly be attributed to the growing imports of pharmaceutical products in the world market in recent years, which also dominates the high-tech exports from India. India majorly exports medicaments (incl. veterinary medicaments) (SITC-542), which accounts for 84.4% share in pharmaceutical exports from India, while the rest is contributed by Medicinal and pharmaceutical products (SITC-541). Within the SITC-542, the segment 'Medicaments, n.e.s., put up in measured doses/in forms/packings for retail sale' (SITC-54293) contributed a significant share of 80.2% (of SITC-542) to the exports in 2017. In fact, the world imports of high-tech pharmaceutical products[11] reached US$ 575.9 billion in 2017, up from US$ 426.7 billion in 2008, thereby recording an AAGR of 3.5%, during this period. Indian exports during the same period for the same segment (SITC- 541 and 542) recorded an average annual growth of 11%.

[6] World bank
[7] Reviving and Accelerating India's Exports: Policy Issues and Suggestions, Working Paper 2017,Ministry of Finance, Government of India https://dea.gov.in/sites/default/files/RevivingAcceleratingIndiaExports_Issues_Suggestions.pdf
[8] World Bank Development Indicators
[9] The data includes only manufacturing exports and excludes the exports of primary products in line with UNIDO development report 2013

[10] Lall (2000), UNCTAD, https://unctadstat.unctad.org/EN/Classifications/DimSitcRev3Products_Ldc_Hierarchy.pdf
[11] Medicinal and Pharmaceutical products(SITC- 541, 542)

While India's exports have been on a positive curve in the last two years, it is vital to identify and assess the sectors, especially based on their technology, which have been contributing to India's export growth story and at the same time, the kind of revenue they are fetching.

Resource-Based Exports

Resource based manufactures mainly include agro/forest based products like prepared meats/fruits, beverages, wood products, vegetable oils. Products such as ore concentrates, petroleum/rubber products, cement, amongst others also fall under this category. While a nation might be exporting the resource-based exports in huge quantities, there is a possibility that the final revenue might not be that high.

In the context of India, it is observed that resource-based exports constitute the largest share of manufactured exports from India at over 35%.

Its exports reached at a level of US$ 91.8 billion in 2017 as compared to US$ 70.6 billion in 2008, recording an AAGR of 5.7%, during this period. It may also be observed that resource-based exports are being dominated mainly by two commodity groups namely, 'petroleum products' (SITC-334) (share of 38% in 2017) and 'pearls and precious stones' (SITC-667) (28%) (Table 4). Further, in 2017, the top 5 commodity groups under resource-based exports contributed to three-fourth of the total resource-based exports from India. Major export destinations for Indian resource-based exports in 2017 included the USA (14%), Hong Kong (11%), the UAE (10%), Singapore (8%) and China (6%).

Table 4: Key Resource Based Exports from India

SITC code	Description	2008	2017	Share in total resource-based exports (2017)	AAGR (2008-2017)
334	Petroleum products	31.6	34.8	38.0%	7.0%
667	Pearls, precious stones	15.2	25.3	27.6%	8.6%
515	Organic-inorganic compounds	0.6	3.4	3.7%	22.8%
511	Hydrocarbons, nes, derivates	2	2.9	3.2%	10.0%
531	Synthetic colours, lakes, etc.	1.2	2.1	2.3%	8.5%
516	Other organic chemicals	2.7	2	2.2%	2.4%
625	Rubber tyres, tubes, etc.	1	1.8	1.9%	9.8%
514	Nitrogen-functional compounds	0.8	1.7	1.9%	10.8%
281	Iron ore, concentrates	5.6	1.7	1.8%	24.7%
661	Lime, cement, construction, material	1	1.3	1.4%	3.7%
Top 10		**61.5**	**77.0**	**84.0%**	**5.5%**
Others		**9.1**	**14.8**	**16.0%**	**16.0%**
Total		**70.6**	**91.8**	**100%**	**100.0%**

Source: UN COMTRADE; EXIM Bank Research

Low-tech exports

Low-tech exports are classified into two categories, namely - textile/fashion cluster like textile fabrics, clothing, headgear, footwear, leather manufactures, and travel goods and other low-tech exports like-pottery, simple metal parts/structures, furniture, jewellery, toys, plastic products.

Low-tech exports from India were registered at US$ 73.8 billion in 2017. This has grown from a level of US$ 42.8 billion in 2008, thereby recording an AAGR of 6.7%, during this period (Table 5).

Low-tech exports constituted approximately 30% of manufactured exports from India in 2017. Jewellery, textile, footwear and apparels are some of the major low-tech commodities which are exported by India.

With respect to destinations, India majorly exports low-tech products to the USA (20%), the UAE (16%), the UK (6%), Hong Kong (6%) and Germany (5%). In the exports of low-tech products particularly in textile and garments, India is facing a tough competition from various economies. Economies such as Bangladesh and Vietnam are increasing their share in the international textile, leather and footwear markets. For instance, India's share in the global exports of textile and garments in 2008 was 3.5% and increased to 4.7% in 2017. During the same time period, Vietnam's share increased from 1.6% to 4.0%. Interestingly, Vietnam which was ranked 18th in 2008, in terms of world's largest exporter of textile and garments, has made a great leap in 2017 to 6th position.

Table 5: Key Low-tech Exports from India

SITC code	Description	2008 (US$ billion)	2017 (US$ billion)	Share in total Low-tech Exports (2017))	AAGR (2008-2017))
897	Gold, silverware, jewellery nes	4.8	13.1	17.7%	25.7%
845	Other textile apparel nes	2.6	6.2	8.4%	10.8%
651	Textile yarn	3.0	5.5	7.4%	11.6%
658	Textile articles nes	2.4	4.9	6.6%	8.8%
842	Women, girl clothing, not knitted	3.2	4.0	5.4%	3.1%
673	Flat-rolled iron etc.	1.5	3.6	4.9%	23.8%
699	Manufacturing base metal, nes	1.9	3.5	4.7%	9.6%
851	Footwear	1.6	2.8	3.8%	7.4%
841	Men's, boys clothing not knitted	1.7	2.6	3.6%	5.5%
843	Men's, boys clothing, knitted	0.9	2.1	2.9%	11.0%
Top 10		**23.6**	**48.3**	**65.4%**	**9.4%**
Others		**19.2**	**25.5**	**34.6%**	**3.9%**
Total		**42.8**	**73.8**	**100%**	**6.7%**

Source: UN COMTRADE; EXIM Bank Research

Mid-tech exports

The share of mid-tech exports from India has increased by almost 5 percentage points in the last 10 years, that is, from 19.6% in 2008 to 24.7% in 2017. Mid-tech exports were recorded at US$ 61.7 billion in 2017, increasing from a level of US$ 30.5 billion in 2008 (Table 6).

Mid-tech exports contribute to almost one-fourth of the manufacturing exports from India. It is observed that the Indian manufacturing exports have displayed a great deal of transition towards the mid-tech products. This is not only visible from the increased share, but also from its growth.

Automotive products and mid-tech process industries; passenger vehicles and parts, commercial vehicles, motorcycles and parts, synthetic fibers, chemicals and paints, fertilizers, plastics, iron, pipes/ tubes are some of the products that constitute mid-tech space.

Mid-tech exports from India have witnessed the highest AAGR of 9.1% during 2008 and 2017, as compared to the other three categories analysed in this chapter.

Within the mid-tech exports, the automotive industry dominates the basket with a share of almost 11%. Major export destinations for this category include the USA (12%), the UAE (6%), Bangladesh (4%), Germany (4%) and Mexico (4%).

Table 6: Key Mid-tech Exports from India

SITC code	Description	2008 US$ (billion)	2017 (US$ billion)	Share in total Mid-tech Exports (2017))	AAGR (2008-2017))
781	Passenger motor vehicles(ex-cluding bus)	2.2	6.6	10.7%	14.8%
784	Parts, tractors ,motor vehicles	1.8	4.9	8.0%	14.9%
793	Ship, boat, floating structures	2.6	4.6	7.5%	11.8%
671	Pig iron, spiegeleisn, etc.	2.1	2.6	4.2%	15.2%
591	Insecticides, etc.	1.0	2.4	3.9%	10.8%
785	Cycles, motorcycles etc.	0.8	2.4	3.9%	14.4%
713	Internal combustion piston engine	1.0	2.3	3.8%	11.8%
772	Electric switch relay circuit	1.1	2.0	3.3%	11.4%
653	Fabrics, man-made fibers	1.6	1.8	2.9%	1.8%
714	Engines, motors non-electrical	0.2	1.8	2.9%	47.8%
Top 10		**14.5**	**31.5**	**51.1%**	**10.0%**
Others		**16.1**	**30.3**	**48.9%**	**8.6%**
Total		**30.5**	**61.7**	**100%**	**9.1%**

Source: UN COMTRADE; EXIM Bank Research

High-tech Exports

High-tech exports which are considered to be one of the vital category of exports, given the dynamics of global economy, includes products with high R&D intensity, such as aerospace, computers, pharmaceuticals, scientific instruments, and electrical machinery.

As mentioned at the beginning of the chapter, this Study uses 17 SITC codes at 3-digit level for the analysis of the high-tech exports. These codes are based on the classification by the UNIDO Industrial Development Report 2013.

Globally, high-tech exports were valued at US$ 3280 billion in 2017 having grown from US$ 2566 billion in 2008, thereby registering an average annual growth rate of 3.1% during 2008-2017. With respect to the products, major exported commodities included transistors Valves etc. (23.3%); telecommunication equipment and parts (15.2%); medicaments (10.7%); automatic data processing equipment (10.6%); and parts for office machines (6.3%).

China is the world's largest high-tech exporter, whereas India is ranked at a distant 23 in terms of high-tech exports. Further, while the share of high-tech exports in total world's manufacturing exports was almost 24% in 2017, the same for India in India's total manufacturing exports was 9.2%. This highlights the fact that India needs to step up in terms of the technology-based exports to cater to the growing global demand of these products.

India's share in the world high-tech exports is below 1% level. However, India's share of hi-tech exports in its overall exports has almost doubled to US$ 23 billion in 2017, from US$ 12 billion in 2008, growing at an average rate of 8.5%, annually, during this period. High-tech exports represented 9.2% of overall Indian manufactured exports in 2017.

It may be observed that while both the total manufacturing exports and the high-tech exports from India reflect a rising trend, the average annual growth rate of total manufacturing exports is 6.5% for the period 2008-2017, while that for the export of high-tech products is 8.5%.

With respect to products, 'pharmaceuticals' and 'electronics' dominate the Indian high-tech exports. Medicaments is the leading export item for India under the high-tech category accounting for 52% of total Indian high-tech exports in 2017 (Table 7). According to Pharmaceutical Export Promotion Council, India is world's largest exporter of pharmaceutical products in terms of volume. In fact, export of generic pharmaceuticals is one of India's major strengths. India exports affordable generic drugs in contrast to costly, patented drugs supplied by MNCs. Additionally, India is also a major supplier of bulk drugs (pharmaceutical raw materials).

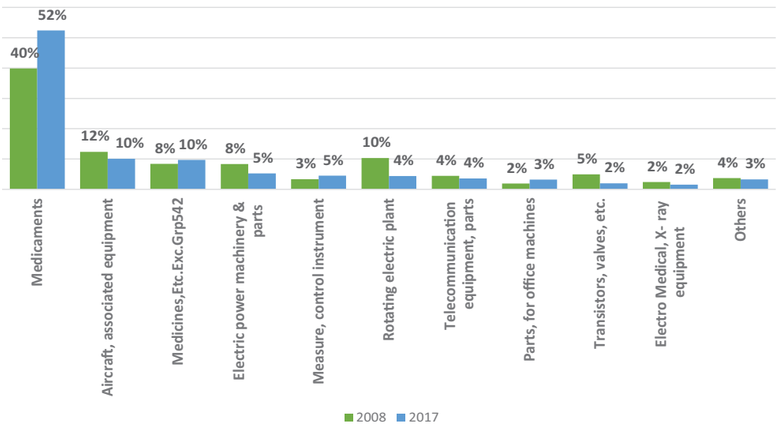
Table 7:High-tech Exports from India

SITC code	Description	2008 US$ (billion)	2017 (US$ billion)	Share in total High-tech Exports (2017))	AAGR (2008-2017))
542	Medicaments	4.8	12.1	52.4%	11.4%
792	Aircraft, associated equipment	1.5	2.3	10.1%	16.6%
541	Medicines, etc. (Exc. Grp542)	1.0	2.2	9.7%	10.1%
771	Electric power machinery & parts	1.0	1.2	5.3%	2.5%
874	Measure, control instrument	0.4	1.0	4.5%	11.8%
716	Rotating electric plant	1.3	1.0	4.4%	-1.3%
764	Telecommunication equip-ment, parts	0.5	0.8	3.6%	67.7%
759	Parts, for office machines	0.2	0.7	3.2%	20.8%
776	Transistors, valves, Etc.	0.6	0.5	2.0%	-1.2%
774	Electro-Medical, X-ray equip-ment	0.3	0.4	1.5%	3.7%
718	Other power generating machinery	0.1	0.3	1.2%	18.4%
752	Automatic data processing equipment	0.23	0.16	0.7%	-1.0%
891	Arms and ammunition	0.04	0.14	0.6%	81.8%
751	Office machines	0.05	0.11	0.5%	12.2%
871	Optical instruments, nes	0.01	0.05	0.2%	31.5%
881	Photograph apparatus and equipment	0.03	0.02	0.1%	8.3%
525	Radio-Active materials	0.01	0.02	0.1%	49.1%
Total		**12.1**	**23.0**	**100%**	**8.5%**

Source: UN COMTRADE; EXIM Bank Research

A growth analysis of the high-tech exports from India reveals that the telecommunication equipment (SITC-764) has registered an AAGR of 67.7% during 2008 to 2017, with exports increasing from US$ 0.5 billion to US$ 0.8 billion during 2008-2017 (Table 7). While exports of 'telecommunication equipment and parts thereof', have been increasing due to various companies setting up plants in India, India continues to face stiff competition from China in this segment.

Figure 5: Changing share of key high-tech exports from India: 2008 and 2017

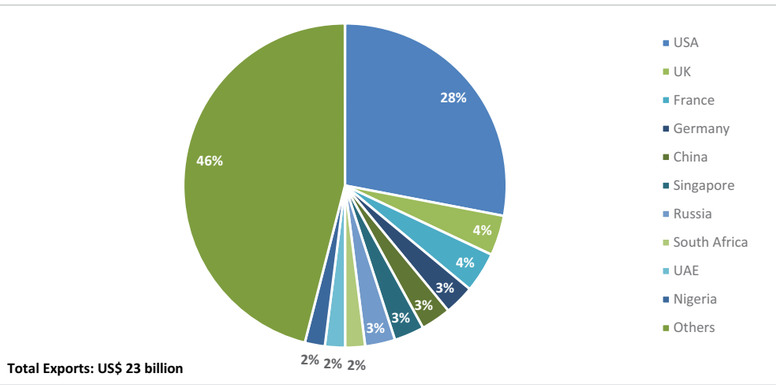


Source: UN COMTRADE; EXIM Bank Research

Indian high-tech exports are concentrated towards pharmaceutical sector and are mainly driven by higher demand in the regions such as North America and Europe[12]. There has been some notable increase in the share of medicaments in high-tech exports during 2008-2017- from 39% in 2008 to over 52% in 2017. It may also be observed that most products witnessed a decline in share amongst high-tech exports in 2017, as compared to 2008 (Figure 5).

The USA is India's largest export destination for high-tech exports in 2017, with exports from this sector to the US touching US$ 6.4 billion, contributing to 28% of India's total exports of high-tech products. The UK has emerged as the second largest export destination with 4% share, followed by France (4%), Germany (3%), and China (3%). It may also be noted that top 10 countries account for more than half of the total high-tech exports from India (Figure 6).

Figure 6: Major Export Destinations of high-tech Commodities for India (2017)



Source: UN COMTRADE; EXIM Bank Research

[12] Ministry of Commerce and Industry, Government of India

India's trade position vis-à-vis the world in technology-oriented products': A brief

In 2017, India's manufactured exports accounted for 1.8% share of global manufacturing exports. Resource-based exports from India accounted for 3.4% share of global resource-based exports in 2017, followed by low-tech exports with a share of 3% in global low-tech exports and mid-tech exports accounting for 1.2% share in its respective category. It is vital to note here that the share of mid-tech exports in global mid-tech exports has more than doubled during 2008-2017. However, the global footprint of India's high-tech exports, though has increased during the analyzed period, remains minuscule. In 2017, its share in global high-tech exports was less than 1% (Table 8).

Table 8: India's exports on the basis of technology vis-à-vis the world (US$ Billion)

Commodity	India's Exports		World Exports		India's share	
	2008	2017	2008	2017	2008	2017
High-tech	12.1	23	2566.2	3280.5	0.5%	0.7%
Mid-Tech	30.5	61.7	4734.5	5268.8	0.6%	1.2%
Low-Tech	42.8	73.8	2206.4	2424.4	1.9%	3.0%
Resource based	70.6	91.8	2639.3	2723.2	2.7%	3.4%
Total	**156.0**	**250.3**	**12146.4**	**13696.9**	**1.3%**	**1.8%**

Source: UN COMTRADE; EXIM Bank Research

In terms of imports, India's share in global high-tech imports was 1.6% in 2017 and has increased from 1.2% in 2008. For the same period, resource-based imports have witnessed the highest increase in share (from 2.2% in 2008 to 3.6% in 2017), followed by mid-tech (1.3% in 2008 to 1.6% in 2017) and low-tech (0.8% to 1.1%) (Table 9).

Table 9: India's imports based on technology vis-à-vis the world (US$ Billion)

Commodity	India's Exports		World Exports		India's share	
	2008	2017	2008	2017	2008	2017
High-tech	32.3	56.1	2664.8	3579.9	1.2%	1.6%
Mid-Tech	62.2	83.9	4664.2	5246.4	1.3%	1.6%
Low-Tech	17.4	26.3	2214.4	2295.8	0.8%	1.1%
Resource based	58.6	100.3	2692.3	2798.8	2.2%	3.6%
Total	**170.4**	**266.6**	**12235.7**	**13920.9**	**1.4%**	**1.9%**

Source: UN COMTRADE; EXIM Bank Research

Way ahead

This chapter has made an attempt to highlight the state of India's exports and categories of products that India is engaged in. The need is to move and graduate towards products which could garner more foreign exchange, and hence it will be crucial for India to participate in the global value chain ecosystem of various products.

While India has displayed an impressive trend in its exports of the high-tech commodities, majorly at the behest of pharmaceuticals, it remains significantly behind when it comes to its hold in the global market, therefore, leaving a significant lacuna to be filled.

It is but necessary to be able to manufacture or produce the entire product within the country. On the contrary given the evolving dynamics it would be ideal to be in the value chain of high-tech product, and produce a part of the final product, i.e., parts of a certain product.

The next chapter dwells into the GVC position of India in the global landscape while evaluating possibility to concentrate on technology-oriented products. The chapter would analyze various parameters relating to the GVCs, which would facilitate in examining India's position vis-à-vis other select economies in terms of GVC participation.

CHAPTER

GVC: INDIA'S LOCUS STANDI

The nature of the technology used in products plays a major role in determining the structure of value chains and the benefits of participation for developing countries. The previous chapter observed a gradual transition towards medium and high-tech exports from low and resource-based exports from India.

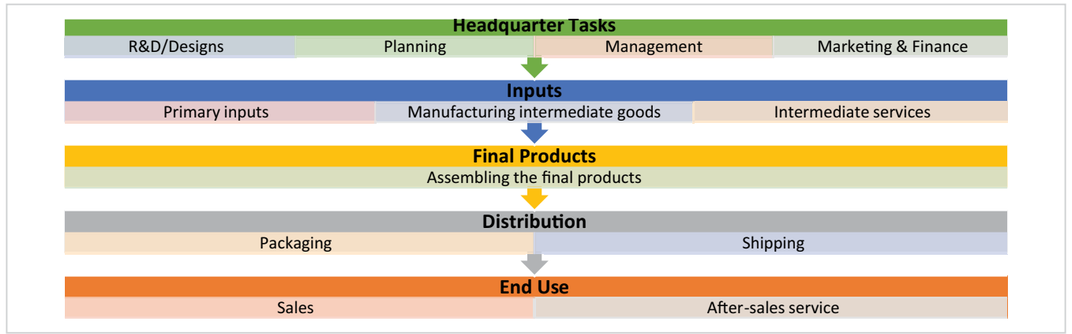
Today, GVCs are more spread in the production of electronics and electrical equipment, chemicals and pharmaceuticals, machinery and transport equipment, and textile and garments, amongst others. Interestingly, these sectors also have a mid to high technological intensity. For India, it is very crucial to increase its production base in these sectors, in order to achieve quicker export success.

Manufacturing in the 21st century is a lot more globalized with production, trade, and investment being increasingly organized, with in the GVCs, where different stages of production are located across different economies of the world. Labour, at the same time, is becoming increasingly mobile. Telecommunication, logistics, transportation, and computing services are also increasingly revolutionizing the production processes. This has resulted in reduction of trade costs across the borders and is further facilitated through trade agreements. In the current global scenario, countries are specializing at stages of value chains, rather than establishing a whole new production plant. A commodity in the current times, changes many hands before it reaches to the final consumers. Hence, there is a strong trend towards the international dispersion of value chain activities such as design, production, marketing, distribution, etc. In short, a GVC essentially, is a sequence of all functional activities required in the process of value creation, involving more than one country.

While GVCs are source of gains for many economies, gains from GVC participation are not automatic.The benefits of GVC depend on the level of operations that any economy is undertaking. Paradoxical concerns exist between developed and developing countries; developed countries tend to participate at high end stages such as product development, R&D, marketing, brand building and promotion whereas developing countries' participation is limited to manufacturing and assembly stages.

The value chain starts with designing, development and innovation in the product which are the upstream stages of production. It then moves to the middle stage where the product is manufactured and assembled. Finally, downstream stages include transportation, marketing, sales, and after sales services (Exhibit 1). Participation in product development, research and development, and the final stages of production leads to significant gains from trade as these stages make high value addition.

Exhibit 1: A simplified value chain

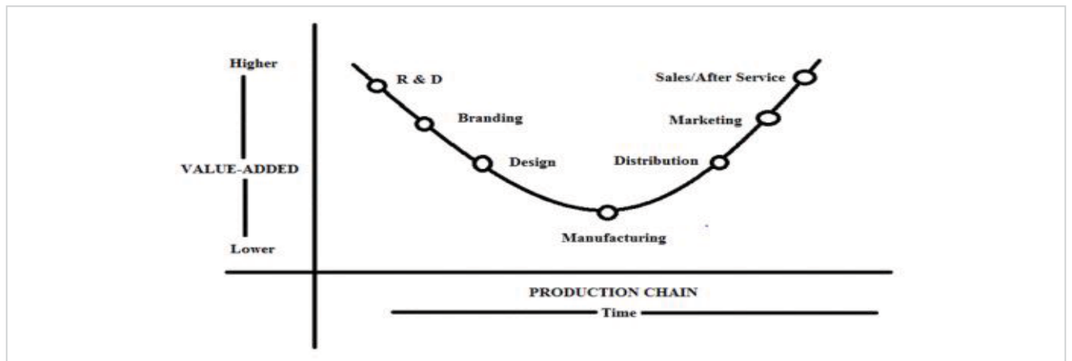


Source: Adapted from UNESCAP, 'Asia-Pacific Trade and Investment Report 2015" [13]

The United States and other developed nations, for instance, are being impacted due to availability of cheap labour in the developing regions, including China, which is posing a threat to employment in developed nations. Since developing countries tend to focus on low value adding production activities such as manufacturing and assembling, they get locked at the low-end value chains, as seen in an imaginary 'smile curve' (Exhibit 2).

The popular "smile curve" is a graphical representation of value creation along a value chain. The distribution of value across different stages of production is not even; initial stages like R&D and final stages like marketing add higher values to the production, while middle stages like manufacturing add less value to it. This flow of value creation from initial to final stages of production takes the smile shape, resulting in a phenomenon called smile curve. Since, there lies a huge difference in comparative advantage and competitiveness across countries, generally, developed countries tend to engage in higher value adding stages of production like R&D, branding, marketing whereas developing countries or LDCs engage in low value adding stages of production like manufacturing and assembly.

Exhibit 2: Smile Curve



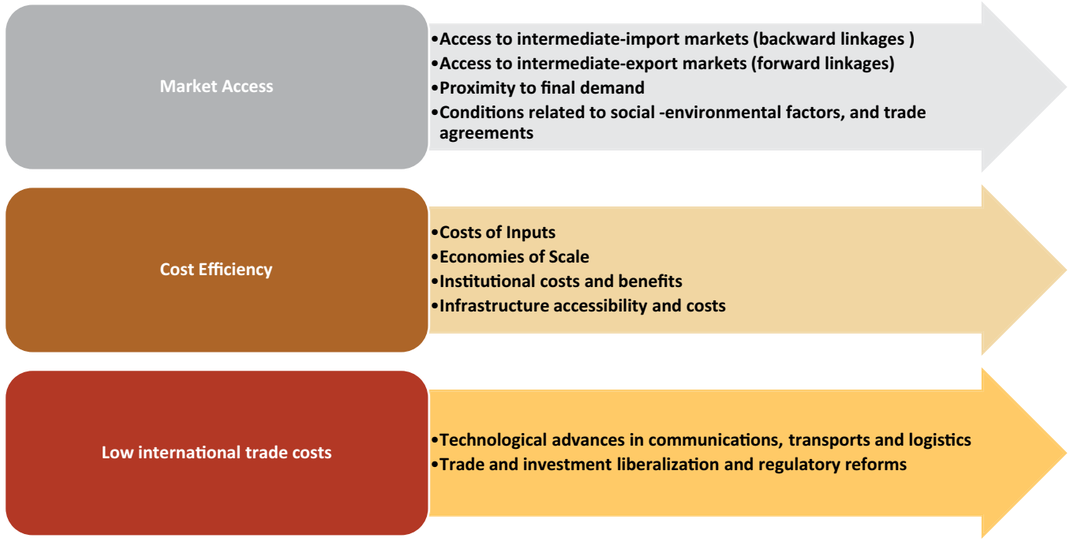
Source: Adapted from "Smile curve and its linkages with Global Value Chains, Munich Personal RePEc Archive"[14]

[13] https://www.unescap.org/sites/default/files/Chapter%207%20-%20GVCs%20in%20the%20Asia-Pacific.pdf
[14] https://mpra.ub.uni-muenchen.de/79324/1/MPRA_paper_79324.pdf

Global Value Chains and Economic Development

In recent years, wider integration of economies through multilateral trade agreements and increasing globalization have significantly reduced the trade costs across the globe, which has resulted in increased integration of economies into the global production network. However, for GVCs to emerge, trade costs must be low enough to enable firms utilizing country-specific advantages related to cost efficiency or market access[15].

Exhibit 3: Main factors behind GVCs



Source: Adapated from UNESCAP, 'Asia-Pacific Trade and Investment Report 2015"

From the view of development, there are several positive aspects of GVCs.

- First, firms can take the benefit of their comparative advantage in a specific production process, instead of establishing the whole course of production capacity and thereby, participating in the global production network.

- Second, more employment opportunities are created once participation in GVCs is initiated (UNCTAD, 2013). For instance, jobs are being created in developing economies from iPhone assembly in China, BPO operations in India, and automobile and auto part production in Thailand, Turkey, and China.

- Third, GVCs also provide the opportunity for technology transfer or spillover to developing countries through local learning.

[15] Asia-Pacific Trade And Investment Report 2015

Participation in value chains to facilitate economic development has benefits and pitfalls. Developing countries are not required to start from scratch and build a whole new industry to kick-start the process of industrialization. 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, followed by productivity benefits and technology spillovers[16]. On the flip side, they are often stuck at low value addition stages and exploit their natural resources for expansion.

Data and Methodology to analyse GVA

The OECD-World Trade Organization (WTO) Trade in Value-added (TiVA) statistics have been used extensively in the evolving value chain literature. The Trade in Value Added (TiVA) database is a collection of measures that can provide insights into global production networks and supply chains beyond what is possible with conventional trade statistics. The latest 2018 edition of TiVA covers 64 economies (including all OECD, the EU and G20 countries and most East and Southeast Asian economies) as well as regional aggregates. Indicators are available for 36 industries for years upto 2015 (in some cases, 2016). The indicators are derived from the 2018 verssion of OECD's Inter-Country Input-Output (ICIO) Database [17].

Value-added Content of Gross Exports

Goods and services exported by an economy are composed of inputs from various countries around the world. The concept of measuring trade based on the value added at each stage of production can provide insights about a country's participation in GVCs. A conclusion based on just exports could be misleading about a country's participation. This is because, a country might have a high export figure, but it may have a low value addition to exports (high dependence of a country on imports of intermediates for exports).

The TiVA initiative addresses the double counting, implicit in current gross flows of trade, and instead, measures flows related to the value that is added by a country in the production of any good or service that is exported. A simple example illustrates this. Country A exports US$ 100 worth goods produced entirely within A to country B that further processes them before exporting them to C, where they are consumed. B adds value of US$ 10 to the goods and so exports goods worth US$ 110 to C. Conventional measures of trade would show total global exports of US$ 210 but only US$ 110 of value-addition has been generated in their production. Conventional measures also show that C has a trade deficit of US$ 110 with B, and no trade at all with A, even though A is the chief beneficiary of C's consumption.

The estimation of trade in value-added terms shows the decomposition of gross exports into their domestic and foreign value-added contents[18] ;

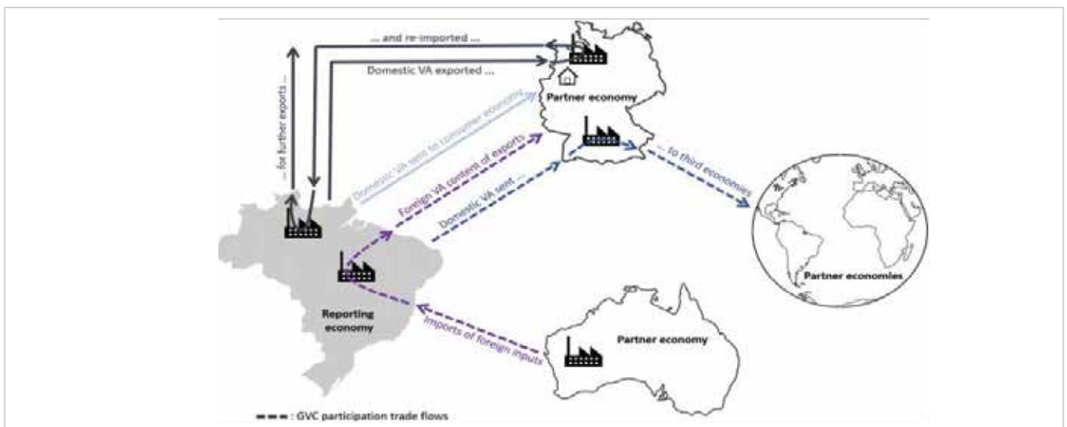
[16] Baldwin & Yan, 2014,Productivity Growth and International competitiveness http://www.iariw.org/papers/2014/Gu2Paper.pdf
[17] OECD TiVA database,2018
See http://www.oecd.org/industry/ind/tiva-2018-differences-tiva-2016.pdf, for differences in 2018 database as compared to earlier version
[18] WTO explanatory note, WTO "Trade in Value-Added and Global Value Chains" profiles https://www.wto.org/english/res_e/statis_e/miwi_e/Explanatory_Notes_e.pdf

Domestic Value-added content of gross exports: This is composed of three elements, namely,' Domestic value-added sent to consumer economy', 'Domestic value-added sent to third economies', and 'Domestic value-added re-imported in the economy'.

- *Domestic value-added sent to consumer economy* corresponds to the domestic value-added embodied either in final or intermediate goods or services that are directly consumed by the importing economy. For instance, India's value added in exports of petro products consumed by other economies.
- *Domestic value-added sent to third economies* represents the domestic value added contained in intermediates (goods or services) exported to a partner economy that re-exports them to a third economy as embodied in other products. This illustrates the multiple value-added exchanges taking place among GVCs and corresponds to the "Forward GVC linkages". For instance, India exports cotton to Bangladesh, Bangladesh produces garments using cotton and then exports it other European and Asian countries.
- *Domestic value-added re-imported in the economy* refers to the domestic value added of exported intermediates or inputs, that is sent back to the economy of origin as embodied in other intermediates and used to produce exports. Such value-added round-trip between two (or more) economies highlights the domestic value-added content present in an economy's imports. For instance, India exports iron ore to China and China uses iron ore to make steel and exports it back to India, and further this steel is used in production of other machinery and engineering goods, which is again exported from India.

Foreign value-added content of exports: This corresponds to the value added of inputs that were imported, in order to produce intermediate or final goods/services to be exported. It corresponds to the "Backward GVC linkages". For instance, i-Phone assembly lines in China, wherein it imports major components of i-Phone and assembles it and then exports it to the world. In this case, these components are foreign value-added content of exports for China.

Exhibit 4: The Value-added Components of Gross Exports and GVC Trade Flows

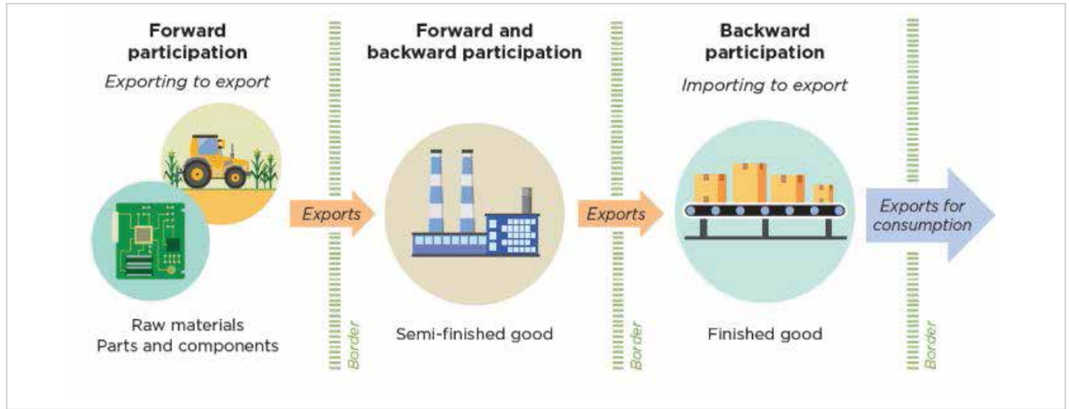


Source: Adapted from WTO explanatory note, WTO "Trade in Value-Added and Global Value Chains" profiles

There are two broad categories of GVCs. These can broadly be categorized as: -

- **Backward Linkages:** A country can integrate with the world through imports of intermediates. This is called backward linkages. It is calculated as share of foreign value-added content of gross exports.
- **Forward Linkages:** A country can also link with global value chains by exporting inputs to the other economies, this is termed as forward linkages. It is calculated as domestic value added embodied in foreign exports as a share of gross exports.

Exhibit 5: Backward and Forward Participation in GVCs



Source: Adapted from World Development Report 2020, 'Trading for development in the age of Global Value Chains'

To measure the extent of India's participation in GVCs, the Study uses various parameters, namely, 'Domestic value-added content of gross exports', 'Domestic value added in foreign final demand', 'Foreign value-added content of gross exports', and 'Services value added content of gross exports' (in chapter 5).

- **Domestic Value-added Content of Gross Exports:** This indicator illustrates domestic value-added content in exports, that is, how much a country adds value domestically, as exports could also include inputs imported from abroad. A higher value of this indicator would imply that domestic production is adding higher value to the exports and indicative of country's focus on manufacturing and skill development.
- **Domestic Value added in Foreign Final Demand:** This captures the value added that industries export both directly, through exports of final goods or services and, indirectly via exports of intermediates that reach foreign final consumers. Additionally, it can be considered as a measure of an industry's reliance on foreign final demand. Further, this indicator also provides insight about a country's position in value chains, for instance, consider a country that has a very high value addition in final demand.This implies that the country is responsible for completing the last stages of value chains and has high interaction with final consumers. In the previously mentioned example of i-Phone assembly line, China would have a very high domestic value added share in foreign final demand because it just assembles and sells it to the final consumers, but China would have low domestic value added share in gross exports because assembly stages are less value adding.

- **Foreign value-added Content of Gross Exports:** This parameter shows the dependence of a country on foreign inputs for their exports. A higher value of this indicator implies growing integration with the world economy through the import of intermediates.

The Study attempts to assess the GVC participation which is defined as a sum of backward and forward participation (UNESCAP, 2015)[19], and the Services Value-Added Content of Gross Exports (in chapter 5).

- **The Ratio of Forward and Backward Linkages:** To analyse if India's growing participation in GVCs is due to higher backward or forward participation, the study also calculates the ratio of forward participation to backward participation. This helps to deduce whether India depends on greater foreign inputs for production (lower value of ratio) or is increasingly becoming a supplier of inputs (higher value of the ratio).

- **Services Value added Content of Gross Exports:** The increased use of services in manufacturing has resulted in a phenomenon called 'Servicification'. Logistics, distribution services, transportation and business services play a vital role in manufacturing. This parameter illustrates the value-added contribution of services in production.

India in Global Value Chains

Chapter 2 explained India's trade story in terms of technology-based exports and revealed that India's exports have majorly been concentrated in the resource, low and mid-tech items. However, GVCs make it easier for developing countries such as India to move away from export reliance on unprocessed primary products and to become exporters of mid to high-tech manufactured goods and services. GVCs allow countries to specialize in an activity and join the global production network.

Using foreign value-added content of gross exports as a parameter to measure the extent of participation in GVCs through backward linkages, it is observed that India's integration in GVCs is low (16.1%), as India's foreign value-added content of gross exports in the recent times has reached below the OECD average (19.3%) (Figure 7).

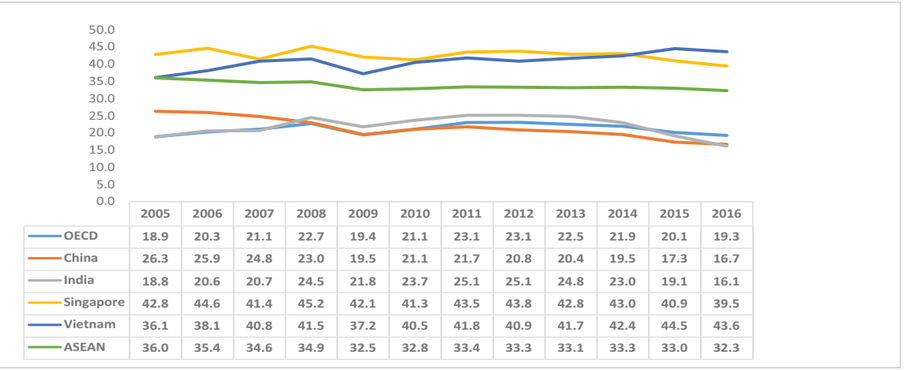
In fact, countries such as Vietnam (43.6%) have more than double foreign value-added content of exports than that of India, as these economies majorly import intermediates from other countries. The growth experience of these economies reveals the importance of foreign intermediates in production.

In comparison to ASEAN nations, India's foreign value-added content in gross exports has always remained lower than the average of ASEAN countries.

India had observed an increase in foreign value-added share of gross exports from 18.8% in 2005 to 25.1% in 2011, indicating growing integration with world production network and higher import content of Indian exports. However, India's foreign value-added content of exports fell rapidly in recent years, going down by 9 percentage points from 25% in 2013 to 16.1% in 2016 (Figure 7).

[19] Trade in Value Added: Concepts, Estimation and Analysis, 2015 https://www.unescap.org/resources/trade-value-added-concepts-estimation-and-analysis

Figure 7: Foreign Value added Content as a Share of Gross Exports



	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
OECD	18.9	20.3	21.1	22.7	19.4	21.1	23.1	23.1	22.5	21.9	20.1	19.3
China	26.3	25.9	24.8	23.0	19.5	21.1	21.7	20.8	20.4	19.5	17.3	16.7
India	18.8	20.6	20.7	24.5	21.8	23.7	25.1	25.1	24.8	23.0	19.1	16.1
Singapore	42.8	44.6	41.4	45.2	42.1	41.3	43.5	43.8	42.8	43.0	40.9	39.5
Vietnam	36.1	38.1	40.8	41.5	37.2	40.5	41.8	40.9	41.7	42.4	44.5	43.6
ASEAN	36.0	35.4	34.6	34.9	32.5	32.8	33.4	33.3	33.1	33.3	33.0	32.3

Source: OECD TiVA database, 2018; EXIM Bank Research

Manufacturing today involves much more than pure production of goods. Services related activities like logistics, business services, transportation and storage, R&D, distribution, branding, after sale services are becoming increasingly important in manufacturing. Manufacturing exports include significant value added from services. Thus, growing services sector in India and its competitiveness has favoured Indian manufacturing. This could be one of the reasons due to which there was a fall in foreign value-added content of Indian exports.

However, analyzing the GVC participation solely based on the parameter 'foreign value-added content in gross exports' could be misleading because a country can link into GVCs through forward linkages as well. Essentially, while a country might be importing raw inputs to process and export (backward linkages), it also might be exporting inputs to foreign country which further exports the finished goods (forward linkages). Forward linkages are the domestic value added which goes into the exports of other countries. This can be understood as the linkages between exporting country and an importing country, the industries of exporting country provide inputs/intermediates into exports of the industries in importing country.

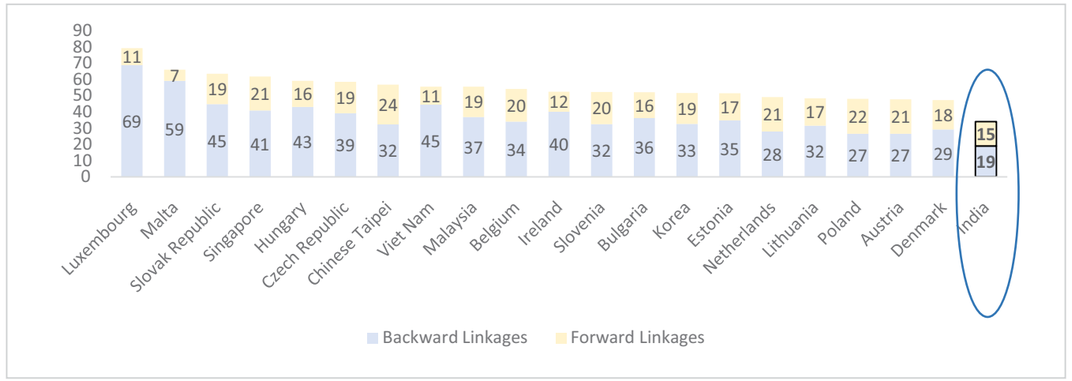
The above concepts help to assess the extent of participation of an economy into the GVCs. Using the methodology described by UNESCAP, 2015[20], GVC participation could be measured as a sum of forward and backward linkages. An analysis of GVC participation for select economies reveals that in the cases of economies such as the US, Japan, and the UK, forward linkages are much stronger than backward linkages, indicating net value-added gains from linking into GVCs. Countries like Luxembourg, Slovak Republic, Hungary, ChineseTaipei, Vietnam, Malaysia, Mexico have very high backward linkages indicating the fact that these economies are highly dependent on imports for their exports (Figure 8).

For India, while the backward linkage in 2016 was 19.1%, the forward linkage was 14.9%.

It is important to note that economies such as Saudi Arabia, Norway, Kazakhstan, amongst others have high forward linkages, as their main exports are natural resources (crude oil) and as a result, a high portion of domestic value added is being used in other countries' exports.

[20] Trade in Value Added: Concepts, Estimation and Analysis, 2015 https://www.unescap.org/resources/trade-value-added-concepts-estimation-and-analysis

Figure 8: GVC participation across select economies[21] and India: 2015



Source: OECD TiVA Database, 2018

In addition, Banga (2013)[22] proposes calculating a ratio of forward to backward linkages to estimate the balance between forward and backward linkages. A ratio greater than one implies that a country's 'domestic value added embodied in foreign exports as a share of gross exports' is higher than its 'foreign value-added content as a share of gross exports'. In case of India, this ratio remains less than one which implies that India is a net importer of intermediates (Table 10).

Table 10: Ratio of Forward to Backward Linkage for India

Year	Forward Linkages	Backward Linkages	Ratio
2005	16.6	18.8	0.88
2006	17.4	20.6	0.84
2007	17.5	20.7	0.85
2008	17.2	24.5	0.70
2009	14.2	21.8	0.65
2010	15.4	23.7	0.65
2011	15.7	25.1	0.63
2012	14.9	25.1	0.59
2013	14.8	24.8	0.60
2014	15.0	23.0	0.65
2015	14.9	19.1	0.78
2016	-	16.1	-

Source: OECD TiVA database, 2018; EXIM Bank Research

[21] The 20 economies other than India in Figure 8 are the ones sorted according to their GVC participation which is, in turn, the sum of for ward and backward linkages. Separately, India is also shown.
[22] Measuring Value in Global Value Chains, 2013
http://wtocentre.iift.ac.in/workingpaper/Measuring%20Value%20in%20Global%20Value%20Chains%20CWS%20WP%20Final.pdf

It is widely believed that increased participation in global production network leads to fall in domestic value-added content of exports and increased share of foreign value added through higher trade in intermediates across globe.

During 2005-15, India's forward linkages have decreased from 16.6% in 2005 to 14.9% in 2015, while backward linkages have increased from 18.8% to 19.9% for the concerned period.

Interestingly, none of the top 20 countries in terms of GVC participation has a ratio greater than one, implying that the major participants in GVCs have stronger backward linkages than forward linkages. It is also vital to note that world's major exporting countries such as China, the USA, Japan, Germany etc. do not make it to the list of top 20 participants in GVCs, reflecting the fact that the departure from traditional trade analysis (based on gross exports and imports) provides interesting insights about value chain production (Table 11).

Table 11: Forward to Backward Linkages Ratio for select economies: 2015

Country	Forward to Backward Ratio: 2015
Luxembourg	0.15
Malta	0.12
Slovak Republic	0.42
Singapore	0.51
Hungary	0.37
Czech Republic	0.49
Chinese Taipei	0.75
Vietnam	0.25
Malaysia	0.51
Belgium	0.59
Ireland	0.30
Slovenia	0.61
Bulgaria	0.44
South Korea	0.59
Estonia	0.48
Netherlands	0.76
Lithuania	0.53
Poland	0.81
Austria	0.80
Denmark	0.62
Thailand	0.41
India	**0.78**

Source: OECD TiVA database, 2018; EXIM Bank Research

CHAPTER

4

INDIA IN GVCs: KEY INDUSTRYWISE ANALYSIS

The previous chapter laid down the importance and structure of GVCs in the modern times, and assessed India's position in the value chains through various parameters such as backward linkages, forward linkages, amongst others, vis-à-vis other economies. This chapter intends to build on the foundation laid by the previous chapter and attempts to make an even deeper analysis at the contribution of GVCs at the key industry level.

Overview

Using the 'foreign value-added content of gross exports' as a measure for integration into GVCs through backward linkages, the industry-wise analysis shows that foreign value-added content in exports of almost every sector in India has gone down in recent years. Similarly, foreign value-added content of services exports has also witnessed a decline.

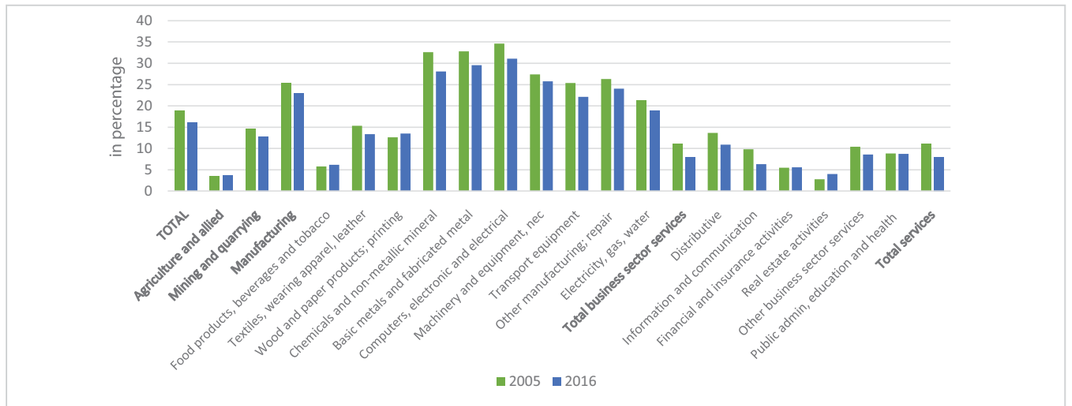
While the foreign value-added content in the manufacturing exports fell by 2.4 percentage points during 2005 to 2016, services registered a fall of over 3 percentage points. This is possibly due to the higher domestic value addition in exports.

Granular analysis shows, foreign value-added content of transportation and storage has gone down from 19.4% in 2005 to 13.8% in 2016, information and communication (from 9.8% to 6.3%) and overall business services (from 11% to 7.9%). Sectors with the most foreign value-added content of exports (backward linkages) are namely in industries such as 'computers, electronic and electrical equipment' (31.1%), 'basic metals and fabricated metal products' (29.6%); 'chemicals and non-metallic mineral products' (28.1%), etc (Figure 9).

Globally, economies are playing an increasingly important role in getting connected to the final consumers in the other nations. The role of foreign final demand in a country's domestic production can be enquired through the indicator 'Domestic value-added content in foreign final demand'. According to OECD-TiVA database, 'domestic value added embodied in foreign final demand' captures the value added that industries export both directly, through exports of final goods or services, and indirectly, via exports of intermediates that reach foreign final consumers (households, government, and as investment) through other countries. The indicator, therefore, illustrates the full upstream impact of final demand in foreign markets to domestic output.

For example, in the case of chemical and pharmaceutical industry, the domestic value-added content in foreign final demand has gone up by 6.2 percentage points from 32.6% in 2005 to 38.8% in 2016 because of high foreign demand. Other industries such as 'textiles, wearing apparel, leather and related products' (33.5%); 'chemicals and pharmaceutical products (38.8%)', amongst others are also highly motivated by final demand abroad.

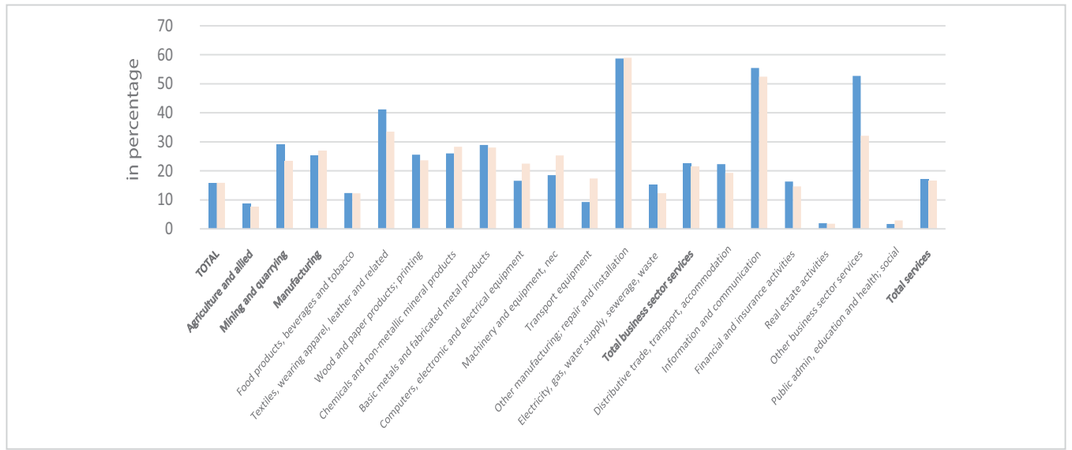
Figure 9: Foreign Value-added Content as a Share of Gross Exports: Industry-wise



Source: OECD TiVA Database, 2018; EXIM Bank Research

It may be noted that overall 26.9% of India's domestic value added in manufacturing exports is driven by consumption abroad. In the case of services sector, around 16.7% of India's domestic value added in exports is due to the final demand abroad. The higher value of this indicator implies the growing contribution of domestic exports in final demand abroad either direct or through the export of intermediates (Figure 10).

Figure 10: Domestic Value-added in Foreign Final Demand in %



Source: OECD TiVA Database, 2018; EXIM Bank Research

Analysis of domestic value-added share of exports by industries also reveals substantial variance. Industries related to use of natural resources, agriculture and retail trade have higher domestic value added in gross exports whereas manufacturing industries have in general lower domestic value-added content in gross exports (Table 12).

Table 12: Domestic Value-added Share of Gross Exports across Sectors

Sector	2005	2010	2016
TOTAL	**81.2**	**76.4**	**83.9**
Agriculture, forestry and fishing	**96.6**	**96.3**	**96.3**
Mining and quarrying	**85.4**	**85.5**	**87.2**
Manufacturing	**74.8**	**66.5**	**77.1**
Food products, beverages and tobacco	94.2	93.2	93.8
Textiles, wearing apparel, leather and related products	84.7	80.8	86.6
Wood and paper products; printing	87.4	85.1	86.5
Chemicals and non-metallic mineral products	67.4	57.5	71.9
Coke and refined petroleum products	54.7	45.8	58.8
Chemicals and pharmaceutical products	76.8	71.6	78.1
Rubber and plastic products	79.5	73.5	78.8
Other non-metallic mineral products	75.9	73.9	77.7
Basic metals and fabricated metal products	67.2	59.4	70.4
Computers, electronic and electrical equipment	65.4	58.6	68.9
Computer, electronic and optical products	64.0	58.9	67.8
Electrical equipment	66.2	58.4	69.3
Machinery and equipment, nec	72.6	67.4	74.2
Transport equipment	74.6	67.6	77.9
Motor vehicles, trailers and semi-trailers	74.7	67.5	76.5
Other transport equipment	74.5	67.8	80.2
Other manufacturing; repair and installation of machinery and equipment	73.7	66.9	76.0
Electricity, gas, water supply, sewerage, waste and remediation services	78.7	73.2	81.2
Total business sector services	**88.9**	**90.2**	**92.1**
Distributive trade, transport, accommodation and food services	86.3	87.1	89.1
Wholesale and retail trade; repair of motor vehicles	95.4	94.8	94.2
Transportation and storage	80.6	80.6	86.2
Accommodation and food services	91.0	90.5	91.0
Information and communication	90.2	91.7	93.7
Publishing, audiovisual and broadcasting activities	90.2	85.2	87.3
Telecommunications	85.3	82.1	85.6
IT and other information services	90.7	92.1	94.1
Financial and insurance activities	94.5	94.1	94.4
Real estate activities	97.3	96.4	96.0
Other business sector services	89.6	91.4	91.5
Public admin, education and health; social and personal services	91.2	90.0	91.3
Total services	**89.0**	**90.2**	**92.0**

Source:OECD TiVA database, 2018; EXIM Bank Research

Box 1: A Note on usage of two parameters for Forward Linkages

As per OECD TiVA's database, two parameters have been described as a measure to assess forward linkages, namely, 'Forward participation in GVCs: Domestic Value Added embodied in foreign exports, as percent of total gross exports of the source country' and 'Domestic value added in exports of intermediate products as a share of total gross exports'.

The 'Forward participation in GVCs: Domestic Value Added embodied in foreign exports, as percent of total gross exports of the source country' refers to the value added in exports by home country that is being used in foreign country's exports.

The parameter 'Domestic value added in exports of intermediate products as a share of total gross exports' reveals the share of industry exports that consists of domestic value added destined for further processing within direct partners' economies - either to meet partners' final demand or to be embodied in exports by direct partners.

However, data for 'Forward participation in GVCs: Domestic VA embodied in foreign exports, as percent of total gross exports of the source country' at industry level is not available at the OECD-TiVA portal. Due to this data limitation, the study uses second parameter, that is, 'Domestic value added in exports of intermediate products as a share of total gross exports', as a measure to assess forward linkages at the industry level.

It is important to note that the conclusion drawn from second parameter may be more appropriate and comprehensive as it also encompasses consumption in the foreign economy, other than its exports.

Increased participation into GVCs leads to considerable fall in domestic value-added share in exports as countries increasingly engage in trade in intermediates. However, in case of India, domestic value added as a share of gross exports has increased from 81.2% in 2005 to 83.9% in 2016, overall. This is indicative of India's growing domestic value-added content in its exports. Major increase in the shares is observed for 'coke and refined petroleum products' (54.7% to 58.8%)'; 'computer, electronic and optical products' (64% to 67.8%); 'transportation and storage' (80.6% to 86.2%); amongst others.

GVC Analysis for select industries

1. Textile and Apparels Industry

The Indian textile industry is extremely diverse, with the hand-spun and hand-woven textiles sectors at the one end of the spectrum, while the capital intensive sophisticated mills sector at the other end of the spectrum[23]. According to the Ministry of Textiles, the textile industry in India accounts for 2% of GDP and employs 45 million people.

[23] India Brand Equity Foundation, Ministry of Commerce and Industry

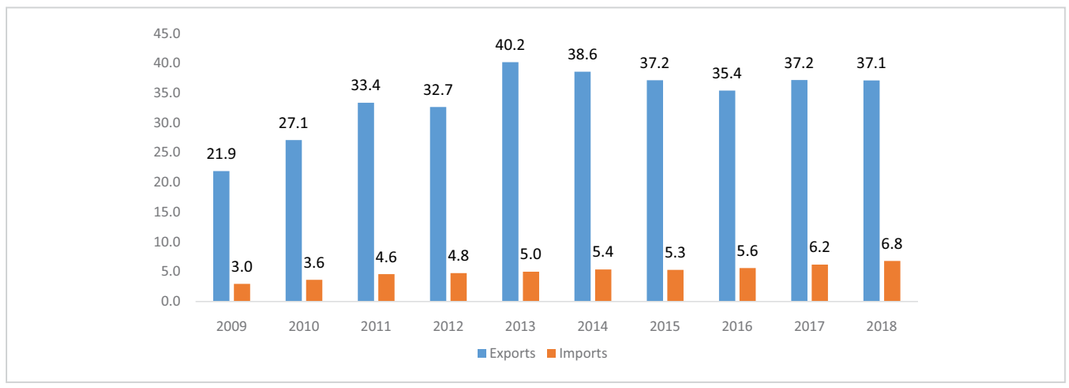
Trade Scenario

Indian textile and apparel exports reached a level of US$ 37.1 billion in 2018, from US$ 21.9 billion in 2009. It also accounted for 11.5% share in the country's total exports in 2018. The sector has witnessed a dynamic growth in its exports during 2009-2018, with an AAGR of 6.7%. The exports registered the highest growth (23.8%) in 2010, while having registered a negative growth of (-) 4.7% in 2016 (Figure 11).

A closer look at the trends reveals that the industry has witnessed declining trends in exports during 2014-2016. This is because cotton-based exports which is one of the major component in Indian textile exports, observed an average annual decline of (-) 17.8%, during 2014 to 2016. In fact, India's share in China's imports of cotton fell from 25.2% in 2013 to 16.4% in 2016. Vietnam's share on the other hand, increased from 5.3% in 2013 to 22.2% in 2016. While Indian cotton yarn carries a 3.5% import duty, Vietnam's textiles get a duty free access to Chinese market.

The Indian textile and apparel industry has consistently maintained a high trade surplus due to the availability of all types of natural and man-made fibres, coupled with a large pool of manpower and the presence of an apt value chain.

Figure 11: India's Trade in Textile and Apparels (US$ Billion)

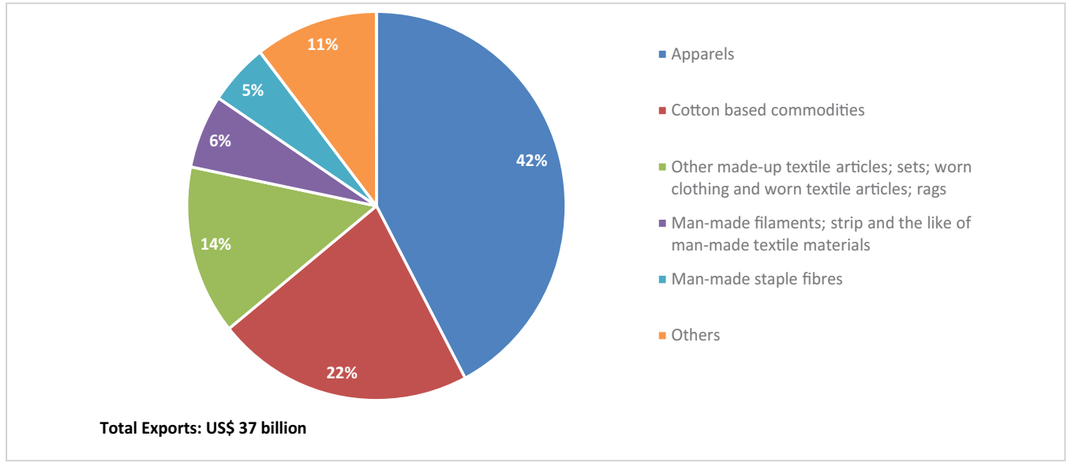


Source: Accessed from ITC Trade Map in September, 2019; EXIM Bank Research

Indian textile and apparel exports are majorly dominated by cotton based commodities and articles of apparel and clothing accessories. Apparel continues to remain the largest contributor with a share of 42% (Exports worth US$ 15.7 billion), followed by cotton based commodities (HS Code- 52) with a share of 22% (Exports worth US$ 8.1 billion) (Figure 12). India is the third largest exporter of cotton based commodities to the world and accounts for 13.8% share of overall world cotton based commodities' exports. Further, India is the sixth largest exporter of apparel to the world, accounting for 3.3% share in overall world apparel exports.

India's share in global apparel exports remained in the range of 3% to 4%, during 2009-2018, while Vietnam (2.6% in 2009 to 6.3% in 2018) and Bangladesh (3.9% in 2009 to 7.7% in 2018) experienced a substantial increase in their shares, during the same period.

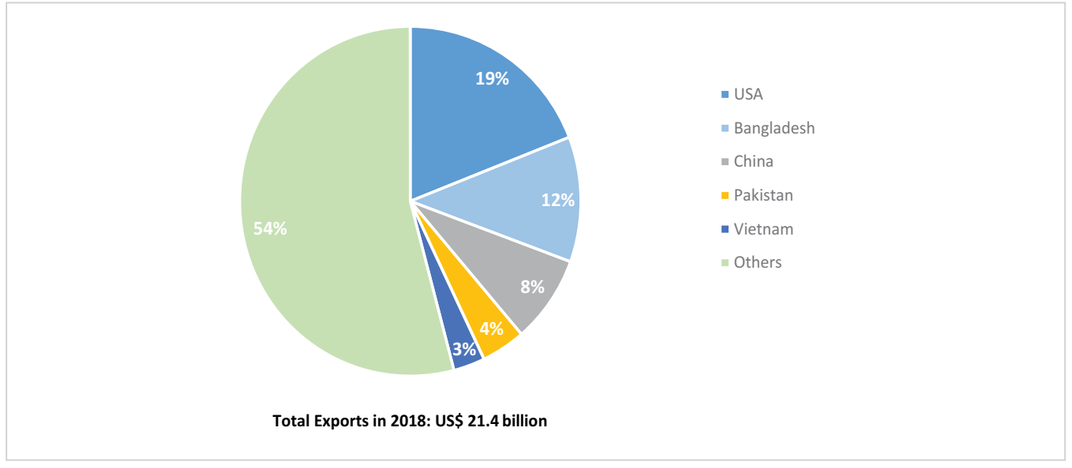
Figure 12: Industry decomposition of Indian textile and apparels exports, 2018



Source: Accessed from ITC Trade Map in July, 2019; EXIM Bank Research

Major export destinations for Indian textiles and apparels are mainly the USA, Bangladesh, China, Pakistan and Vietnam. India majorly exports cotton-based comodities to these nations (Figure 13). During 2009-2018, India's exports of cotton to Vietnam have increased by more than 8 times from US$ 60.7 million in 2009 to US$ 510.5 million in 2018.

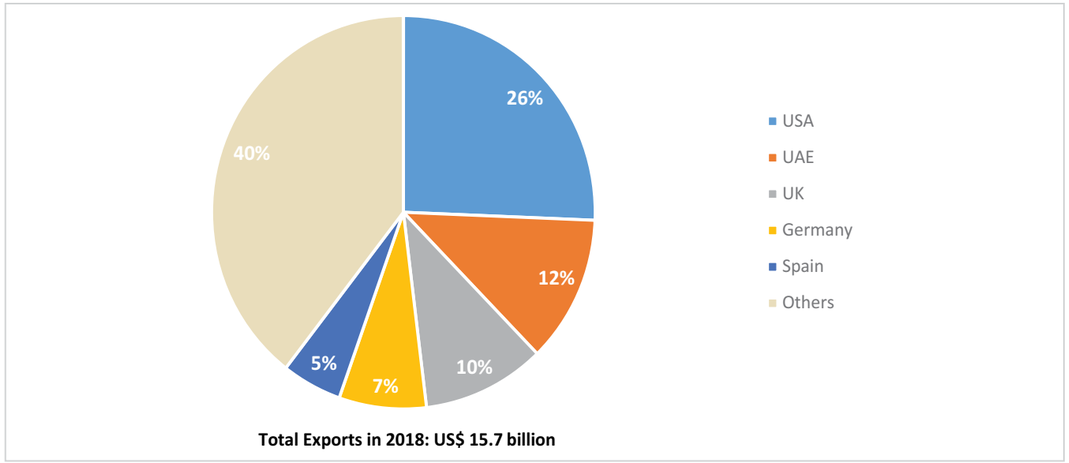
Figure 13: Major Export Destinations of Indian textiles (excluding apparels), 2018



Source: Accessed from ITC Trade Map in July, 2019; EXIM Bank Research

With respect to the India's apparel exports, India majorly exports garments to the USA, UAE, the UK, Germany and Spain. These top 5 nations constitute 60% of apparel exports from India (Figure 14).

Figure 14: Major Export Destinations of Indian Apparels



Source: Accessed from ITC Trade Map in July, 2019; EXIM Bank Research

Indian Textile and Apparel Industry in Textile Global Value Chains[24]

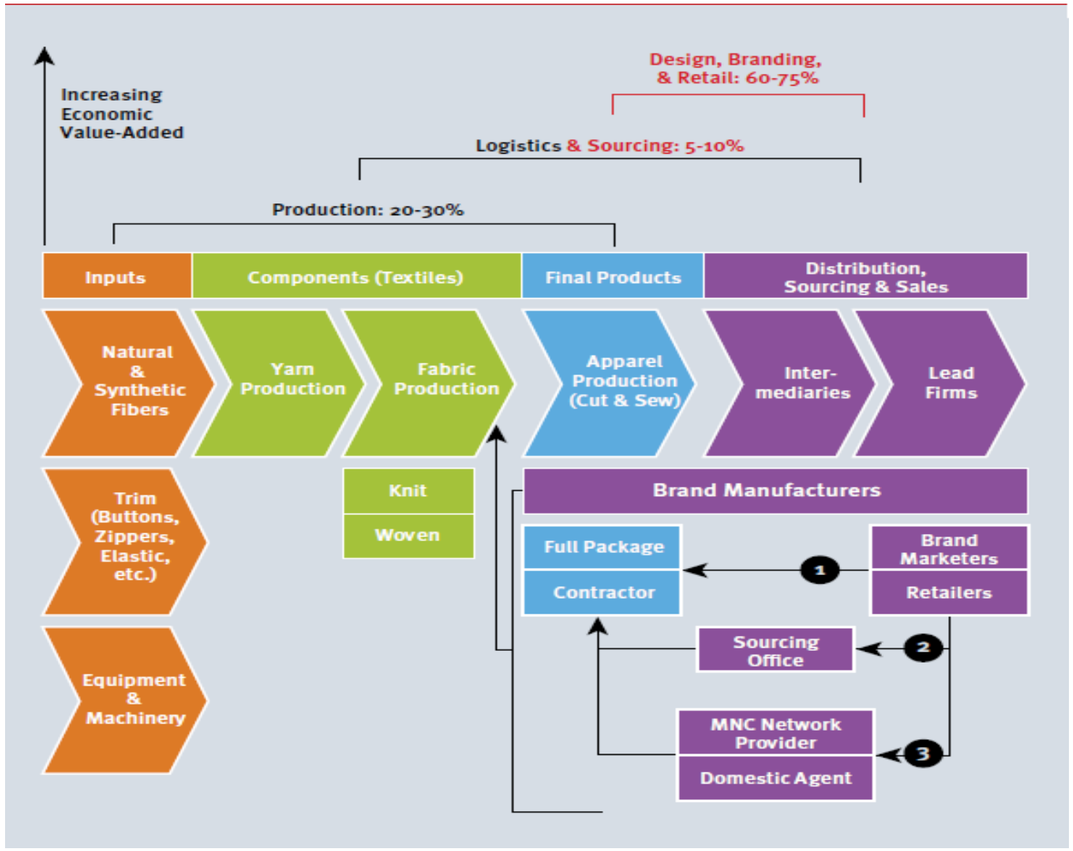
India is the fifth largest nation in terms of exports of textile and apparel. India's prowess in the textile sector is reflected by the fact that the domestic value-added share of gross exports in textile industry is very high, at 84% in 2015.

India's foreign value added content of exports (backward linkages) for textile industry is low (16.4%) which implies less dependence on imports of intermediates for exports. Importantly, India has greater forward participation[25] (37.2%) in the textile and apparel sector (because India is a major supplier of intermediates to the world like cotton, man-made fabrics etc., as well as the end products like ready-made garments) (Figure 15). In addition, services sector account for 24.3% of the value added created by textile and apparel sector in its exports.

Indian textile and apparel industry's value-added contribution to Indian gross exports was 9.3% in 2015. While the domestic value addition was 7.8%, the foreign value addition stood at 1.5% (Figure 16). India's Textile and Apparel Industry provides an opportunity to increase participation in GVCs because textile and apparel industry of India has already a decent forward linkage. India's key strengths in this sector lie in the availability of all types of natural and manmade fibers, a large pool of manpower, presence of complete value chain, and a large and growing domestic market and design capability.

[24] The data for textile and apparel industry at TiVA database also includes the leather products, however, share of leather products under this particular industry is significantly low.
[25] Forward participation: Domestic value added in exports of intermediate products as a share of total gross exports

Exhibit 6: A Generalized Textile and Apparel Value Chain

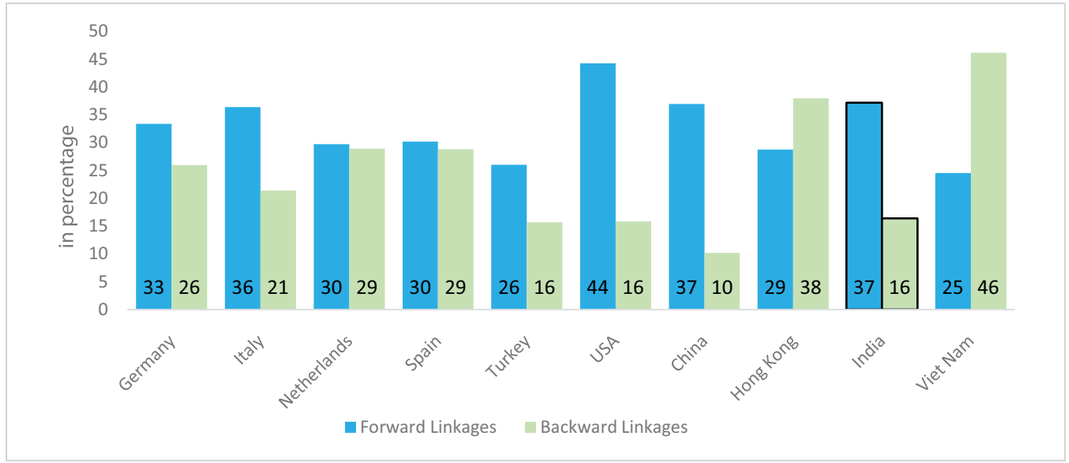


Source: Adapted from Global Value Chains and Industrial Development: Lessons from China, South-East and South Asia, UNIDO[27]

It should also be noted that domestic value-added share of textile and garment industry in foreign final demand stood at 36.4% in 2015 (Table 13). The measure reflects how domestic industries in a value-chain are connected to consumers in other countries, even where no direct trade relationship exists. This value indicates the production of textile and garments, which is driven by demand or consumption abroad. However, the value of this indicator has fallen from 41.2% in 2005, because of the increased GVC participation by new players such as Vietnam and Bangladesh in this segment, during the same period.

[27] https://www.unido.org/sites/default/files/files/2018-06/EBOOK_GVC.pdf

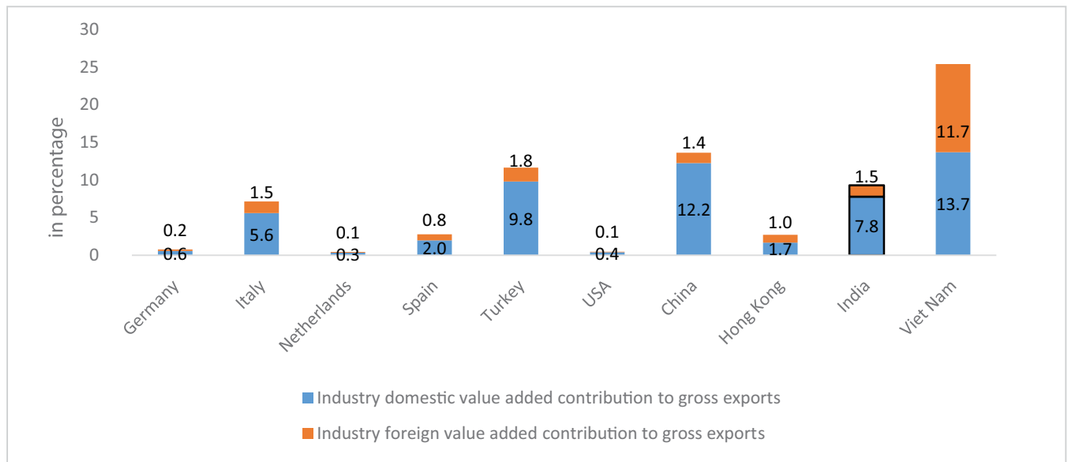
Figure 15: GVCs in Textiles and Apparel, 2015 (as a percent of gross exports of industry)



Source: OECD TiVA, 2018; Exim Bank Research

Note: The above figure shows data for major textile and apparel exporting countries. Bangladesh, which is a major exporter of apparel, is not mentioned because data is not available for Bangladesh at OECD TiVA database.

Figure 16: Textile and Apparels value added contribution to gross exports of the economy, 2015



Source: OECD TiVA, 2018; Exim Bank Research

Textile and apparel industry contribute 9.3% value added to overall exports of the country whereas this share is quite higher in case of Vietnam, China and Turkey. This high value is signifying the dependence of a country's gross exports on a particular sector, in terms of value addition (both domestic and foreign).

Further, economies such as India, China and the USA have lower backward linkages in textile and apparel, that is, the use of foreign intermediates in production (import content of exports), as compared to other major textile and apparel exporting nations, due to an abundance of indigenous raw material base. China leads the world in cotton production, followed by India and the United States[28], while countries such as Vietnam and Hong Kong have a high dependence on foreign inputs, reflected by high backward linkages. On the flipside, the USA, China and India have higher forward linkages, while economies such as Vietnam and Turkey have lower forward linkages, as these economies specialise in garments manufacturing by sourcing inputs from other countries, which is primarily based on CMT (Cut, Make, Trim) model. Garment manufacturing accounts for 70% of the total businesses in this sector in Vietnam, with CMT being the main method (85%) of export.[29]

Table 13: Textile and apparel sector in GVCs, 2015[30]

Country	Forward Linkages	Domestic value added share of gross exports	Domestic value added embodied in foreign final demand
Germany	33.4	74.0	45.6
Italy	36.4	78.6	49.2
Netherlands	29.7	71.1	56.0
Spain	30.2	71.1	54.2
Turkey	26.0	84.3	39.9
USA	44.3	84.2	13.5
China	36.9	89.8	50.8
Hong Kong	28.7	62.1	34.2
India	**37.2**	**83.6**	**36.4**
Vietnam	24.5	53.9	89.2

Source: OECD TiVA, 2018; Exim Bank Research

As explained previously, economies such as the USA, China, and India, have higher forward linkages as they are supplier of intermediates like cotton yarn and fibers etc. Further, these economies have higher domestic value added contribution to gross exports, but very low contribution to foreign final demand (the measure reflects how domestic Industries are connected to final consumers in other countries) which implies that these economies stand at initial stages of value chain.

[28] FAO

[29] Vietnamese Textile and Apparel Industry in the context of FTA: The Labour and Social Impacts, 2017 https://www.unescap.org/sites/default/files/DA9%20Viet%20Nam%20Session%207%20-%20textile%20and%20apparel%20industry.pdf

[30] 'Forward linkages' are measured as a percent of gross exports of the economy. 'Domestic value added embodied in foreign final demand' is measured as percentage of total value added by the industry.

Interestingly, if we consider Vietnam, a major exporter of garments, it can be observed that Vietnam has very low forward linkages because the country is highly dependent on imports of intermediate inputs for exports; however, it has a very high share of domestic value added in foreign final demand, because manufacturing under textile and garments is basically based on CMT (cut, make, trim) model. The domestic value added from such economies is low vis-à-vis other major textile and apparel exporting economies.

In fact, a revealed comparative advantage (RCA) index analysis for India illustrates that India has RCA greater than one, in both textile and apparel exports. However, the RCA for textile (3.6) is much better than the same for apparels (1.9). On the other hand, major competing nations such as Vietnam and Bangladesh have high RCA in apparels (34.7 for Bangladesh and 4.4 for Vietnam) but low RCA in textiles (2.4 for Bangladesh and 1.5 for Vietnam). This precisely explains why countries such as Vietnam have high domestic value added in foreign final demand and high backward linkages, but a low share of domestic value addition in its gross exports and low forward linkages.

2. Chemical and Pharmaceutical Sector

Pharmaceutical

Indian Pharmaceutical Industry is in the midst of exciting times. India enjoys an important position in the global pharmaceutical sector because of superior quality products, lower cost of production and most importantly, compliance to international standards.

Pharmaceutical sector in India is highly regulated. India's dominant position in the pharmaceutical sector can be attributed to major policy developments, namely, compulsory licensing, National Pharmaceutical Pricing Policy, and Drug price control etc. that favored the sector's growth. Government of India's "Pharma Vision 2020" aims at making India a global leader in the pharmaceutical Industry.

India is the largest provider of generic drugs to the world. India accounts for 2.4% share of world pharmaceutical exports with exports amounting to US$ 14.3 billion in 2018, an increase of 11% over 2017 (Table 14). Pharmaceutical products are the sixth largest product group among the products exported by India at HS-2 digit level. Pharmaceutical exports account for 4.4% share of overall exports of goods from India. According to the Pharmaceutical Export Promotion Council (PHARMEXCIL) of India, during 2017-18, drug formulation and biologicals contributed to almost three fourth of pharmaceutical exports. This was followed by bulk drugs and drug intermediates at 20%. Rest of the exports are contributed by products such as Ayush medicines, herbal products and surgicals.

India is emerging as a leading global supplier of affordable medicines (antibiotic and vaccines) to the world. India produces 65% of WHO demand for DPT& BCG and 90% of Measles vaccine[31].

[31] Pharmaexcil

Table 14: Key Pharmaceutical Products Exported by India (US$ Million)

HS Code	Description	2017	2018	Growth in 2018 over 2017	Share in pharmaceutical exports: 2018
300490	Medicaments consisting of mixed or unmixed products for therapeutic or prophylactic purposes	9665.2	10743	11.2%	75.2%
300420	Medicaments containing antibiotics	950.1	1004.4	5.7%	7.0%
300220	Vaccines for human medicine	612	667.7	9.1%	4.7%
300410	Medicaments containing penicillin or derivatives thereof	427.7	494.4	15.6%	3.5%
300390	Medicaments consisting of two or more constituents mixed together for therapeutic or prophylactic	262.8	314.5	19.7%	2.2%
Others		977.7	1053.2	7.7%	7.4%
Total		**12895.5**	**14277.2**	**10.7%**	**100.0%**

Source: Accessed from ITC Trade Map in September 2019; EXIM Bank Research

India majorly exports pharmaceutical products to the USA (35%), the UK (4%), South Africa (4%), Nigeria (3%) and Russia (3%). These nations accounted for about half of the pharma exports from India in 2018. In comparison to 2009, the USA's share in Indian pharma exports has increased by 11.9 percentage points in 2018, while countries such as the UK, Nigeria, Russia and Brazil have witnessed decline during the same period. It should be noted that Canada and Australia are emerging markets for India as these countries have witnessed an increase in share during 2009-2018 (Table 15). According to Government of India, Indian pharmaceutical sector supplies over 50% of global demand for various vaccines, 40% of generic demand in the US and 25% of all medicine demand in the UK. Interestingly, India imports drug intermediates from China and exports various end products like vaccines and antibiotics.

Table 15: Export Destinations of Pharmaceutical Products (US$ Million)

Importers	2009	2018	Share in India's pharma exports: 2009	Share in India's pharma exports: 2018
USA	1170.1	5024.4	23.3%	35.2%
UK	236.3	549.7	4.7%	3.9%
South Africa	190.0	537.8	3.8%	3.8%
Nigeria	167.6	417.3	3.3%	2.9%
Russia	262.0	409.2	5.2%	2.9%
Brazil	114.0	257.3	2.3%	1.8%
Canada	35.5	248	0.7%	1.7%
Australia	63.3	247.5	1.3%	1.7%
Kenya	90.6	227.7	1.8%	1.6%
Germany	102.0	215.4	2.0%	1.5%
Others	2579.9	6143	51.5%	43.0%
Total	**5011.4**	**14277.2**	**100.0%**	**100.0%**

Source: Accessed from ITC Trade Map in September 2019; EXIM Bank Research

Chemicals

The chemical industry in India is highly diversified, provides raw material to many industries, including textile, paper, paints, soap, detergent pharmaceutical, agrochemical etc. India is the fourth largest producer of agrochemicals and sixth largest producer of chemicals in the world. India ranked 12th in exports of chemical products (HS Code 29-38, excluding HS-30) in 2018.

Chemical exports were US$ 30.5 billion in 2018, recording a growth rate of 24% in 2018 over 2017. Chemical exports segment is mainly dominated by organic chemicals, accounting for 58.2% share in total chemical exports from India in 2018 (Table 16).

Table 16: Key Chemical Products Exported by India (US$ Million)

HS Code	Description	2017	2018	Growth in 2018 over 2017	Share in Chemical Exports: 2018
29	Organic chemicals	13571.8	17742.5	30.7%	58.2%
38	Miscellaneous chemical products	3711.3	4412.7	18.9%	14.5%
32	Tanning or dyeing extracts	2786.4	3230.7	15.9%	10.6%
28	Inorganic chemicals	1618.4	2032.7	25.6%	6.7%
33	Perfumery, cosmetic or toilet preparations	1821.6	1933.7	6.2%	6.3%
34	Soap and washing preparations	564.7	597.8	5.9%	2.0%
35	Modified starches, glues, enzymes	233.3	249.8	7.1%	0.8%
31	Fertilizers	89	135.5	52.2%	0.4%
36	Explosives	109.4	119.9	9.6%	0.4%
37	Photographic or cinematographic goods	13.6	11.6	-14.7%	0.0%
Total		**24519.6**	**30466.9**	**24.3%**	**100.0%**

Source: Accessed from ITC Trade Map in September 2019; EXIM Bank Research

India exports over 20% of its total chemical products exports to China and the USA. China and the USA mainly import organic chemicals and dye stuff from India. China has emerged as leading export destination of chemicals from India; it has witnessed an increase in the share from 6.1% in 2009 to 11.8 % in 2018. Further, top 10 export destinations account for almost half of the chemicals exports from India. Countries such as China, Brazil, Indonesia and Malaysia witnessed a high growth in chemical exports from India (Table 17).

Table 17: Major Export Destinations of Chemical Products (US$ Million)

Importers	2009	2018	Share in India's chemical exports: 2009	Share in India's chemical exports: 2018
China	741.2	3591.5	6.1%	11.8%
USA	1611.1	3363.4	13.2%	11.0%
Brazil	338.2	1338.2	2.8%	4.4%
UAE	458.9	1182.3	3.8%	3.9%
Germany	622.2	1078.9	5.1%	3.5%
Indonesia	386.4	1026.9	3.2%	3.4%
Netherlands	367.3	842.3	3.0%	2.8%
Japan	269.6	792.1	2.2%	2.6%
Saudi Arabia	341.8	775.5	2.8%	2.5%
Malaysia	297.2	774.6	2.4%	2.5%
Others	6732.3	15701.2	55.3%	51.5%
Total	**12166.3**	**30466.9**	**100.0%**	**100.0%**

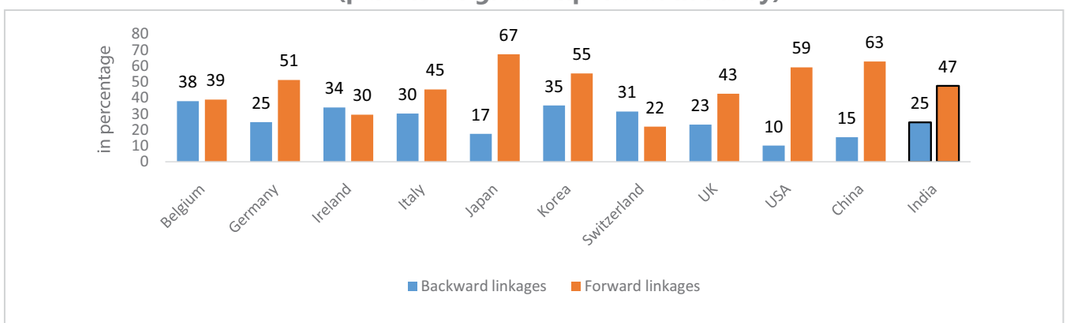
Source: Accessed from ITC Trade Map in September 2019; EXIM Bank Research

Chemicals and Pharmaceutical industry in the Global Value Chains

Growing world demand for pharmaceutical products as a consequence of aging population, growing income and increasing prevalence of chronic diseases, are expected to boost opportunities for Indian pharmaceuticals.

Chemical and pharmaceutical sector has the potential to put India at a higher trajectory in global value chain. Together it contributes 8.5% (Domestic value addition: 6.4%, Foreign value addition: 2.1%) of value addition to gross exports from India. Further, the domestic value added contribution of this sector in foreign final demand has increased from 32.6% in 2005 to 39.5% in 2015, which is indicative of India's increasing link with the final consumer abroad. In addition, services sector contributes to 22.2% value added share in chemicals and pharmaceutical gross exports.

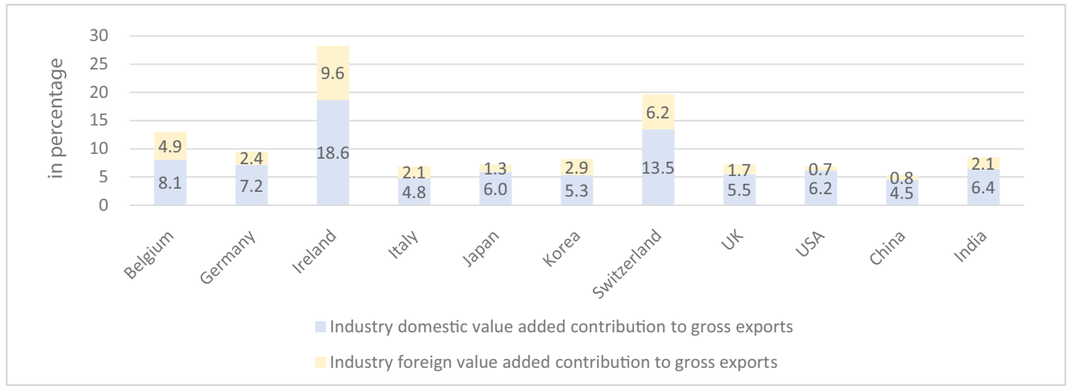
Figure 17: GVCs in Chemical and Pharmaceuticals, 2015 (percent of gross exports of industry)



Source: OECD TiVA, 2018; EXIM Bank Research

India's forward linkages in chemical and pharmaceuticals is higher than its backward linkages implying that India is a major supplier of pharmaceutical intermediates to the world, either for foreign country's final consumption or end-exports (Figure 17). India is the largest supplier of generic drugs to the world. Also, Indian chemical industry supplies raw materials to various other industries, including textiles, paper, paints, soap and detergents, agrochemicals etc., in China, the USA, Brazil and other countries.

Figure 18: Chemical and pharmaceutical industry's value added contribution to gross exports of the economy, 2015



Source: OECD TiVA, 2018; EXIM Bank Research

In terms of industries' value added contribution to gross exports, chemical and pharmaceutical industry contributes 8.5% to India's gross exports. Interestingly, in Ireland, the chemicals and pharmaceuticals industry contributes to 28.2% share of value added in the gross exports. The contribution of value added by the chemicals and pharmaceutical industry is also higher in countries such as Switzerland and Belgium (Figure 18).

Exhibit 7: Pharmaceutical Value Chains

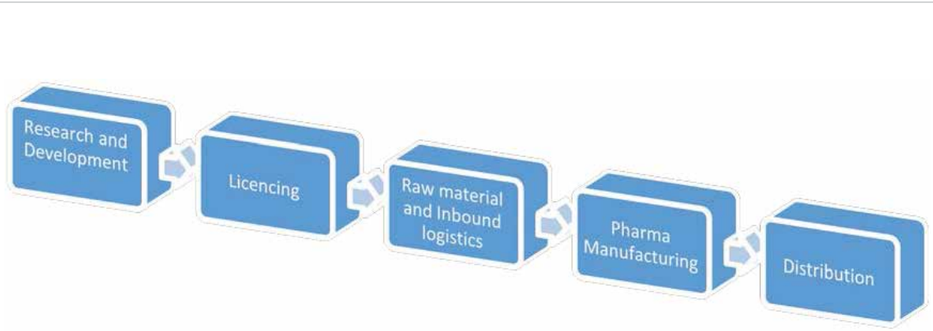


Exhibit 8: Generalized Chemicals Value Chains

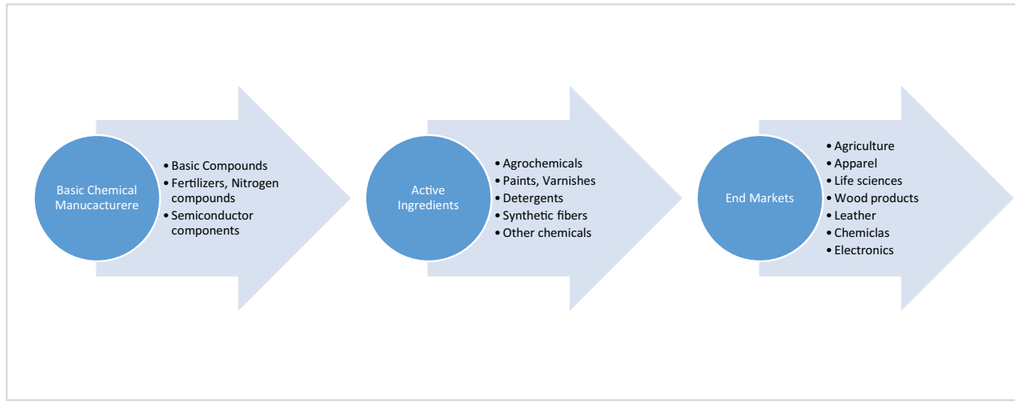


Table 18: Chemical and Pharmaceutical sector in GVCs, 2015

Importers	Forward linkages	Domestic value added share of gross exports	Domestic value added embodied in foreign final demand
Belgium	38.9	62.1	78.8
Germany	51.3	75.2	71.3
Ireland	29.6	65.9	93.7
Italy	45.3	69.8	58.1
Japan	67.3	82.5	33.0
South Korea	55.3	64.8	63.4
Switzerland	22.0	68.5	88.5
UK	42.5	76.7	61.4
USA	59.1	89.9	22.3
China	62.8	84.7	28.1
India	**47.5**	**75.3**	**39.5**

Source: OECD TiVA, 2018; EXIM Bank Research

An analysis of forward linkages reveals that USA, China, India and Japan have higher forward linkages as compared to other major chemical and pharmaceutical products exporting nations as these countries are major suppliers of intermediates (dyes stuffs, organic chemical, inorganic chemicals, generic drugs, API etc.) to chemicals (adhesives, paints soaps cosmetics, fertilizers, perfumes etc.) and pharmaceutical (antibiotics, vaccines etc.) manufacturers across the world. However, these countries have very low domestic value added share in foreign final demand, which illustrates that these countries are at low end of chemical and pharma value chains. Noticeably, these countries add higher value to the exports domestically (Table 18).

There are countries like Ireland, where a large number of multinational companies produce pharmaceutical and biotech products. Ireland, which is a home for 24 of the world's top 25 biotech and pharma companies, has very low forward linkages because it imports inputs from other economies and only manufacturing and process development takes place in the country. Ireland has a very high

share of domestic value addition to foreign final demand which implies that the country is responsible for completing final stages of production in value chains and has high link with final consumers.

3. Electrical Equipment and Electronics Industry

Electrical machinery and equipment exports (HS code-85) were US$ 11.7 billion in 2018 by recording a growth rate of 34%, over the exports achieved in 2017 (Table 19). It is seventh largest among the product groups exported by India at HS-2 digit level, representing 3.7% share of overall exports from India. However, India's footprint in global electrical machinery and equipment market is miniscule, accounting for 0.4% share of global electrical machinery and equipment exports.

Electrical equipment market is highly diverse. India majorly exports telephone sets (17% share in total electrical equipment exports) to UAE (36%), the USA (12.9%), China (7.3%), Russia (7.1%) and the Netherlands (6%). Also, India's electrical apparatus are highly demanded in the USA, Singapore, Germany, France and Hong Kong.

Further, in the trade of electronics, India incurs a huge deficit. India's exports of electronic products were worth US$ 8.4 billion in 2018-19, while its imports were US$ 55.5 billion, thereby registering a trade deficit of US$ 47.1 billion, accounting for about one-fourth of the overall trade deficit of India in 2018-19.

Table 19: Key Electrical Products Exported by India, 2018 (US$ Million)

Code	Description	2017	2018	Growth in 2018 over 2017	Share in 2018
8517	Telephone sets	1038.1	2016.0	94.2%	17.1%
8504	Electrical transformers	1209.6	1430.7	18.3%	12.1%
8545	Carbon electrodes	288.5	1078.7	273.9%	9.2%
8544	Insulated wire, cable	818.2	889.0	8.7%	7.5%
8536	Electrical apparatus for switching or protecting electrical circuits	625.4	713.8	14.1%	6.1%
Others		4820.8	5659.8	17.4%	48.0%
Total		**8800.6**	**11788.0**	**33.9%**	**100.0%**

Source: Accessed from ITC Trade Map in September 2019; EXIM Bank Research

Table 20: Major Export Destinations of Electrical products from India (US$ million)

Importers	2009	2018	Share in 2009	Share in 2018
USA	1417.6	1663.4	14.7%	14.1%
UAE	695.3	1342.7	7.2%	11.4%
Germany	495.3	586.9	5.1%	5.0%
China	249.3	533.3	2.6%	4.5%
UK	308.0	373.0	3.2%	3.2%
France	127.4	351.9	1.3%	3.0%
Bangladesh	40.6	297.0	0.4%	2.5%
Hong Kong	430.4	258.1	4.5%	2.2%
Saudi Arabia	251.6	254.2	2.6%	2.2%
Netherlands	205.5	248.3	2.1%	2.1%
Others	5403.4	5879.2	56.1%	49.9%
Total	**9624.5**	**11788.0**	**100.0%**	**100.0%**

Source: Accessed from ITC Trade Map in September 2019; EXIM Bank Research

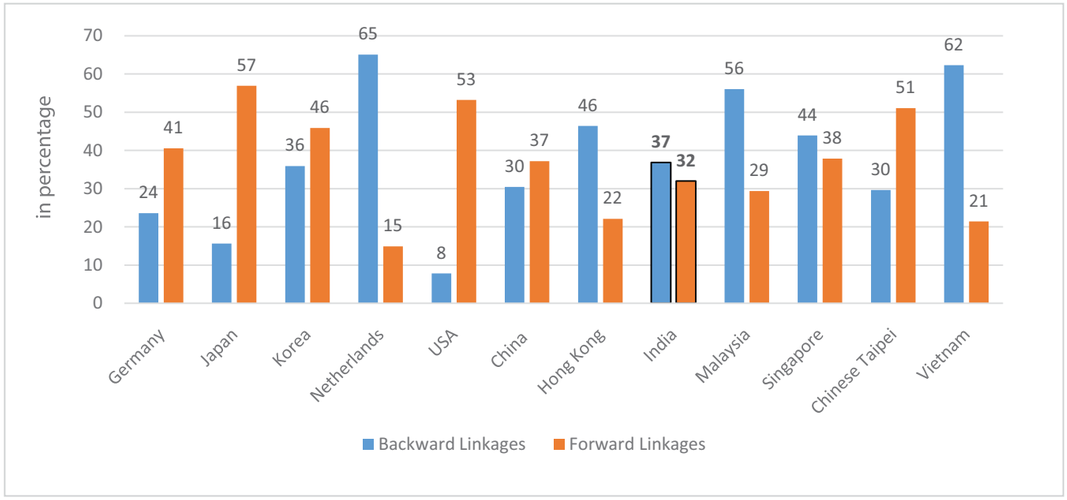
India has made its presence in France, UAE, China, Bangladesh and Turkey in terms of exports of electrical machinery and equipment; India has also increased its share in these nations during 2009-2018. Exports to Bangladesh have increased seven times, while it has more than doubled in France during the same period. However, India's share has declined in the USA and the UK (Table 20).

Computer, electronics and optical products industry and GVCs

The electronics industry consists of three main group of actors; lead firms, contract manufacturers and component suppliers. Lead firms focus on design and development, marketing, branding, while contract manufacturers specialize in logistics, production and assembly.

India has higher backward linkages than forward linkages in this industry which implies that India is participating more as an importer of inputs, rather than a supplier in computer, electronics and optical sector's value chains. While countries such as the Netherlands, Vietnam, and Malaysia have higher backward linkages like India, the USA, China and Japan have higher forward linkages (Figure 19).

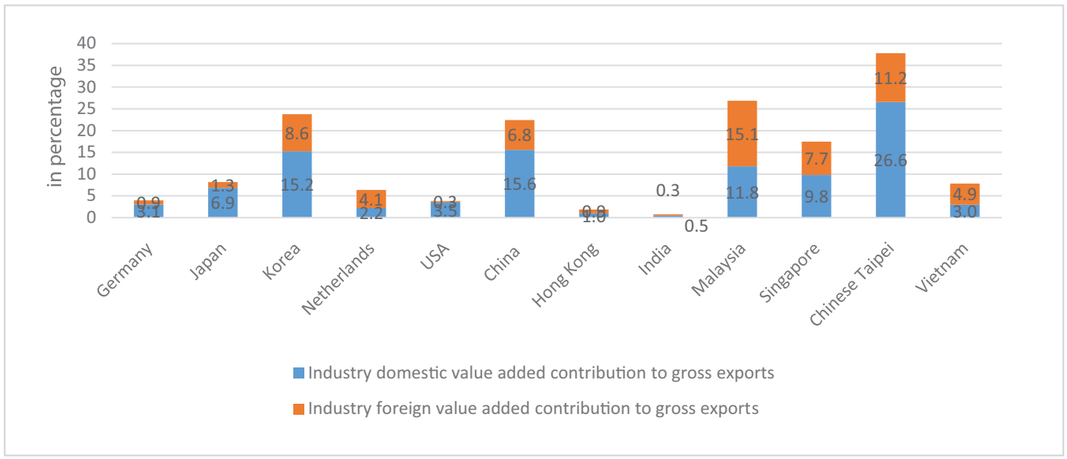
Figure 19: GVCs in Computer electronics and optical products, 2015 (percent of gross exports of industry)



Source: OECD TiVA, 2018; EXIM Bank Research

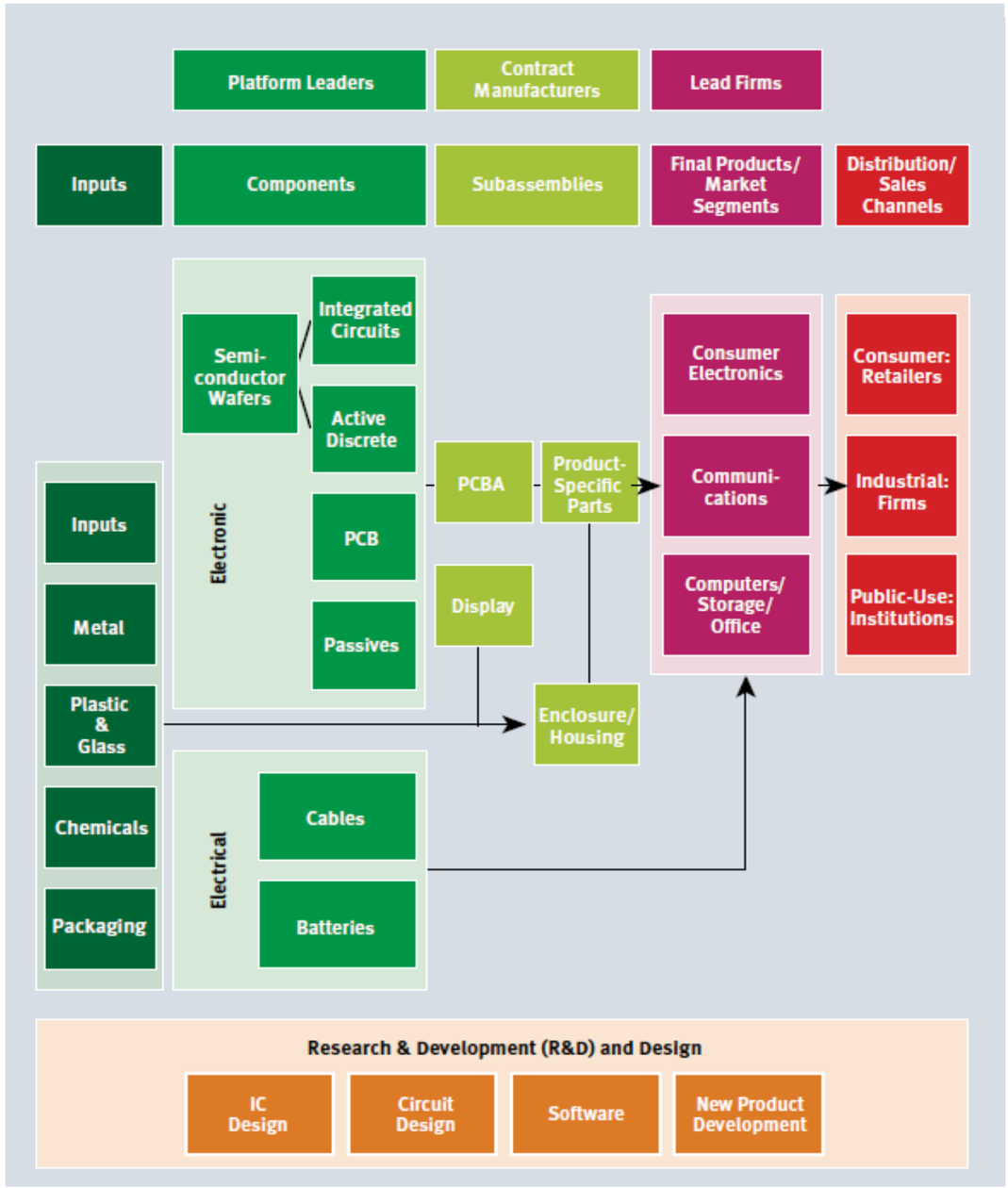
The computer electronics and optical product industry's value added contribution to gross exports is less than one percent in India, while the value-added contribution of the industry in countries such as Chinese Taipei, Malaysia, and South Korea is substantially higher than India. These countries rely heavily on import in the electronics industry for value addition to gross exports (Figure 20).

Figure 20: Computer, electronics and optical products industry's value added contribution to gross exports of the economy, 2015



Source: OECD TiVA, 2018; EXIM Bank Research

Exhibit 9: Generalized Electronics GVC



Source: Global Value Chains and Industrial Development Lessons from China, South-East and South Asia, UNIDO

The table below illustrates that the countries such as Japan, the USA and China specialize in component manufacturing as these economies have stronger forward linkages and lower share in foreign final demand.

Most of the production and assembly is located is low wage countries such as Vietnam, Chinese Taipei (could also be taken as a special case as design and product development also takes place in Chinese Taipei. The country is also a supplier of intermediates in electronics production), Malaysia and South Korea. These economies have higher share in domestic value added in foreign final demand and lesser forward linkages. This implies that these economies import intermediate inputs from other economies in order to produce final product. China could also be featured in this category because the country enjoys assembly line in mobile manufacturing (Table 21).

Further there are countries such as India and Hong Kong, having decent forward linkages and lower share in domestic value added in foreign final demand, positioned at the middle stages of value chains (Table 21).

Table 21: Computer, electronics and optical product Industry in GVCs, 2015

	Forward Linkages	Domestic value added share of gross exports	Share of domestic value added embodied in foreign final demand
Germany	40.6	76.4	63.8
Japan	57.0	84.4	43.0
South Korea	45.9	64.1	78.1
Netherlands	14.9	34.9	66.7
USA	53.2	92.2	24.8
China	37.2	69.5	55.4
Hong Kong	22.1	53.6	29.7
India	**32.0**	**63.2**	**22.2**
Malaysia	29.4	44.0	88.5
Singapore	37.9	56.1	90.4
Chinese Taipei	51.1	70.4	86.3
Vietnam	21.4	37.7	87.7

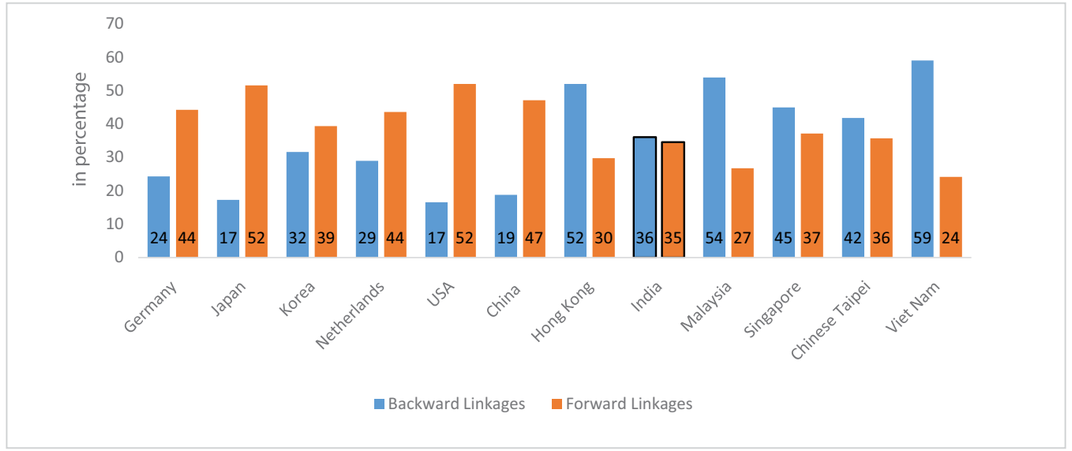
Source: OECD TiVA, 2018; EXIM Bank Research

Electrical Equipment Industry and GVCs

Electrical equipment industry's domestic value added share of gross exports was recorded at 63.9% in 2015, while its foreign value added content for the same year was 36.1%, which implies that, of the total exports by India under this industry, 63.9% of the value addition is created domestically and rest is being sourced from foreign counterparts. It is observed that India's backward linkages (foreign value added content of gross exports) in electrical equipment industry have fallen from 42% in 2010 to 36% in 2015 and further to 31% in 2016. During the same period, its forward linkages jumped from 28% in 2010 to almost 35% in 2015, reflecting the increasing exports in intermediates. Further, the services sector's value added contribution to gross exports was 26.5% in 2016.

Countries such as Vietnam, Hong Kong and Malaysia have higher backward linkages as these economies primarily import their inputs from China, Japan and the USA to produce electrical equipment (Figure 21) .

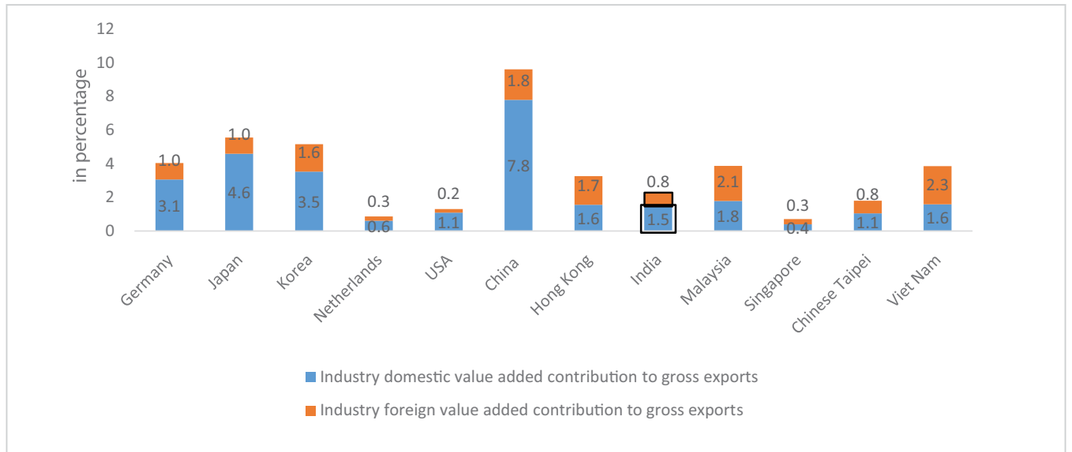
Figure 21: GVCs in Electrical equipment sector, 2015 (% of gross exports of industry)



Source: OECD TiVA, 2018; Exim Bank Research

In terms of industry's contribution to gross exports, electrical equipment industry's value added contribution to India's gross exports was 2.3% in 2015. The value added contribution of the electrical equipment industry in India, in terms of gross exports, is lesser in comparison to other major players such as China, Japan, South Korea and Vietnam (Figure 22).

Figure 22: Electrical equipment industry's value added contribution to gross exports of the economy, 2015



Source: OECD TiVA, 2018; EXIM Bank Research

Table 22: Electrical Equipment Industry and GVCs, 2015

Country	Forward Linkages	Domestic value added share of gross exports	Share of domestic value added embodied in foreign final demand
Germany	44.2	75.7	61.6
Japan	51.6	82.7	34.6
South Korea	39.4	68.4	67.2
Netherlands	43.6	71.0	63.6
USA	52.0	83.5	25.5
China	47.1	81.2	37.3
Hong Kong	29.8	48.0	56.4
India	**34.6**	**64.0**	**23.5**
Malaysia	26.8	46.0	90.4
Singapore	37.1	55.1	91.8
Chinese Taipei	35.7	58.2	54.0
Vietnam	24.2	41.0	62.3

Source: OECD TiVA, 2018, Exim Bank Research

Countries such as China, the USA, Japan, have high forward linkages in electrical equipment manufacturing value chains and also, these economies have low share in foreign final demand, implying that the participation of these economies in electrical equipment value chains are as a supplier of intermediates (parts and components) (Table 22).

India has both moderate backward and forward linkages which means that India stands at middle stages of value chains in the electrical equipment industry. Other economies like Vietnam, Malaysia are more like the "assembly rooms" for global electrical equipment production as they seem to have a large domestic value added induced by foreign final demand of these products. In other words, they are responsible for completing the last stage of producing electrical equipment, but not much value creation is done by these economies as it can be observed in the domestic value added share of gross exports for these economies. Additionally, there are other economies such as Germany and South Korea in GVCs, which have higher forward linkages as well as have maintained a quite high share in foreign final demand. Such economies are in the upstream of the GVCs as they have advantage in the final stage of production. This is probably because of high quality (technology) in production and presence of complete value chain domestically, rather than low cost.

4. Motor Vehicle and Transport Equipment Industry

Motor vehicle and transport equipment industry is a significant element of the manufacturing sector in the Indian economy in terms of its contribution to GDP as well as its potential for employment and growth. Automobile industry contributes 7-8% to India's GDP. The industry attracted US$ 21.4 billion FDI Equity inflow during April 2000 to March 2019. The Automotive Mission Plan 2026, of the Government of India, is aimed at bringing the Indian automotive industry among the top three countries in the world in engineering, manufacture and exports of vehicles & components; growing in value to over 12% of India's GDP during the next decade.

The exports of motor vehicle and transport equipment (HS 87) stood at US$ 18.2 billion in 2018, almost thrice of the exports in 2009. Motor cars and parts and accessories dominate the export basket, and together, these two commodities account for more than two-third of overall motor vehicle and transport equipment exports from India (Table 23).

Table 23: Key Motor Vehicle and Transport Equipment Products Exported by India

Code	Description	2009	2018	Share in 2009	Share in 2018
8703	Motor cars and other motor vehicles principally designed for the transport of persons	2940.8	7188.1	51.4%	39.4%
8708	Parts and accessories for tractors, motor vehicles for the transport of ten or more persons	1167.9	5123.5	20.4%	28.1%
8711	Motorcycles.	546.0	2140.2	9.6%	11.7%
8704	Motor vehicles for the transport of goods	250.9	1334.6	4.4%	7.3%
8701	Tractors	286.4	970.8	5.0%	5.3%
8714	Parts and accessories for motorcycles and bicycles and for carriages for disabled persons	196.0	587.1	3.4%	3.2%
8706	Chassis fitted with engines, for tractors, motor vehicles for the transport of ten or more	87.8	483.3	1.5%	2.6%
8702	Motor vehicles for the transport of >= 10 persons	123.6	172.5	2.2%	0.9%
8716	Trailers and semi-trailers	16.3	101.1	0.3%	0.6%
8712	Bicycles and other cycles	24.1	46.4	0.4%	0.3%
8705	Special purpose motor vehicles	15.6	35.9	0.3%	0.2%
8713	Carriages for disabled persons	4.2	25.3	0.1%	0.1%
8707	Bodies, incl. cabs, for tractors, motor vehicles for the transport of ten or more persons	2.9	22.1	0.1%	0.1%
8709	Works trucks, self-propelled, not fitted with lifting or handling equipment, of the type used	24.0	6.0	0.4%	0.0%
8710	Tanks and other armoured fighting vehicles, motorised, whether or not fitted with weapons	27.8	1.7	0.5%	0.0%
8715	Baby carriages and parts thereof, n.e.s.	2.9	0.4	0.1%	0.0%
Total		**5717.3**	**18238.9**	**100.0%**	**100.0%**

Source: Accessed from ITC Trade Map in September 2019; EXIM Bank Research

Table 24: Major Export Destinations for Indian motor vehicles and transport equipment

Country	2009	2018	Share in 2009	Share in 2018
USA	391.9	2848.7	6.9%	15.6%
Mexico	63.6	1713.1	1.1%	9.4%
Bangladesh	213.7	1154.3	3.7%	6.3%
South Africa	166.6	847.3	2.9%	4.6%
Nepal	125.6	721.1	2.2%	4.0%
Indonesia	57.1	612.3	1.0%	3.4%
Sri Lanka	187.9	492.3	3.3%	2.7%
Germany	451.4	451.8	7.9%	2.5%
Nigeria	165.2	450.4	2.9%	2.5%
UK	480.1	446.8	8.4%	2.4%
Others	3414.2	8500.7	59.7%	46.6%
Total	**5717.3**	**18238.9**	**100.0%**	**100.0%**

Source: Accessed from ITC Trade Map in September 2019; EXIM Bank Research

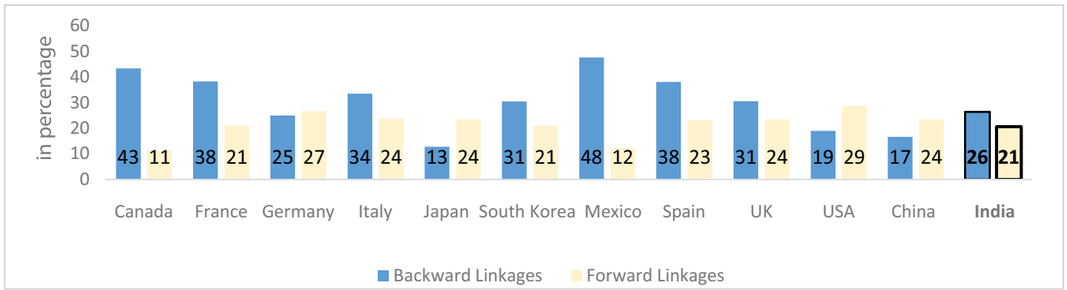
India's exports of motor vehicles and transport equipment are majorly to the USA, Mexico, among other countries. Top 10 export destinations account for more than half of total motor vehicles and transport equipment exports from India (Table 24).

Motor vehicle and transport equipment Industry and GVCs

The span of value chains for automotive industry is quite wide and intense, globally. However, India's presence is not substantial yet. India's share in global motor vehicle and transport equipment exports is just 1.2%, though it has increased from 0.7% in 2009. The share is low, as compared to Mexico which has a share of 7.5%; and China with a share of 4.9%.

The industry's domestic value added share of gross exports was 73.6% in 2015, which means that India added an equivalent proportion of the value to its exports domestically, while rest of the value addition accrues to the foreign counterparts. Services value added contributed to 27.9% of the industry's gross exports in 2016 for India.

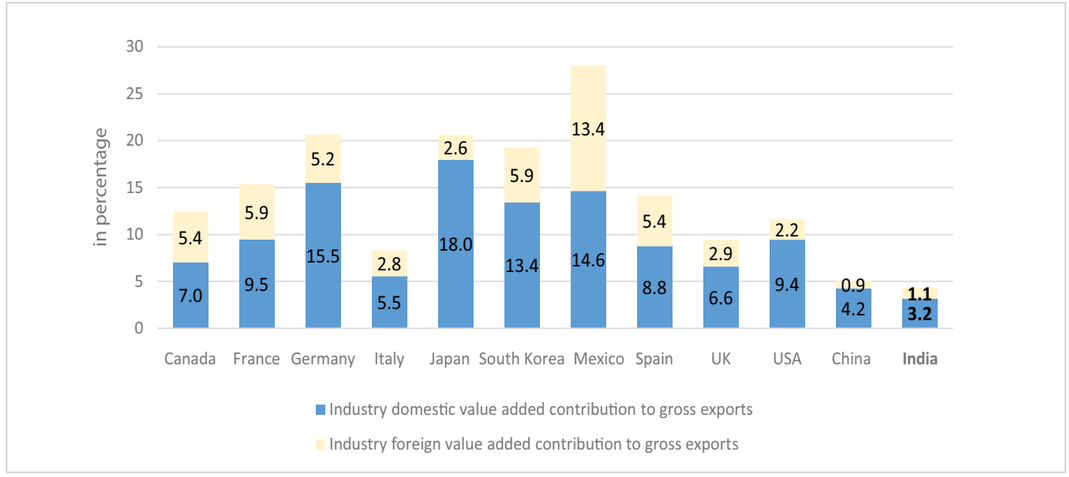
Figure 23: GVCs in Motor vehicle and transport equipment industry, 2015 (% of gross exports of industry)



Source: OECD TiVA, 2018; EXIM Bank Research

A country can link into the global value chains through backward or forward linkages. In case of automobiles, India's backward linkages is higher than forward linkages in the motor vehicle and transport equipment production value chain (Figure 23). Due to the nature of automobile manufacturing, the production involves many stages including component manufacturing and assembly, value chains are spread across the globe. Various components are being manufactured in different countries, with assembling tasks bestowed with yet another country. It is then exported to the consumers across the world. This is the reason that almost all major exporters of motor vehicles and transport equipment have mid to high backward linkages than forward linkages because these nations source auto-parts/intermediate inputs in the production of automobiles.

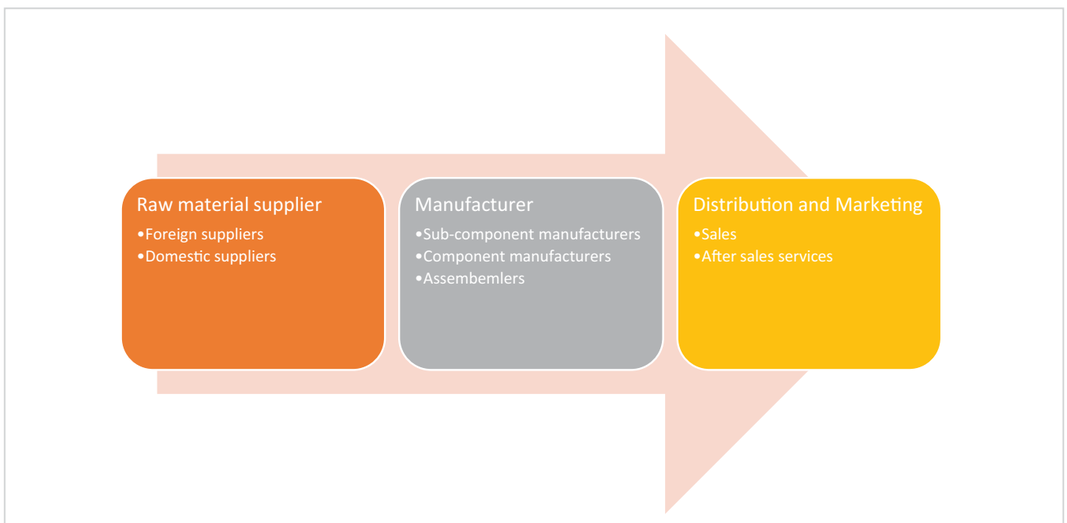
Figure 24: Motor vehicle and transport equipment industry; Contribution to Gross Exports of the economy, 2015



Source: OECD TiVA, 2018; EXIM Bank Research

Motor vehicle and transport equipment industry plays a significant role in the development of an economy, not just because it generates employment, but it also creates spillover effects for growth in other industries. In India, transport industry's value added contribution to India's gross exports is just over 4%. However, this share is quite low as compared to other major transport equipment exporting nations. In Mexico, the automobile hub of the world, the industry's valued added contribution is 28% of its gross exports (Figure 24).

Exhibit 10: Generalized Automobile Value Chains



Source: Exim Bank Research

Table 25: Motor vehicle and transport equipment Industry and GVCs

Country	Forward Linkages	Domestic value added share of gross exports	Share of domestic value added embodied in foreign final demand
Canada	11.4	56.5	61.5
France	21.1	61.6	78.0
Germany	26.8	75.0	69.5
Italy	23.7	66.5	57.5
Japan	23.5	87.2	55.6
South Korea	21.0	69.5	70.7
Mexico	12.4	52.3	64.9
Spain	23.2	61.9	65.1
UK	23.5	69.4	60.1
USA	28.8	81.0	27.2
China	23.5	83.3	18.7
India	**20.6**	**73.6**	**18.6**

Source: OECD TiVA, 2018; Exim Bank Research

There could be three types of countries in motor vehicle and transport equipment value chains. Type 1 would include countries such as India, China, and the USA, which specialize in production of intermediates, like parts, component and accessories. As these nations have decent forward linkages, and low value added share in foreign final demand, therefore, high proportion of their value added is being used in production of automobiles by other countries to further export. Type 2 economies would include nations such as Mexico and Canada; these economies are more like assembly lines in transport equipment value chains which is reflected by their high domestic value added share in foreign final demand, and low domestic value addition to gross exports. Finally, Type 3 would include economies such as Germany, South Korea and France, who, noticeably, have high share of domestic value added in foreign final demand. Forward linkages for these economies are comparatively high and their domestic value in gross exports is also decent, implying that these economies possess most of the stages in the value chain (Table 25).

CHAPTER

SERVICES: INDIA'S STRONGHOLD IN VALUE CHAINS

Manufacturing today involves much more than the pure production of goods. It increasingly includes services related activities such as business services, logistics, communication services, computing services, etc. Additionally, services add value to products through design development, marketing, etc. and ensure the competitiveness in manufacturing.

Importance of Services in International Trade and GVCs

With a few exceptions, such as finance and logistics, the role of services in global value chains (GVCs) is usually neglected. Yet, services contribute to GVCs in broader and deeper ways. For example, it was technological advances in transport and communication that made it possible for all transnational corporations, retailers, and brand houses to outsource and offshore production to distant countries[32].

An analysis through the TiVA database reveals the contribution of services in domestic production and their value-added contribution to trade. TiVA database provides two parameters regarding trade in services, namely- domestic services value-added (DSVA) share in gross exports, and foreign services value-added (FSVA) share in gross exports. Services, in this context, include construction, wholesale and retail, hotels and restaurants, transport and communications, finance, real estate and business services as well as public services.

While foreign services value-added share in gross exports (both goods and services) for India was 5.7%, the domestic services value-added share in gross exports during the same year was 46.4%, in 2016.

The services sector is very crucial for manufacturing competitiveness, and hence plays a significant role in GVCs. In 2016, services value added contributed to 25.1% of manufacturing exports (17.9% domestic and 7.2% foreign) with the highest share for 'Basic metals and fabricated metal products' at 30.9%, under the manufacturing sector. In fact, the share of DSVA in the manufacturing exports has increased from 16% in 2005 to 17.9% in 2016, while during the same period, the share of the FSVA has almost remained the same (7.4% in 2005 to 7.2% in 2016) (Table 26).

[32] Leveraging the Services Sector for Inclusive Value Chains in Developing Countries; ICTSD, 2017
https://www.ictsd.org/sites/default/files/research/issue_paper_iet_services_and_gvcs_fessehaie.pdf

Table 26: Services content in select sectors for India: 2005 and 2016

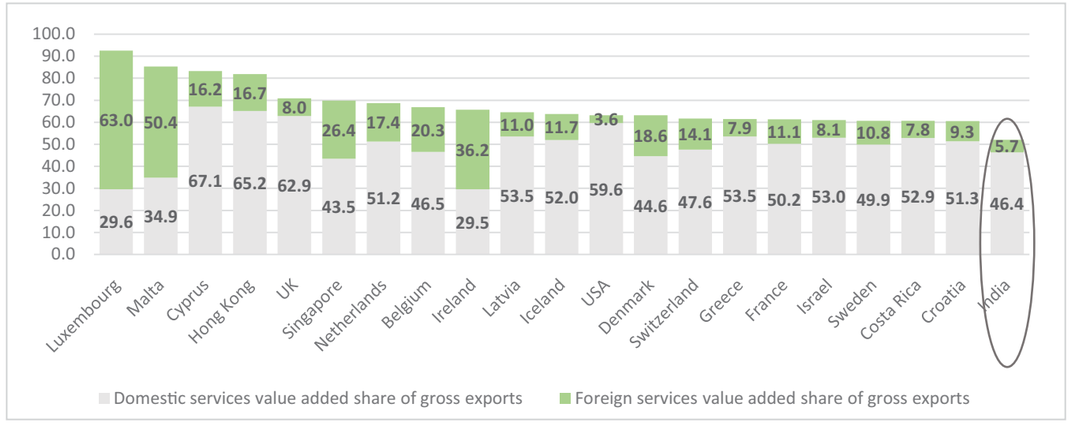
	2005		2016	
	Domestic services value added share of gross exports	**Foreign services value added share of gross exports**	**Domestic services value added share of gross exports**	**Foreign services value added share of gross exports**
TOTAL	**41.42**	**6.23**	**46.38**	**5.66**
Agriculture, forestry and fishing	**5.37**	**1.1**	**6.05**	**1.23**
Mining and quarrying	**14.9**	**4.55**	**15.51**	**4.03**
Manufacturing	15.95	7.36	17.91	7.18
Food products, beverages and tobacco	16.13	2.22	19.43	2.32
Textiles, wearing apparel, leather and related products	18.11	5.48	19.54	4.8
Wood and paper products; printing	13.61	4.41	16.8	4.89
Chemicals and non-metallic mineral products	12.87	6.93	13.99	7.09
Coke and refined petroleum products	10.46	6.51	10.54	7.1
Chemicals and pharmaceutical products	14.74	7.28	15.12	7.1
Rubber and plastic products	13.1	6.7	17.02	7.25
Basic metals and fabricated metal products	17.23	10.05	21.44	9.48
Basic metals	17.69	10.14	22.72	9.6
Fabricated metal products	15.72	9.78	17.55	9.12
Computers, electronic and electrical equipment	13.86	11.88	15.87	10.89
Computer, electronic and optical products	12.76	13.23	16.03	11.54
Electrical equipment	14.49	11.11	15.82	10.66
Machinery and equipment, nec	15.15	9.15	17.71	8.98
Transport equipment	17.12	9.04	19.71	8.21
Motor vehicles, trailers and semi-trailers	17.49	8.98	20.86	8.62
Other transport equipment	15.92	9.21	17.74	7.51
Other manufacturing; repair and installation of machinery and equipment	18.33	8.93	20.88	8.5
Electricity, gas, water supply, sewerage, waste and remediation services	**13.75**	**4.74**	**15.73**	**5.15**
Industry (mining, manufactures and utilities)	**15.9**	**7.24**	**17.89**	**7.14**
Total services	**77.16**	**5.01**	**83.59**	**3.88**

Source: OECD TiVA database, 2018; EXIM Bank Research

The domestic value added of services embodied in gross exports reflects the value-added contribution of domestic services supplied in producing goods and services for exports, while the foreign one refers to the foreign services value-added intermediates used by the exporting economy.

It may be noted that economies such as Luxembourg, Malta, Ireland, Vietnam and Hungary have a very high share of FSVA content in exports while economies such as the USA, India, Australia and Germany have a higher share of DSVA content in exports (Figure 25).

Figure 25: Services Value-added Share of Gross Exports of Goods and Services, 2016



Source: OECD TiVA database, 2018; EXIM Bank Research

As highlighted previously, the role of services in GVCs is multi-faceted. Services link manufacturing activities across countries. There are GVCs because companies can split production internationally and use transport, communication, logistics and a variety of other services to coordinate and manage activities that are geographically fragmented. But services are not just the 'glue' in value chains, they are also essential inputs in key stages of the production process, starting with design and engineering at the beginning of the value chain, and finishing with marketing, distribution, sales and after-sales services at the end (Miroudot et.al, 2017)[33].

Further, at a services level too, it becomes important to assess the contribution of services at a cross-country level in terms of both domestic and foreign services share.

While there are multiple sources to extract the services exports data, the paper relies on the classification of the TiVA database to select important services, which contribute majorly to the services exports from India. Some of the major services in the Indian context are 'IT and other information services'; 'transportation and storage'; 'wholesale and retail trade; repair of motor vehicles'; 'financial and insurance activities'; 'accommodation and food services' and 'telecommunications' (Table 27).

[33] Services in Global Value Chains: Trade patterns and gains from specialization, OECD, 2017

Table 27: Domestic and foreign services value added in the services sector

Service sector segments	Exports in US$ Million	Domestic value added share of gross exports	Domestic Services value added share of gross exports		Foreign Services value added share of gross exports	
	2005	2015	2005	2016	2005	2016
Wholesale and retail trade; repair of motor vehicles	7317.6	23966.2	90.2	88.1	2.5	3.3
Transportation and storage	14062.6	28148.9	65.6	72.1	7.6	5.0
Accommodation and food services	3116.3	8436.8	45.8	58.3	3.4	3.6
Publishing, audiovisual and broadcasting activities	294.4	725.8	77.4	73.7	4.7	6.9
Telecommunications	2494.2	2779.8	75.5	76.5	7.0	7.1
IT and other information services	24254.1	78478	82.9	90.1	4.7	3.4
Financial and insurance activities	2964.4	9024.4	88.5	89.4	2.8	3.2
Real estate activities	881	1900.6	93.9	92.2	1.4	2.4
Education	147.6	471.7	91.1	88.2	1.5	2.5
Human health and social work	119.2	318.9	74.1	77.4	3.2	3.2
Arts, entertainment, recreation and other service activities	515.9	1704.4	73.8	79.6	4.2	4.0
Total services	**66048.7**	**175964.2**	**77.2**	**83.6**	**5.0**	**3.9**

Source: OECD TiVA Database; EXIM Bank Research

IT & other information services

The IT & other information (IT, hereafter) services sector's exports from India, according to the OECD's TIVA database were recorded at US$ 78.5 billion in 2015 and has grown more than thrice from 2005. Its contribution to the total services sector's exports stands at around 45%.

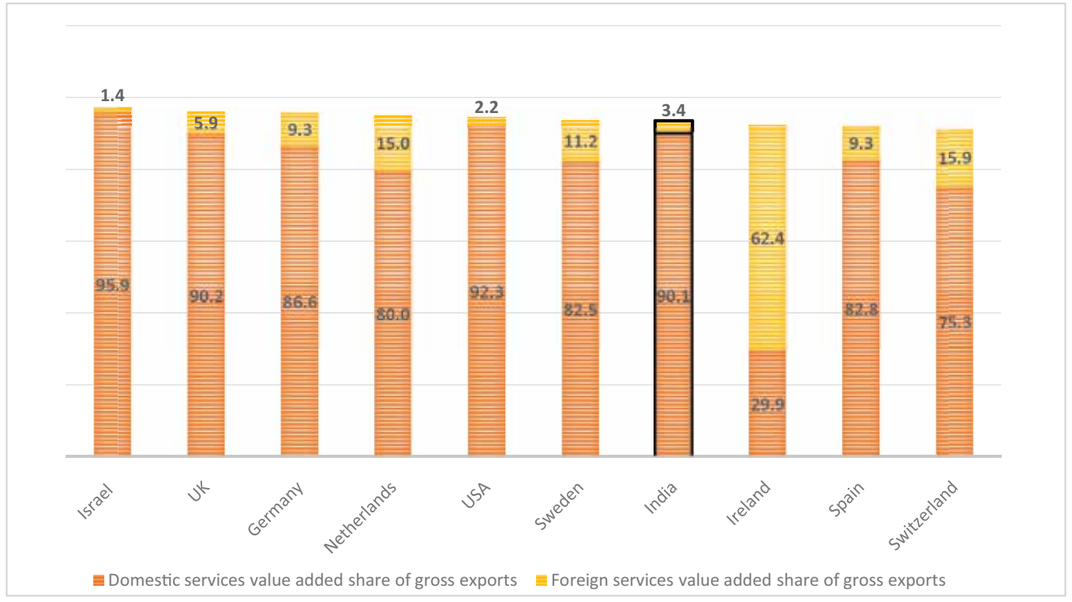
The IT sector's importance to the Indian economy is well known. In fact, India has made its presence felt significantly, in the global IT sector, in the last two decades. The cost of skilled Indian workforce being reasonably low as compared to the developed nations, is precisely the reason, as to why the IT enabled services like business process outsourcing and knowledge process outsourcing have expanded significantly in the Indian job market.

According to the Department for Promotion of Industry and Internal Trade, 'computer software and hardware' has received the second highest FDI vis-à-vis other sectors, cumulatively, at US$ 39.5 billion, during April 2000 to June 2019. This accounts for over 9% of the total FDI equity inflows in India, during this period.

With respect to the value chains in the IT sector, firms globally tend to produce in-house services that correspond to core strategic functions in which they are interested in investing in the human skills and training that will contribute to the productivity of the firm and guarantee that it remains more competitive than other firms. On the contrary, activities that are too costly to maintain in-house, are more efficiently carried out by external providers and are not part of the core functions of the firm are outsourced (Miroudot et.al, 2017)[34]. This is often referred to as body-shopping – a phenomenon that is quite prevalent in the IT sector. In some cases, these firms also establish their own entities to carry out non-core activities in destinations that provide skill-sets at competitive cost. Such models are also prevalent in IT sector, besides in other services such as accounting, consultancy and R&D activities.

The DSVA share of gross exports in Indian IT exports was as high as 90.1% in 2016 and is an increase of over 7 percentage points from 2005. On the other hand, FSVA share of gross exports in Indian IT exports was just 3.4% in 2016 and has declined from 4.7% in 2005. In other words, the total services component in the IT exports increased by almost 6 percentage points from 2005 to 2016. Ireland, which is the 2nd largest exporter in the world for IT & information services (IT sector has approximately 16% share in Ireland's total exports) has a total services component of 92.3%. However, its DSVA component is just under 30% while over 60% is from the foreign services value added (Figure 26). In fact, major global tech companies such as Google, Facebook, PayPal, Microsoft etc. have their European headquarters in Ireland.

Figure 26: Services value added share of gross exports for IT & other information services, 2016



Source: OECD TiVA database; EXIM Bank Research

[34] Services in Global Value Chains: Trade patterns and gains from specialization, OECD, 2017

Transportation and Storage

The transportation and storage industry's exports from India, according to OECD TiVA database, were over US$ 28 billion in 2015, which has almost doubled since 2005. Its share is over 6% in India's gross exports of goods and services.

The importance of logistics is being increasingly realized by economies which intend to be a part of the global value chains. In order to manage production processes that are spread across geographies, companies need services such as transport and logistics. Without the presence of such services, the existence of the value chains becomes challenging. It is important to understand that many companies outsource the services, such as transport and courier, because it is less costly to companies and at the same time, the customer firm can benefit from the economies of scale.

In fact, in India's case too, for programs like 'Make in India' to succeed, the performance of transport and logistics needs to improve. In the Logistics Performance Index 2018, India's rank was 44, out of 160 countries, with an LPI score 3.18. There is a significant scope for improvement in the parameters such as infrastructure (India's rank in 52) and timeliness (India's rank is 52).

The DSVA share of gross exports in Indian transportation and storage exports was recorded at 72.1% in 2016, while the FSVA share of gross exports was 5%. Amongst the major exporters for the transportation and logistics, the USA has the highest services value added as a share of gross exports at almost 92%, with the domestic contribution being 84.6%. However, countries such as Denmark and Singapore are exceptions, as they have a high FSVA share in gross exports. In fact, countries such as Denmark, Singapore and Luxembourg have shares of more than 30% with respect to FSVA share of gross exports in the transportation and storage sector (Figure 27).

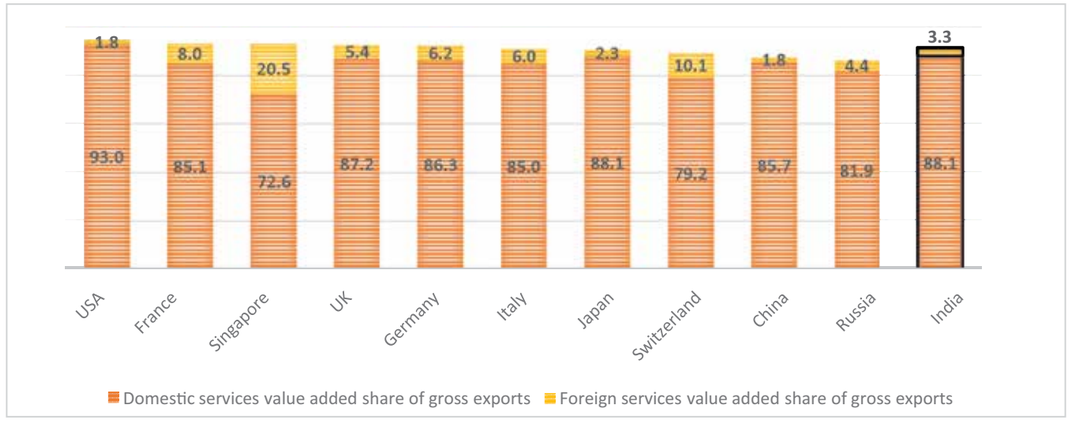
Figure 27: Services value added share of gross exports for transportation and storage, 2016

Source: OECD TiVA database; EXIM Bank Research

Wholesale and retail trade

Within the services sector, wholesale trade services take a prominent place. The main economic function of wholesale trade is to bridge the distance and time lags between production and final consumption of goods. This includes storage and the organization of goods transport, but also the collection and provision of information to customers, both upstream and downstream, in the value chain. As distinct from retail trade, wholesaling activity only includes sales to retailers or to commercial and industrial users[35].

Figure 28: Services value added share of gross exports for wholesale and retail trade, 2016



Source: OECD TiVA database; EXIM Bank Research

According to OECD TiVA database, the exports from India under this category reached US$ 24 billion in 2015, more than three times from its level in 2005. The trading sector in India has received FDI inflows amounting to US$ 24.2 billion, during April 2000 to June 2019. This reflects a share of 5.5% in the total FDI received by India during this period.

India's DSVA share of gross exports in the wholesale and retail trade industry is 88.1%, while the FSVA share of gross exports is 3.3%. Within the major exporters of this category, the USA has the highest DSVA as a share of gross exports at 93%. Additionally, Singapore has a share of over 20% in the FSVA as a share of gross exports (Figure 28).

[35] EU wholesale trade: Analysis of the sector and value chains, 2016 https://ec.europa.eu/docsroom/documents/20210/attachments/7/translations/en/renditions/native

CHAPTER

6

HOW TO INTEGRATE INTO GVCs?

The preceding chapters discussed both India's position in technology-based exports and its integration with the world economy with respect to the GVCs. It is revealed that India's participation in GVCs is more of an importer of intermediates rather than a supplier of inputs to the world. This requires some amount of policy interventions initiative to target all parts of the GVC smile curve. The smile curve represents stages of a product life-cycle in the GVC, from conception to development, to manufacturing, to after-sales service. Countries at the high end of the curve earn the most from GVC participation.

This chapter, thus, attempts to identify various viable strategies which can help India in increasing its participation in the GVCs and eventually, increase its footprint into global production network.

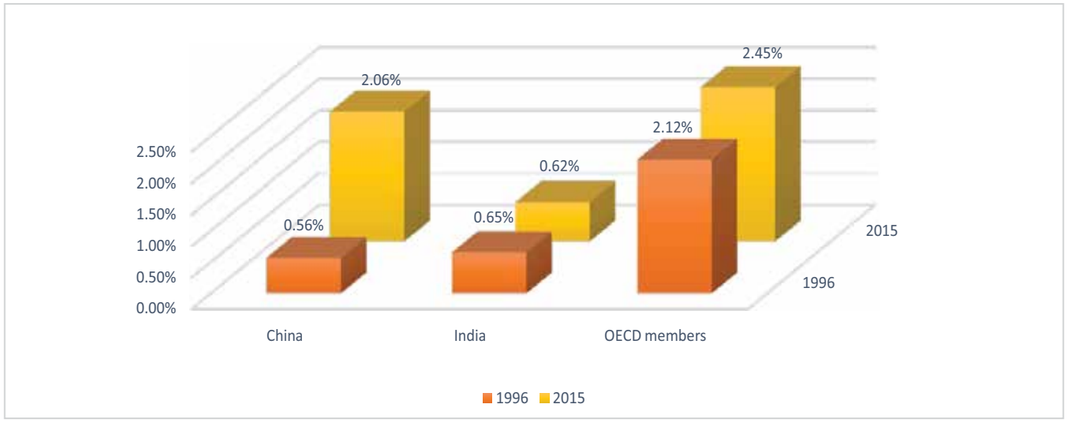
Technological Upgradation

Technology up-gradation plays a significant role in the success of a country in its economic development. In the context of India, there is evidence of India transiting from resource and low tech-based exports towards mid to hi-techbased exports. However, despite its moderate achievement in transfer of manufacturing to the hi-tech, India needs to revisit its spending on the research and development (R&D). R&D forms the backbone of GVCs. R&D activities are the core activities in value chains and correspond to the upstream stages of value chains. Developing economies are generally considered to be spending less than 1% of GDP on the R&D, while the developed economies generally spend over 2% of GDP in R&D activities. China, however, is considered to be an exception in this regard. China's spending on R&D as a percent of GDP which was 0.56% in 1996, lower than that of India (0.65%), leaped to 2.06% in the following two decades (2015). India's spending on the R&D, however, remains miniscule, and remained stable in the last two decades and was recorded at 0.62% in 2015 (Figure 29).

WTO, in its GVC Development Report 2019[36] mentions that one of the most important aspects of the policy environment for R&D is protection of intellectual property rights. Since most R&D funding comes from the industry, it is aimed at developing commercial innovations – new technologies for providing goods and services. The logic of IPR protection is to provide a temporary monopoly for the innovator. This is necessary to create a financial incentive to innovate. If innovations could be instantly copied, then there would be no incentive for undertaking R&D proactively.

[36] WTO, GVC Development Report 2019, Chapter 7, Should high domestic value added in exports be an objective of policy? https://www.wto.org/english/res_e/booksp_e/gvc_dev_report_2019_e_ch7.pdf

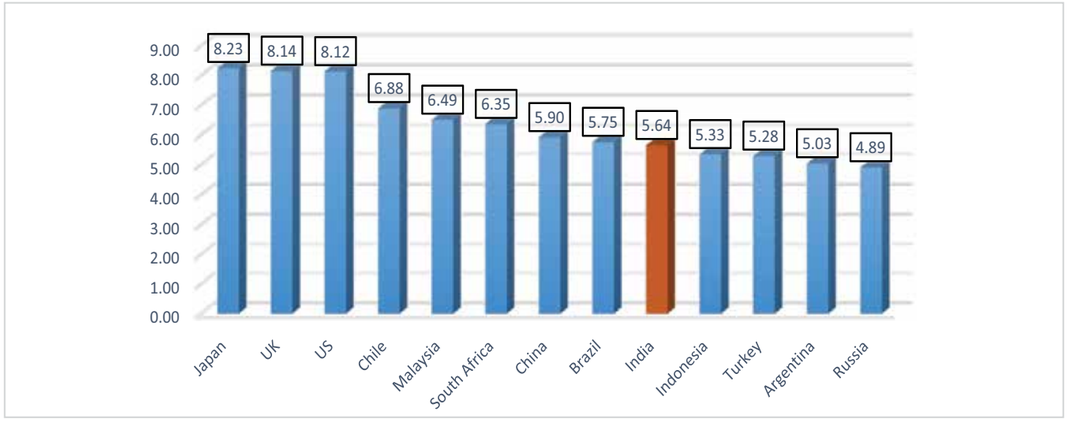
Figure 29: R&D expenditure as a percent of GDP



Source: World Bank; EXIM Bank Research

With respect to this, it is important to assess the International Property Rights Index (IPRI)[37] provided by the Property Rights Alliance. The IPRI covers various aspects while calculating this index, which includes factors such as legal and political aspects; judicial independence; rule of law; protection of physical property; property rights protections; IP rights; patent protection; copyright piracy; amongst others. In the 2018 IPRI, India's score was recorded at 5.63, while the economies such as Japan (8.23); UK (8.14); and USA (8.12) recorded a higher score. China's score on the same parameter was 5.90 (Figure 30). Economies such as Brazil, Chile, Malaysia, and South Africa rank higher than India on this parameter.

Figure 30: International Property Rights Index scores for select economies: 2018



Source: Property Rights Alliance

[37] https://www.internationalpropertyrightsindex.org/

It may be noted that in case of India, while the R&D expenditure remains immensely low, even the motivation to innovate by the private players gets somewhat hampered by the low intellectual property rights protection, as indicated by the IPRI score.

Overall, presently, India's participation is limited in the GVCs. In order to make Indian enterprises competitive and thus, integrate with the value chains, it is imperative to accord priority to R&D efforts and encourage firms to specialize in activities such as product design and development. However, technological progress and movement into higher value-added activities requires increasing efforts from developing economies such as India to put in place the right policy and institutional environment, along with the higher investment in the R&D space.

Box 2: Upgrading Along the Apparel GVC: Red Collar (China)[38]

When the Chinese economy opened in 1979, many township enterprises responded to produce clothing for the domestic wholesale market. The Red Collar Group was established in Qingdao from one such enterprise in 1995. In addition to operating its private brand domestically, the Group produced apparel for foreign brands under an OEM model. An original equipment manufacturer (OEM) designs and makes a product to its own specifications and sells to a buyer who markets the products under its own name. Red Collar invested heavily in world-class processing equipment, imported fabrics and accessories to ensure high quality, and invited designers from Italy in order to promptly follow global fashion trends. In the early 2000s, Red Collar sold to well-known brands from the United States, Italy, Germany and other EU countries, and OEM revenues far exceeded sales to the domestic market.

A second turning point came in 2003 when the information technology began flourishing in China. Red Collar explored the digitalization of the manufacturing process to become a mass customizer through a platform in which the firm directly interacts with end customers.

For example, a customer buying a suit in a departmental store can use a portable system provided by a salesperson to complete the design process and transmit the customer's data to Red Collar's manufacturing plant. Customization was initially limited to a small scale for the New York market, while OEM remained Red Collar's principal business; but by 2015, revenue from apparel customization accounted for 96% of Red Collar's total sales of RMB 1.1 billion (approximately US$ 180 million), with a net profit margin of 25%. Most of Red Collar's sales are to major retail chains or tailors, with 70% of customized orders in 2015 placed by the United States, Canada, Italy and other EU countries.

Tailored suits, can be delivered within seven working days. Red Collar's initial development was based on abundant rural labour. In the twenty-first century, university graduates with backgrounds in science and technology have become integral to Red Collar's transformation to mass customization. China's increased pool of skilled labour provided Red Collar with the human capital to enable the company to move from the low end of the GVC to high value-added production.

[38] Adapted from 'Global Value Chains and Industrial Development Lessons from China, South-East and South Asia'

Trade Agreements

Trade agreements play a crucial role in the global production network as countries get duty free access or special status to major markets. Laget et al. (2018)[39] estimated the relationship between GVCs and the depth of trade agreements and revealed that depth of trade agreementsincreases GVC-related trade among participating countries. The positive impact of deep agreements[40] on GVC integration is driven by value-added trade in intermediates rather than in final goods and services. Adding a policy area to a PTA increases domestic value added of intermediates (forward GVC linkages) and foreign value added of intermediates (backward GVC linkages) by 0.48% and 0.38%, respectively. Further, it revealed that provisions outside the current WTO mandate such as competition policy and investment are key drivers of the relationship between deep trade agreements and GVC-related trade, particularly for North-South PTAs.

However, border provisions are still an important driver of GVC trade for South-South PTAs. There is thus a significant evidence on how trade agreements, especially the latest trade agreements which go into the various factors are considered to facilitate integration in the GVCs.

India may also need to take a relook at the existing FTAs and explore the possibility of re-negotiating them.Recently the USA did something similar with the NAFTA, despite being the most successful trade blocs globally. India may analyze the low extent of the utilization of tariff preferences when it comes to India's FTAs. While the global utilization of preferences is as high as 70% to 80%, in the case of India it stands at around 5%-25%. This again is dependent on selection of trade partners and the depth of tariff concessions secured from them.

Another factor relevant for lesser utilization of the preferences, inter alia, is the relative ignorance of Indian exporters about the available trade preferences, and their benefits. In many cases, the exporters are simply not aware of the existence of the FTA or believe that the compliance such as obtaining Rules of Origin certificates, to such FTAs will be expensive and time consuming. Some of the trade agreements India has negotiated are with countries which have low average tariffs and therefore, the likelihood of using the trade preferences is limited. Unless peak tariffs of interest are addressed in such agreements, their utility raises questions. Indian exports are also more responsive to income changes as compared to price changes. Therefore, in a scenario of economic slowdown, the uptake of India's exports is adversely impacted[41].

[39] Deep Trade Agreements and Global Value Chains, 2018 http://documents.worldbank.org/curated/en/356541529933295649/pdf/WPS8491.pdf

[40] The contents of the newer trade agreements have changed. Newer agreements are deeper in the sense that the set of policy areas covered has expanded. Older PTAs focused on fewer than ten policy areas, which were mostly commitments on tariffs on industrial and agricultural goods and other border measures such as export taxes. Newer agreements extended their reach, first to areas such as trade remedies (i.e. countervailing measures, antidumping duties) and subsidies, and then to a broader set of behind the border measures relating to services trade, investment, intellectual property rights and domestic regulation

[41] Non-Tariff Measures on Indian Exports, Export Import Bank of India, 2019 https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/SpecialPublications/Study%20on%20Non-Tariff%20Measures_Part%20I.pdf

India should also explore the possibility of putting in place an FTA with the BIMSTEC[42] bloc to boost its intra-regional trade which was negotiated first in 2004. While trade agreements are one side of the coin, the other side is the utilization of these agreements by the exporters. A low utilization rate beats the very purpose of the trade agreements. With respect to this challenge, the government may consider establishing an extensive and well-equipped architecture for building skills and awareness among economic operators to make efficient use of international trade opportunities.

India should approach trade agreements to reduce and solve coordination failures, structural or systematic, and which would support a predictable trade environment. Trade agreements should look at trade remedies (i.e. countervailing measures, antidumping duties) and subsidies, and then to a broader set of behind the border measures relating to services trade, investment, intellectual property rights and domestic regulation[43].

Focus on Services Sector

Services play a crucial role in the functioning of GVCs, and services liberalization is in many ways different from goods liberalization. When the production of goods involves intermediate inputs crossing borders multiple times, developing countries that wish to take a more active part in GVCs have more options than just lowering tariffs or non-tariff barriers. Liberalizing trade in services can provide new pathways for developing countries to utilize their comparative advantage in global supply chains. Furthermore, allowing the cross-border supply of services without local presence is crucial to increasing countries' participation in manufacturing GVCs[44]. According to WTO's 'Trade in Services data by mode of supply (TISMOS)', during 2005 to 2017, almost 50% of the global exports of the services are in the Mode 3 category which 'establishment of commercial presence abroad', followed by Mode 1 category. In India's case, Mode 1 category accounts for over 70% of the services exports, which is essentially the cross-border supply of services-provided by phone, fax, or electronic means, including body-shopping[45]. Non-trade related business services and information & communication are the major services exports from India.

This Study at various points has illustrated the role of services in GVCs, drawing on selected evidence. Coordinating dispersed production blocks requires services linkages such as transportation, telecommunication, and various producer services like business and financial services. A streamlined services sector, enables and facilitates fragmentation, leading to an increased reallocation of production stages across borders.

In the Indian scenario, the importance of the services sector for the Indian economy has increased tremendously in the last 2 decades. It contributes more than 50% to the total gross value addition by

[42] The BIMSTEC member states are Bangladesh, India, Myanmar, Sri Lanka, Thailand, Nepal and Bhutan

[43] Deep trade agreements as public goods, Mattoo et al. (2017) https://voxeu.org/article/trade-effects-deep-agreements

[44] Services liberalization and global value chain participation: Heterogeneous effects by income level and provisions', world bank https://voxeu.org/article/services-liberalisation-and-global-value-chain-participation

[45] Body shopping is the practice of consultancy firms recruiting IT workers in order to contract their services out on short-term bases. Regarded as legitimate consultancy by both the companies that practice it and by the people employed, body shopping is disparaged by those IT services companies in India that assert that they provide real services (such as software development) rather than the "sham" of merely farming out professionals to overseas companies.

India. In fact, services exports which have been one of India's key sources of foreign exchange held a 3.5% share in global services exports in 2018, and has increased from 1.2% in 2001 and 2.6% in 2009. As of 2018, India's services exports account for 38% of the overall exports from India.

Table 28: Services Trade Restrictiveness Index for select countries, 2018

Sector	Australia	Chile	Japan	Turkey	UK	USA	Brazil	China	India	Indo-nesia	Russia	South Africa
Accounting	0.183	0.096	0.196	1.000	0.270	0.169	0.303	0.754	0.827	0.708	0.325	0.270
Air transport	0.305	0.165	0.395	0.554	0.393	0.534	0.560	0.479	0.573	0.481	0.571	0.464
Architecture	0.150	0.146	0.148	0.268	0.186	0.204	0.283	0.233	0.684	0.312	0.310	0.235
Broadcasting	0.189	0.294	0.258	0.404	0.171	0.266	0.480	0.707	0.439	0.432	0.433	0.423
Commercial banking	0.172	0.214	0.201	0.227	0.172	0.206	0.443	0.409	0.517	0.489	0.354	0.336
Computer	0.161	0.170	0.163	0.278	0.178	0.203	0.293	0.342	0.377	0.334	0.377	0.227
Construction	0.192	0.163	0.123	0.250	0.145	0.251	0.247	0.341	0.366	0.441	0.365	0.241
Courier	0.369	0.493	0.262	0.472	0.171	0.378	0.545	0.881	0.570	0.469	0.405	0.490
Distribution	0.137	0.140	0.125	0.168	0.116	0.163	0.220	0.265	0.445	0.649	0.263	0.223
Engineering	0.132	0.160	0.118	0.239	0.152	0.221	0.258	0.254	0.303	0.301	0.320	0.245
Insurance	0.195	0.168	0.166	0.219	0.148	0.288	0.368	0.444	0.565	0.486	0.390	0.198
Legal	0.131	0.161	0.538	0.610	0.182	0.206	0.309	0.532	0.886	0.890	0.251	0.310
Logistics cargo-handling	0.218	0.247	0.210	0.360	0.160	0.248	0.351	0.412	0.404	0.463	1.000	0.368
Logistics customs brokerage	0.166	0.351	0.160	0.282	0.148	0.237	0.284	0.336	0.328	0.314	0.375	0.278
Logistics freight forwarding	0.168	0.201	0.201	0.281	0.136	0.222	0.256	0.340	0.316	0.380	0.337	0.281
Logistics storage and warehouse	0.168	0.199	0.173	0.306	0.162	0.220	0.320	0.361	0.400	0.391	1.000	0.290
Maritime transport	0.184	0.204	0.191	0.243	0.201	0.369	0.313	0.358	0.395	0.557	0.436	0.272
Motion pictures	0.151	0.185	0.103	0.226	0.179	0.155	0.294	0.615	0.319	0.328	0.343	0.220
Rail freight transport	0.145	0.234	0.198	0.245	0.168	0.164	0.262	0.298	1.000	0.357	0.994	0.314
Road freight transport	0.133	0.127	0.124	0.206	0.167	0.188	0.230	0.273	0.315	0.467	0.294	0.173
Sound recording	0.143	0.188	0.106	0.237	0.155	0.178	0.222	0.498	0.280	0.233	0.303	0.218
Telecom	0.173	0.235	0.253	0.211	0.171	0.172	0.267	0.682	0.421	0.644	0.381	0.306

Source: OECD database; EXIM Bank Research

However, with all the boom that services sector has provided to the Indian economy, there lies a significant scope for improvement. India lags in terms of openness of the services sector for the foreign entrants. According to the OECD database, India stands high on the services trade restrictiveness index (STRI) for a significant number of industries (Table 28). There could be both horizontal and sector specific restrictions. There are some horizontal measures under the STRI which are cross-cutting across sectors. As a result, even if a sector is less restrictive as per sector-specific measures, the horizontal measures make the whole sector restrictive. Horizontal restrictions might include factors such as foreign investment; residency requirements; regulations and limitations on location and transfer of data; restrictions to movement of natural persons; public procurement; barriers to competition; regulatory transparency; amongst others. The presence of some of the policy restrictions, like foreign equity restrictions, automatically reflects on STRI scores even if there are no restrictions in these areas[46].

Any strategy for services exports should take into consideration the value addition contributed by the services sector on India's exports, and whether India is moving up the ladder of value addition. As per the OECD-TiVA database (explained in Chapter 4), in 2016, India's domestic, foreign and, total services value-added share of gross exports are 46.4%, 5.7% and 52.1%, respectively. In fact, domestic services value added is higher in India compared to all other BRICS countries. Further, services value added contributed to 25.1% of manufacturing exports (17.9% DSVA and 7.2% FSVA). This amply corroborates the increasing role of the services sector, especially domestic services in India's manufacturing exports. In India's case, for the total services sector, almost 17% of the domestic value addition in the services value addition was used in meeting foreign final demand in 2016.

As a result, there is a growing need to focus on services reforms in order to make Indian manufacturer more competitive. A well-developed and competitive services sector will enable India to get more involved into the fragmented global production network. It may be noted that the most technologically advanced countries have seen their DVA in exports decline in recent years as they make proportionally more use of imported inputs. These economies also tend to have large shares of services in their value added exports. This rising service share reflects two factors: first, there is growing service content embodied in manufactured products, such as software in automobiles and appliances; second, as value chains become more fragmented, services such as finance, telecom, and transport are increasingly important in managing value chains. Given these trends, it is not surprising that the most technologically advanced countries tend to be very open to trade and investment in services. In these sectors, trade and investment tend to go together because it is hard to trade most services without an investment presence[47]. Taking a cue from this, while India should be focusing increasingly on the manufacturing sector, it should not lose its established strength in the services sector, besides adopting appropriate strategies build on the existing strengths.

[46] India's Services Trade Liberalisation and Export Promotion, Export Import Bank of India, 2019 https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/SpecialPublications/STRI%20Study_Main%20Report.pdf

[47] WTO, GVC Development Report 2019, Chapter 7, Should high domestic value added in exports be an objective of policy? https://www.wto.org/english/res_e/booksp_e/gvc_dev_report_2019_e_ch7.pdf

Attracting FDI

Attracting FDI is probably the fastest way to integrate into desired GVCs. Foreign subsidiaries bring with them capital, technologies and managerial skills that may be superior to those available domestically. Most importantly, they bring knowledge about the production process in GVCs of interest, their way of operation, their structures and governance and their markets. It is also a way to quickly increase the DVA produced in an industry (in absolute terms) by inviting FDI in segments of the chain that are currently not undertaken domestically.

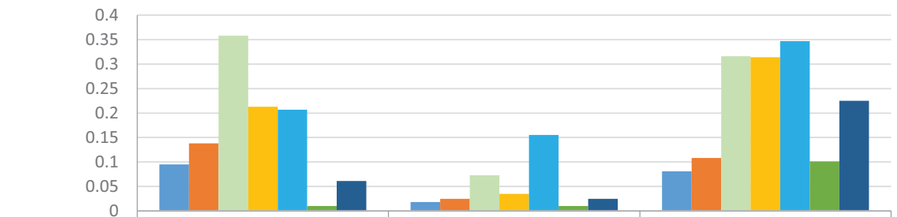
Since 2000, interest in developing countries has centered on two main phenomena: the upsurge of foreign capital inflows, and their increasing participation in the fragmentation of production. Developing economies are the main beneficiaries of the global rise in foreign direct investments (FDI)[48]. In fact, on an average, FDI towards developing countries grew by 7.7% per year during the period 2000 to 2018, a growth level of more than thrice in investment attracted by the advanced economies, which grew at an AAGR of 2.5%.

India's recent trends in inward FDI has been of quite significance to the Indian economy. According to the Department for Promotion of Industry and Internal Trade, during 2000-01 to 2018-19, India has received FDI equity inflows to the tune of US$ 420 billion, with the major recipients being those in the services sector[49] (17.7%); computer software and hardware (8.9%); telecommunications (7.8%); construction development (6%); and trading (5.5%).

However, it is interesting to analyze how open is India to FDI vis-à-vis other countries. The OECD calculates a direct investment restrictiveness index for whole economies and for sectors[50]. It is observed from the FDI restrictiveness index for the advanced economies that make up the OECD that they are open in virtually all sectors. Emerging markets, on the other hand, tend to be open in attracting investment in manufacturing, but still somewhat closed in attracting investment in services, such as telecom and finance. In India's case it is seen that amongst the BRICS nations, India has the second most investment restrictiveness in the primary sector, third most in investment restrictiveness in the manufacturing space, and third most in investment restrictiveness in the tertiary space, for the year 2018. However, it is interesting to note that while the restrictiveness index for India in the primary and manufacturing space is 0.213 and 0.035, it is as high as 0.314 in tertiary sector. In fact, some of the industries under the tertiary sector have quite high score under this index. The legal, and accounting and audit sectors have the highest restrictions with a score of 1. Other sectors with high restrictions include real estate investment (0.95); business services (0.563); retail (0.558); banking (0.413); and insurance (0.4) (Figure 31).

[48] FDI, Global Value Chains, and Local Sourcing in Developing Countries, IMF, 2017 https://www.imf.org/en/Publications/WP/Issues/2017/12/21/FDI-Global-Value-Chains-and-Local-Sourcing-in-Developing-Countries-45513
[49] Services sector here includes Finance, Banking, Insurance, Non Finance/Business, Outsourcing, R&D, Courier, Tech. Testing and Analysis
[50] This index gauges the restrictiveness of a country's FDI rules by looking at the four main types of restrictions on FDI which include foreign equity limitations; screening or approval mechanisms; restrictions on the employment of foreigners as key personnel; and operational restrictions, e.g. restrictions on branching and on capital repatriation or on land ownership.

Figure 31: FDI restrictiveness index for primary, manufacturing, and tertiary sectors for select economies (2018)



	Primary	Manufacturing	Tertiary
OECD - Average	0.095	0.018	0.081
Brazil	0.138	0.025	0.108
China	0.358	0.073	0.316
India	0.213	0.035	0.314
Russia	0.207	0.155	0.347
South Africa	0.01	0.01	0.101
Vietnam	0.061	0.025	0.225

Source: OECD TiVA, 2018; EXIM Bank Research

FDI may have direct and indirect positive impacts on manufacturing value-added via technology spillover and creating new job opportunities. However, there are various factors which can increase the positive effects of MNCs on the host country. Government policy of host countries is one of the most important factors for directing FDI into right channels[51]. As a result, India needs to build appropriate environment to attract foreign investors. It is also important to broaden the scope of incentives and instruments to include domestic firms as this will induce them to enter desired value chains, rather than just offering incentives to foreign players.

Focus on Infrastructure

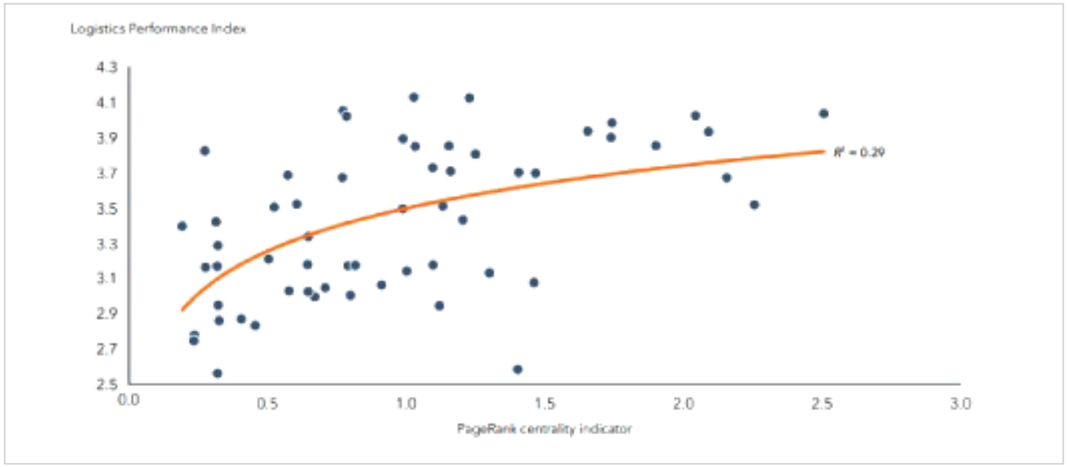
Access to reliable physical and "soft" infrastructure (notably logistics and telecommunications) is crucial for attracting GVC activities. As value chains are often regional in nature, international partnerships for infrastructure development can be particularly beneficial[52].

As a result, infrastructure becomes a parameter of significance for not just development in general, but in the context of GVCs too. Delays in transportation can significantly disrupt the production of the final product. Logistical and transport infrastructure can help reduce inventory and handling costs as well as reduce delivery times. In fact, a World Bank study[53], showed a clear relationship emerges between better logistics performance and deeper involvement in GVCs when the Logistics Performance Index is plotted against a centrality indicator of each country's role in GVCs (Exhibit 11).

[51] The Effect of FDI on China's Position in the Global Value Chain, Behzad Azarhoushang, 2015 https://www.global-labour-university.org/fileadmin/GLU_conference_2015/papers/B.Azarhoushang.pdf
[52] World Investment Report 2013, UNCTAD
[53] Global Value Chain Development Report 2017, Measuring and Analyzing the Impact Of GVCs on Economic Development, World Bank http://documents.worldbank.org/curated/en/440081499424129960/pdf/117290-WP-P157880-PUBLIC.pdf

The link is not that tight (R^2 = 0.29), however, indicating that other factors are at work as well. But it is interesting that there are no countries in the lower right quadrant: no countries with poor logistics performance are central to GVCs. For countries that want to get more involved in GVCs, trade facilitation and infrastructure are obvious places to start.

Exhibit 11: Relationship between the Logistics Performance Index and a centrality measure of country involvement in global value chains



Source: Adapted from Global Value Chain Development Report 2017, Measuring and Analyzing the Impact of GVCs on Economic Development, World Bank

An integrated focus on infrastructure will not only enhance the competitiveness of domestic manufacturer but also attract foreign investment thereby initiating both forward and backward linkages. Additionally, a well-developed infrastructure like roads, ports, building logistics network and improvement in information and communication technology can increase access to foreign markets. This would not only increase the competitiveness of Indian manufacturer but also increase their compliance with international standards.

Box 3: Suzhou Industrial Park –Integrating Drivers of Competitiveness to Boost Global Value Chain Participation: A Case Study[54]

Challenge confronted from the early 1980s to the early 1990s, government-led development of Suzhou's economy focused on state-owned enterprises (SOEs) and low-end, collectively owned township and village enterprises (TVEs). While generally successful in stimulating economic growth and rural industrialization, this model ran into serious problems. Over interference of local governments, lack of economies of scale, weak integration into global value chains (GVCs) and environmental pollution were all major impediments to sustainable growth. The challenge was how to upgrade the existing growth model to boost competitiveness and to better integrate the local economy into GVCs.

Solution Used

Suzhou adopted an export-oriented strategy to target foreign direct investment (FDI) in high-end manufacturing sectors with an eye toward the future. These included information and communication technology (ICT), automotive and aeronautical parts, pharmaceuticals, and, more recently, software and outsourcing services. In support of this strategy, the Government of Suzhou, with the strong backing of the central government, did the following:

- Set up the Suzhou Industrial Park (SIP) in partnership with the Government of Singapore. SIP has been governed by the China-Singapore Joint Steering Council (JSC). This partnership has helped Suzhou to tap into Singapore's advanced knowledge and know-how of zone development and operations.
- Established a highly conducive business environment, including sound legal, regulatory and incentive regimes, including a "one-stop shop" service centre, which provides a streamlined and more transparent approach on registration, licensing, permits, taxation, immigration and customs clearance, etc.
- Implemented preferential policies. Besides a rather standard exemption of income tax for the first two years (once making profit) and half the normal rate for the following three years, the Government of Suzhou also gives special tax incentives and refunds for specific new and high-tech sectors. Incentives for firms in the export processing zones within the SIP include exemption of import and export licenses, export taxes and import duties.
- Developed and built first-class hard infrastructure, including power, water, roads, telecom and high-quality green facilities.
- Carried out many experimental programmes addressing services

Outcomes and Results

There has been rapid agglomeration of industries in ICT, including firms specializing in integrated circuits, thin-film transistors and liquid crystal display screens. The automotive and aeronautical parts industries have also grown significantly. In more recent years, there has been a rapid emergence of high-end sectors in the zone that include software, outsourcing services and pharmaceuticals. While most of the high-tech manufacturing and service sectors were created through attraction of new firms (especially anchor firms or top and second tier suppliers) and new workers, many of the traditional sectors such as the machinery and paper products have been upgraded. SIP has become a major growth engine of the Suzhou economy, achieving an annual average economic growth of around 30% since its inception. With only 3.3% of the total land, 7.4% of the population and 6.3% of the industrial land, SIP contributes about 15% of Suzhou's GDP, 13% of its industrial output, 29% of its total trade and 16% of its public revenues.

[54] Adapted from the world economic forum's case studyhttp://www3.weforum.org/docs/Manufacturing_Our_Future_2016/Case_Study_15.pdf

Annexure: List of products based on the technology

SITC 3-digit code	Description
016	Meat and edible meat offal, salted, in brine, dried or smoked; edible flours and meals of meat or meat offal
017	Meat and edible meat offal, prepared or preserved, n.e.s.
023	Butter and other fats and oils derived from milk
024	Cheese and curd
035	Fish, dried, salted or in brine; smoked fish (whether or not cooked before or during the smoking process); flours, meals and pellets of fish, fit for human consumption
037	Fish, crustaceans, molluscs and other aquatic invertebrates, prepared or preserved, n.e.s.
046	Meal and flour of wheat and flour of meslin
047	Other cereal meals and flours
048	Cereal preparations and preparations of flour or starch of fruits or vegetables
056	Vegetables, roots and tubers, prepared or preserved, n.e.s.
058	Fruit, preserved, and fruit preparations (excluding fruit juices)
059	Fruit juices (including grape must) and vegetable juices, unfermented and not containing added spirit, whether or not containing added sugar or other sweetening matter
061	Sugars, molasses and honey
062	Sugar confectionery
073	Chocolate and other food preparations containing cocoa, n.e.s.
098	Edible products and preparations, n.e.s.
111	Non-alcoholic beverages, n.e.s.
112	Alcoholic beverages
122	Tobacco, manufactured (whether or not containing tobacco substitutes)
232	Synthetic rubber; reclaimed rubber; waste, parings and scrap of unhardened rubber
247	Wood in the rough, whether or not stripped of bark or sapwood, or roughly squared
248	Wood, simply worked, and railway sleepers of wood
251	Pulp and waste paper
264	Jute and other textile bast fibres, n.e.s., raw or processed but not spun; tow and waste of these fibres (including yarn waste and garnetted stock)
265	Vegetable textile fibres (other than cotton and jute), raw or processed but not spun; waste of these fibres
281	Iron ore and concentrates
282	Ferrous waste and scrap; remelting scrap ingots of iron or steel
283	Copper ores and concentrates; copper mattes; cement copper
284	Nickel ores and concentrates; nickel mattes, nickel oxide sinters and other intermediate products of nickel metallurgy
285	Aluminium ores and concentrates (including alumina)
286	Uranium or thorium ores and concentrates
287	Ores and concentrates of base metals, n.e.s.
288	Non-ferrous base metal waste and scrap, n.e.s.
289	Ores and concentrates of precious metals; waste, scrap and sweepings of precious metals (other than of gold)
322	Briquettes, lignite and peat
334	Petroleum oils and oils obtained from bituminous minerals (other than crude); preparations, n.e.s., containing by weight 70% or more of petroleum oils or of oils obtained from bituminous minerals, these oils being the basic constituents of the preparatio
335	Residual petroleum products, n.e.s., and related materials
342	Liquefied propane and butane
344	Petroleum gases and other gaseous hydrocarbons, n.e.s.
345	Coal gas, water gas, producer gas and similar gases, other than petroleum gases and other gaseous hydrocarbons
411	Animal oils and fats
421	Fixed vegetable fats and oils, soft, crude, refined or fractionated
422	Fixed vegetable fats and oils, crude, refined or fractionated, other than ôsoftö
431	Animal or vegetable fats and oils, processed; waxes; inedible mixtures or preparations of animal or vegetable fats or oils, n.e.s.
511	Hydrocarbons, n.e.s., and their halogenated, sulphonated, nitrated or nitrosated derivatives
514	Nitrogen-function compounds
515	Organo-inorganic compounds, heterocyclic compounds, nucleic acids and their salts, and sulphonamides
516	Other organic chemicals
522	Inorganic chemical elements, oxides and halogen salts
523	Salts and peroxysalts, of inorganic acids and metals
524	Other inorganic chemicals; organic and inorganic compounds of precious metals
531	Synthetic organic colouring matter and colour lakes, and preparations based thereon
532	Dyeing and tanning extracts, and synthetic tanning materials
551	Essential oils, perfume and flavour materials
592	Starches, inulin and wheat gluten; albuminoidal substances; glues
621	Materials of rubber (e.g., pastes, plates, sheets, rods, thread, tubes, of rubber)
625	Rubber tyres, interchangeable tyre treads, tyre flaps and inner tubes for wheels of all kinds
629	Articles of rubber, n.e.s.
633	Cork manufactures
634	Veneers, plywood, particle board, and other wood, worked, n.e.s.
635	Wood manufactures, n.e.s.
641	Paper and paperboard
661	Lime, cement, and fabricated construction materials (except glass and clay materials)
662	Clay construction materials and refractory construction materials
663	Mineral manufactures, n.e.s.
664	Glass

667	Pearls and precious or semiprecious stones, unworked or worked
689	Miscellaneous non-ferrous base metals employed in metallurgy, and cermets
Low tech products	
611	Leather
612	Manufactures of leather or of composition leather, n.e.s.; saddlery and harness
613	Furskins, tanned or dressed (including heads, tails, paws and other pieces or cuttings), unassembled, or assembled (without the addition of other materials), other than those of heading 848.31
642	Paper and paperboard, cut to size or shape, and articles of paper or paperboard
651	Textile yarn
652	Cotton fabrics, woven (not including narrow or special fabrics)
654	Other textile fabrics, woven
655	Knitted or crocheted fabrics (including tubular knit fabrics, n.e.s., pile fabrics and openwork fabrics), n.e.s.
656	Tulles, lace, embroidery, ribbons, trimmings and other small wares
657	Special yarns, special textile fabrics and related products
658	Made-up articles, wholly or chiefly of textile materials, n.e.s.
659	Floor coverings, etc.
665	Glassware
666	Pottery
673	Flat-rolled products of iron or non-alloy steel, not clad, plated or coated
674	Flat-rolled products of iron or non-alloy steel, clad, plated or coated
675	Flat-rolled products of alloy steel
676	Iron and steel bars, rods, angles, shapes and sections (including sheet piling)
677	Rails or railway track construction material, of iron or steel
679	Tubes, pipes and hollow profiles, and tube or pipe fittings, of iron or steel
691	Structures and parts of structures, n.e.s., of iron, steel or aluminium
692	Metal containers for storage or transport
693	Wire products (excluding insulated electrical wiring) and fencing grills
694	Nails, screws, nuts, bolts, rivets and the like, of iron, steel, copper or aluminium
695	Tools for use in the hand or in machines
696	Cutlery
697	Household equipment of base metal, n.e.s.
699	Manufactures of base metal, n.e.s.
821	Furniture and parts thereof; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings
831	Trunks, suitcases, vanity cases, executive cases, briefcases, school satches, spectacle cases, binocular cases, camera cases, musical instrument cases, gun cases, holsters and similar containers; travelling bags, insulated food or beverages bags, toilet
841	Men's or boys' coats, capes, jackets, suits, blazers, trousers, shorts, shirts, underwear, nightwear and similar articles of textile fabrics, not knitted or crocheted (other than those of subgroup 845.2)
842	Women's or girls' coats, capes, jackets, suits, trousers, shorts, shirts, dresses and skirts, underwear, nightwear and similar articles of textile fabrics, not knitted or crocheted (other than those of subgroup 845.2)
843	Men's or boys' coats, capes, jackets, suits, blazers, trousers, shorts, shirts, underwear, nightwear and similar articles of textile fabrics, knitted or crocheted (other than those of subgroup 845.2)
844	Women's or girls' coats, capes, jackets, suits, trousers, shorts, shirts, dresses and skirts, underwear, nightwear and similar articles of textile fabrics, knitted or crocheted (other than those of subgroup 845.2)
845	Articles of apparel, of textile fabrics, whether or not knitted or crocheted, n.e.s.
846	Clothing accessories, of textile fabrics, whether or not knitted or crocheted (other than those for babies)
848	Articles of apparel and clothing accessories of other than textile fabrics; headgear of all materials
851	Footwear
893	Articles, n.e.s., of plastics
894	Baby carriages, toys, games and sporting goods
895	Office and stationery supplies, n.e.s.
897	Jewellery, goldsmiths' and silversmiths' wares, and other articles of precious or semiprecious materials, n.e.s.
898	Musical instruments and parts and accessories thereof; records, tapes and other sound or similar recordings (excluding goods of groups 763 and 883)
899	Miscellaneous manufactured articles, n.e.s.
Mid Tech Products	
266	Synthetic fibres suitable for spinning
267	Other man-made fibres suitable for spinning; waste of man-made fibres
512	Alcohols, phenols, phenol-alcohols, and their halogenated, sulphonated, nitrated or nitrosated derivatives
513	Carboxylic acids and their anhydrides, halides, peroxides and peroxyacids; their halogenated, sulphonated, nitrated or nitrosated derivatives
533	Pigments, paints, varnishes and related materials
553	Perfumery, cosmetic or toilet preparations (excluding soaps)
554	Soap, cleansing and polishing preparations
562	Fertilizers (other than those of group 272)
571	Polymers of ethylene, in primary forms
572	Polymers of styrene, in primary forms
573	Polymers of vinyl chloride or of other halogenated olefins, in primary forms
574	Polyacetals, other polyethers and epoxide resins, in primary forms; polycarbonates, alkyd resins, polyallyl esters and other polyesters, in primary forms
575	Other plastics, in primary forms
579	Waste, parings and scrap, of plastics
581	Tubes, pipes and hoses, and fittings therefor, of plastics
582	Plates, sheets, film, foil and strip, of plastics
583	Monofilament of which any cross-sectional dimension exceeds 1 mm, rods, sticks and profile shapes, whether or not surface-worked but not otherwise worked, of plastics

591	Insecticides, rodenticides, fungicides, herbicides, anti-sprouting products and plant-growth regulators, disinfectants and similar products, put up in forms or packings for retail sale or as preparations or articles (e.g., sulphur-treated bands, wicks an
593	Explosives and pyrotechnic products
597	Prepared additives for mineral oils and the like; prepared liquids for hydraulic transmission; anti-freezing preparations and prepared de-icing fluids; lubricating preparations
598	Miscellaneous chemical products, n.e.s.
653	Fabrics, woven, of man-made textile materials (not including narrow or special fabrics)
671	Pig-iron, spiegeleisen, sponge iron, iron or steel granules and powders and Ferro-alloys
672	Ingots and other primary forms, of iron or steel; semi-finished products of iron or steel
678	Wire of iron or steel
711	Steam or other vapour-generating boilers, superheated water boilers, and auxiliary plant for use therewith; parts thereof
712	Steam turbines and other vapour turbines and parts thereof, n.e.s.
713	Internal combustion piston engines and parts thereof, n.e.s.
714	Engines and motors, non-electric (other than those of groups 712, 713 and 718); parts, n.e.s., of these engines and motors
721	Agricultural machinery (excluding tractors) and parts thereof
722	Tractors (other than those of headings 744.14 and 744.15)
723	Civil engineering and contractors' plant and equipment; parts thereof
724	Textile and leather machinery and parts thereof, n.e.s.
725	Paper mill and pulp mill machinery, paper-cutting machines and other machinery for the manufacture of paper articles; parts thereof
726	Printing and bookbinding machinery and parts thereof
727	Food-processing machines (excluding domestic); parts thereof
728	Other machinery and equipment specialized for particular industries; parts thereof, n.e.s.
731	Machine tools working by removing metal or other material
733	Machine tools for working metal, sintered metal carbides or cermets, without removing material
735	Parts, n.e.s., and accessories suitable for use solely or principally with the machines falling within groups 731 and 733 (including work or tool holders, self-opening die-heads, dividing heads and other special attachments for machine tools)
737	Metalworking machinery (other than machine tools) and parts thereof, n.e.s.
741	Heating and cooling equipment and parts thereof, n.e.s.
742	Pumps for liquids, whether or not fitted with a measuring device; liquid elevators; parts for such pumps and liquid elevators
743	Pumps (other than pumps for liquids), air or other gas compressors and fans; ventilating or recycling hoods incorporating a fan, whether or not fitted with filters; centrifuges; filtering or purifying apparatus; parts thereof
744	Mechanical handling equipment and parts thereof, n.e.s.
745	Non-electrical machinery, tools and mechanical apparatus and parts thereof, n.e.s.
746	Ball- or roller bearings
747	Taps, cocks, valves and similar appliances for pipes, boiler shells, tanks, vats or the like, including pressure-reducing valves and thermostatically controlled valves

748	Transmission shafts (including camshafts and crankshafts) and cranks; bearing housings and plain shaft bearings; gears and gearing; ball or roller screws; gearboxes and other speed changers (including torque converters); flywheels and pulleys (including
749	Non-electric parts and accessories of machinery, n.e.s.
761	Monitors and projectors, not incorporating television reception apparatus; reception apparatus for television, whether or not incorporating radio-broadcast receivers or sound or video recording or reproducing apparatus
762	Reception apparatus for radio-broadcasting, whether or not combined, in the same housing, with sound recording or reproducing apparatus or a clock
763	Sound recording or reproducing apparatus; video recording or reproducing apparatus; whether or not incorporating a video tuner
772	Electrical apparatus for switching or protecting electrical circuits or for making connections to or in electrical circuits (e.g., switches, relays, fuses, lightning arresters, voltage limiters, surge suppressors, plugs and sockets, lamp-holders
773	Equipment for distributing electricity, n.e.s.
775	Household-type electrical and non-electrical equipment, n.e.s.
778	Electrical machinery and apparatus, n.e.s.
781	Motor cars and other motor vehicles principally designed for the transport of persons (other than motor vehicles for the transport of ten or more persons, including the driver), including station-wagons and racing cars
782	Motor vehicles for the transport of goods and special-purpose motor vehicles
783	Road motor vehicles, n.e.s.
784	Parts and accessories of the motor vehicles of groups 722, 781, 782 and 783
785	Motor cycles (including mopeds) and cycles, motorized and non-motorized; invalid carriages
786	Trailers and semi-trailers; other vehicles, not mechanically-propelled; specially designed and equipped transport containers
791	Railway vehicles (including hover trains) and associated equipment
793	Ships, boats (including hovercraft) and floating structures
811	Prefabricated buildings
812	Sanitary, plumbing and heating fixtures and fittings, n.e.s.
813	Lighting fixtures and fittings, n.e.s.
872	Instruments and appliances, n.e.s., for medical, surgical, dental or veterinary purposes
873	Meters and counters, n.e.s.
882	Photographic and cinematographic supplies
884	Optical goods, n.e.s.
885	Watches and clocks
High Tech Products	
525	Radioactive and associated materials
541	Medicinal and pharmaceutical products, other than medicaments of group 542
542	Medicaments (including veterinary medicaments)
716	Rotating electric plant and parts thereof, n.e.s.
718	Power-generating machinery and parts thereof, n.e.s.
751	Office machines

752	Automatic data-processing machines and units thereof; magnetic or optical readers, machines for transcribing data onto data media in coded form and machines for processing such data, n.e.s.
759	Parts and accessories (other than covers, carrying cases and the like) suitable for use solely or principally with machines falling withing groups 751 and 752
764	Telecommunications equipment, n.e.s., and parts, n.e.s., and accessories of apparatus falling within division 76
771	Electric power machinery (other than rotating electric plant of group 716) and parts thereof
774	Electro diagnostic apparatus for medical, surgical, dental or veterinary purposes, and radiological apparatus
776	Thermionic, cold cathode or photo-cathode valves and tubes (e.g., vacuum or vapour or gas-filled valves and tubes, mercury arc rectifying valves and tubes, cathode-ray tubes, television camera tubes); diodes, transistors and similar semiconductor devices
792	Aircraft and associated equipment; spacecraft (including satellites) and spacecraft launch vehicles; parts thereof
871	Optical instruments and apparatus, n.e.s.
874	Measuring, checking, analysing and controlling instruments and apparatus, n.e.s.
881	Photographic apparatus and equipment, n.e.s.
891	Arms and ammunition

About Exim Bank's Working Paper Series

As part of its endeavour in enriching the knowledge of Indian exporters and thereby to enhance their competitiveness,Exim Bank periodically conducts research studies. These research studies are broadly categorized into three segments, viz. sector studies, country studies and macro-economic related analysis. These studies are published in the form of Occasional Papers, Working Papers and Books. The research papers that are brought out in the form of Working Papers are done with swift analysis and data collation from various sources. The research papers under the series provide an analytical overview on various trade and investment related issues.

Previous Working Papers brought out by Exim Bank

Working Paper No. 60 India's Investments in Select East African Countries: Prospects and Opportunities, March 2017
Working Paper No. 61 International Trade in Processed Food: An Indian Perspective, March 2017
Working Paper No. 62 Machinery Sector in India: Exploring Options for Neutralizing Trade Deficit, March 2017
Working Paper No. 63 Feed Africa : Achieving Progress through Partnership, May 2017
Working Paper No. 64 Water, Sanitation and Healthcare in Africa: Enhancing Facility, Enabling Growth, May 2017
Working Paper No. 65 Integrate Africa: A Multidimensional Perspective, May 2017
Working Paper No. 66 Manufacturing in Africa: A Roadmap for Sustainable Growth, May 2017
Working Paper No. 67 Power Sector in Africa: Prospect and Potential, May 2017
Working Paper No. 68 Indian Investments in East Africa: Recent Trends and Prospects, November 2017
Working Paper No. 69 Trade in Environmental Goods: A Perspective, December 2017
Working Paper No. 70 Oil Price and International Trade in Petroleum Crude and Products: An Indian Perspective, January 2018
Working Paper No. 71 Revitalising Trade Finance: Development Banks and Export Credit Agencies at the Vanguard February 2018
Working Paper No. 72 Connecting Africa: Role of Transport Infrastructure, March 2018
Working Paper No. 73 Pharmaceutical Industry: Regulatory Landscape and Opportunities for Indian Exporters, March 2018
Working Paper No. 74 Indo-Sri Lanka Trade and Investment Relations: Current Trends and Prospects, March 2018
Working Paper No. 75 Indian Investments in Latin America and Caribbean- Trends and Prospects, March 2018
Working Paper No. 76 Enhancing India's Engagement in Healthcare Sector of CLMV Countries, May 2018
Working Paper No. 77 Act East: Enhancing India's Trade with Bangladesh and Myanmar Across Border, June 2018
Working Paper No. 78 Export Strategy for Madhya Pradesh, June 2018
Working Paper No. 79 India-Russia Trade Relations: Recent Trends and Potential, August 2018
Working Paper No. 80 Indian Handloom Industry: Potential and Prospects, September 2018
Working Paper No. 81 India- LAC Trade: Recent Trends and Opportunities in Select Countries, September 2018
Working Paper No. 82 Indian Investments in West Africa: Recent Trends and Prospects, October 2018
Working Paper No. 83 Enhancing Exports of Technical Textiles, December 2018
Working Paper No. 84 Indian Tourism Industry : Exploring Opportunities for Enhancing growth, February 2019
Working Paper No. 85 India-SADC Trade and Investment Relations: Harnessing The Potental, March 2019
Working Paper No. 86 Exports from Punjab: Trends, Opportunities, and Policy Insights, March 2019
Working Paper No. 87 Analytical Enquiry into inertia in India's Exports and Growth Prospects, March 2019
Working Paper No. 88 Promoting Exports From Bihar: Insights And Policy Perspectives, March 2019
Working Paper No. 89 India-Africa Partnership in Agriculture and Farm Mechanisation, June 2019
Working Paper No. 90 India-Myanmar Trade and Investment: Prospects and Way Forward, June 2019

EXPORT-IMPORT BANK OF INDIA

HEAD OFFICE

Centre One Building, 21st Floor, World Trade Centre Complex, Cuffe Parade, Mumbai 400 005.
Phone: (91 22) 22172600 Fax : (91 22) 22182572
E-mail : ccg@eximbankindia.in Website: www.eximbankindia.in

LONDON BRANCH

5th Floor, 35 King Street, London EC2V 8BB United Kingdom
Phone : (0044) 20 77969040 Fax : (0044) 20 76000936 E-Mail :eximlondon@eximbankindia.in

DOMESTIC OFFICES

Ahmedabad

Sakar II, 1st Floor,
Next to Ellisbridge Shopping Centre,
Ellisbridge P. O.,
Ahmedabad 380 006
Phone : (91 79) 26576843
Fax : (91 79) 26578271
E-mail : eximahro@eximbankindia.in

Bangalore

Ramanashree Arcade, 4th Floor,
18, M. G. Road,
Bangalore 560 001
Phone : (91 80) 25585755
Fax : (91 80) 25589107
E-mail : eximbro@eximbankindia.in

Chandigarh

C- 213, Elante offices, Plot No. 178-178A,
Industrial Area phase 1,
Chandigarh 160 002
Phone : (91 172) 2641910
Fax : (91 172) 2641915
E-mail : eximcro@eximbankindia.in

Chennai

Overseas Towers,
4th and 5th Floor,
756-L, Anna Salai,
Chennai 600 002
Phone : (91 44) 28522830/31
Fax : (91 44) 25224082
E-mail : eximchro@eximbankindia.in

Guwahati

NEDFi House, 4th Floor, GS Road,
Dispur, Guwahati 781 006
Phone : (91 361) 2237607/609
Fax : (91 361) 2237701
E-mail : eximgro@eximbankindia.in

Hyderabad

Golden Edifice, 2nd Floor,
6-3-639/640, Raj Bhavan Road,
Khairatabad Circle,
Hyderabad 500 004
Phone : (91 40) 23379060
Fax : (91 40) 23317843
E-mail : eximhro@eximbankindia.in

Kolkata

Vanijya Bhawan, 4th Floor,
(International Trade Facilitation Centre),
1/1 Wood Street,
Kolkata 700 016
Phone : (91 33) 22891728/29/30
Fax : (91 33) 22891727
E-mail : eximkro@eximbankindia.in

New Delhi

Office Block, Tower 1, 7th Floor,
Adjacent Ring Road, Kidwai Nagar (E)
New Delhi - 110 023
Ph.: +91 11 61242600 / 24607700
Fax: +91 11 20815029
E-mail: eximndo@eximbankindia.in

Pune

No. 402 & 402(B) 4th floor Signature
Building, Bhamburda, Bhandarkar Rd.,
Shivajinagar, Pune - 411 004
Phone : +91 20 25648856
Fax:+91 20 25648846
E-mail: eximpro@eximbankindia.in

OVERSEAS OFFICES

Abidjan

5th Floor,
Azur Building,
18-Docteur Crozet Road,
Plateau,
Abidjan,
Côte d'Ivoire
Phone : (225) 20 24 29 51
Mobile : (225) 79707149
Fax : (225) 20 24 29 50
Email : eximabidjan@eximbankindia.in

Addis Ababa

House No. 46,
JakRose Estate Compound,
Woreda 07,
Bole Sub-city,
Addis Ababa,
Ethiopia.
Phone : (251 116) 630079
Fax : (251 116) 610170
E-mail : aaro@eximbankindia.in

Dhaka

Madhumita Plaza, 12th Floor,
Plot No. 11, Road No. 11, Block G,
Banani, Dhaka, Bangladesh - 1213.
Phone : (088) 0170820444
E-mail : eximdhaka@eximbankindia.in

Dubai

Level 5, Tenancy 1B,
Gate Precinct Building No. 3,
Dubai International Financial Centre,
PO Box No. 506541, Dubai, UAE.
Phone : (971 4) 3637462
Fax : (971 4) 3637461
E-mail : eximdubai@eximbankindia.in

Johannesburg

2nd Floor, Sandton City Twin Towers East,
Sandhurst Ext. 3, Sandton 2196,
Johannesburg, South Africa.
Phone : (27) 716094473
Fax : (27 11) 7844511
E-mail : eximjro@eximbankindia.in

Singapore

20, Collyer Quay, #10-02,
Tung Centre, Singapore 049319.
Phone : (65) 65326464
Fax : (65) 65352131
E-mail : eximsingapore@eximbankindia.in

Washington D.C.

1750 Pennsylvania Avenue NW,
Suite 1202, Washington D.C. 20006,
United States of America.
Phone : (1 202) 223 3238
Fax : (1 202) 785 8487
E-mail : eximwashington@eximbankindia.in

Yangon

House No. 54/A, Ground Floor,
Boyarnyunt Street, Dagon Township,
Yangon, Myanmar
Phone : (95) 1389520
Mobile : (95) 1389520
Email : eximyangon@eximbankindia.in

एक्ज़िम बैंक
EXIM BANK
भारतीय निर्यात-आयात बैंक
EXPORT-IMPORT BANK OF INDIA

Centre One Building, 21st Floor, World Trade Centre Complex, Cuffe Parade, Mumbai - 400 005.
Ph.: (91 22) 22172600 | Fax: (91 22) 22182572
E-mail: ccg@eximbankindia.in | Website: www.eximbankindia.in, www.eximmitra.in

Follow us on