



A CALL TO ACTION FOR
BROADENING AND
DEEPENING
ELECTRONICS
MANUFACTURING

BY THE
HONOURABLE
PRIME MINISTER
NARENDRA MODI



Vision Document Volume 1

INCREASING INDIA'S ELECTRONICS EXPORTS AND SHARE IN GVCS

TOWARDS AN ATMANIRBHAR BHARAT.

#MakeInIndia



Table of Contents

CHAPTERS

1. Introduction **05**
2. India's participation in Electronics' Global Value Chains (GVCs) **09**
3. Export promotion strategies **21**
4. Exporting in a WTO-consistent way **32**
5. Increasing domestic value addition in electronics exports **37**
6. Other relevant issues for building scale through exports **52**
7. Conclusions and recommendations **61**

Introduction



“Post Covid, there is an extensive debate in the world on global supply chains. We must put all our strength into taking advantage of new opportunities. Currently, exports comprise nearly 20% of India’s GDP. Given the size of our economy and potential, our manufacturing and service industry base, there is a lot of scope for growth. At a time when we have already embarked on the road to an Aatmanirbhar Bharat, one of our goals is to increase our exports and India’s share in global supply chains. Our businesses should be able to scale up and grow. Our industries should adopt the best technology, focus on innovation and increase R&D. Only if we take this route can we increase our share in global value chains. It is only through competition and excellence that we can build global champions in every sector.”

- Prime Minister Narendra Modi,
6 August 2021

Background

Addressing the heads of Indian missions abroad and stakeholders in the trade and commerce sector, on 06 August 2021, Prime Minister Narendra Modi gave a clarion call on 'Local Goes Global' and emphasized the need to "increase India's share in the global supply chains in exports manifold", ensure the "growth of our share in the global value chains"(GVCs), and "set up export hubs in the states".

An increase of India's exports and share in GVCs will spur efficiency, innovation and international competitiveness.

The PM identified four crucial factors for increasing exports. First, an environment to make Indian manufacturing "qualitatively competitive", along with increasing production. Second, to put "an end to logistics-related problems" and thereby reduce costs. For example, currently India's air freight costs are nearly twice that of China's. Resolving this issue would consequently shrink the cost differential between India and other countries. Third, encouraging collaboration between the Centre, states, including exporters' councils, and the private sector. Fourth, improving access to international markets.

Underlining the importance of a stable policy regime for exporters, the PM assured that the "Central government is working closely with the states in minimizing the regulatory burden to give a boost to exports and investments".

The Production-Linked Incentive (PLI) scheme will play a crucial role in this regard. The PM mentioned that the PLI scheme will help in "increasing not only the scale of our manufacturing but also the level of global quality and efficiency [. . .] facilitate the development of a new ecosystem of Made-in-India products [. . .] and new global champions in manufacturing and exports" (emphasis added).

Earlier on July 17 and 28, 2021, Shri Rajeev Chandrasekhar, the Minister of State for Electronics and Information Technology, and Skill Development and Entrepreneurship met the industry. Emphasising the Hon'ble Prime Minister's vision, he stated that exports was not only critical for enhancing India's market share and competitiveness in the multi-trillion dollar global electronics market but also for broadening and deepening the electronics manufacturing and linked capabilities in India.

Electronics to Lead the Way

Electronics are among the most intensive GVC sectors in the world, and its global value chains are largely concentrated among a few countries in Asia.

The PM specifically mentioned mobile phones during his address. In fact, a number of PLI schemes

has identified specific electronic products as focus areas of support, within an integrated approach that covers different parts of the supply chain, including parts and components. It includes schemes to support capital investment and “plug and play” facilities as well.

The National Policy on Electronics (NPE) 2019 has also set a target of achieving a turnover of \$400 billion by 2025. This involves the targeted production of mobile handsets valued at \$190 billion, including \$110 billion for exports. The policy envisions to “strengthen India’s linkages with global trade, integrate with global value chains and build facilitative programmes and incentive framework to boost Indian ESDM exports”.

This report focuses on a number of key electronic products, particularly those for which major export hubs can be established in India. These products include mobile phones, IT hardware, and hearables and wearables.

Challenges and Solutions

Experience has shown that the key factors affecting GVCs are not the same across products—even for the major ones in the electronics sector. A one-size-fits-all approach is definitely not right in this scenario. Even the PLI schemes for different electronic products should be devised keeping in mind the differences in the parameters of their disabilities.

Electronics GVCs are amongst the longest in terms of the several stages of inputs and tasks performed.¹ The PM emphasized on scaling up and increasing exports, as well as domestic value addition. For all three, it is critical to “shift the ecosystem” in the short term (1–4 years) while building skills and competency, after which domestic companies can start plugging into GVCs from a stronger base. Lead firms² such as Apple or Samsung cannot generate the required scale of production for a major export boost without the ecosystem shifting along with them.

The geographical concentration of the electronics GVCs suggests that only a few countries are the main competing ones for India in terms of attracting Foreign Direct Investment (FDI) and generation of exports and links to GVCs. In 2019, electronics constituted 33.3% of China’s manufacturing exports and 44.1% of Vietnam’s.³ In comparison, India’s share was only 4.9%. That same year, China’s and Vietnam’s electronic exports (USD) were 81 and 11 times, respectively, that of India’s.⁴ Their electronics imports were 12 and 1.8 times, respectively, that of India’s.

¹ See Figure 2 in <https://voxeu.org/article/global-value-chain-transformation-decade-ahead>.

² Lead firms and their component manufacturers together comprise much of the ecosystem.

³ Taking HS 6-digit level coverage for electronics categories

⁴ Based on HS 6-digit export and import data from UNCOMTRADE.

The report provides an overview of the policy approaches of China and Vietnam, focusing on their main differences with regard to India. Not only do these two countries have a highly comprehensive and supportive policy approach, which played a big role in expediting the set-up of the supply chain in these two regions, but they also have lower import tariffs and duties than India.

Vietnam and Mexico have been the key beneficiaries of the relocation of investment in the electronics sector. The report also discusses policies that would be of strategic importance to encourage relocation to India, while keeping in mind the wider security concerns of the country.

Nearly 80% of electronic exports come from GVCs. Thus, Ease of Doing Business and predictable, facilitating and stable policies are very important for achieving efficient GVC participation and increase in exports. India is currently a very small participant, with its GVC exports accounting for only about 1.5% of global GVC exports. For India to competitively integrate in supply chains of electronics, policies that are supportive of the key factors need to be expeditiously implemented. These include reduction in production and logistics costs; reducing tariff barriers, particularly on inputs; improving skills and production capabilities; and introducing innovative practices and techniques.

Stability of policies, including incentives, is very important for attracting FDI and ensuring efficient operations. India's policies should be WTO-consistent as the inconsistent ones can be challenged by competitors. The PM also stressed on this point. He said, "Rationalizing export incentives and making them WTO-compliant will also boost our exports." The report explores this issue in the later chapters.

The Remission of Duties and Taxes on Exported Products (RoDTEP) scheme is one such important WTO-consistent policy that was implemented in August 2021, for reimbursing the duties and taxes with effect from January 2021. In fact, this is another crucial point. At a time when FDI is seeking alternative locations, speedy implementation of policies is a must. Otherwise, competing economies will attract investment and improve their export capabilities, and the major objectives highlighted by the PM would be difficult to achieve.

The report identifies the major policy steps that would help to substantively achieve the PM's vision over the next few years. Accordingly, Chapter 2 discusses GVC issues. Chapter 3 examines the strategies required for export promotion of electronic products for achieving the targets of NPE 2019. Chapter 4 looks at the WTO-consistency of existing export- or manufacturing-supportive policies and suggests ways in which these could be tweaked to make them consistent with WTO. Chapter 5 outlines the issue of value added in the electronics sector, including a discussion of Indian champions. Chapter 6 looks at some residual issues, followed by key recommendations in Chapter 7.

Chapter 2

India's participation in Electronics' Global Value Chains (GVCs)



Introduction

Participation in GVCs leads to better developmental outcomes for countries that are keen to transition to a higher growth trajectory,⁵ according to the new trade theory.⁶

The PM too has highlighted the need for enhanced participation in GVCs to increase India's exports.

⁵ Drivers and benefits of Enhancing participation in global Value Chains: Lessons for India, ADB South Asia Working Paper Series no 79, December 2020

⁶ New trade theory (NTT) suggests that a critical factor in determining international patterns of trade are the very substantial economies of scale and network effects that can occur in key industries. These outweigh the factors emphasized in the more traditional theory of comparative advantage. In some industries, two countries may have no discernible differences in opportunity cost at a particular point in time. But if one country specialises in a particular industry then it may gain economies of scale and other network benefits from its specialisation. <https://www.economicshelp.org/blog/6957/trade/new-trade-theory/>

It is important to note that 70% of the global exports of goods and services comes from GVCs.⁷ They provide new opportunities for engaging in global trade by expanding both markets and products—another aspect emphasized by the Hon'ble PM.

Participation in GVCs also builds the capacity of local supplier firms through cross-border transfer of knowledge, investment, management, and best practices. Apart from enhancing share in global exports, greater participation in GVCs can help India achieve other developmental goals, such as generating jobs, increasing the share of manufacturing in GDP, and ensuring faster and more inclusive growth.

2.1 GVCs: Main Agents, Roles and Activities

What is a GVC?

Global value chains are international production chains; they are a phenomenon where production is broken into activities and tasks carried out in different countries.⁸ The electronics sector is characterized by value chain modularity, enabling a clear division of labour between design and manufacturing at multiple points in the GVC. Factories producing a large variety of end products can be relocated with relative ease. Hence, GVCs in the electronics industry are more geographically extensive and dynamic than in any other goods.⁹

Main Actors and Their Roles in a GVC

The GVCs of electronics industry's hardware have three principal actors: lead firms, contract manufacturers, and platform leaders.

Lead firms carry brands and sell branded products and systems in final markets to individual consumers, other businesses, or government agencies. These firms 'lead' the GVC's activities by placing orders with contract manufacturers and suppliers, and often coordinate with the other parts of the GVC. Their 'buyer power' is earned by the global demand for their products, technological and R&D leadership, large investments in brand development, and for taking on the financial risk between placing orders and selling products. While the lead firm usually manages the activities of the GVC, its operation requires successful participation of the other partners as well.

⁷ ADB, 2018

⁸ <https://iap.unido.org/articles/what-are-global-value-chains-and-why-do-they-matter>

⁹ https://www.researchgate.net/publication/227441000_Global_value_chains_in_the_electronics_industry_Characteristics_crisis_and_upgrading_opportunities_for_firms_from_developing_countries, page 122.

Contract manufacturers make products for lead firms and sometimes provide some design services. While some lead firms still assemble products in their own factories, the use of contract manufacturers has been a strong trend since the late 1980s. In some industries, such as PCs and mobile phones, platform leaders play a crucial role.¹⁰

Platform leaders are companies that have been successful in implanting their technology (in the form of software, hardware, or a combination of both) in the products of other companies, for example, Intel in personal computers (PCs).¹¹ A platform has no value until it is linked with other components or complements.¹² Apps create increased functionality for mobile phones and laptops. Hence, Apple becomes a platform leader. An Intel chipset is the core of a computer but has no value by itself. Hence, Intel becomes a platform leader in PCs.¹³ Apple is an example of a platform leader that is also a lead firm, while Intel is an example of a platform leader that is not a lead firm.

Suppliers make sub-assemblies, intermediate components and modules for the final products or accessories that go with the final products. These are supplied to contract manufacturers or to the lead firms. Suppliers include producers of customized machinery for products and parts of lead firms. Significantly, they are also responsible for the setup, training and troubleshooting of production lines at the factory units of all manufacturers or suppliers.

Activities of GVCs

Production services—comprising component purchasing, circuit board assembly, final assembly, and testing—are referred to in the industry as electronics manufacturing services (EMS). Historically, the largest EMS contract manufacturing firms have been based in the US and Canada. In recent years, however, Foxconn (Hon Hai), based in Taiwan but with very large production facilities in China, Vietnam, and the Czech Republic, have emerged as the industry's largest player. Manufacturing plus product design services are collectively known as original design manufacturing (ODM) services. Most large ODM contract manufacturers are based in Taiwan, with manufacturing now concentrated in China. In a number of cases, a complementary pattern has emerged where global suppliers rely on 'second tier' developing country suppliers for components, services and subcontractors. To specialize in key products and services and create mutual synergies, developing country suppliers require initial co-location with the lead firms. For India to engage in these tiers of activities it is essential that leading suppliers, including Chinese firms, from the first two tiers are relocated to India and set up a manufacturing base to strengthen and expedite GVC operations.

¹⁰ Galvin and Morkel, 2001; Fixson and Park, 2008

¹¹ Gawer and Cusumano, 2002

¹² Perrons, 2009: 1300.

¹³ <https://ideas.repec.org/p/jet/dpaper/dpaper714.html>



2.2 GVCs of Specific Electronic Products and Countries Involved

GVCs of Mobiles

Inputs are raw materials extracted from all over the world. Gold from Peru, copper from Chile, along with many other minerals from various countries, are used in the production process. As much as 90% of “rare earth minerals, naturally occurring solids whose combination comprises essential mobile phone parts, are mined [. . .] in Mongolia”.¹⁴ These inputs are supplied to tier 1, 2, and 3 suppliers called firms A, B, and C in Figure 1 below. Each of these so-called tiers have their own suppliers who could be operating locally. These suppliers or aggregators can either sell directly to the lead firm or to different lead firms classified as Firms D and E here, who then market and sell the products. They add their brand value at this stage. The different stages in the manufacturing of a smartphone are shown in Annex 1.

¹⁴ <https://u.osu.edu/iphonecommoditychainproject/extraction-of-raw-materials/>

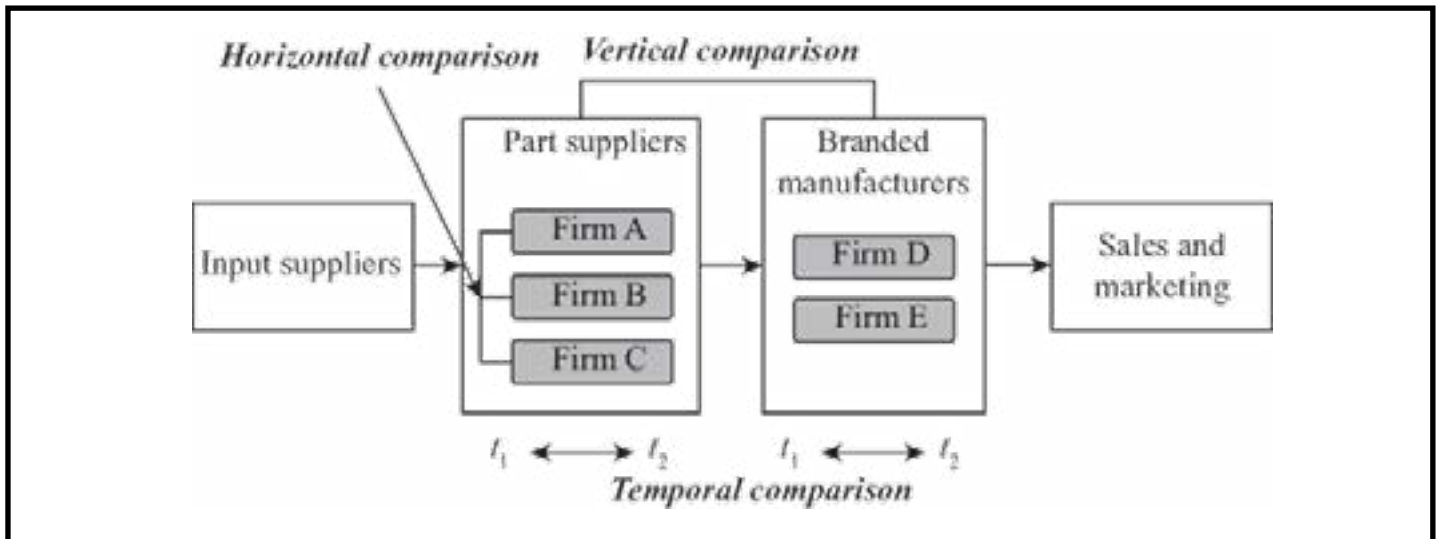


Fig 1 GVC of Mobiles

Source: https://www.researchgate.net/figure/Mobile-phone-global-value-chains-and-three-modes-of-comparison-Source-Authors_fig1_311297067

GVCs of Laptops

For most electronic products, lead firms define the system architecture. However, the role of platform leaders is crucial in PCs and laptops. A firm such as Intel can decide how to bundle tacit, proprietary activities and where to locate the points in the chain, where codified handoffs can occur and open standards can begin. Personal computers and mobile phone handsets are important and well-known cases where platform leaders dominate and often function as lead firms. Apple is an interesting case of a lead firm that is also a platform leader. Apple has successfully created a vibrant ecosystem of third-party vendors to supply parts, inputs and the products itself. On the other hand, the Microsoft operating system is a good example of a platform leader that does not manufacture laptops but is used by Lenovo, Hewlett Packard and other companies as an essential operating system in laptops.

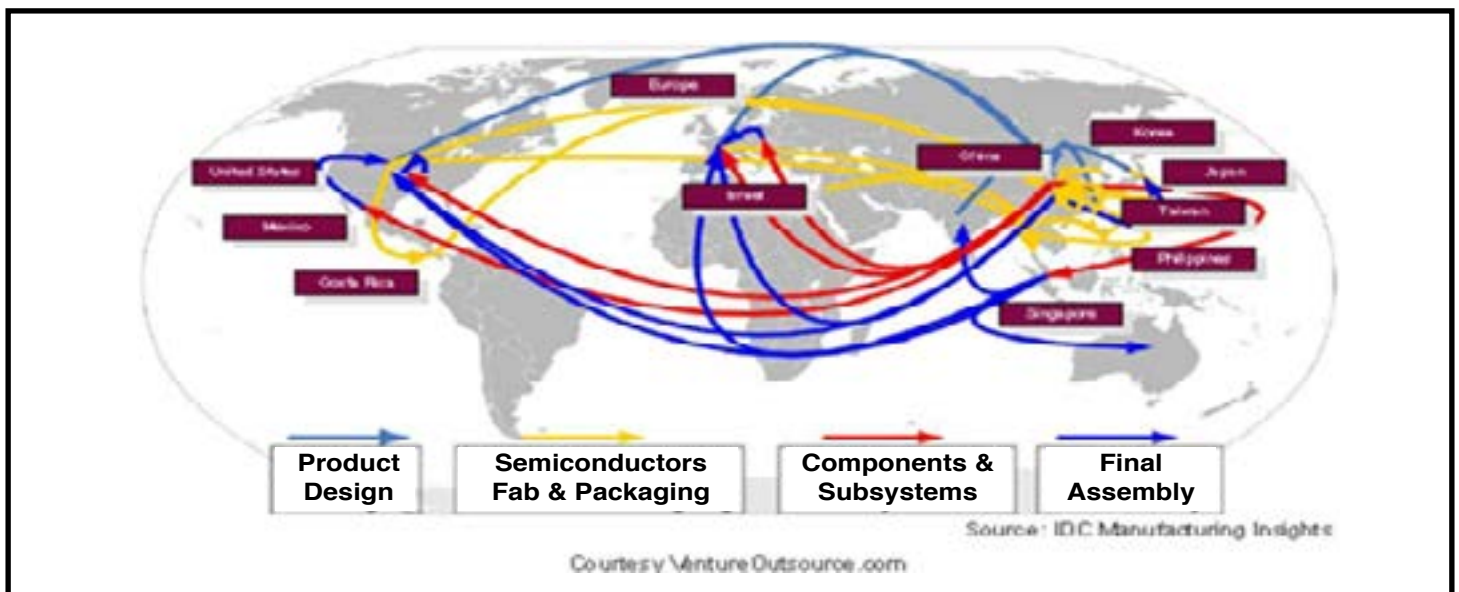


Fig 2 GVC of Laptops

Source: https://www.researchgate.net/figure/Mobile-phone-global-value-chains-and-three-modes-of-comparison-Source-Authors_fig1_311297067

Location and Relocation of GVCs in Electronics

China is the top exporter of electronic products, including PCs, mobile phones, laptops, tablets, hard disk drives (HDD), parts for PCs, TWS (Bluetooth wireless headsets), smartwatches accounting for more than 60% of the global market for mobile phones.¹⁵ As such, China is an important import source of both final electronic products and intermediate components for the Asian countries and the US. Whatever the origin of exports, China is the port from where most intermediate products for mobiles and the phones themselves are manufactured and exported. For example, while Foxconn is a Taiwanese company, of its 35 supplier locations, 29 are in China. Similarly, while Mexico exports about 30% components to the US, it imports 80% of these from China.¹⁶ Almost all intermediate products are assembled in China or by Chinese firms in different locations.¹⁷ At this point, it would be impossible to build a GVC in mobiles without involving key contract manufacturers from China.

Taiwan is the largest global exporter of semi-conductors and fabs. It is the main supplier to China, Japan, Malaysia and Thailand, and a major source for the Philippines and South Korea. The two firms dominating global high-end semi-conductor and fab design and manufacturing are Taiwan Semiconductor Manufacturing Company Limited (TSMC) and the South Korean firm Samsung.¹⁸ The leading laptops and their components manufacturers are Quanta, Compal, Wistron, Pegatron and Inventec.¹⁹ About 90% of their manufacturing is done in China, irrespective of the origin of the firm. The location of the GVC of tablets and other electronic products is very similar to those of mobiles and laptops. Both lead firms and their main contract suppliers are few in number, and thus policies to develop both GVCs and exports could be devised keeping in mind the practices that enabled them to operate efficiently in their major locations.

Among the Asian economies, Vietnam has seen the greatest intensification of electronics industry linkages with China, due to the adoption of a “China plus 1” production model by lead firms. China outsources the production of electronic peripherals as well as components, notably headphones/earphones and PC parts, to Vietnam. These are mainly in the form of investments by small- and medium-sized enterprises (SMEs) specializing in providing EMS. China also sources more ICs from foreign semi-conductor plants set up in Vietnam. As a result, China's intermediate imports from Vietnam grew at a staggering 72% per annum in the decade (2007–17). Apart from China, South Korea has become one of Vietnam's largest investors, with companies such as Samsung and LG setting up production facilities in the country to tap into its proximity to China as well as its low-cost base. The companies specialize in the manufacture of mobile phones as well as intermediate parts using components and integrated circuits (ICs) imported from South Korea. The phones are

¹⁵ https://www.eulerhermes.com/en_global/news-insights/economic-insights/China-Riding-the-silicon-ox.html

¹⁶ Ibid

¹⁷ Ibid.

¹⁸ <https://www.notebookcheck.net/TSMC-has-the-largest-market-share-in-the-global-semiconductor-manufacturing-industry-Counterpoints-Research.518137.0.html#7320644>

¹⁹ <https://en.tab-tv.com/?p=22230>

then exported to end consumer markets while the parts are forwarded to China or sent back to South Korea for assembly into final products. As a result of these linkages, South Korea is now the largest source of ICs, the second largest source of mobile phone components for Vietnam, as well as the second largest market for Vietnam's exports of mobile phone parts.²⁰ A large part of these are produced or processed in China. Thus, Vietnam's growth can be very significantly attributed to Chinese investment either directly or indirectly.

2.3 GVCs and Innovations

Intangible asset, notably in the form of technology, design, and branding, currently accounts for around one-third of the production value that is created in GVCs—and this share has been rising over time.²¹ This intangible asset includes: (1) global knowledge sourcing, (2) GVC governance, and (3) co-location of innovation and production. In global knowledge sourcing, the role of both intra- and inter-firm linkages are important for lead firms to tap into foreign knowledge pockets. This helps in overcoming the constraint of local search and provides opportunities for knowledge recombination and, in turn, novelty.²² Firms systematically bring foreign-educated scientists and engineers back home to gain access to the knowledge base of the countries in which these skilled resources have been trained.²³ Firms also increasingly rely on geographically dispersed teams to make new discoveries,²⁴ and the team's geographical dispersion impacts the novelty of the team's innovative outcomes.²⁵ It is important that innovation is carried out not only by lead firms but also by their suppliers. A key insight that has been under-appreciated in general is that the type and intensity of knowledge transfer to suppliers depend on the governance patterns ruling the connection between the suppliers and lead firms.²⁶ The presence of platform leaders like Apple in India, the software talent for Apps could both blend to improve innovation capabilities in India.

2.4 Factors Determining the Location of GVCs

Participation in GVCs is not automatic. Identifying the drivers of GVC participation and incorporating technologies and introducing policies that can strengthen these drivers are crucial. World Bank (2020) points out that GVC participation is determined by fundamentals like endowments, market size, geography and institutional quality.²⁷ However, national policies play an important role in

²⁰ Asia's supply Chain in Electronics, 2020, op .cit

²¹ Chen, Los, and Timmer (2018)

²² Cano-Kollmann, Cantwell, Hannigan, Mudambi, & Song, 2016; Scalera et al., 2018.

²³ Choudhury, 2016

²⁴ Kerr & Kerr, 2018; Marino, Mudambi, Perri, & Scalera, 2020; Perri et al., 2017

²⁵ Tzabbar & Vestal, 2015.

²⁶ Schmitz & Knorringa, 2000.

²⁷ World Bank. 2020. World Development Report 2020: Trading for Development in the Age of Global Value Chains. Washington, D.C.111 Claire H. Hollweg. 2019. Firm Compliance and Public Disclosure in Vietnam. Policy Research Working Paper 9026. World Bank. Washington, D.C.

shaping these fundamentals, including policies related to tariffs and trade facilitation, logistics and infrastructure, FDI, skill Development , and the labour market. A necessary condition for efficient participation in GVCs is the presence of low trade barriers and stability and/or reduction of international trade costs. Average tariff rates have a strong negative relation with GVC participation, implying that countries with lower tariff rates are more amenable to GVC participation.²⁸ India's MFN tariffs for most intermediate products in the electronics sector are in general higher than China, Mexico and Vietnam.

While trade logistics need to be improved for all sectors, a pressing constraint for the electronics sector arises due to high air freight rates. India's rates have been estimated to be twice that of China, for example.²⁹

GVC participation or cross-border production sharing is often a result of firms setting up foreign affiliates and situating certain stages of their production process in other countries. As India is a large country with a growing market, some stages of production, especially from the EMS of electronics, could be relocated here, provided there are relevant policies. Nearly 70% of GVCs of several electronics products are located in China, and a significant shift in the near term would require creating tiers 1, 2 and 3 operations within India. Such a process of relocation has begun with firms looking more at Vietnam and Mexico, whose FDI policies are investor- and GVC-friendly than India because they allow linked contract suppliers to shift together with the lead firm. India's general FDI Restrictiveness Index at 0.21 is higher than that of Vietnam (0.13) and Mexico (0.19).³⁰ However, if the FDI policy restricts specific movement of tiers 1 to 3 linked suppliers in a sector such as electronics, then the potential for increasing domestic content in the GVCs and effective participation in GVCs is significantly reduced.³¹

In contrast, allowing larger parts of the GVC to shift together with the lead firm would result in a more rapid and higher production of parts and components within the country. Such a shift also provides a basis for internationalization of local firms by: (i) providing access to global marketing, supply and distribution networks; (ii) enabling local sourcing of different intermediate products and requiring the domestic firms to meet global standards in terms of quality and time; and (iii) enhancing the scale and productivity of the local firms.

²⁸ Several studies have shown that trade restrictions play a significant role in determining the extent of GVC participation, and that measures such as weighted tariff and customs burden exhibit a significant negative impact. Specifically, for instance, it was found that if a country were to reduce its average weighted tariff from 12.3% to around 5.2%, the ratio of GVC exports to total merchandise exports could increase by an average of 6.9%.. See ADB study, 2020, op.cit

²⁹ https://www.joc.com/maritime-news/international-freight-shipping/cost-shipping-container-india-double-china-report-says_20140826.html.

³⁰ <https://www.oecd.org/investment/fdiindex.htm>

³¹ By the time that domestic suppliers come up over the medium term, the existing business opportunities would result in FDI considering other alternative locations as more preferable, especially for increasing their exports.

One of the main reasons for the geographic fragmentation of production under GVCs is to take advantage of varying production costs across countries and produce each component at its cheapest location. The quality of power, industry, logistics, and communication infrastructure in an economy is a key determinant of production costs. In the electronics sector, power is an important input and often accounts for nearly 2% of the total cost, and GVC location is highly sensitive to power costs.³²

Transaction costs involved in moving investment facilities (e.g. costs involved in getting permits, burden imposed by regulatory requirements, and delays in getting permissions) are another key determinant of participation in GVCs. These transaction costs are determined by the quality of institutions and policy practices that follow “good governance”, i.e. practices that reduce transactions costs, increase policy stability, and reduce uncertainty in operational conditions. Quality institutions can help improve the contracting ecosystem and facilitate GVC operations.³³ In the case of electronics in India, the most important issues are the stability and consistency of policy. For example, the PLI was brought in to encourage investment and output of electronics, but by increasing tariffs the cost of production increased, thus negating the support provided by the PLI.

Conclusions

Studies and feedback from industry show that India’s participation in GVCs of sectors such as electronics requires an understanding of the key features of GVCs. Lead firms are a very important part of GVCs, with the primary responsibility of coordinating the chain of activities. However, while crucial, they need the support of and strong links with both contract suppliers and platform leaders, particularly in a technology-intensive industry such as electronics. In certain cases, contract suppliers can be the more dynamic part of the chain and also play a major role in developing domestic capabilities and innovations to increase the presence of domestic producers in GVCs.

Further, GVCs for major electronics products, mobile phones, PCs and laptops, are not the same. The difference in commercial linkages and structure of the GVCs imply that dissimilar policies may be needed for different major products in the electronics sector

GVC establishment is not automatic. A favourable investment climate with supportive policies are needed. For example, establishing GVC would be facilitated by reducing trade costs. These include reducing tariffs, especially on intermediate goods, which have the potential to act as inputs for exports, reducing customs burden, and improving trade facilitation. India’s applied tariff on

³² ADB study, 2020, op.cit

³³ Andrei Levchenko. 2007. Institutional Quality and International Trade. *Review of Economic Studies*. 74(3). pp: 791–819. 148 Also, Nathan Nunn and Daniel Trefler. 2014. Domestic Institutions as a Source of Comparative Advantage. In G. Gopinath, E. Helpman, and K. Rogoff (eds). *Handbook of International Economics*. Chapter 5. pp: 263–315. Elsevier.

intermediate goods is significantly higher than East and Southeast Asian economies. This raises the cost of production for the domestic market and exports. A recent study shows that tariff hikes in the last two years alone on intermediate inputs in electronics would increase costs by 4–5%, thus completely negating the positive effects of policies such as the PLI. There is a need to reduce tariffs on intermediate inputs to make exports competitive vis-à-vis other countries.

On the infrastructure front, power costs need to be rationalised, especially for exports. RoDTEP rates which fully reimburse the indirect costs of electricity and transport have already been introduced. These will be reviewed periodically to match the current taxes to support exporters.

Not only do China's and Vietnam's policies specifically focus on providing support to priority sectors, but they also give specific and high priority attention to addressing the needs of major lead firms in GVCs—this includes issues such as clearance at ports, Centre and state-related administrative burdens. This is possible because there are only a limited number of lead firms or platform leaders in the world for every major electronic product. Furthermore, the main contract supplier for them, either as tier 1 or tier 2 suppliers, is also limited in number. Thus, a coordinated approach with the limited number of lead firms and their contract suppliers would be feasible for generating GVC momentum for India as well. GVCs follow a tiered structure with know-how at the apex, leading to the establishment of a tiered manufacturing base that finally ends up with locally operating firms (domestic or FDI) developing an ecosystem for the industry. India in the next 1–4 years needs a relocation of the international ecosystem to establish a large scale of operation, productive capacities and technical know-how, creating a skilled workforce by producing intermediate inputs and critical design capacities. India will then have a strong basis to take forward a structured programme from the fifth year onwards to develop/consolidate Indian manufacturers and EMS players to participate fully in GVCs.

To incentivize export-related FDI and develop domestic production in the near term in the electronics sector, it is imperative that lead firms and platform providers be allowed to relocate their key contract suppliers to India, wherever they are located. In the short run this would be the only way to quickly build GVCs, because domestic capabilities are inadequate for a number of parts of the GVC. It so happens that a large number of these contract suppliers are from China. If FDI moves from China to India for establishing their GVCs, then the Chinese suppliers for the previous facilities in China should also be allowed, subject to whatever conditions may be required to meet security concerns. In fact, Chinese investment has been allowed in certain important areas such as start-ups. The electronics sector, which is also a major priority area, may also be considered in a self-contained manner for promoting both GVCs and domestic production, leading to local capacity and the required ecosystem for a robust electronics industry. Initially tier 3 suppliers can be developed in India, but gradually both tiers 1 and 2 suppliers can establish a strong Indian manufacturing base, eventually decoupling from the initial prominent suppliers, including from China and other countries.

Improvement of institutions that ensure equitable protection of rights, enforceability of contracts, and anticorruption measures to make customs processes efficient will help electronics firms to join GVCs. Deeper trade agreements can enhance GVC participation as these agreements target specific institutional bottlenecks. Finally, an open and facilitative trade policy, investment policy, and industrial policy have deep and direct impact on GVC participation.

Increasing GVC participation requires a focus on exports, which in turn needs a larger scale of production and improved cost efficiency. By definition, a GVC involves imports as a part of the production process and then exported further. The efficiency and competitiveness of the GVC thus depends on how quickly inputs could be turned around for exports. Furthermore, any constraint on the operations of contract suppliers compared to alternative locations implies that the lead firm in a GVC would find it more attractive to locate in countries with lesser regulatory burdens. The use of tariffs on final products to encourage a shift to India will not work to relocate contractor firms to India if constraints are imposed on relocation from China.

Annex 1

A lead company decides to make a new model based on older models and previous research, so they do not need to start from scratch. All the shortcomings of the previous models are taken care of and with the new innovation, the technology is injected into the latter model.

Six Steps of Smartphone Manufacturing

1. Making of prototype

An idea conceived in a board meeting is passed on to the R&D team after careful consideration. The research team commences with a non-working prototype— aesthetics is the first thing considered. After finalizing the external appearance of the model, work starts on the internal kit by the electronics engineering team. It is at this juncture that the decisions on the processor, memory and other specifications are taken. The matching display screen and the required battery potential are selected. The front and rear cameras are added. Post adding all the components, the device's performance is checked. If the decision-making team is reasonably satisfied, then the handset is sent for further approval.

Today, most of world's smartphone manufacturing is being done in China.

2. Software Installation

The software team steps in to breathe life into the handset. The installation is basically pre-decided on the operating system that is to be loaded into the phone. The selected design, loaded with hardware and software, is then readied for mass production. At this juncture, it is often difficult to go back and alter the already approved working prototype.

3. Testing Phase

Before the production begins, the handset is rigorously tested for quality, performance and on other parameters. The functionality of both hardware and software is tested. Various checks such as drop test, bend test and water tests are carried out.

4. Mass Production

When the final prototype is ready, it is time for mass production. Internal components may either be manufactured in-house or outsourced. This could be in the manufacturer's own plant or can be outsourced to other manufacturers, known as original equipment manufacturers (OEM) to be made as per the instructed quality and standards.

During mass production, smartphones are usually code-named to avoid leakage of information related to specifications and design.

5. Packaging

When the handset passes all the tests, it is sent for packaging. The handset, along with accessories and a user manual, is put into the box and is ready to be shipped.

6. Shipment

The final stage is shipment. The packaged phones are dispatched to distributors, stockists and retailers across the globe, and it is from these retailers that the end customer buys the handset.

Chapter 3

Export Promotion Strategies



Introduction

In his speech on 6 August 2021, the PM highlighted the need for India to increase its exports. For this, it is important for manufacturing to increase exponentially, in which the government's PLI scheme would play a key role, he said. He added that logistics should be improved, government assistance through export promotion councils should be offered, and India must tap into international markets to promote the scale of its businesses.

The implicit message here is that domestic demand may be insufficient to bring about the desired scale of production. Instead, export growth is critical for achieving this end.

A higher scale of production would also lead to a reduction of costs and expand available external markets. In this context, the PM stressed on increasing India's share in the GVCs. This chapter focuses on developing the relevant scale and increasing exports in the Indian electronics sector.

The PM has outlined a larger vision and deeper conceptual framework of export promotion than the conventional approach that focuses on building markets abroad. To realize his vision for the electronics sector, this chapter has identified key action points in line with this larger approach. However, before discussing these specific action points, it is important to highlight some specific targets for electronics exports.

3.1 Potential for Export Promotion in the Electronics Sector

India has tremendous potential to increase exports in the electronics sector. First of all starting from a low base, it can grow exponentially. Secondly all the lead firms are present in India. Hence it can tap on their expertise and suppliers to link to GVCs. Thirdly recognising this potential, the National Policy on Electronics (NPE) 2019 envisaged very large targets for export growth. Hence policy support for the sector is envisaged in both the NPE 2019 and the recent speech of the Honourable Prime Minister.

India's share in global electronics manufacturing is about 3.6%.³⁴ Its share in global electronics exports is much lower at 0.34%. In contrast, Vietnam's share in global exports is 3.86%.³⁵

Most of the leading electronics firms are present in India. With appropriate policies that incentivize increasing the scale of their production, the potential for a manifold increase in exports is high. Table 3.1 shows the scope of expansion of output in India for the major firms. Currently, their production in the country accounts for a very small share of their global production. The share of exports of electronics from India is less than 0.4%—much lower than that in the domestic market.³⁶ Clearly, the potential for increasing the export market share of India is very high.

Name of the Company	Revenue in India (USD Bn)	Global Revenue (USD Bn)	Percentage share of Indian Revenue to Global Revenues
Dell	5	92.15	5.4%
Hewlett Packard	3	56.64	5.3%
Samsung	10	200	5%
Apple	1.84	274.52	0.7%

Table 3.1: Revenue of Major Companies in India and Globally

Source: UN Comtrade 2020

The National Policy on Electronics (NPE) 2019 stated: “Promote domestic manufacturing and exports in its entire value chain of Electronic System Design and Manufacturing (ESDM) for economic development to achieve a turnover of USD 400 billion (INR 26,00,000 crore) by 2025. This will include targeted production of 1.0 billion (100 crore) mobile handsets by 2025 valued at USD 190 billion (INR 13,00,000 crore) including 600 million (60 crore) mobile handsets valued at USD 110

³⁴ <https://www.investindia.gov.in/sector/electronic-systems>, and <https://www.thehindubusinessline.com/opinion/encouraging-value-added-electronics-manufacturing-must-for-atmanirbhar-bharat/article35321095.ece>

³⁵ Based on ITC Trade Map data for HS 6 digit categories covering those items which comprise India's estimates of electronics exports.

³⁶ This share is calculated for electronics exports for 6-digit product categories covered by items under electronics. Data source is ITC Trade Map for 2020.

billion (INR 7,00,000 crore) for exports. The rest i.e. USD 80 billion would be for the domestic market.”³⁷ (Paragraph 4.1.)

These targets are to be compared with the actual exports of electronics of USD 10.6 bn in FY2020-21.³⁸ For the Indian electronics sector to reach the target set by the National Policy on Electronics 2019 a major effort on the part of all the players is required.

3.2. Export Promotion Strategy

The Hon’ble PM’s speech refers to a four-pronged strategy: (1) expand manufacturing to increase exports (2) improve trade logistics (3) support exporters through better Centre–state export promotion councils (4) seek new international markets. For the electronics sector the implications and implementation of these strategies will require specific initiatives that must be rolled out in a timebound manner.

3.2.1. Expanding Manufacturing and Exports

For increasing the manufacturing of electronics in line with the targets of NPE 2019, India needs to build large-scale ESDMs, invest in technological upgradation spurred by large global firms, and make a strong push for domestic capacity building. For this, an ecosystem involving both domestic and global firms will need to be nurtured, by providing incentives similar to those developed by other major exporting economies. The two major exporting countries are China and Vietnam, which together account for more than 70% of global exports of final and intermediate electronics exports to the US—most of it from China.³⁹

Let us first understand the route India’s competitors have taken to increase the scale of production that it hasn’t.

India’s Disabilities versus China and Vietnam

Considering the scale of investment, the technology requirements and the imperative of creating an ecosystem to cater to domestic demand and export targets, the importance of attracting investments, especially global firms, assumes special significance. China and Vietnam have implemented support policies to promote the electronics sector. These cover a range of issues such as Ease of Doing Business, tax breaks, support for working capital, provision of relevant infrastructure, support to the ecosystem and special policies for lead firms. The incentives are aimed mainly at reducing costs and increasing retained profits, both leading to higher competitiveness. The cumulative impact of all these incentives in Vietnam vis-à-vis India shows that the cost reduction or competitiveness gains

³⁷ Gazette of India, Extraordinary, Part1, section 1, 26 (1) 2019-IPHW, Government of India, Ministry of Electronics and Information Technology, National Policy on Electronics, 2019 (NPE 2019).

³⁸ <https://www.ibef.org/industry/electronics-system-design-manufacturing-esdm.aspx>

³⁹ <https://www.mas.gov.sg/publications/economic-essays/2020/asias-electronics-supply-chains-and-global-trade-corridors>

for investors ranges from 9.4% to 12.6%. A similar exercise for China estimates that the weight of disability for investors in India ranges from 19.2% to 21.7%.⁴⁰

An additional disability, which was not a part of the analysis earlier in 2019, has been introduced in the last two years, FY 2020 and FY 2021. These are tariffs on intermediate inputs—which are estimated to increase the cost of production between 4–5%.⁴¹

Further, the decision after May 2020 to not allow the major GVC tier 1, 2, and 3 suppliers to relocate from China to India has introduced yet another disability for developing GVCs, exports and domestic content. As global lead firms evolve a strategy of China+1, India will lag in the race unless its policies encourage relocation from China. The Government may want to consider selective entry of Chinese companies. In the absence of such investments and lack of domestic capacity to produce these inputs, costs would rise, making India uncompetitive in global markets. Keeping such a restriction in place introduces yet another disability for India compared to its competing economies that do not have this restriction on FDI. India needs to carefully analyse and seize the current opportunity, which may not come soon or ever again.

Countering Disabilities

Three schemes were announced in March 2020 to implement the NPE 2019 policy vision and objectives, and to offset the disabilities faced by the industry to incentivize development of a robust EMS sector. These include the PLI scheme for large-scale electronics manufacturing, the Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECES), and the Electronics Manufacturing Clusters 2.0 (EMC 2.0) scheme. However, the combined impact of these schemes may not be sufficient in the long run to compensate for these disabilities, and make India a truly competitive manufacturing destination if tariffs are not rationalized and relocation of tier 1, 2, and 3 suppliers from China are not allowed. For long-term sustainability, the ecosystem has to be built up, and not the lead firms alone.

The PLI Scheme

Among these schemes, only the PLI Scheme for large scale manufacturing (Smartphones) has been implemented so far, in the sense that funds are expected to be disbursed under this scheme in FY 21. This would be a critical milestone that investors will watch carefully. In the first year, FY 21, only one out of 15 approved applicants applied for subsidy under PLI. However, all the approved firms have been granted a year's extension as the year 2020 was treated as an aberration due to Covid-19. Devised after intense consultations at senior levels for about a year and a half, the final PLI scheme aims for a huge increase in domestic production capabilities, employment, and exports, and a reduction in imports of mobiles and specific electronic components. According to Ministry of

⁴⁰ Ibid.

⁴¹ IKDHVAJ report on Tariffs

Electronics and Information Technology (MeitY), the scheme will generate about 9 lakh additional employment opportunities in the next five years, and domestic value addition will grow from the current 15–20% to 35–40% in the case of mobile phones and 45–50% for electronic components.⁴²

India is an investment destination where a win-win situation could be created for both the investor and the country. Feedback from the industry suggests that some important previous incentive policies, for example, MSIPS, had less than the originally anticipated effect because of delays in assessment and disbursement of funds. Hence, timely completion of all steps, including disbursement, must be given priority in the PLI scheme. Moreover, other aspects of trade, such as fast clearances at the ports, visas for foreign nationals linked to GVCs, support for continuous process manufacturing, should be fully supported. Further, it is necessary to ensure that benefits from PLI are not diluted by other domestic or trade-related policies, for example, tariffs on intermediate products.



⁴² <https://pib.gov.in/PressReleasePage.aspx?PRID=1662096>

Tariffs on Intermediate Products and PLI ⁴³

Tariffs can increase the cost of production in the absence of domestic capacity to produce components. For example, for smartphones, cumulatively the cost increase in BOM (bill of materials) from tariff increases in 2020 and 2021 amounts to over 8%. As BOM accounts for nearly 70–75% of the ex-factory price of smartphones and nearly 60% of the ex-factory price of a feature phone, the average share of BOM would be about 65%. Hence, the cost increase is around 65% of 8.08% (4.8%) of the ex-factory price. Overall, tariff impact on the import of raw materials is more than 6–7% of the manufacturing costs. PLI provides about 5% reduction in the cost of manufacturing and hence, almost the entire benefit would be negated by tariffs and further increases.

Tariffs have been introduced on inputs that account for around 92% of the BOM value of mobile phones. Of all these inputs, India has the domestic capacity to manufacture roughly 30–40% of them. However, the rest of the inputs would need to be imported as it takes time to develop domestic capacity and scale. Meanwhile, the tariffs will lead to a decrease in aggregate output and exports due to high import duties, resulting in an increase in cost of production and uncompetitive pricing. Hence, even if tariffs are imposed for revenue purposes, GST losses would far exceed tariff revenue gains due to reduced production/output. Using 2019 as a base and ICEA data that only 3% of the demand for mobiles is met by imports, estimates suggest that the GST revenue loss because of a fall in output would be about 1.62% of GDP, whereas tariff revenue gain would be only 0.38% of GDP. The fall in GST would result from the decrease in output of electronics consequent to the cost increase introduced by tariffs on inputs. Electronics are used in several areas and the macroeconomic effects of tariffs and consequent cost rises are likely to spill over to other sectors. Examining only two sectors, automobiles and medical devices, with over 40% share of electronics in their total costs shows an estimated fall in investment and output from 3.5% to nearly 8.5%. ⁴⁴

India is a minor participant of the global GVCs of mobile handsets. Shifting parts of the value chain to India may have been encouraged by schemes such as PLI, SPECS and EMCs. However, tariffs would have a chilling effect on further investment. For example, a lead firm could easily shift production to Vietnam and import those products to India under zero tariffs under ASEAN India FTA. As modular production structures in electronics can be easily shifted from one country to another, tariffs may actually act as a disincentive to value addition. For example, it is reported that following the tariff increase, Samsung did not want to avail of PLI on some production lines as it would continue to import from Korea and Vietnam under the FTAs.⁴⁵ This was also a response to the small scale of the domestic market.

⁴³ Calculations from the Tariff Report by IKDHVAJ, 2021

⁴⁴ IKDHVAJ Tariff Report, 2021.

⁴⁵ <https://telecom.economictimes.indiatimes.com/news/samsung-wont-avail-plis-for-equipment/83657606>

Moving GVC Suppliers to India

The average BOM for components (Tiers 1,2, and 3 suppliers) accounts for approximately 50% of the cost of most electronic devices. So, for a market of USD 400 billion by 2025 (NPE, 2019) the demand for components would be to the tune of USD 200 billion. Currently, domestic component manufacturing in India is worth USD 10–12 billion. ⁴⁶

The conclusion of one analysis is worth recalling: “A recent report from ELCINA featured in electronicsb2b.com stated that demand for electronic components in India in 2020 was about USD 32 billion, of which locally manufactured components amount to almost USD 10 billion. The remaining USD 22 billion is split between imported components and PCB assemblies. Reaching even 40% of the original target, USD 100 billion, seems difficult at the moment.⁴⁷ Hence, components’ manufacturing in India should aim to grow by at least 25–30% per annum to reach a turnover of USD 40 billion by 2025.” This can however be achieved sooner by allowing firms located in China to relocate to India, which could also be connected to improving skills and production capacities of local firms. ⁴⁸

3.2.2 Improving Trade Logistics

Nearly two-thirds (65%) of electronics shippers favour air freight over slower modes to shorten supply-chain transit time.⁴⁹ Hence, appropriate air cargo at economic prices should be available for electronics exports for relocating manufacturing to India. It is reported that India’s air freight rates both for exports and imports are, in most instances, much higher than that of China’s. ⁵⁰

High-tech electronics manufacturers and vendors customize logistics strategies to meet the needs of delicate and high-value products. Moving the contents of a data centre to a new location, for example, requires a great deal of planning and specialized knowledge and equipment.⁵¹ Hence, investment plans made by lead firms, for example, need to be followed and implemented by expertise and experience from the relevant country. This kind of logistics requires specialists usually from the point of manufacture. Otherwise, machines may remain idle, and investment may go to waste.

⁴⁶ <https://www.daijiworld.com/news/newsDisplay?newsID=846966>

⁴⁷ <https://www.electronicb2b.com/electronics-manufacturing-india-new-and-features/why-is-the-indian-electronic-components-industry-not-growing-faster/>. See also, <https://www.thehindubusinessline.com/opinion/encouraging-value-added-electronics-manufacturing-must-for-atmanirbhar-bharat/article35321095.ece>

⁴⁸ Ibid.

⁴⁹ <https://www.faq-logistique.com/CAP-GEMINI-3PL-04-Electronics.htm>

⁵⁰ ICEA

⁵¹ <https://www.inboundlogistics.com/cms/article/electronics-logistics-tech-transport-tlc/>

3.2.3 Role of EPCs in Promoting Electronics Exports

The PM also stressed on the crucial role played by Central- and state-level export promotion councils (EPCs) in ensuring export expansion. EPCs are government-initiated authorities that **promote and support export firms in developing their overseas trade and presence by providing technical and industry insights**. Additionally, EPCs also promote government schemes, act as a data store and conduct overseas tours and studies.⁵² They also act as an intermediary between the government and the export industry and are critical in formulating foreign policies of the country. EPCs perform both advisory as well as executive functions.⁵³

In the electronics sector, Electronics and Computer Software Export Promotion Council (ESC), sponsored by the Government of India, is the country's largest electronics and IT trade facilitation organization. Given the significance of electronics hardware and components as a sunrise manufacturing sector, it may be worthwhile to establish an EPC for these products.

The traditional role of EPCs has been largely limited to buyer–seller meets, participation in international fairs, gathering data, helping to disseminate government-related incentives. The era of GVCs, however, demand reforms in their role. For example, the need for EPCs to better understand the GVCs of electronics, encourage investment from dominant players, and suggest relevant policies to the government to do so.⁵⁴ It may also have to match foreign contractors with local ones to form meaningful JVs to develop the entire ecosystem of electronics.⁵⁵ The role of lead firms and platform leaders will be critical in EPCs as they have the capability to relocate their contract manufacturers.

In this context, other countries through their trade promotion organizations facilitate lead firms to network with SME suppliers in their own country and in export markets. For example, Business Sweden is bringing together large firms and SMEs to create highly competitive bids for infrastructure projects in energy, mining, transportation and information and communications technologies. Twenty projects are underway globally, valued at EUR 4.7 billion. More than half of the participating companies are SMEs.⁵⁶

The EPCs' role is also that of monitoring the effects of government policies on exports. Hence, they should address issues such as the distortive effects of tariffs on intermediate products, and the remission of complete indirect taxes through RoDTEP. As and when domestic policies distort export opportunities or there is a contradiction between investment and trade policies these issues should be taken up by the EPC and resolved in a dialogue with the government.

⁵² <https://www.dripcapital.com/resources/blog/export-promotion-council-role>

⁵³ Ibid.

⁵⁴ <https://commerce.gov.in/wp-content/uploads/2021/06/Reforms-in-Export-Promotion-Councils-Driving-Trade-1.pdf>

⁵⁵ <https://pib.gov.in/PressReleaseDetail.aspx?PRID=1601890>

⁵⁶ <https://www.intracen.org/news/Global-awards-recognize-excellence-in-trade-promotion-to-build-back-better/>

At the state level, there is more flexibility in providing incentives for promoting GVCs. State EPCs should also work towards supporting tier 1, 2, and 3 suppliers to build ESDM over the course of the operation of the PLI scheme. The government's vision of district-level targeted exports should also take account of the GVC linkages and suppliers of the electronics sector.⁵⁷ In this context, it is noteworthy that electronic component-producing states such as Karnataka, AP, Tamil Nadu and Uttar Pradesh are already members of this DGFT-initiated scheme of state and district initiatives.⁵⁸

Promoting Export Hubs

India should also position itself to build an electronics export hub. Export hubs are collaborative business networks that help SMEs in electronics to harness opportunities in global marketplaces. Export hubs leverage lead firms to scale up business operations, and position regional businesses to participate in global supply chains.⁵⁹ India's aspiration to become a major global hub for electronics manufacturing is twofold. Firstly, boost export-led electronic manufacturing strategy at a global scale and make Indian manufacturing globally competitive. Further, the PLI scheme is proposed to offer a production-linked incentive to boost domestic manufacturing and attract large investments in mobile phone manufacturing and specified electronic components, including assembly, testing, marking and packaging (ATMP) units. To promote high-value local manufacturing, India provides a financial incentive of 25% on capital expenditure for some electronic components, semiconductors and display fabrication units (SPECS). Companies investing in new plants or expanding existing facilities would be eligible for this benefit. As part of the plan, the Government of India also aims to create manufacturing clusters—with a minimum area of 200 acres—that have common facility centres, factory sheds and plug-and-play facilities.⁶⁰

The move is likely to give an aggressive push to enable big companies such as Apple, Samsung, Oppo and Vivo, besides contract manufacturers like Foxconn and Wistron, to bring their global supply chains to India and make the country an electronics hub.⁶¹ However, this will not be possible without a liberal trade regime promoting GVCs and exports, especially low tariffs and non-tariff barriers on intermediate inputs, a liberal investment regime of permitting relocation of component manufacturers with the help of lead firms, and, most importantly, taking advantage of global trends in relocation of the China+1 strategy of lead firms.

⁵⁷ <https://commerce.gov.in/wp-content/uploads/2021/06/Reforms-in-Export-Promotion-Councils-Driving-Trade-1.pdf>

⁵⁸ *ibid*

⁵⁹ <file:///C:/Users/User/Downloads/SME%20Export%20Hubs%20FAQs%20PDF.pdf>

⁶⁰ FICCI, see fn 29.

⁶¹ <https://ficci.in/ficci-in-news-page.asp?nid=20821>

3.2.4 New Markets for Indian Electronics

So far, India's major markets for electronics have been the US, China and UAE. Mobile phone exports from India have been restricted, for the most part, to South Asia, Africa and Middle East. India's export of electronics while increasing, continues to be very small in comparison to its main competitors. The EPCs could play a major role here. It is important to develop relevant standards, especially for exports to developed countries. In this context, consistency with international standards becomes crucial.⁶² Again, the role of lead firms and platform leaders who play a critical role in setting international standards would be important. The development of new products in India would also set the pace for larger participation in harmonizing with international standards.



Conclusion

The PM has laid out a more comprehensive framework of export promotion than the conventional approach that considers export promotion as creation of additional and new export markets (mainly creating additional demand abroad for Indian exports). PM Modi has also discussed factors integral to increasing the supply of exported products, including the role of lead firms, building other segments

⁶² <https://www.fibre2fashion.com/industry-article/9160/can-new-ftp-bring-an-inflexion-point-for-india-s-exports>

of the supply chains and GVCs, and key factors important for sustaining the GVCs. A closer look at the relevant interrelation of issues shows that increasing exports require both GVCs and a higher scale of operations. For India, a focus on exports requires increasing the scale of production, which in turn leads to lower costs and greater competitiveness in global markets. In the case of electronics, specific targets have already been enunciated by the NPE 2019, which have now been taken further with a coherent framework by the PM in his speech.

NPE 2019 set very high export and manufacturing targets, amounting to several times the current production and exports. Progress towards these and achieving the vision of the PM requires addressing the disabilities of the Indian electronics industry. This chapter has built upon the previous analysis of disabilities and notes that higher tariffs on inputs create an additional disability, especially for products that are not easy to make in India. Another disability is the inability of the Indian industry to move different tiers of the GVCs to India. The disabilities have in part been addressed by PLI, but the new disabilities reduce the impact of PLI and delay participation in GVCs and increase in exports. At a time when India is one among a number of alternative locations being considered by lead firms for connecting with global markets, India has broadly about a three-to-four-year window to develop its ESDM. For one, the PLI is available till FY 2025–26. Further the China+1 strategy of FDI by major firms also has an expiry date—in about three years' time most of the relocation would already have happened. In this situation, given the time constraints, a quick way to generate domestic investment and production is by allowing a shift of larger parts of the GVC—tiers 1, 2 and 3 companies—to India. If this involves an exception to be made for certain specific Chinese investments in the manufacturing sector linked to the supply chain, for enabling GVC production and growth within India, then a special selection process for this sector would be worth considering.

Further to promote exports, RoDTEP rates have been announced on August 17, 2021 with effect from January 01, 2021 and are expected to provide a relief to exporters. The mechanism permits rate revision to be in line with market realities. Such a policy would help boost exports directly. Here, the states could go beyond the RoDTEP rates set by the Centre to promote exports, if they are less than what the WTO would allow, as is the case for some important electronics items. Moreover, to support the impact of PLI, the states could provide other services in kind to promote relocation of GVCs to India. This would also make exports competitive.

Given the critical role of electronics in other economic sectors (within electronics, automotive sector, medical devices), and their importance for implementing social policies and public services, it would continue to be a priority sector for many years ahead. This sector will also play a key role in implementing the PM's vision of a digital India. It also has the potential to become one of the top items of exports of India within the next 3–5 years. India has the potential to emerge as an important exporting hub, but some of the factors mentioned above have stymied the process.

Chapter 4

Exporting in a WTO-Consistent Way

“Recently, the government made a major decision regarding exporters. With this decision, our exporters will get a boost of about Rs 88,000 crore in the form of insurance cover. Similarly, *rationalizing export incentives and making them WTO-compliant will also boost our exports*. Friends, our exporters [. . .] know very well *the impact of stability*. The decision to get rid of retrospective taxation shows our commitment and consistency in policies” (emphasis added).

- Prime Minister Narendra Modi,

August 2021



Introduction

A stable policy regime and WTO-compliant policies will enable exporters to better plan and implement their investment, production, and export business plans.

For companies in the GVCs and for export markets of India, stability of policies is particularly important, as continuity of production and sales depend on whether or not a policy regime, including incentives, high tariffs or regulatory requirement, will remain stable for the foreseeable period to execute a planned investment or an export contract.

If a policy is not consistent with WTO provisions, it will be challenged or retaliated against by other WTO members. Such challenge usually results in a change of that policy, which further means that business plans, as a result, have to be amended. This causes hesitation or delay in investment decisions (affecting FDI as well), and makes major importers unwilling to enter into significant contracts.

A case in point is the Merchandise Exports from India Scheme (MEIS), which after it was found to be WTO-inconsistent had to be replaced by another scheme.⁶³ The PM alludes to MEIS in his speech.

PM Modi too has emphasized on the need for implementing stable and WTO-consistent policies to safeguard exporters' investments in India.

4.1 WTO Challenge Leading to Change in India's Policies

India's policies have been challenged in numerous areas, including tariffs on a number of electronic items.⁶⁴ Resultantly, India has had to change its policies on export subsidy (MEIS) and local content requirement.⁶⁵ Further, the major economies where India seeks to export, such as the European Union and US, would monitor the policies of India that are challenged under the WTO dispute settlement process for being a violation of WTO provisions.⁶⁶ Following the imposition of tariffs on steel and aluminum by the US in 2018, which were considered WTO-inconsistent by several countries, retaliatory tariffs were imposed by many, including India.⁶⁷ These retaliatory tariffs were in place

⁶³ For WTO documents relating to this dispute, see https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds541_e.htm

⁶⁴ https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds582_e.htm, https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds584_e.htm and https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds588_e.htm

⁶⁵ https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds456_e.htm

⁶⁶ In the WTO disputes brought against India in relation to tariffs on ICT imports by European Union, Japan and Taiwan, countries that have formally expressed an interest by joining the dispute procedures include Brazil, Canada, China, Indonesia, Norway, Pakistan, Russian Federation, Singapore, South Korea, Thailand, Turkey, Ukraine, UK and US. See, for example, the list of third parties in the dispute at https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds584_e.htm

⁶⁷ See <https://www.trade.gov/feature-article/foreign-retaliations-timeline> and <https://www.bbc.com/news/world-asia-india-48650505>

even when the US action was challenged at the WTO and the matter was in a sense sub judice.⁶⁸ With the dispute settlement system at the WTO in abeyance due to the appeal process coming to a standstill, such retaliatory measures are readily considered, especially by large economies.

The importance of WTO-consistent policies for providing a stable operational environment likely increased more than in the pre-Trump era because of the possibility of retaliatory action being taken even before the WTO challenge is complete.

4.2.1 Crucial WTO Provisions Essential for Policymaking

Prohibited Policies under WTO Agreements

The agreements under WTO constrain policy actions through two types of provisions. First, policy measures that are prohibited under WTO (“Prohibited” policies); and second, those that are allowed unless they adversely impact the trading opportunities of the complainant WTO member (“Actionable” policies). Prohibited policy measures are relatively easier to prove in a dispute and are of particular interest to others monitoring India’s policies. These are the measures that become priority candidates for examination of WTO-consistency in line with the point emphasized by the PM.

Article 3 of the Subsidies and Countervailing Measures (SCM) Agreement delineates what is prohibited under WTO. It reads as under,

3.1 Except as provided in the Agreement on Agriculture, the following subsidies, within the meaning of Article 1, shall be prohibited:

- 1. (a) subsidies contingent, in law or in fact⁴, whether solely or as one of several other conditions, upon export performance, including those illustrated in Annex I;*
- 2. (b) subsidies contingent, whether solely or as one of several other conditions, upon the use of domestic over imported goods.*

WTO provisions prohibit a number of other policies as well. For example, increasing tariffs beyond the level “bound” under WTO without relevant justification (for example safeguards measures), export subsidies (such as the previous MEIS scheme), local content requirement (including domestic content or value addition being a pre-condition for grant of subsidy)⁶⁹, and imposing quantitative restraints on trade without relevant justification in WTO. Instances of local content requirement and unjustified quantitative restraints to trade are provided in the “Illustrative List” of the WTO Agreement on Trade Related Investment Measures (TRIMS)⁷⁰.

⁶⁸ See for example the several disputes relating to certain measures (tariffs) on steel and aluminium products in the several complaints against the US from DS 544 to 564 in the list given at https://www.wto.org/english/tratop_e/dispu_e/dispu_by_country_e.htm

⁶⁹ For prohibition of subsidies linked to domestic content, see Article 3.1(b) of the WTO Agreement on Subsidies and Countervailing Measures available at https://www.wto.org/english/docs_e/legal_e/24-scm_01_e.htm

⁷⁰ See https://www.wto.org/english/docs_e/legal_e/18-trims_e.htm

Tariff bindings are the maximum level of tariffs agreed to by a WTO member country that it would not breach unless a situation arose that could be justified under the various provisions of WTO.⁷¹ The recent dispute cases in the area of ICT relate to complaints that India's tariff increase breach the binding agreed to in the WTO under Information Technology Agreement (ITA). These challenges are against a number of tariffs increased under the Phased Manufacturing Programme (PMP) till 2019. They imply a likelihood of similar disputes arising with respect to tariff increases after 2019.

Likewise, if a subsidy scheme such as the PLI includes domestic value addition or local content as one of the requirements to qualify for the subsidy, that condition could be challenged as being a violation of the WTO requirements. Such a possibility of challenge at the WTO would create uncertainty regarding the sustainability of the PLI scheme or any other subsidy scheme which has domestic value addition as a requirement to qualify for the benefit.

Non-Prohibited Policies under WTO Agreements

Apart from specifying policies that are prohibited, the WTO agreements also shed light on policies that are WTO-consistent. In principle, PLI is aimed to be a WTO-consistent subsidy provided it is not coupled with some policy condition that is prohibited under WTO.

Likewise, for a GVC, indirect taxes on the entire supply chain could be refunded for exports.⁷² The government's Remission of Duties and Taxes on Exported Products (RoDTEP) scheme aims to use these provisions to be WTO-consistent. The WTO allows full refund of all indirect taxes, which are defined broadly.⁷³ The government can provide full refund of indirect taxes in the total supply chain on all inputs as well as on transport, power and oil used in production. For credibility of policy, consistent principles need to be applied to all products covered. Arbitrary application of policies to some products selectively leads to uncertainty, inconsistency and lack of stability associated with the governance procedures.

While there are some legal provisions such as Annex 1 of the WTO's Agreement on Subsidies and Countervailing Measures ("SCM Agreement") that provide an illustrative list of prohibited export subsidies, certain other provisions show the possibility of devising policies that escape the scope of the limits imposed on policies under WTO. However, these provisions haven't yet gained the attention of policymakers. These include provisions that allow general subsidies for R&D, small- or

⁷¹ For an explanation of tariff bindings, see https://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm2_e.htm#con

⁷² See Annex 1 of the Agreement on Subsidies and Countervailing Measures, in particular paragraphs (g) and (h) of this Annex.

⁷³ The definition of the term "indirect taxes" covers "sales, excise, turnover, value added, franchise, stamp, transfer, inventory and equipment taxes, border taxes and all taxes other than direct taxes and import charges". Other relevant definitions include those of "prior stage" and "cumulative". They are: "Prior stage indirect taxes are those levied on goods or services used directly or indirectly in making the product", and "Cumulative indirect taxes are multi staged taxes levied where there is no mechanism for subsequent crediting of the tax if the goods or services subject to tax at one stage of production are used in a succeeding stage of production."

medium-scale enterprises, infrastructure, and specific parts of the manufacturing sector based on a prespecified criteria.

An example of the latter is Footnote 2⁷⁴ of the SCM Agreement, which could be a basis to devise a policy so that it is exempt from the disciplines of the WTO.⁷⁵

Conclusion

In his August 2021 speech, the PM rightfully stresses on the need to carefully devise policies that are consistent with the WTO. Inconsistent policies could be challenged at the WTO and may even face retaliatory trade measures (including by India's major markets). This would damage the reputation of that policy regime. WTO-inconsistent policies adversely affect FDI, exports and participation in GVCs.

The WTO agreements specify the few policies that are prohibited, and care is required to ensure that such policies are not implemented. Otherwise, WTO-inconsistency will introduce uncertainty, risk and lack of policy stability—the precise conditions that the PM recognizes as important for improving export performance.

At the same time, WTO provisions also provide guidance on policies that provide flexibility to the policymaker. These provisions need to be identified, and when applied an important principle of “good governance” should be kept in mind—that is, a policy should not be based on arbitrary criteria; and, consistent criteria should be applied to all products covered by the policy measure.



WORLD TRADE
ORGANIZATION

⁷⁴ Footnote 2, SCM Agreement, “Objective criteria or conditions, as used herein, mean criteria or conditions which are neutral, which do not favour certain enterprises over others, and which are economic in nature and horizontal in application, such as number of employees or size of enterprise.”

⁷⁵ Footnote 2 clarifies the concept of objective criteria or conditions required for exemption from the WTO discipline, and says that: “as used herein, mean criteria or conditions which are neutral, which do not favour certain enterprises over others, and which are economic in nature and horizontal in application, such as number of employees or size of enterprise.”

Chapter 5

Increasing Domestic Value Addition in Electronics Exports



Introduction

“This is the time for us to establish a new identity of quality and reliability. We have to constantly try to add value to India’s high value-added products for their exports in every nook and corner of the world.”

Products in the electronics sector could be considered broadly under two categories, particularly with respect to the value of exports. First are high value products known for their quality and reliability and the second are relatively inexpensive products. The domestic value added for the latter is often higher than that in the former. With respect to the value of exports, the former tends to constitute a major share of the volume, especially for mobile phones. Hence, if increasing the value of exports is a priority, then increasing the value added in high-value and quality products destined for markets

in developed countries becomes an important target group. Before turning to the strategy that could enhance domestic value added, it would be useful to look at lessons from other countries that are major exporters of electronics. These countries are also a host to most GVCs. Section 6.1 analyses the trends in value added when exports grow. Sections 6.2 and 6.3 analyse the experience and policies of Vietnam and China to promote export growth and domestic value added. Section 6.4 discusses a strategy for India to increase value added for exports. Finally, the conclusion shows the fallacy of focusing solely on domestic value added and highlights the importance of other factors, such as large-scale manufacturing, exponential growth in exports and linking with GVCs in achieving the aim of higher domestic value added.

5.1 Export growth and value added

India aspires to increase domestic value added in the electronics manufacturing sector together with a major jump in the value of exports, as mentioned by the PM in his speech on 6 August 2021. These objectives require a closer look at the factors that contribute to domestic value addition and exports, especially because imported goods and services are important for building India's competitiveness. If India forcibly replaces key imported inputs through tariffs with inferior or higher cost domestic versions, the result is likely to be lower gross exports and less, not more, total value-added exports. Thus, the domestic value addition should take place in a manner that cost-effective quality inputs are produced domestically to increase the country's share in value added.

Value added dips before increasing

In almost all countries, developed and developing alike, the share of domestic value added in exports has tended to trend downwards in the last decade.⁷⁶ Over the last four years, India has increased its domestic value added in low value phones to 30%, and an average of approx. As much as 15–20% for the industry as a whole. However, as India moves into higher technology or into the production of higher value products, with FOB values of USD 300+, for example, its initial production will have to rely more on imports than domestic inputs. To the extent alternative cost and quality efficient options for inputs emerge in other countries such as China, domestic value addition will first dip before it increases when these capabilities are built in India. A leading industrial conglomerate in India, for example, has expressed the view that it would take at least three years to manufacture the mechanical parts of a high value mobile phone with a joint venture partner with the requisite expertise.⁷⁷ In this background, a policy which stipulates a relatively high threshold for domestic value added from the beginning, may lock India at a particular stage of technological development or reduce the potential for exports from the country.

⁷⁶ <https://www.oecd.org/dev/Global-Value-Chain-Development-Report-2019-Technological-Innovation-Supply-Chain-Trade-and-Workers-in-a-Globalized-World.pdf>. Chapter 7. The domestic value added in the electronics sector in Japan has reduced from over 60% in 1995 to less than 40% in 2015, in Republic of Korea it reduced from over 45% to less than 40%, and in Taiwan from 55% to 30%.

⁷⁷ Industry Feedback.

Increasing domestic value added through co-location

In this situation, there are two ways to increase domestic value addition together with exports within a short time horizon. One is to encourage a shift to India by producers of the different tiers of the GVC; the lead firm could be encouraged or facilitated to bring its different suppliers of inputs to invest and produce in India. A foreign investor (lead firm and its suppliers) producing in India would be adding to the domestic value addition by replacing the imported inputs that would otherwise be part of the supply chain. This also improves competitiveness by reducing the time taken within the value chain to produce the product for sales, and provides a basis for skill and technology augmentation as well as building the domestic ecosystem more quickly.

Increasing scale of production more important initially than percentage of value added

The second relevant approach is to consider ways to increase the volume or scale of production. A larger scale of production with the same per unit of domestic value addition will result in a higher absolute level of the value added produced domestically, which in turn will have positive impact on the domestic ecosystem aimed at exports. In fact, there is a close mutual synergetic link between scale and exports (Figure 5.1): investment in a high scale of production, especially for high value products, will come for electronics mainly with the global markets or exports in mind; higher scale of production lead to lower costs and improved competitiveness; higher level of exports generate a momentum for greater investment, scale and improvement in technology. To illustrate this point regarding domestic value addition, a closer look at the numbers involved would be instructive. Currently, India's total value of mobile phone business is approximately USD 30 bn, of which approx. USD 27 bn is domestic and USD 3 bn is exports. India currently has an average Domestic Value Added (DVA) ratio of 15-20%, implying an aggregate value addition of approx. USD 4.5-6 bn. If India's export of mobile phone goes up to USD 110 bn (as per the NPE 2019 target), and the DVA ratio reaches 25% at the end of 5 years, India's exports will be making a DVA contribution of USD 27.5 bn, adding an additional USD 20 bn. to the existing level of DVA. This quadrupling of India's contribution in aggregate terms would have a multiplier effect on jobs, skill development, investments, technology infusion. Thus, it is important to consider DVA from the point of view of its aggregate value rather than in terms of DVA percentages. Figure 5.1 below shows the schematic sequence of activities that lead to higher domestic value added.

This will become clearer when exports of certain electronics items from India, China and Vietnam are compared. Table 5.1 shows the absolute increase in the level (or scale) of exports in 2000 and 2019.

	Telecommunications Equipment		Integrated Circuits and Electronic Components		Electronic Data Processing and Office Equipment	
	2000	2019	2000	2019	2000	2019
India	0.1	4.3	0.1	0.8	0.2	1.3
China	19.5	296.7	5.4	136.8	18.6	199.7
Vietnam	0.1	47.4	0.1	15.5	0.5	29.2

Table 5.1: Exports of Selected Electronics Items from India, China and Vietnam: 2000 and 2019 (USD Billion)

Source: WTO

Note: The numbers have been rounded up to the nearest single decimal point.

The scale of increase of exports from both Vietnam and China is so large that the absolute impact on domestic value addition would be very significant compared to India. With an increase in scale over time, China and Vietnam have also managed to increase their DVA ratios and thus the impact of the rise in exports on domestic value addition is larger with time.

Stages of Increasing Value added

Figure 5.1: Schematic Sequence of Inter-Linked Steps for Increasing Domestic Value Added

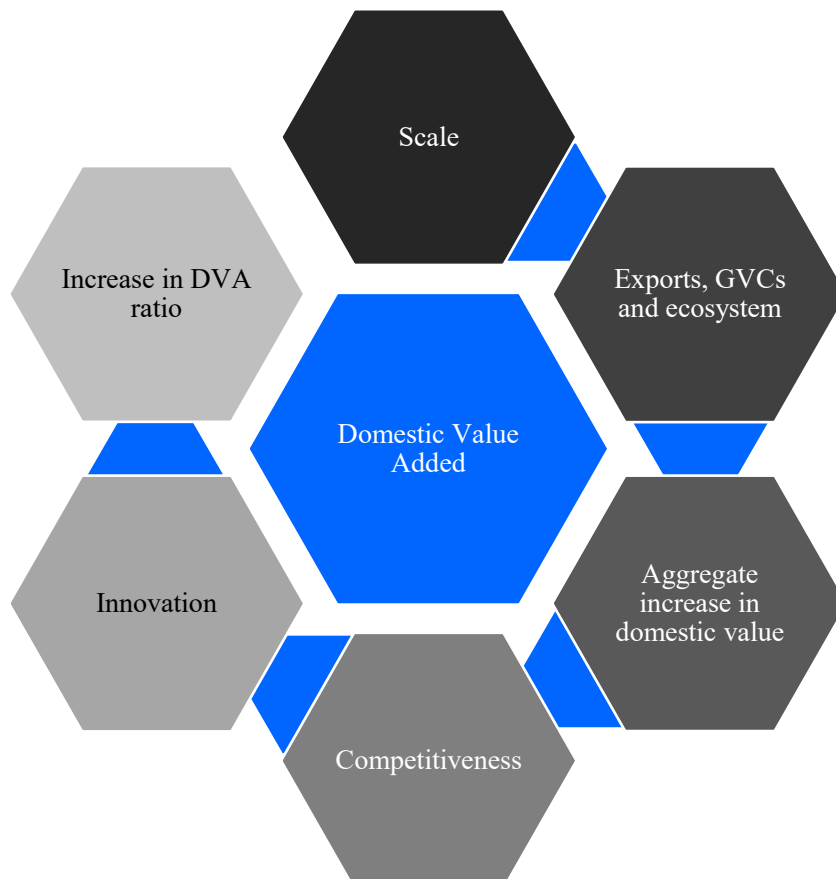


Figure 5.1 shows that the higher scale also encourages skill development and innovation within the country, leading inter alia to higher domestic value addition as well. It also builds a better base for introduction of new products or technologies, for which the cycle of exports, innovation and domestic value-addition starts afresh. In each situation, the domestic value-added (DVA) ratio will increase with the use of technologies through FDI and skill development. This will take place more easily as tier 2 and 3 partners move with the lead firms when Indian firms can both absorb existing technologies and innovate new ones. As noted earlier in Chapter 2 on GVCs, innovation takes place in two directions in the GVC: one is due to the lead firms, and the other is the innovation by tier 1, 2 and 3 producers in the GVC.

Quality of Inputs affect scale of production

The quality of inputs and outputs also affect the scale of production.⁷⁸ Studies show that there is positive correlation between the quality of inputs and the plant size and the price of the output, an indicator of quality of the product.⁷⁹ Experience of China shows that it invested hugely in improving human capital in the last two decades to complement the advanced technology adoption by Chinese firms. A study suggests that substantial improvement in domestic technology in China, along with falling trade costs, has been the reason for the rising DVA ratio in gross exports recently.⁸⁰

In this context, a noteworthy point is that normally technological advancement leads to an increase in the DVA ratio, and not otherwise, i.e., not from DVA ratio to technological advancement. Moreover, mandatory domestic value addition requirements would be a WTO violation. In addition to this policy's impact on limiting technological advances, there would be possible trade conflicts (already begun at the WTO) which create policy uncertainty.⁸¹ This would also delay the growth of GVCs through a significant investment by lead firms (and platform leaders in the electronics sectors), as well as their Tier 1, 2, and 3 partners to India.

It is important to understand that these changes are not instantaneous but are possible with supportive policies and take time. Specific lessons can be learnt from the experience of Vietnam and China.

⁷⁸ Kugler and Verhoogen (2012), "Prices, Plant Size, and Product Quality," *Review of Economic Studies*, vol. 79(1), pages 307-339.

⁷⁹ Kugler and Verhoogen (2012), "Prices, Plant Size, and Product Quality," *Review of Economic Studies*, vol. 79(1), pages 307-339. Kugler, Maurice and Eric Verhoogen (2012), Another finding that the more productive plants use higher-quality imported inputs as indicated by comparing the price of domestic input in the same category by the same plant.

⁸⁰ Tang et al, 2018.

⁸¹ https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds582_e.htm

5.2 Policies and Experience of Vietnam to increase DVA Ratio

Vietnam focused on increasing its scale of production and exports rather than on DVA ratio. It encouraged investment from China, in general had very low tariffs for intermediate and component inputs (including through FTAs) and focused on export promotion as its domestic market was too small. As a result, its exports of electronics rose by 1,610% between 2010 and 2020, its imports by 961% in the same period.⁸² Exports of the country's electronics industry have an average annual growth rate of about 33% between 2010 and 2020, which is among the highest in the world. According to Vietnamese trade officials this growth could be attributed to working and cooperating with the world's leading companies and corporations from the US, Europe, Japan and South Korea. Vietnamese businesses are fully capable of participating in the supply chains of large companies and corporations around the world. Between 2010 and 2020, Vietnam's share of electronics exports in the world increased from 0.11% to about 3.86%. The corresponding share of India in global electronics exports were about 0.14% and 0.34%.

Soft interactive approach

Vietnam did not mandate requirement to increase domestic value added in the electronics sector.⁸³ Instead, it used a soft approach through institutional mechanisms and incentives to increase domestic value addition. It had already instituted regular consultations with major multinational enterprises (MNEs) for addressing their problems as they arose. In these consultations it also encouraged MNEs to use domestic suppliers of parts and components without imposing this requirement.

Supplier Development Program

In November 2015, the Government of Vietnam issued the Decree on Development of Supporting Industry (Decree of Government on Development of Supporting Industry 2015). The decree regulates policies and incentives in relation to domestic firms in supplying industries to electronics MNEs. These policies are aimed at facilitating research and development, technology application and transfer, human resource development and marketing capabilities of domestic firms. The firms reported that they experienced initial spurts in technology and scale shortly after these policies helped them establish indirect supply linkages with companies such as Samsung.

Investment Aftercare services

Vietnam provides 'Aftercare' services to MNEs broadly in three forms: administrative services that enable operations (e.g. permits, permissions, visas and tax matters), operational services which support the effective and efficient operations of MNEs (e.g. premises for expansion, export promotion), and strategic services (e.g. linking senior managers and executives of MNEs with high-

⁸² Source: ITC Trade Map

⁸³ Vietnam and Value Added, https://ash.harvard.edu/files/ash/files/grozier_keene_sypa_final_4.29.20.pdf

level policy and consultation networks). When implemented effectively, goodwill and credibility can be established at high levels within FDI entities, which are a valuable channel for exerting “soft” pressure on MNEs, e.g. to induce their participation in the nurturing of local suppliers to attain international standards.

Co-location

Vietnam offers a conducive environment for foreign suppliers that choose to “co-locate” (to reduce the costs and complexity of import sourcing). Compared to import sourcing, co-location offers greater possibilities for linkages. The tier-1 intermediaries follow the stringent quality and process control requirements uniformly applied by the MNEs. Tier-1 suppliers typically provide inputs in the form of specialized parts, which in turn consist of generic and specialized components. While local firms may not possess the skills to process and produce the specialized parts in the short term, a useful entry point for them is to focus on the manufacturing of more generic components within a fragmented production process before proceeding to the production of more complex products through upgrading. The increase in Vietnamese tier-2 suppliers to Samsung between 2014 and 2017 exemplifies at least the first part of this process. India can draw experience from Vietnam once the local capacity matches tariffs, scale and quality.

Building local Capacity

Vietnam has also helped build capacity of local firms to reach a minimum capability threshold before foreign firms can consider them as potential suppliers. As the inaugural Samsung Sourcing Fair demonstrated, the gap between the minimum capability threshold and the existing capabilities of local firms is often very large.⁸⁴ Once linkages with FDI have been formed, the first generation of linked local firms need government assistance to continuously upgrade to diversify their product range, improve processes and find new market channels and a wider customer base (other than the foreign firms they initially served). For example, generic industry globally harmonised standards like ISO9001 are often treated as basic requirements by foreign firms though not a guarantee for firm entry into GVCs. Product and process standards imposed by global lead firms and their key suppliers across the value chains have advanced so much that they now often exceed the industry and national standards.

⁸⁴ Vietnam and Value Added, https://ash.harvard.edu/files/ash/files/grozier_keene_sypa_final_4.29.20.pdf

5.3 How China Defied the International Trend of Value Added and Export Growth

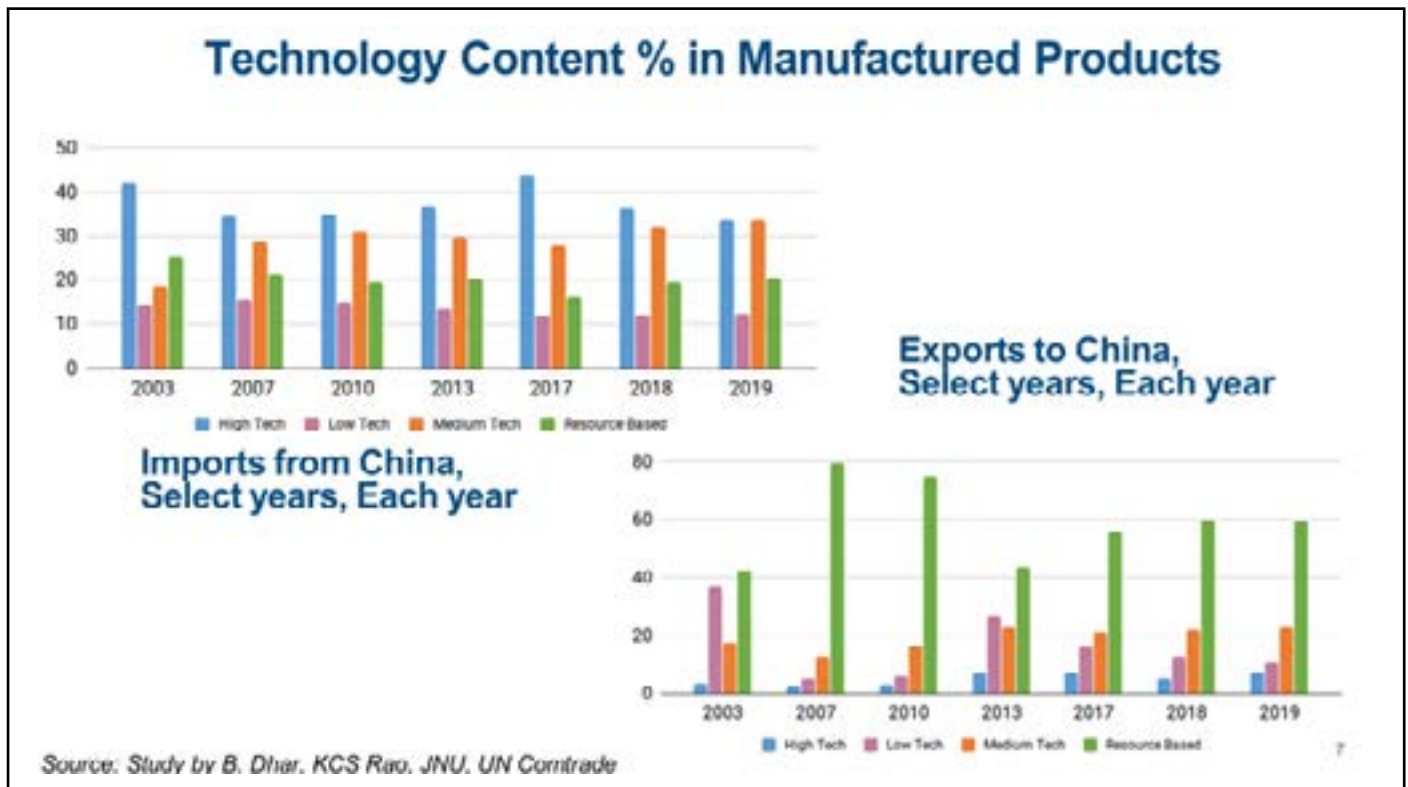
China's recent experience is often given as an important counter-example, since its domestic value-added ratio has risen over the past decade with increasing exports. Research indicates that this trend is primarily the result of technological advances in China.⁸⁵ Figure 5.2 below shows a comparison of the technology content of Chinese exports to India and those of India to China. However, even after 20 years of massive manufacturing expansion in the electronics sector, China with a total production of USD 1 trillion and export of USD 700 billion in electronics, still imports electronics worth nearly USD 500 billion.⁸⁶ In effect, the domestic value addition across the electronics sector after two decades has reached approximately 50%. For more high-end IT products and mobile phones, it remains at a much lower level. Once the Chinese economy catches up in technology with other economies and achieves the maximum DVA ratio in exports, rising labour costs will shift production to the other regions in the world to maintain competitiveness by the exporting firms. In fact, this is already happening as Chinese firms are moving investment to Vietnam, Philippines and Indonesia in the electronics sector. Hence domestic value added in China is expected to reduce in future.



⁸⁵ Quanrun Chen, Yuning Gao, Jiansuo Pei, Gaaitzen de Vries, and Fei Wang August 2018, Formerly Assembled, But Now Designed in China? Assessing the Domestic Value-Added of Activities in Gross Exports, <https://research.rug.nl/en/publications/formerly-assembled-but-now-designed-in-china-assessing-the-domestic-value-added>

⁸⁶ Source: worldexports.com

Figure 5.2: Comparison of India and China’s technological content of Exports



Specialisation in different parts of the value-added chain in different Provinces

China’s DVA ratio in exports increased between 2002 and 2012 through the expansion in manufacturing activities, mainly driven by provinces like Guangdong, Jiangsu, and Zhejiang. This process was helped by enabling a large scale of production and exports from China: for example, between 2001 to 2010, China’s electronics exports increased from about USD 47.3 billion to USD 535 billion. This trend further emphasizes the fallacy of concentrating on DVAR versus support for suppliers and scale. However, there is clearly sub-national variation in domestic value added from activities in exports. Beijing, Shanghai and Tianjin, started to specialize in R&D and sales and marketing activities.⁸⁷ For example, income from R&D activities increased almost ninefold, sales and marketing more than sixfold, which compares to a fourfold increase in income from manufacturing activities. Thus, the value added share of manufacturing in total exports declined by almost 9 percentage points. In contrast, R&D, and sales and marketing shares increased by 5 and 4.6 percentage points respectively. Hence the increase in total value added took place in China.

⁸⁷ <https://research.rug.nl/en/publications/formerly-assembled-but-now-designed-in-china-assessing-the-domestic-value-added>

5.4 A Strategy for India for Increasing Domestic Value Added in exports of Electronics

The above analysis has shown that value addition takes time and a direct focus on DVA ratio to the exclusion of other issues such as scale and export growth may be counter-productive. Further value addition follows an inverted U-curve as a country goes up the technological curve and increases the production of higher value products.

Technological Upgrading takes time

Technological upgrading is an important part of the convergence process of DVA ratio and export growth. India can absorb already existing technologies through foreign direct investment and skill upgradation. For instance, the embodied technology in intermediate inputs from Chinese tier 1-3 producers can be assimilated and improved over time by local producers in India. Even if India joins at the lower value-added segment, it will still generate more and better job opportunities for the unskilled workers. Once Indian firms are integrated in electronics GVCs, to enhance the value-addition (or move up the value-chain), following the Chinese example, they will need to invest in upskilling workers, R&D and technology adoption by firms, as well as supporting ICT and physical infrastructure. If India tries to increase the DVA in exports by artificially supporting the inputs/intermediates by using tariffs and non-tariff measures, it will likely increase the cost of production and make the product less competitive in the international market, resulting in reduced demand for the product as well as workers in the exporting sector. The productivity and quality of the domestic firms will also be affected, adversely impacting welfare in the society.

Increase GVC participation for increasing DVA ratio

Studies have found that national economic policy influences the relationship between GVC participation and domestic value added.⁸⁸ A set of ten policy areas was examined, namely, infrastructure, connectivity, investment and trade policy, business climate and institutions, financial and labour markets, education and skills, product standards and innovation, labour standards, social standards and environmental standards. All ten policy areas reinforce each other to increase domestic value added in GVCs.



⁸⁸ Kummritz et al. (2017:32)

Advantages of co-location

Until recently, the offshoring of knowledge-intensive activities by MNEs from high-income countries was pioneered by only a few companies and was primarily between a limited set of high-income countries. In particular, since 2004 a new phase in which high-skilled services jobs are offshored to emerging countries has begun.⁸⁹ Cheap but educated workforces in India provide enormous opportunities for firms to offshore entire functions such as marketing, human resources and customer services. High-technology US start-ups have established offshore subsidiaries to undertake for example high-end semiconductor design activities and software algorithm development.⁹⁰ The combined focus of lead firms, its contracting partners of Tiers 1-3, and supportive government policies can together create the momentum for moving to higher domestic value added along with export growth.

Role of Indian Industry and Manpower is Critical

For the development of domestic firms that can participate in GVCs of electronics the Indian government would need to invest in supplier development programs. They could begin by linking and handholding appropriate domestic firms in joint ventures with contract manufacturers to lead firms. In the short run, similar to China, the Indian public sector firms in the technology space could also help transfer key technologies to local firms. This could specially hold for mechanical parts in smartphones and other electronics. In the longer run, however, the focus must be on improving the quality of the human capital base through investments in education and training at all levels.⁹¹ Efforts to strengthen vocational education e.g. restructuring Skill India program may be particularly valuable in the medium term, while more advanced skills will be required to conduct research, product development and design in the longer term. Policy support provided for technology development would be of key importance in this context. For example, China pre-selects a group of meritorious students to work with lead firms in their major projects. India could also provide a pool of local low-cost engineers to work on such projects as part of their curriculum.

Timelines for increasing DVAR

In view of the time taken to build value chains, policymakers could look at specific timelines such as:

- 1-4 years: Shifting the ecosystem since PLI is only for 5 years and needs production of large volumes - INR 10.5 lakh crores, of which exports are Rs.6.5 lakh crores, and about 9 lakh jobs created (direct and indirect).⁹²

⁸⁹ Dossani and Kenney 2007.

⁹⁰ Dossani and Kenney 2007; Di Gregorio et al. 2009; Lewin et al. 2009; Nieto and Rodríguez 2011; Castellani et al. 2013, Kenney et al. 2009.

⁹¹ Bodewig & Badiani-Magnusson, 2014.

⁹² <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1662096>

- 4-10 years: Create list of domestic companies which can plug into the GVC in large numbers subject to quality, competitive price, volumes and dependability. This will be dependent on the policy measures that are taken to bring local firms to meet global requirements.

5.5 Domestic Champions

Developing the domestic ecosystem and need for building domestic champions

While the global firms are essential for providing the foundation and momentum for India's exports and GVCs in electronics, domestic firms are essential for sustaining and expanding the domestic ecosystem over time. This aspect has been recognised also by the Government of India which provides PLI support to global as well as domestic firms.⁹³ For building domestic firms, including Indian champions, it is important that a large number of medium to large scale domestic electronics firms come up in India. A major ecosystem of a large number of medium-scale enterprises could be developed only as a part of the process of being in the supply chain for large companies. Likewise, small enterprises can only be built by the demand for their products and services by the medium and larger scale enterprises. The large firms thus become a means of transformation of the sector. There is a potential symbiotic relationship between the global firms operating in India and India champions, which needs to be nurtured.

Importance of Scale and Improving Competitiveness

Domestic champions face the same challenges as global firms to build exports, increase scale of operations, improve competitiveness, develop the eco-system and above all reduce costs. As discussed in other parts of the report, the importance of scale and export orientation becomes paramount in building the domestic champions as well. In fact, a domestic company's ability to compete successfully in domestic markets will depend upon its ability to match the competencies of multinational companies, with whom they compete in their own domestic markets. The boundary between a company's domestic market and foreign market is getting blurred. Only a company which is internationally competitive can protect its domestic market, and could emerge as an Indian champion. There are a number of market segments where Indian firms can develop a large presence, such as a global market of about \$ 110 billion for mobile phones with a price below \$200, where Indian firms could have a strong competitive position provided they operate in a level playing field.⁹⁴ This requires a focus on both improving competitiveness of the domestic firms (in which scale plays an important part), and providing them with stable, supportive and non-disruptive operational conditions while they grow their scale of operations.

⁹³ The domestic firms under the PLI schemes include domestic firms like Lava, Bhagwati (Micromax), Padget Electronics, UTL Neolyncs, Optimus Electronics, AT&S, Ascent Circuits, Visicon, Walsin, Sahasra, Neolync, Dixon Technologies (India) Limited, Infopower Technologies (JV of Sahasra and MiTAC), Netweb, Smile Electronics, VVDN and Panache Digilife. Another groups of potential Indian champions in electronics would be established companies in electronics and other sectors with which the lead firms begin discussions for their engagement for producing parts of the value chain, e.g. Tatas.

⁹⁴ Calculations based on industry calculations. See also <https://www.mordorintelligence.com/industry-reports/smartphones-market>



Main Challenge for domestic champions: Disruption before growth process is stabilised

One of the most destabilizing situations for a growing domestic firm is predatory pricing from competitors with deep pockets. In addition, if their access is blocked to important parts of the value chain (including the distribution sector) it is difficult for them to survive. Past experience of domestic firms suggests that some specific policy initiatives are required to support them to prevent such disruptions in the market, by ensuring fair competition, and providing support in key operational areas where the domestic firms face significant problems.

Tackling unfair competitive practices

Innovative ways of unfair competitive practices are emerging globally due to novel or unconventional ways of sustaining losses that arise when a firm practices predatory pricing.⁹⁵ Two important parts of a solution include periodic consultation with the domestic firms on their insights on new ways that may have been used to sustain predatory pricing against them, and a need to establish a rapid response system to address the situation of predatory pricing, because the demand swing could be very large even within a short period. This is especially important for Tier 1 suppliers, for which a more regular oversight may be required with quicker decisions and regulatory solutions. As mentioned above, with a level playing field, certain domestic Tier 1 producers could potentially access a very large global market.

Access to Capital and interest subvention

With predatory pricing by foreign firms, several domestic firms have become cash strapped and are left with no profits for reinvestment. Their cost of borrowing money is much higher than that of international firms. Policy support for these “disabilities” is required especially in the phase when these firms are growing. One possibility could be to classify the PLI eligible domestic companies as “strategic companies” for lending at prime rates and ease their access to bank loans. This could be operationalised through an interest subvention scheme for PLI eligible domestic companies.

Knowledge and skills

Global competitiveness is also significantly determined by knowledge, skills and technologies (including design). Support for these is crucial. A supportive design ecosystem park could be established/strengthened interactively to improve design capabilities. Likewise, a special fund for R&D could be created to harness the inherent technological capabilities of domestic producers.⁹⁶ This would improve technological capabilities of the domestic firms in addition to those that will develop through their links with large firms in the GVCs.

⁹⁵ See for example, https://unctad.org/system/files/official-document/ciclpd54_en.pdf

⁹⁶ For example of some Chinese firms for R&D, see <https://chinainnovationfunding.eu/chinese-local-innovation-funding-programmes/>

Conclusion

Most countries have seen their DVA ratio fall over time both because of moving up the technology chain and transfer of more labour-intensive parts of the GVC to other locations. Nevertheless, their electronics exports have increased exponentially, especially Vietnam and China. While India may aspire to increase its DVA ratio through exports, it is important not to focus as much on DVA ratio but rather on expanding exports and DVA through scale and technology diffusion. Some countries which have defied the trend of falling DVA ratio with growing exports in the electronics sector are China and Vietnam. China has followed a broad policy of technological adaptation and innovation throughout the value chain. Vietnam on the other hand has followed a policy of targeted support for MNEs and suppliers to MNEs. Therefore if countries adopt an export oriented approach, it tends to create opportunities through scale and links between scale, competitiveness and DVA. Initially, the aggregate DVA increases with scale of production, and over time with the rise in technological capacities, the DVA ratio also increases.

Technological diffusion occurs when domestic firms link with, or supply to, foreign firms with a higher degree of productive capabilities. The linkage process is far from automatic and relies on the spill-over potential of FDI, the absorptive capacity and capability of domestic firms, and the host country's business policy and institutional environment. In general, open trade and investment policies are crucial to these spill-overs. India thus needs to attract Tier 1-3 suppliers to increase diffusion as well as keep low tariffs on inputs. It needs an open trade regime to attract FDI from intermediate products and sub-assemblies. Tariff and non-tariff barriers should in general be kept at low levels.

To increase exports as indicated in Chapter 3, India will need to increase the scale of production by allowing participation by GVCs and moving the various tier producers from China to India. Further the requisite quality of inputs can only be sourced from efficient and high-quality producers such as from China because domestic firms lack the capacity to produce them in India within the short term (1-4 years).

Further supportive policies for domestic suppliers would help India to go up the value added chain. These include linking selected domestic suppliers in joint partnership with foreign firms to GVCs and also using public sector technology to build capacities and a pool of domestic suppliers to lead firms. Apprentices or interns from the Skill India program could also be used by lead firms to develop a labour base. In addition, students from IITs could be used as interns for technology development and dissemination to local firms.

Instead of mandatory domestic value-added thresholds, which are also WTO inconsistent, India may be better off developing suppliers, encouraging select FDI from China, lowering tariffs and focusing in a targeted way on R&D. All relevant international experience over the last two decades supports this finding and recommendation.

Chapter 6

Other Relevant Issues for Building Scale Through Exports



Introduction

Among the many significant operational parts identified by the PM in his speech on 6 August 2021 for increasing the impact of any policy are, Centre-State collaboration, stability of a policy and its timely and effective implementation.

6.1. Importance of Stability and Consistency of Policy

Stability and predictability of policies are important parts of “good governance”. In a discussion on good governance and the rule of law, the United States Council for International Business stated that: “Business needs the stability and predictability of good governance to put down roots and flourish, stimulating growth and opportunities for others.”⁹⁷

⁹⁷ See , <https://www.uscib.org/docs/Governance%20and%20the%20Rule%20of%20Law.pdf>

The aim of instituting stability and predictability in the policy regime is to prevent changes in regulation that are arbitrary, frequent or burdensome. As explained in a document of the World Bank on Doing Business: “The foundation of Doing Business is the notion that economic activity benefits from clear and coherent rules: [. . .] And rules that enhance the predictability of economic interactions and provide contractual partners with essential protections against arbitrariness and abuse”⁹⁸ (emphasis added).

The need for stability demands certain precautions in policymaking. One, frequent changes in policy—especially those which increase cost and procedural burden in a GVC, such as frequent tariff increases on electronics components—make it difficult to plan and efficiently implement investments in the medium term. Two, policies that could be challenged and found inconsistent with an international agreement such as the WTO should be avoided—for example, export subsidy or subsidy linked with domestic value addition that are prohibited under the WTO. Such a policy may need to be changed within a foreseeable time horizon and would thus cause unpredictability. Three, if there are unexpected changes in the operational conditions for major GVC firms, then policy should provide for flexibility or breathing space to the affected firms. For example, lockdown during Covid-19 affected the operations of firms and made it difficult for most of them to meet the targeted output levels for PLI. The government’s decision to extend the timeline for PLI for major electronics was an appropriate and supportive step to increase confidence in the policy regime.

Unlike traditional policymaking, the expertise on electronics manufacturing lies with the private sector, and in some cases, global firms. They will bring to India the experience of having succeeded in several countries over the last two decades. It is critical for prior consultation to become mandatory while formulating a policy and bringing about changes. This is the case with any policy that is progressive. For instance, in the case of Smartphone PLI, the government spent nine months (June 2019-March 2020) on industry consultation. Thereafter, the guidelines were issued in June after 3 months (March-May 2020). The same holds true for tariffs that impact competitiveness—it is critical that the industry and nodal ministry are consulted in advance before planning any increase or change in tariffs.

6.2. Timely and Effective Implementation of Policy

It is equally important that policies are implemented timely and without any delay. For this, it is essential not only to monitor and evaluate a policy’s implementation but also to institute mechanisms for effectively implementing it.

⁹⁸ <https://www.doingbusiness.org/content/dam/doingBusiness/media/Annual-Reports/English/DB18-Chapters/DB18-About-Doing-Business.pdf>

The PM too has stressed on this time and again. “Just having the best ideas for development are not enough, the Prime Minister said. He added that **initiatives have to be completed on time and the fruits of development must reach the intended beneficiaries.** Efforts have to be comprehensive and ‘outcome driven’, not ‘output driven’, the Prime Minister said.”⁹⁹ (emphasis added)

It is noteworthy that one of the common obstacles identified by industrialists in India is that the policies announced are not effectively implemented, i.e. the fruits of the policy do not reach the intended beneficiaries.¹⁰⁰ This is not unusual and happens in every nation. That is why monitoring policy implementation and ensuring that policy is being effectively implemented are an integral part of the suggestions to improve the impact of industrial policy.¹⁰¹ Just as the government monitors various components of “ease of doing business”, it should identify, based on industry feedback, certain priority policies and ensure that they are effectively implemented in a timely manner.

(a) Timely decisions very important for achieving investment and export growth

Reducing delays in approvals and enabling firms to begin operations in the near future are important for improving competitiveness in GVCs and encouraging investment to plan for scale and exports. Timely implementation of policy measures would enable commencement of operations of a large part of the production chain within the country. It would instill confidence in investors for increasing the scale of their production and not seeking alternative locations, as the world economy picks up after Covid-19.

(b) Building quality and developing parts of GVC from ground-up in India will take time. Shifting important tiers in the GVC achieves objectives earlier.

Beginning operations early in as many parts of the value chain as possible helps in timely engagement with large parts of a GVC in India. To the extent this is achieved in as many Tiers of the GVC as possible, it will enable early domestic production of appropriate quality inputs, thereby reducing imports and boosting exports. Limiting the possibility of such investment by Tier 1, 2 or 3 of the GVC will delay domestic production of inputs and exports. Previous discussion has already pointed out such an implication of limiting FDI from such producers from China that are linked to a rapid roll out of the GVC. This is a policy that pertains to the Centre and should be reconsidered to achieve a carve out that allows timely operation of GVCs and an increase in exports of the priority sectors such as electronics.

⁹⁹ https://www.pmindia.gov.in/en/news_updates/pm-attends-inauguration-of-birth-centenary-celebration-of-nanaji-deshmukh/?tag_term=good-governance&comment=disable

¹⁰⁰ See for example, pages 16 to 18 of <https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/SpecialPublications/Report-on-Domestic-Constraints-on-Exports-of-Selected-Sectors-new.pdf>

¹⁰¹ See for example, <https://link.springer.com/content/pdf/10.1007/s10842-019-00322-3.pdf>, and https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_242878.pdf

(c) Skills and quality are essential for rapid increase in exports. This takes place most quickly through on-the-job experience.

Skill and quality requirements for different electronic products vary. Some major items that achieve a larger part of the export growth have relatively high skill and technology content (see Table 6.1). For electronics, an important feature of generating skills and improving quality is that in many instances they are built on-the-job or require production to become operational on the ground within a short period of time. Thus, any policy that delays the investment or a more complete domestic engagement with the GVC within a short period, reduces the possibility of building skills, quality, exports and creating export hubs within a relatively short period.

	Lead Firms – Foreign	Lead Firms - Indian	Technical Complexity/ Quality Requirement	Import Content	Domestic R&D	Impact of Delays (Approval, Clearance) on Cost
High Value Mobile Phones	√		Very High	Very High	Company Does R&D	Very High
- Major Firms for Domestic Ecosystem	√	√ (need more time than FDI)	High to Very High		Domestic Firms Need Support	Very High
Low Value Mobile Phones	√	√	Medium to High	High	Domestic Firms Need Support	Very High

Table 6.1: Different skill and quality requirements within the same product category, e.g. mobile phones

6.3. Centre-State Collaboration

In addition to emphasizing Centre-State collaboration, the Honourable Prime Minister Modi has identified some specific areas. They include:

- a. Cutting down costs and logistics
- b. Investment, ease of doing business, improving last-mile logistics
- c. Setting up export hubs in States
- d. States to focus on one product per district, and State governments could prioritize five or six products that can be exported to 75 countries.

The specific policy initiatives that are required for the abovementioned objectives and other objectives emphasized by the Honourable Prime Minister in his speech of 6th August 2021 have

been discussed in the foregoing chapters. They include improving conditions for logistics and power, trade facilitation, reducing delay in approvals and other policy decisions (including those relating to FDI and GVCs), simplifying documents and processes, policy changes to reduce operating costs, and enabling timely establishment of Tier 1, 2 and 3 suppliers of GVCs through FDI or domestic investment.

The Central and State governments already have several initiatives to fulfill the vision of the PM,¹⁰² and established mechanisms for improving their collaboration and coordination.¹⁰³

Many states, either alone or with others, are very actively pursuing policies to promote exports. These initiatives are complementary or supplementary to Central policies. This chapter does not address the range of policies/processes established or already in the pipeline for Centre-State cooperation. Instead, it highlights certain features of the policy framework that can help identify areas crucial for underpinning Centre–State collaboration. The discussion shows that for a number of reasons, Central policies have a much larger role to play and their implementation would make Centre–State collaboration more effective.

6.3.i. Central Policies Are Very Important in the Process to Boost Exports

(a) Central policies are the basis on which state-level policies operate and are evaluated by foreign investors

The most important basis for a firm to consider a location for its FDI is the policies followed at the national level. Policies at the State level are the next consideration. Difficulties at the Central level (e.g., clearance of FDI, customs and other import-export conditions, and operations of the main incentive schemes) discourage firms from considering State-level policies.

It must be noted that State policies build upon their Central counterparts, but do not replace them—even for those that deal with the establishment of a business that involves a number of State-level clearances. The consistency and long-term sustainability of Central- and State-level policies are very critical for the lead firm and the GVCs.

(b) Central policies have a wider impact

Central policies impact all states. But States' policies are only for operations within the state. There may be possible spillover effects on other States but those are likely to be relatively small compared to the impact of the Central policies.

¹⁰² See for instance the various areas of such cooperation in the work of DPIIT at <https://dpiit.gov.in/about-us/role-and-functions-dpiit>

¹⁰³ Examples include <https://www.niti.gov.in/development-support-services-states-and-union-territories> ; <https://www.niti.gov.in/social-sector-indices> ; and <https://www.niti.gov.in/index.php/cooperative-federalism>.

	Impact on the Centre	Impact on State 1	Impact on State 2
Policies of the Centre	√	√	√
Policies of State 1		√	
Policies of State 2			√

Table 6.2: Main Impact of the Policies of the Centre and State

Further, individual States compete with each other to attract investors. Given that key parts of GVCs may operate from more than one State, improving India's participation in GVCs requires special attention to Central-level policies. Such an approach is also relevant to enable firms to increase their scale of operations in India, in order to function efficiently and competitively in world trade.

(c) States actively build upon Central policies and work closely with specific companies that are key for GVCs and a large export push. Collaboration and support of the Centre are important for a positive impact.

Implementation of several policies rests with the States. Similar to China and Vietnam, Indian State governments can follow firm specific policies, with much more flexibility than is feasible for Central policies. For example, in the case of the electronics sector, a number of States, such as Andhra Pradesh, Karnataka, Tamil Nadu, Telangana and UP, have very progressive and facilitative approaches. These States have electronics as one of their priority areas of focus.¹⁰⁴

The States work actively with specific companies that are important as Tier 1, 2 or 3 companies in a GVC. Further, these States closely engage with lead firms and other major companies that are key performers for an efficient GVC to determine the main support initiatives that are required by them. Consequently, the MoUs of large companies with States include a more granular focus on conditions that impact day-to-day operations. They have been adept at formulating incentive plans for individual companies that facilitate and attract investment with policies that go beyond those of the Centre. In certain instances, however, State governments need to be more liberal in encouraging investments and fast-tracking projects.

In this context, the Central government, which is not in a position to take such a granular approach, needs to be supportive in reducing obstacles that might adversely affect the State in meeting the conditions of its MoU. An important example of synergy and coordination is Invest India's initiative "Maadhyam",¹⁰⁵ which strives to improve India's performance in the area of starting a business

¹⁰⁴ See for example, https://www.indembassybern.gov.in/docs/1617966871Tamil_Nadu_Industrial_Policy_2021.pdf; <https://www.investkarnataka.co.in/wp-content/uploads/2020/11/Booklet-final-.pdf>; http://apindustries.gov.in/IndustriesSpandana/Data/APIndustrail_Development_policy2023.pdf; http://www.fisme.org.in/export_schemes/IP-High/Row%2027/27H.pdf

¹⁰⁵ <https://www.investindia.gov.in/team-india-blogs/investment-clearance-cell-bringing-businesses-and-government-closer>

(India ranks quite low in World Bank's Index on Starting a Business).¹⁰⁶ This programme provides a comprehensive list of Central and State procedures that are required to start a business in India. Such initiatives need to be supplemented with hand-holding by Central- and State-level focal points. Invest India provides such hand-holding; the States also need to have a similar counterpart.

(d) Healthy competition amongst states needs supporting policies from the Centre and monitoring of effective and timely implementation by both the Centre and the State

The PM noted in his speech that, "A healthy competition is being promoted so that export hubs are set up in the states." To achieve a positive impact of this competition, a supportive operating environment needs to be created by the Centre. Manufacturers and suppliers have to compete globally on prices, costs and delivering products on time. For electronics exports, apart from costs, it is equally important to meet the delivery Service Level Agreement (SLA). Hence, cost-impacting policies such as tariffs, incentives and local logistics are of utmost importance for a lead firm and Tiers 1, 2, and 3 manufacturers.

A priority list of the relevant policies for improvement would need to be identified in consultation with domestic industry/exporters, followed by a regular process to monitor implementation and ensure a timely solutions for the concerns. Its implementation requires a monitoring mechanism that would examine the extent of shortfall, identify the gap and address the delay.

(e) Central policies are the key part of most major trade facilitation policies

With the growth of GVCs in international trade, trade facilitation policies have been recognized as crucial in boosting trade. Table 6.3 shows a number of indicators considered by the OECD for evaluating the efficiency of a trade facilitation policy regime.¹⁰⁷ Most of these key policies that enable trade performance are implemented primarily by the Centre.¹⁰⁸

¹⁰⁶ India's rank was 136th in 2019. See, <https://www.doingbusiness.org/en/rankings>

¹⁰⁷ A number of areas such as "starting a business are very important but not covered by trade facilitation indicators. Ease of doing business shows that all the countries in Table 6.3 have better scores than India on starting a business. See, for example, <https://www.doingbusiness.org/en/data/exploretopics/starting-a-business>

¹⁰⁸ Another important factor, which is important but not a focus of the discussion in the present context, is the access created for exports due to free trade agreements. Vietnam has many more free trade agreements than India, and therefore its access to world markets is much larger than for products produced in India.

		India	China	Mexico	Thailand	S. Korea	Vietnam	Primary Responsibility
	Average Trade Facilitation Performance	1.52	1.56	1.55	1.44	1.86	1.49	Centre/State
A	Information availability	1.91	1.48	1.24	1.30	1.91	1.57	Centre/State
B	Involvement of the trade community	1.43	1.86	1.63	1.71	2.00	1.43	Centre/State
C	Advance rulings	1.30	2.00	1.50	1.71	2.00	2.00	Centre
D	Appeal procedures	1.25	1.63	1.00	1.75	1.31	1.63	Centre
E	Fees and charges	1.69	1.92	1.77	1.08	1.85	1.85	Centre/State
F	Documents	1.44	1.50	1.50	1.88	2.00	1.63	Centre
G	Automation	1.69	1.60	1.92	1.82	2.00	1.39	Centre/State
H	Procedures	1.49	1.52	1.60	1.74	1.63	1.56	Centre
I	Internal border agency co-operation	1.91	1.00	1.46	0.60	1.91	1.00	Centre
J	External border agency co-operation	0.91	0.80	1.55	0.91	1.89	0.80	Centre
K	Governance and impartiality	1.75	1.88	1.89	1.33	2.00	1.56	Centre/State

Table 6.3: OECD's Trade Facilitation Indicators: Comparison of India and Selected Competing Economies

Source: <http://www.compareyourcountry.org/trade-facilitation?cr=oeed&lg=en>

Note: Highlighted numbers show estimates higher than India's estimates for the indicator concerned

In Table 6.3, a higher value of the index shows better performance for the indicator. The performance of some of these economies, such as Vietnam, is lower than that of India. However, Vietnam is a particularly important competitor of India in terms of FDI and trade performance, especially in the space of electronics manufacturing and exports. It is significant that certain trade facilitation indicators for which Vietnam is better than India, are primarily in the domain of Central policies, e.g. fees and charges, requirements relating to documents, easier procedures, and better system of advance rulings.

Conclusion

Centre-State collaboration and cooperation are essential for achieving the PM's vision to increase India's exports manifold. For a number of reasons, special attention needs to be paid on Central policies, which have a greater impact than their state counterparts—as they are the first port of call for those considering FDI. Most trade facilitation policies are within the Central domain of operation. Without the Centre's support, the impact of state-level policies would be below their potential. States should strive to adopt granular policies similar to those followed in China and Vietnam. These policies need the support of the Centre.

This chapter also discusses the stability and consistency of policies, and their timely and efficient implementation.



Chapter 7

Conclusions and Recommendations



Introduction

The PM has stressed on an integrated approach to improve India's international trade and industrial performance. The objectives are a major increase in India's exports, scale of production, links with GVCs, and the country's domestic content within GVCs. The PM has envisioned export hubs to be set up in every state. In addition to "encouraging competition and excellence," he says, "we have to prepare global champions in every sector." He has identified a number of significant strategic policy areas, including electronics, for achieving these objectives,¹⁰⁹ and noted that: "Our ambitious target regarding exports can be achieved only through a holistic and detailed action plan."

This report attempts to provide such an action plan, identifying the key features of GVCs and the policy actions required to achieve a major rise in exports and India's participation in GVCs.

¹⁰⁹ These include, for example, cutting down time and costs of logistics, collaboration between the Centre, State Governments and private players, exporters' Councils in the States, and specific policies of the Government including incentives and facilitation policy to ease the burden of procedural requirements and major improvements in the conditions for production and trade.

7.1 Lessons Based on Experience of GVCs in Competing Economies

1. Scale of Production and Export Orientation are Key Areas for Policy Focus

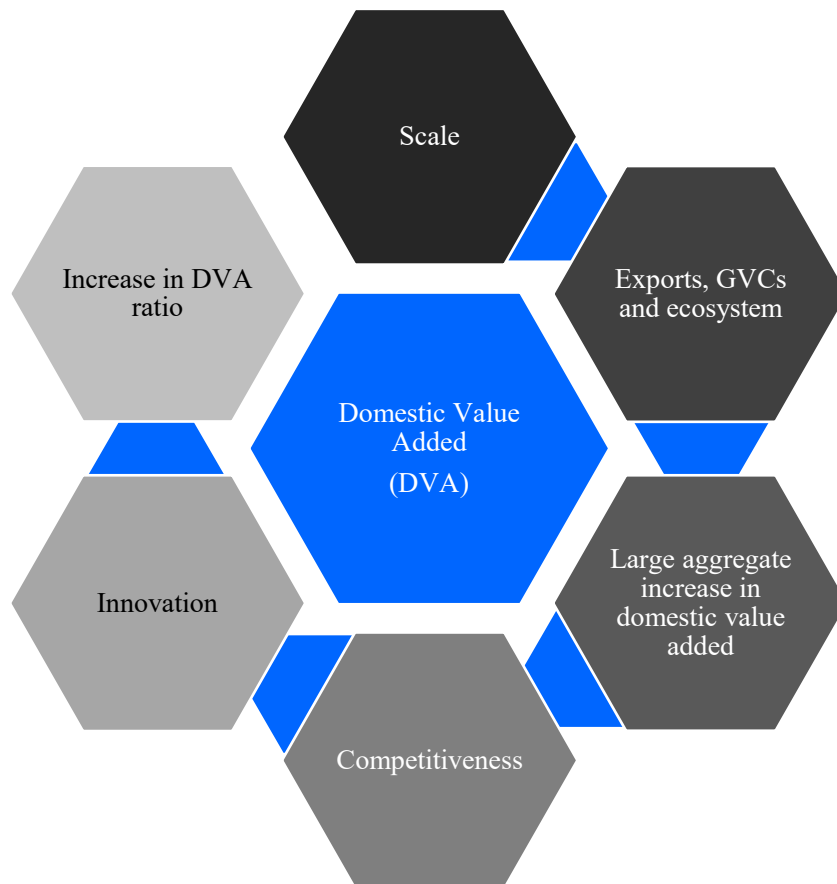
This report clarifies that an emphasis on scale and export orientation is necessary for achieving the vision of the Hon'ble PM and is also the starting point of the policy approach (Figure 7.1 below). Meeting these two objectives requires an export-oriented approach (instead of an inward-oriented one), and implementing policies that encourage higher investment and scale of production with co-location of both the lead firms and different tiers of the GVCs.

An interesting feature of scale and exports is the synergy between these objectives, i.e., they mutually contribute to each other. **Without an increase in the scale of production, a manifold rise in India's presence in export markets and GVCs is not possible. In turn, without export markets, foreign investors (especially lead firms in GVCs) are unlikely to invest in a higher scale of production.** And without them the vision of the Hon'ble PM would not be achieved.

A focus on scale has a positive impact on several mutually connected objectives (see Figure 7.1 below).

- a. A larger scale of production **reduces costs and improves competitiveness, increasing the ability to export and link up with GVCs.** This in turn paves the ground for creating a larger scale of production.
- b. A larger scale of production **creates incentives for co-location of tiers 1 to 3 of the GVC within the nation, and helps in preparing the conditions for more quickly building the domestic ecosystem for the industry concerned.** Interestingly, without such co-location of the lead firm and its suppliers within the nation, achieving a larger scale of operations is not possible.
- c. A larger scale **helps to achieve success in increasing the domestic value addition in the GVC.** Experience of other countries shows that even an initial low domestic value addition ratio can be converted into a large aggregate level of domestic value addition with an increase in the scale of production.

Figure 7.1: Key Interlinked Steps for Achieving the Vision of the Hon'ble Prime Minister



2. Developing GVCs Requires a Focus on Both the Lead Firm and Its Main Suppliers

An important insight from experience with GVCs is that developing them requires providing support for establishment of both the lead firm and its main suppliers. This enables quicker progress in several of the objectives emphasized by the Hon'ble PM scale of production.

3. Role of Indian Industry and Manpower Critical for Relocating GVCs

The role of the Indian industry and manpower is an essential part of the process to relocate and expand GVCs in India. Their contribution will differ during two phases. In the first phase, the participation would predominantly be through the workforce and as parts of the management structure (or as JV partners). During this process, the local workforce and firms will develop the skills that would enable an increase in scale of operations. In this phase, Indian firms would provide some local inputs and a dominant part of the workforce. In the second phase, local industry would be part of the innovation chain, participate with higher skills, and be able to provide competitively priced quality inputs for the GVCs.

4 (i). Building Local Skills and Indian Electronics Manufacturers

The suppliers in GVCs—tiers 1, 2 and 3 manufacturers for lead firms—bring the requisite experience and train the local manpower. They bring with them the experience of setting up production, operating high-tech manufacturing with customized machinery. They also have global supply-chain procurement experience. Therefore, they are very critical for training the local manpower and for the management of resources within India. It is this local manpower trained by lead firms and suppliers, from tiers 1–3, that will provide a skilled base for Indian manufacturers to become well established. Benefiting from the global experience of lead firms and its established suppliers, the increasingly skilled manpower and management base in India would become a more integral part of GVCs in about 4 to 8 years after the lead firm's main suppliers begin operations within the country.

4 (ii). Building Higher-Level Local Technological Capabilities Will Take Time

The primary focus should be on establishing GVCs through FDI within the first three to five years. More active participation of local firms in electronics GVCs takes longer, especially for high quality/value products.

One implication of this is that instead of a policy mandating domestic value addition ratio, policies that focus on scale, exports and GVC promotion would more easily increase domestic value addition. This is because, in the initial phase, there is no major increase in the domestic value addition ratio;¹¹⁰ the overall increase in aggregate domestic value addition takes place through a rise in the scale of production. Over time, this would pave the way for a more inherently integrated process to provide a basis for raising the domestic value addition ratio.

5. While Centre-State Collaboration is Imperative for Efficient Policies, Central Policies Have a Larger Impact on GVCs

Central policies are the most important ones for promoting the efficient establishment of GVCs. Further, the policy areas where competing economies such as Vietnam are better than India are under the domain of the Centre. Thus, a large impact could take place by improvement at the Central level, and the overall impact would be larger with effective Centre-State collaboration.

States are in a position to implement more flexible and granular policies. This flexibility could be used to supplement the RoDTEP rates wherever they are below the level permissible under WTO (such as for a number of electronics products), provide a coordinated single window for clearance at the State level, and supplement the funds for supplier development programs of the Centre in a more targeted manner.

¹¹⁰ In fact, as production moves to more technologically complex or higher value products, local capacity to provide the inputs would be smaller than for established products. This would mean an initial decrease in the domestic value added ratio. This ratio would increase over time with higher skill acquisition by local workforce and firms.

7.2 Major Actions to Be taken

1. Time is of Essence: Focus on Establishing Scale, GVCs and Export Momentum Within the Next Three to Five Years

Another important insight is that policy should focus on establishing the main operational conditions within the next three to five years. The window of opportunity is short and this time should be used to establish as large a part of the GVC as possible. This is especially important given the large production and export targets announced for the NPE 2019 and the PLI scheme. The quickest way to do so is to ensure that when a lead firm of the GVC invests in the country, its tiers 1, 2 and 3 suppliers are also facilitated to co-locate with that firm.

2. Relocate GVCs: Advantage India

- GVCs: Between 1–4 years, tiers 1, 2 and 3 manufacturers should be incentivized to relocate capacities for finished products, sub-assemblies and components from China, Vietnam, Japan, South Korea, etc. The path taken could be 100% FDI, or through joint ventures, and encouraging skill building through international manufacturers and domestic skill-building institutions.
- Develop an Indian ecosystem within 5–8 years: Skill building and JVs with international manufacturers should be encouraged and Indian companies should be incentivized to manufacture global sub-assemblies and components to supply to GVCs for global consumption.

3. Co-location in GVCs is the Key to Achieving Scale, Exports, Skills, and for Building the Domestic Ecosystem

Co-location of lead firms and main suppliers to the lead firm is the quickest way to achieve scale, and developing the GVC's links with local producers, building skills and establishing the domestic ecosystem. The scale and momentum of production generated by such co-location also enables a quicker rise in the aggregate domestic value addition in the country. In this context, certain key policy insights based on experience of competing economies are essential to achieve successful growth of GVCs.

Policy support provided for technology development would be of key importance in this context. For example, China pre-selects a group of meritorious students to work with lead firms on their major projects. India could also provide a pool of local low-cost engineers to work on such projects as part of their curriculum.

Since lead firms of a GVC when investing in India either relocate their investment from China or add the incremental capacity in India (instead of China), they need their existing suppliers from different tiers in the GVC to also move with them to smoothly begin production operations within the new location for the GVC. As most of them are from China, the government has to support the co-location of Chinese firms as contract manufacturers of lead firms. Hence, special co-location policies should be introduced on a priority basis that could be limited for the electronics sector only.

Further administrative clearances through single window systems should be activated at both the Central and the state levels. Together with co-location, the Skill India programme could work in tandem with lead firms to build capacities in this sector as the labour turnover tends to be high. A common fund could be created with public-private partnership for assisting with R&D and skill building of the local firms. Just like in Vietnam and China, the Indian government could strengthen supplier development programmes for improving skills and technology for local firms.

4. Reduce Tariffs for Inputs and Policy-Related Operational Burden and Delays

Experience with GVCs shows the key role of policies that reduce time and cost of GVC operations and provide policy stability and certainty for a larger investment and business plan to be operationalized. Countries that achieved rapid growth of GVCs kept tariffs low on inputs (parts and components) so that their policy approach was not oriented away from exports, i.e. they focused on export promotion and not import substitution per se; import substitution was achieved over a longer period after establishment of a larger scale of production, exports and GVC operations. This policy has been combined with a strong focus on reducing burden and delays. Particular attention was paid to large operators, and implementation of policy monitored and any shortcomings addressed.

Thus, tariffs should be rationalized especially for components and sub-assemblies—with the introduction of lower tariffs and removal of an inverted tariff structure. The currently prevailing high tariffs would increase costs by 4–5%, significantly negating the positive support provided by the PLI scheme. Tariff stability and predictability are crucial for investments. Mechanisms such as the RoDTEP should be allocated more funds and the existing rates should be reviewed. Further, to maximise export support, RoDTEP rates should reflect the actual indirect taxes charged and the items covered should draw upon the practices of other similar countries. For instance, refunding all indirect taxes on power is likely to reduce power costs by 30% and total costs by 0.6%. Furthermore, policies THAT are critical for relocation of the industry, such as PLI, should be implemented expeditiously.

The PLI programme emphasized by the PM was introduced to address the cost disabilities of the Indian electronics industry vis-à-vis the main competing economies, China and Vietnam. In this background, it is important not to introduce new cost disabilities that reduce the impact of PLI and delay participation in GVC, such as higher tariffs on inputs and restrictions on co-location of existing

suppliers of lead firms. At a time when India is one among a number of alternative locations being considered by lead firms for connecting with global markets, this is especially important. Once relocation has taken place elsewhere, the China+1 strategy of FDI by major firms would also be less significant for making FDI decisions because the relocation would already have happened. Any change in the next 10 years is unlikely.

5. Essential to have Stable Policy Regime and Consultation with Major Stakeholders

A stable policy regime followed by timely implementation is needed for investment and business plans to be executed effectively. Stability of the policy regime reduces operational risks and supports growth in long terms strategic investments outlook which has four important components: keeping policies unchanged for a reasonable period of time such as the time period encompassed in the PLI schemes; consultation with the main stakeholders before changing policies; including the possibility of flexibility to address serious deterioration in operational conditions, such as Covid-19; and not introducing uncertainty for instance by choosing policies which are likely to be challenged at the WTO. Hence, raising tariffs should be avoided, particularly on inputs, and policies inconsistent with WTO should also be avoided.

Consultation is important also because not all GVCs are the same. Even within the electronics sector, the characteristics of GVCs differ for mobile phones, laptops, and tablets. Therefore, determining suitable policies for the relevant GVC would involve consultation with the major stakeholders in that GVC.

6. Export Promotion: A New Perspective

The Prime Minister in his 6 August speech has emphasized on a more comprehensive approach to export promotion—one that focuses on the creation of additional and new export markets (i.e. mainly creating additional demand abroad for Indian exports). The Prime Minister has included various supply side considerations as well, which are especially important because of a major export potential for India (Table 7.1 below). The points above pertain to the supply side factor. They also suggest that for seeking additional export markets, export promotion councils should plan initiatives using the framework of GVCs, and considering the experience of competing economies and strategies of successful EPCs in other countries. Countries like China and developed nations like the US and EU work out a medium-term strategy in consultation with major stakeholders; this practice should be adopted in India as well. Further, there should conceptually be an export promotion policy chain, with Indian Missions abroad being an integral part of it (as emphasized by the PM in his speech).

	Product with huge potential for major increase in exports from India	Products for which a major part of global export capacity could be shifted to India
Finished Products	Smartphones; Laptops, Tablets, Smart Watches; Wireless Head/Ear Phones; Bluetooth Speakers	Mobile phones (Feature phone/ Smartphone), Tablets Wireless Head/Ear Phones.; Bluetooth Speakers
Sub-Assemblies & Components	Battery packs; Camera Module; Cables; Magnetics, Coils, Chargers, Enclosures for Smartphones, Flex PCBA, Vibration Motors, Fan Modules, Graphites & Passives (Thermal modules), Keyboards for Desktops & Laptops	Battery packs; Camera Module; Cables; Magnetics, Coils, Enclosures for Smartphones, Flexible PCBA, Vibration Motors, Fan Modules, Graphites & Passives (Thermal modules), Keyboards for Desktops & Laptops

Table 7.1: A Range of Electronics Products with Major Export Potential from India

7. The Critical Role of Indian Industry and Manpower in GVCs

For the development of domestic firms that can participate in GVCs of electronics, the Indian government would need to invest in supplier development programs. They could begin by linking and handholding appropriate domestic firms in joint ventures with contract manufacturers to lead firms. In the short run, similar to China, the Indian public sector firms in the technology space could also help transfer key technologies to local firms. This could specially hold for mechanical parts in smartphones and other electronics. During the initial 3–5 years when scale and exports are the main focus, discussions between the lead firms and local firms should be encouraged with institutional support.

In the longer run, however, the focus must be on improving the quality of the human capital base through investments in education and training at all levels. Efforts to strengthen vocational education, e.g. restructuring the Skill India program may be particularly valuable in the medium term, while more advanced skills would be required to conduct research, product development and design in the long term.

While global firms are essential for providing the foundation and momentum for India's exports and GVCs in electronics, domestic firms are essential for sustaining and expanding the domestic ecosystem over time. For this domestic champions need to be built along with global champions.

¹¹⁰ Bodewig & Badiani-Magnusson, 2014.

The main challenges faced by domestic firms are the disruptive influence of predatory pricing by firms with deep pockets. In addition small and medium firms are cash strapped in comparison to the larger firms. Funds should be made available to them through banks and an interest subvention scheme could be considered for domestic champions. Further technological development is key to building competitiveness and the government needs to address this issue among others through an R&D fund to facilitate technology development similar to practices in Vietnam and China.

8. Monitor Implementation of Policies and Address Gaps in Implementation

Good policies need to be implemented effectively and in a timely manner. A number of policies with major objectives has not been implemented effectively.¹¹² Therefore, a process to monitor gaps in implementation should be part of the policy framework itself, such as the implementation timelines included in the PLI scheme for large-scale electronics manufacturing. However, an important aspect to ensure should be that the implementation process does not introduce cumbersome requirements that the time and cost of the firms unduly rises. Similar to continuous review and improvement envisaged in application of the principle to manufacturing (Kaizen),¹¹³ policy implementation also needs regular review for ensuring effective outcomes.

Conclusion

Given the critical role of electronics in other economic sectors (within electronics, automotive sector, medical devices), and its importance for implementing social policies and public services, it would continue to be a priority sector for many years ahead. The sector will also play a key role in implementing the PM's vision of a 'digital India'. The electronics sector has the potential to become one of the top exports of India within the next 3–5 years, together with a number of products that could emerge as important exporting hubs. In this situation, concerted efforts should be made to achieve the objectives emphasized by the PM.

¹¹² See for example, Chapter 5 of <https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/SpecialPublications/Report-on-Domestic-Constraints-on-Exports-of-Selected-Sectors-new.pdf>

¹¹³ Kaizen mean "continuous improvement" or "change for the better" through feedback and involving all stakeholders. See <https://www.kaizen.com/what-is-kaizen.html>

Bibliography

About Doing Business 2018

<https://www.doingbusiness.org/content/dam/doingBusiness/media/Annual-Reports/English/DB18-Chapters/DB18-About-Doing-Business.pdf>

ADB, Annual Report 2018

<https://www.adb.org/documents/adb-annual-report-2018>

ADB, Asian Development Outlook (ADO) 2020: What Drives Innovation in Asia? April 2020

<https://www.adb.org/publications/asian-development-outlook-2020-innovation-asia>

ADB, Drivers, Drivers and Benefits of Enhancing Participation in Global Value Chains: Lessons for India Working Paper 79, Mitra S, Gupta A.S., and Sanganer A. December 2020

<https://www.adb.org/publications/enhancing-participation-gvcs-lessons-india>

Australian Government, Department of Industry, Innovation and Science, Business, Small and Medium Enterprises (SME) Export Hubs grant opportunity

<http://business.gov.au>

BBC News, India announces retaliatory trade tariffs against the US, June 15, 2019

<https://www.bbc.com/news/world-asia-india-48650505>

Business Standard, Govt to observe 'Good Governance Day' today, ANI, December 25, 2016

https://www.business-standard.com/article/news-ani/govt-to-observe-good-governance-day-today-116122500058_1.html

Daijiworld.com, No Atmanirbhar Bharat without electronics manufacturing: ELCINA, June 25 2021

<https://www.daijiworld.com/news/newsDisplay?newsID=846966>

Department of Commerce, Ministry of Commerce and Industry, GOI, Export Promotion Councils: A Catalyst to promote India Exports

<https://commerce.gov.in/wp-content/uploads/2021/06/Reforms-in-Export-Promotion-Councils-Driving-Trade-1.pdf>

DRIPC, Export Promotion Council of India | Functions & Registration procedures

<https://www.dripcapital.com/en-in/resources/blog/export-promotion-council-role>

Econ Papers, The open kimono: How Intel balances trust and power to maintain platform leadership, Perrons R.K., Research Policy, 2009, vol. 38, issue 8, 1300-1312

https://econpapers.repec.org/article/eeerespol/v_3a38_3ay_3a2009_3ai_3a8_3ap_3a1300-1312.htm

Econ Papers, Modularity on Industry Structure: The Case of the World the effect of Product Bicycle Industry, Galvin P and Morkel A, Industry and Innovation, 2001, vol. 8, issue 1, 31-47

https://econpapers.repec.org/article/tafindinn/v_3a8_3ay_3a2001_3ai_3a1_3ap_3a31-47.htm

Econ Papers, The Next Wave of Globalization: Relocating Service Provision to India, Dossani R and Kenney M, World Development, 2007, vol. 35, issue 5, 772-791

https://econpapers.repec.org/article/eeewdevel/v_3a35_3ay_3a2007_3ai_3a5_3ap_3a772-791.htm

ET Telecom, The Economic Times, Samsung won't seek PLI for telecom gear; says not ready to commit fresh investment, Mukherjee W , June 19, 2021

<https://telecom.economictimes.indiatimes.com/news/samsung-wont-seek-plis-for-equipment/83657606>

Exim Bank, Domestic Policy Constraints for Exports in Select Sectors - Main Report, March 2020

<https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/SpecialPublications/Report-on-Domestic-Constraints-on-Exports-of-Selected-Sectors-new.pdf>

Faq Logistique, Electronics Complexity Inside and Out

<https://www.faq-logistique.com/CAP-GEMINI-3PL-04-Electronics.htm>

Fibre2Fashion.com, Can new FTP bring an inflexion point for India's exports? August 2021

<https://www.fibre2fashion.com/industry-article/9160/can-new-ftp-bring-an-inflexion-point-for-india-s-exports>

FICCI, Media Coverage, India to become an Electronic Manufacturing Hub, March 23, 2020

<https://ficci.in/ficci-in-news-page.asp?nid=20821>

Government of Andhra Pradesh, Industries & Commerce Department – “Andhra Pradesh Industrial Development Policy 2020-23, Industries & Commerce (P&I) Department G.O.MS.No.39, August 10, 2020

http://apindustries.gov.in/IndustriesSpandana/Data/APIndustrail_Development_policy2023.pdf

Government of Karnataka, Commerce & Industries Department, New Industrial Policy 2020 - 25
<https://www.investkarnataka.co.in/wp-content/uploads/2020/11/Booklet-final-.pdf>

GSOV, Socio-Economic Situation in the Fourth Quarter and the whole year 2017, December 29, 2017
<https://www.gso.gov.vn/en/data-and-statistics/2019/10/report-social-and-economic-situations-in-2017/>

GVC Développment Report, Should high domestic value added in exports be an objective of policy ?
Tang, Heiwai; Qi, Steffan; Lai Edwin (2018)
https://www.wto.org/english/res_e/booksp_e/gvc_dev_report_2019_e_ch7.pdf

Harvard University, Domestic Institutions as a Source of Comparative Advantage, Nunn N and Trefler D, 2014
https://scholar.harvard.edu/files/nunn/files/nunn_trefler_handbook_final.pdf

Harvard Kennedy School, Ash Center. Advancing Excellence and Innovation in Governance
<https://ash.harvard.edu/>

IBEF, Electronics System Design & Manufacturing (ESDM) Industry in India, September 9 2021
<https://www.ibef.org/industry/electronics-system-design-manufacturing-esdm.aspx>

ICA, International Conference on Arbitration in the era of Globalisation, Background Paper
<https://ficci.in/spdocument/20707/arbitration-Background-Paper.pdf>

ICEA, A Study on Disabilities and Smart Policy Measures including Replacement of Merchandise Export Incentive Scheme (MEIS)
<https://icea.org.in/wp-content/uploads/2021/02/DisabilityReport.pdf>

ICEA, Inspire Enable Lead
<https://icea.org.in/>

ICRIER, India's GVC integration: An analysis of upgrading efforts and facilitation of lead firms, Working Paper 386, Ray S and Milani S
https://icrier.org/pdf/Working_Paper_386.pdf

ICT, Press Release, Global awards recognize excellence in trade promotion to 'build back better', October 14, 2020
<https://www.intracen.org/news/Global-awards-recognize-excellence-in-trade-promotion-to-build-back-better/>

ITC, Trade Map, Trade statistics for international business development

<https://www.trademap.org/Index.aspx#>

Ideas, Elsevier, Handbook of International Economics, Volume 5, Gopinath Rogoff K, Helpman E

<https://ideas.repec.org/h/eee/intchp/4-263.html>

Ideas, Value chain governance in the age of platforms, Humphrey, John, 2018

<https://ideas.repec.org/p/jet/dpaper/dpaper714.html>

ILO, Transforming Economies, Making industrial policy work for growth, jobs and development, José M. Salazar-Xirinachs, Irmgard Nübler and Richard Kozul-Wright, 2014

https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_242878.pdf

ILO, The distribution of value added among firms and countries : The case of the ICT manufacturing sector, Working Paper 16, Delautre G, January 2017

https://www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_544190.pdf

Inbound Logistics, Electronics Logistics: Tech Transport TLC, April 19, 2013

<https://www.inboundlogistics.com/cms/article/electronics-logistics-tech-transport-tlc/>

Industrial Analytics Platform, UNIDO, What are global value chains and why do they matter? Seric A and Yee Tong Y.S., August 2019

<https://iap.unido.org/articles/what-are-global-value-chains-and-why-do-they-matter>

Industries Department, Government of Tamil Nadu, Tamil Nadu Industrial Policy 2021

https://www.indembassybern.gov.in/docs/1617966871Tamil_Nadu_Industrial_Policy_2021.pdf

International Trade Administration, Foreign Retaliation TimeLine

<https://www.trade.gov/feature-article/foreign-retaliations-timeline>

Invest India, Electronic Systems, India is one of the largest consumer electronics markets in Asia Pacific Region, Bist A

<https://www.investindia.gov.in/sector/electronic-systems>

Invest India, Investment Clearance Cell: Bringing businesses and government closer, Maadhyam Team, June 04, 2021

<https://www.investindia.gov.in/team-india-blogs/investment-clearance-cell-bringing-businesses-and-government-closer>

Investopedia, Business Ecosystem, Hayes A, January 20, 2021

<https://www.investopedia.com/terms/b/business-ecosystem.asp>

Kaizen Institute, What is Kaizen tm

<https://www.kaizen.com/what-is-kaizen.html>

MAS, Asia's Electronics Supply Chains and Global Trade Corridors, April 28, 2020

<https://www.mas.gov.sg/publications/economic-essays/2020/asias-electronics-supply-chains-and-global-trade-corridors>

Ministry of Electronics and Information Technology, GOI, Gazette of India, Extraordinary, Part1, section 1, 26 (1) 2019-IPHW, February 25, 2019

https://www.meity.gov.in/writereaddata/files/Notification_NPE2019_dated25.02.2019.pdf

Ministry of Electronics and Information Technology, GOI, Modified Electronics Manufacturing Clusters (EMC 2.0) Scheme

<https://www.meity.gov.in/esdm/emc2.0>

Ministry of Electronics and Information Technology, Notification on National Policy on Electronics 2019 (NPE 2019)

<https://www.meity.gov.in/content/notification-national-policy-electronics-2019-npe-2019>

Monetary Authority of Singapore, Asia's Electronics Supply Chains and Global Trade Corridors, April 28, 2020

<https://www.mas.gov.sg/publications/economic-essays/2020/asias-electronics-supply-chains-and-global-trade-corridors>

NBER, Trade and Industrialisation after Globalisation's 2nd Unbundling: How Building and Joining A Supply Chain are Different And Why It Matters. Working Paper 17716, DOI 10.3386/w17716, Baldwin R, December 2011

<https://www.nber.org/papers/w17716>

Niti Aayog, Development Support Service for States and Union Territories

<https://www.niti.gov.in/development-support-services-states-and-union-territories>

Niti Aayog, Indices

<https://www.niti.gov.in/social-sector-indices>

Niti Aayog, Cooperative Federalism

<https://www.niti.gov.in/index.php/cooperative-federalism>

Niti Aayog, Development Support Service for States and Union Territories

<https://www.niti.gov.in/development-support-services-states-and-union-territories>

Notebook check, TSMC has the largest market share in the global semiconductor manufacturing industry: Counterpoints Research

<https://www.notebookcheck.net/TSMC-has-the-largest-market-share-in-the-global-semiconductor-manufacturing-industry-Counterpoints-Research.518137.0.html#7320644>

Oxford Academic, The Review of Economic Studies, Prices, Plant Size, and Product Quality, Volume 79, Issue 1, Kugler M and Verhoogen E, January 2012

<https://academic.oup.com/restud/article-abstract/79/1/307/1564402>

PIB, Ministry of Commerce and Industry, GOI, DGFT portal to enable States/ UTs to develop all districts as Export Hub, February 04, 2020

<https://pib.gov.in/PressReleaseDetail.aspx?PRID=1601890>

PM India, PM attends inauguration of birth centenary celebration of Nanaji Deshmukh, October 11, 2017

https://www.pmindia.gov.in/en/news_updates/pm-attends-inauguration-of-birth-centenary-celebration-of-nanaji-deshmukh/?tag_term=good-governance&comment=disable

PIB, Ministry of Electronics & IT, GOI, PLI Scheme to herald a new era in mobile phone and electronic components manufacturing, October, 06, 2020

<https://pib.gov.in/Pressreleaseshare.aspx?PRID=1662096>

ProQuest, The elements of platform leadership, MIT Sloan Management Review; Cambridge Vol. 43, Issue. 3, 2002: 51-58. Cusumano, Michael A and Gawer A

<https://www.proquest.com/openview/4492afa976940a18b9065e2e1eeca3eb/1?pq-origsite=gscholar&cbl=26142>

RBI, Handbook of Statistics on the Indian Economy, 2018-19

<https://rbidocs.rbi.org.in/rdocs/Publications/PDFs/0HB2018-19A91A298806164470A2BCEF300A4FE334.PDF>

ResearchGate, Global value chains in the electronics industry: Characteristics, crisis, and upgrading opportunities for firms from developing countries, *International Journal of Technological Learning Innovation and Development*, Sturgeon T, August 2011, 4(1):120-147

<https://www.researchgate.net/publication/227441000> Global value chains in the electronics industry Characteristics crisis and upgrading opportunities for firms from developing countries

ResearchGate, The Power of Integrality: Linkages Between Product Architecture, Innovation, and Industry Structure, Fixson S and Park J.K., August 2008, 37:1296-1316

<https://www.researchgate.net/scientific-contributions/Jin-Kyu-Park-72372904>

ResearchGate, “Why are companies offshoring innovation ? The emerging global race for talent” *Journal of International Business Studies*, vol. 40, pp.901- 925, Lewin, A. Y., S. Massini, C. Peeters , 2009

<https://www.researchgate.net/publication/285855977> Why are companies offshoring innovation the emerging global race for talent Journal of International Business Studies 2009 40 901-925 DOI101057jibs200892

ResearchGate, Offshore outsourcing as source of international competitiveness for SMEs, *Journal of International Business Studies*, Di Gregorio, D., M. Musteen, and D. Thomas, August 2009

<https://www.researchgate.net/publication/46526156> Offshore outsourcing as source of international competitiveness for SMEs

ResearchGate, Value Capture in the Global Electronics Industry: Empirical Evidence for the “Smiling Curve” Concept, *Industry and Innovation*. Volume 19(2):89-107, Shin, N.; Kraemer, K. & Dedrick, J., 2012

<https://www.researchgate.net/publication/238046291> Value Capture in the Global Electronics Industry Empirical Evidence for the Smiling Curve Concept

Safe Journals, Sustainability in global production networks – Introducing the notion of extended supplier networks, Alexander R, April 3, 2018

<https://journals.sagepub.com/doi/abs/10.1177/1024529418768606>

Science Direct, The nature of innovation in global value chains, *Journal of World Business*, Volume 56, Issue 4, Ambosa B, Brandl K, Perri A, Scalera V.G., Assche A.V., June 2021, 101221

<https://www.sciencedirect.com/science/article/pii/S109095162100033X?via%3Dihub>

Science Translation Medicine, Strogen Supports Urothelial Défense Mechanisms, Lüthje et al.
Volume 5, Issue 190, June 19, 2013

<https://www.science.org/doi/abs/10.1126/scitranslmed.3005574>

Semantic Scholar, Offshoring of R&D: Looking abroad to improve innovation performance, Journal of International Business Studies, M. Nieto, A. Rodríguez, 2011

<https://www.semanticscholar.org/paper/Offshoring-of-R%26D%3A-Looking-abroad-to-improve-Nieto-Rodr%C3%ADguez/e4897032c8ddffef44d3bf25420bf6ecd9ebdba7>

Semi, Rags to Riches: Vietnam's Growing Electronics Industry, Schaag S, March 2, 2021

<https://www.semi.org/en/blogs/technology-trends/rags-to-riches-vietnams-growing-electronics-industry-1>

Springer Science + Business Media, Journal of Industry, Competition and Trade, Rebirth of Industrial Policy and an Agenda for the Twenty-First Century, Aiginger K & Rodrik D, January 06, 2020

<https://link.springer.com/content/pdf/10.1007/s10842-019-00322-3.pdf>

SYPA: Vietnamese Development Policy, Vietnamese Development Policy:Upgrading the Domestic Private Sector Through FDI Linkages

https://ash.harvard.edu/files/ash/files/grozier_keene_sypa_final_4.29.20.pdf

tab-tv, Who actually makes laptops, leading manufacturers

<https://en.tab-tv.com/?p=22230>

Tamil Nadu, Fiscal Incentives, Exemptions & Subsidies, Incentives for manufacturing sector

http://www.fisme.org.in/export_schemes/IP-High/Row%2027/27H.pdf

The Hindu, Business Line, Encouraging value-added electronics manufacturing must for Atmanirbhar Bharat, Vasani P, July 14, 2021

<https://www.thehindubusinessline.com/opinion/encouraging-value-added-electronics-manufacturing-must-for-atmanirbhar-bharat/article35321095.ece>

The Ohio State University, iPhone Community Chain, Extraction of Raw Materials

<https://u.osu.edu/iphonecommoditychainproject/extraction-of-raw-materials/>

The Star, Vietnamese electronics industry still low in technology and value, May 17, 2021

<https://www.thestar.com.my/aseanplus/aseanplus-news/2021/05/17/vietnamese-electronics-industry-still-low-in-technology-and-value>

The World Bank, Doing Business, Starting a Business

<https://www.doingbusiness.org/en/data/exploretopics/starting-a-business>

UN Comtrade Database

<https://comtrade.un.org/data>

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

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

UNIDO, Linking FDI and local firms for global value chain upgrading: Policy lessons from Samsung mobile phone production in Viet Nam, Working Paper 5, 2019

<https://www.unido.org/api/opentext/documents/download/15784588/unido-file-15784588>

United States Council for International Studies, Good Governance & the Rule of Law, January 2015

<https://www.uscib.org/docs/Governance%20and%20the%20Rule%20of%20Law.pdf>

University of Groningen, Formerly Assembled, But Now Designed in China? Assessing the Domestic Value-Added of Activities in Gross Exports, Research Output, Working Paper, Chen Q, Gao Y, Pei J, Vries G, Wang F., 2018

<https://research.rug.nl/en/publications/formerly-assembled-but-now-designed-in-china-assessing-the-domest>

Unravel, Vietnam's role as a global manufacturing hub will fuel growth, Fenner S, April 27, 2021

<https://unravel.ink/vietnams-role-as-a-global-manufacturing-hub-will-fuel-growth/>

Vietnamese Development Policy: Upgrading the Domestic Private Sector Through FDI Linkages, Grozier B and Keene J, March 2020

https://ash.harvard.edu/files/ash/files/grozier_keene_sypa_final_4.29.20.pdf

VOX EU CEPR, Global value chain transformation to 2030: Overall direction and policy implications, Zhan J, Bolwijn R, Casella B, Santos-Paulino A.U., August 13, 2020

<https://voxeu.org/article/global-value-chain-transformation-decade-ahead>

World Bank, OKR, Skilling Up Vietnam: Preparing the Workforce for a Modern Market Economy, Bodewig, C., Badiani-Magnusson, R., Macdonald, K., Newhouse, D., & Rutkowski, J., January 2014

<https://openknowledge.worldbank.org/handle/10986/18778>

World Bank, OKR, Economic Upgrading through Global Value Chain Participation : Which Policies Increase the Value Added Gains?, Policy Research Working Paper 08, Kummritz, V, Taglion D, Winkler D, 2017

<https://openknowledge.worldbank.org/handle/10986/26348>

World Bank, OKR, Global Value Chains in the Electronics Industry: Was the Crisis a Window of Opportunity for Developing Countries? Policy Research Paper No.5417, “Sturgeon T. J., Momoko K, 2010

<https://openknowledge.worldbank.org/handle/10986/3901>

World Bank, World Development Report 2020: Trading for Development in the Age of Global Value Chains, 1818 H Street NW, Washington, DC 20433

<https://www.worldbank.org/en/publication/wdr2020>

World Development Report 2020, Trading for Development in the age of Global value chains

<https://documents1.worldbank.org/curated/en/310211570690546749/pdf/World-Development-Report-2020-Trading-for-Development-in-the-Age-of-Global-Value-Chains.pdf>

Worldexports.com

<http://worldexports.com/>

WTO, Analytical Index. SCM Agreement – Article 2 (Jurisprudence)

https://www.wto.org/english/res_e/publications_e/ai17_e/subsidies_art2_jur.pdf

WTO, Dispute Settlement, Disputes by member

https://www.wto.org/english/tratop_e/dispu_e/dispu_by_country_e.htm

WTO, Dispute Settlement, DS541: India – Export Related Measures, November 19, 2019

https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds541_e.htm

WTO, Dispute Settlement, DS582: India – Tariff Treatment on Certain Goods in the Information and Communications Technology Sector, August, 31, 2020

https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds582_e.htm

WTO, Dispute Settlement, DS584: India — Tariff Treatment on Certain Goods, October 7, 2020

https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds584_e.htm

WTO, Dispute Settlement, DS588: India — Tariff Treatment on Certain Goods in the Information and Communications Technology Sector, August, 31, 2020

https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds588_e.htm

WTO, Dispute Settlement, DS456: India — Certain Measures Relating to Solar Cells and Solar Modules, January 12, 2018

https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds456_e.htm

WTO/OECD/World Bank, Global Value Chain Development Report 2019, Technical Innovation, Supply Chain Trade, and Workers in a Globalized World

<https://www.oecd.org/dev/Global-Value-Chain-Development-Report-2019-Technological-Innovation-Supply-Chain-Trade-and-Workers-in-a-Globalized-World.pdf>

WTO, Rules Negotiations: Chairperson's Texts 2007

Draft Consolidated Chair Texts of the AD and SCM Agreements, TN/RL/W/213, November 30, 2007

https://www.wto.org/english/tratop_e/rulesneg_e/rules_chair_text_nov07_e.htm

WTO, Uruguay Round Agreement, Agreement on Subsidies and Countervailing Measures

https://www.wto.org/english/docs_e/legal_e/24-scm_01_e.htm

WTO, Uruguay Round Agreement, Agreement on Trade-Related Investment Measures

https://www.wto.org/english/docs_e/legal_e/18-trims_e.htm

WTO, Understanding the WTO: The Agreements, Tariffs: more bindings and closer to zero

https://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm2_e.htm#con



About the Authors

IKDHVAJ Advisers LLP is a boutique consultancy firm comprising a select group of experts dedicated to bridging the gap between systemic issues in trade policy and industrial/regulatory policy analysis. The experts at IKDHVAJ each have over 30 years of experience in industrial policy and trade, with deep insights into the overlap of trade policies with domestic policies. The research and advisory work of IKDHVAJ helps develop strategies for Indian policymakers and industries to improve effectiveness of policy measures, identify priority areas for strategic and policy focus, selection of appropriate policies for meeting major objectives, improve options for negotiations of trade-related agreements, and suggest ways to improve access to markets abroad. Our research and advisory work is also focused on helping Indian industries remove operational constraints and enhance capabilities of domestic industries, provide a supportive framework to improve the domestic regulatory environment, establish structured interaction with various stakeholders, and develop relevant institutions including those that enable industry to self-govern. The strategies we help create are both sustainable and holistic, and provide policy makers and industries with the flexibility to combat a constantly changing global trade landscape, as well as to enhance domestic competitiveness



About ICEA

ICEA with its motto - INSPIRE, ENABLE, and LEAD is the apex industry body for mobile and electronics industry comprising of manufacturers, brand owners, technology providers, VAS application & solution providers, distributors and retail chains of mobile handsets and electronics. ICEA is committed to carrying forward its vision of building strong “self – reliant and export focused” Indian electronics manufacturing and design ecosystem while consolidating the gains made in the mobile handset and components industry. ICEA is fully devoted towards improving the competitiveness and growth of the industry by closely working with the ministries of the Government for creating a robust, legal and ethical electronics industry, thereby creating an innovative market environment in the country.

