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Confederation of Indian Industry

Building India's Export Competitiveness in Electronics – 2025-26

From Assembly to Manufacturing Hub: Call to Action Report

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Foreword

Chandrajit Banerjee
Director General
Confederation of Indian Industry (CII)

The National Policy on Electronics 2019 was announced to boost the domestic electronics industry to achieve a turnover of USD 300 billion by 2026. It aims at increasing domestic value addition and leveraging the potential of both domestic demand and exports to make India a global hub of electronics manufacturing.

In line with this aspiration, electronics has emerged as a sector which has fully embraced the Atmanirbhar Bharat mission and as one of India's bellwether sectors for manufacturing. This is witnessed in the steep rise in the domestic production of electronic goods from ₹2,43,263 crore (USD 37 billion) in 2015-16 to ₹5,54,461 crore (USD 74.7 billion) in 2020-21, clocking a CAGR of 18%. A significant component of this growth narrative is the doubling of electronics exports to ₹81,822 crore (USD 11 billion) during the same period.

While exports have touched new highs, their potential translates to rising over 10-fold from the current level to USD 120 billion in order to meet the USD 300 billion target. There remains considerable room to complete the transition from being a producer, largely through assembly, for meeting domestic demand to becoming a hub for global supply chains.

Confederation of Indian Industry (CII) in collaboration with NCAER has developed the present report Building India's Electronics Export Competitiveness, transitioning from Assembly to Manufacturing Hub as a call-to-action to chart India's electronics exports and explore ways to catalyse it to the target levels. The report outlines key actions that will help drive the export competitiveness of the electronics sector and facilitate its transition from assembly to deeper value chain integration.

We believe that our efforts would result in enabling industry to develop scale and enable the much-needed access to the global supply chains while at the same time help policymakers to further electronics industry's contribution in making India Aatmanirbhar.

CII looks forward to working with the Government to implement the requisite initiatives and taking the Indian electronics sector to the next level of growth.

Foreword

Vinod Sharma
Chairman – CII National Committee on ICTE
Manufacturing & Managing Director – Deki Electronics Limited

Sunil Vachani
Co-Chairman – CII National Committee on ICTE Manufacturing &
Chairman – Dixon Technologies Limited

Electronics has very well been recognised as a 'horizontal enabler' (for manufacturing & services alike), touching lives socially and economically. The pandemic has only helped in deepening and widening its penetration further. This has amplified the sector's footing, making it the world's largest and fastest growing industry with global electronics manufacturing reaching US$2.2 trillion. Thus, having a robust electronics manufacturing sector today has become an imperative when viewed from both strategic and economic lenses. Underpinning its importance, countries like China, South Korea, Taiwan and recently Vietnam, have been able to transform themselves by placing their economic strategy largely on electronics.

In recent years, India has been able to make its mark on the global electronics manufacturing map with its domestic production registering a CAGR of 18% between 2015-16 and 2020-21 to reach US$74.7 billion. The country is well poised to further consolidate this momentum and has developed some unique advantages which have been instrumental in this journey. Some of these include a forward-looking policy support, strong demand-pull (stemming from one of the world's lowest electronics per capita consumption), vibrant EMS ecosystem with labour arbitrage, presence of a strong design habitat (including chip design and embedded software system), having the third largest start-up hub, amongst others.

Recognising this, the Government of India's mission to position India as the world's electronics manufacturing hub and boost domestic electronics industry's turnover to US$300 billion by 2026 is a welcome move. Since a manufacturing hub would not cater only to the domestic demand, boosting exports form one of the cornerstones in achieving this vision.

In order to further this vision, CII in collaboration with NCAER has come out with this report highlighting the areas of improvement and suggestions to boost India's export competitiveness. Some of the thrust areas highlighted in the report include encouraging large foreign companies to manufacture in India, further improving the EoDB climate, developing electronics parks (instead of clusters) near finished product manufacturing, expediting payment of overdue export subsidies, pressing the pedal on skill development, among others. We firmly believe that these measures, if implemented timely, would boost the indigenous electronics industry's manufacturing and export competitiveness and help realise the sector's true potential.

The Report is part of our effort in reaffirming our commitment to make India an electronics manufacturing and exports hub. We would like to thank the members of the CII National Committee on ICTE Manufacturing and NCAER for their support in making this a comprehensive and actionable report.

Message

Dr. Poonam Gupta
Director General
National Council of Applied Economic Research

The need to create a globally competitive electronics industry that meets international standards of excellence and efficiently caters to both the domestic and export markets has always been a priority for the country. Accordingly, the National Policy on Electronics (NPE), 2019, and its precursor in 2012, laid down certain goals to significantly boost domestic production by encouraging and driving capabilities in the country for developing core components and creating an enabling environment for the industry to compete globally. Meanwhile, the Government has also been offering incentives and other forms of support to the electronics industry to enable it to meet both its domestic and global demands. The 'Digital India' programme has also been designed to drive economic growth and digitally empower the country's population besides enhancing trade in the Information and Communications Technology sector, facilitating last-mile connectivity, and promoting the use of emerging technologies.

Against this backdrop, NPE, 2019, set an aspirational target for the electronics industry to achieve a turnover of USD 300 billion by 2025-26, which, in turn, would entail a fourfold increase in electronics production between 2020-21 and 2025-26. In this context, the National Council of Applied Economic Research (NCAER) in collaboration with the Confederation of Indian Industry (CII) prepared this Call to Action Report to assess the current scenario of the electronics industry and propose recommendations for policy interventions to facilitate achievement of the NPE goals and build export competitiveness in the country in a span of 1000 days, in line with the Vision document released by the Ministry of Electronics and Information Technology in November 2021.

This report highlights the limitations and constraints faced by the industry and proposes short-term recommendations to address the same.

I would like to thank CII National Committee on ICTE Manufacturing for providing us an opportunity to undertake this critical study. I hope that the study will prove to be a useful reference point and guide for policy-makers, the industry, and other stakeholders.

New Delhi
June, 2022

TABLE OF CONTENTS

01

Executive Summary

The country's first National Policy on Electronics (NPE) in 2012, set itself a lofty goal. It sought to 'create a globally competitive electronics, design and manufacturing industry to meet the country's needs and service the international market.'

In the years thereafter, the digital India program was designed under the leadership of Prime Minister Narendra Modi, to drive the economic growth of the country and digitally empower the 1.3 billion population. The mission was kick-started to enhance trade in ICT sector, increase domestic manufacturing, enable last-mile connectivity, and deploy emerging technologies.

Reiterating the goals of previous policies, NPE-2019 envisaged India to become a global leader in the Electronics Manufacturing Services segment and achieve a turnover of USD 400 billion by 2025-26(now revised to USD 300 billion), in order to cater to both domestic and export demand. Subsequently, to achieve these goals, the Government of India continued to introduce successive iteration of the NPE in 2019, offering fresh incentives and support to the electronics sector. These included the trilogy of schemes announced by the Government in 2020 namely the Production-linked Incentive scheme ("PLI") for large scale electronics manufacturing, Scheme for promotion of manufacture of components and semiconductors ("SPECS") and the Electronics Manufacturing Cluster ("EMC")scheme.

However, despite the enormous strides made by the domestic industry, we still are far from our

goals as per NPE 2019. Given that the policy underlines the domestic as well as external demand for electronic products to rise to USD 300 billion by 2025-26, the exports may likely increase, if timely steps are taken to boost indigenous electronic manufacturing.

However, the challenge, would be to transition from being a producer for the domestic demand to becoming a producer to serve the global demand via exports and become a large scale manufacturing hub, competing with international markets like China and Vietnam, which already are serving the global market economies for electronics.

This was also highlighted by Prime Minister, Shri Narendra Modi, in his address during the interaction with Heads of Indian Missions abroad and stakeholders of the trade and commerce sector, on August 6, 2021[1]. The Hon'ble Prime Minister urged the stakeholders "to put all their efforts to take advantage of the new opportunities created by the changes in the Global Supply Chain in the Post Covid Global World." He also added that one of the goals of Aatmanirbhar Bharat campaign is to increase India's share in exports manifold. For electronics exports, the aim of reaching USD 120 billion by 2025-26 would require over 10-fold increase from current level. In order to achieve this, it should be ensured that we get access to the global supply chain, so that businesses can scale and grow.

Within electronics sector, the hope is that starting with mobile handsets, India will soon move up the value chain to production of tablets, laptops and other more sophisticated electronic items, including medical electronics

The following measures could go a long way in realising the promise of the sector:

- Invite tier 1-2-3 companies, including those leading in global value chains, to manufacture in India in order to create our own manufacturing ecosystem and scale up the volume of production for both domestic and export market. This should be for 1-5 years, thereafter once the eco-system develops, domestic companies should be encouraged to use their global experience and set up high-tech manufacturing.

[1]Ministry of External Affairs, Press Release, 06 August, 2021, "Prime Minister interacts with Heads of

> The Hon'ble Prime Minister urged the stakeholders to put all their efforts to take advantage of the new opportunities created by the changes in the Global Supply Chain in the Post Covid Global World.

- The sustainability of continued domestic manufacturing may require creation of local companies that are well entrenched in India in the long run. Such local firms can be the domestic champions which can be fostered to not only take on the global market players but also to create a strong Indian manufacturing ecosystem. Indian champions will be the key to achieving economic self-reliance and global success.
- Improve ease of doing business which has a direct positive impact on the foreign direct investment. Single window clearance for setting up new units and for dispute resolution is a critical component of the ease of doing business.
- Expensive imported inputs on account of tariff increase have an adverse effect on the competitiveness of manufacturers in international market. Therefore, it is important for Government, to have a rational approach toward any tariff increases. Any such decision should be done with the prior consultation of the nodal ministry which has the primary task of nurturing the eco-system and the industry.
- The government must ensure prompt payment of overdue export subsidies, PLI and prompt payment of all legitimate dues in future. The RoDTEP ("Remission of Duties and Taxes on Export Products (RoDTEP)") scheme announced in January 2021 is expected to be an improvement over the earlier incentive schemes. However, the guidelines and rules released in August 2021 have kept the Electronic Hardware Technology Parks, Advance Authorisation SEZs, and Private Bonded Warehouse Manufacturers outside the scope of the scheme. While a committee has been setup to arrive at new RoDTEP rates for SEZ and EOUs, The Private Bonded Warehouse Manufacturers and Advance Authorisation should be given the existing RoDTEP rates from 1st January 2021 with immediate effect. The committee has been reconstituted and we expect the outcome to be in line with the industry recommendations.
- In order to move to a large scale manufacturing hub, MeitY should facilitate the setting up of electronic components manufacturing, near the finished product (say, mobile handset) manufacturing units. This would require developing electronics parks, rather than clusters, with full infrastructure development and 100 percent power so that plug-and-play becomes the norm.
- Move up the value chain from mobiles to computers/laptops, hearables & wearables and more advanced electronic items, that can cater to important segments like healthcare, education, logistics and entertainment, especially in the times of COVID-19.
- The shortage of chips has had severe impact on electronics production. However, the recent government announcement (on December 16, 2021) of Rs. 76,000 crore incentive package for semiconductor manufacturing is expected to not just address the shortfall of the critical input component but also put India among the league of top electronics manufacturing countries.
- The government may also extend some employment-linked incentives to the industry, given its employment generation potential and leverage the availability of affordable labour.
- Special incentives on research and development (R&D) may be given. As of now, India spends a meagre 0.65 percent of GDP on R&D while the advanced economies spend about 2 to 3 percent of GDP on R&D[2].
- Set up inland container depots near manufacturing centres to ensure faster clearances for export. This will facilitate logistics and transportation sector significantly which will drive economy and growth.

The vision that can be gleaned from our report is of India becoming a manufacturing export powerhouse with higher competitiveness in the electronics sector.

[2]Source: The World Bank Database

02

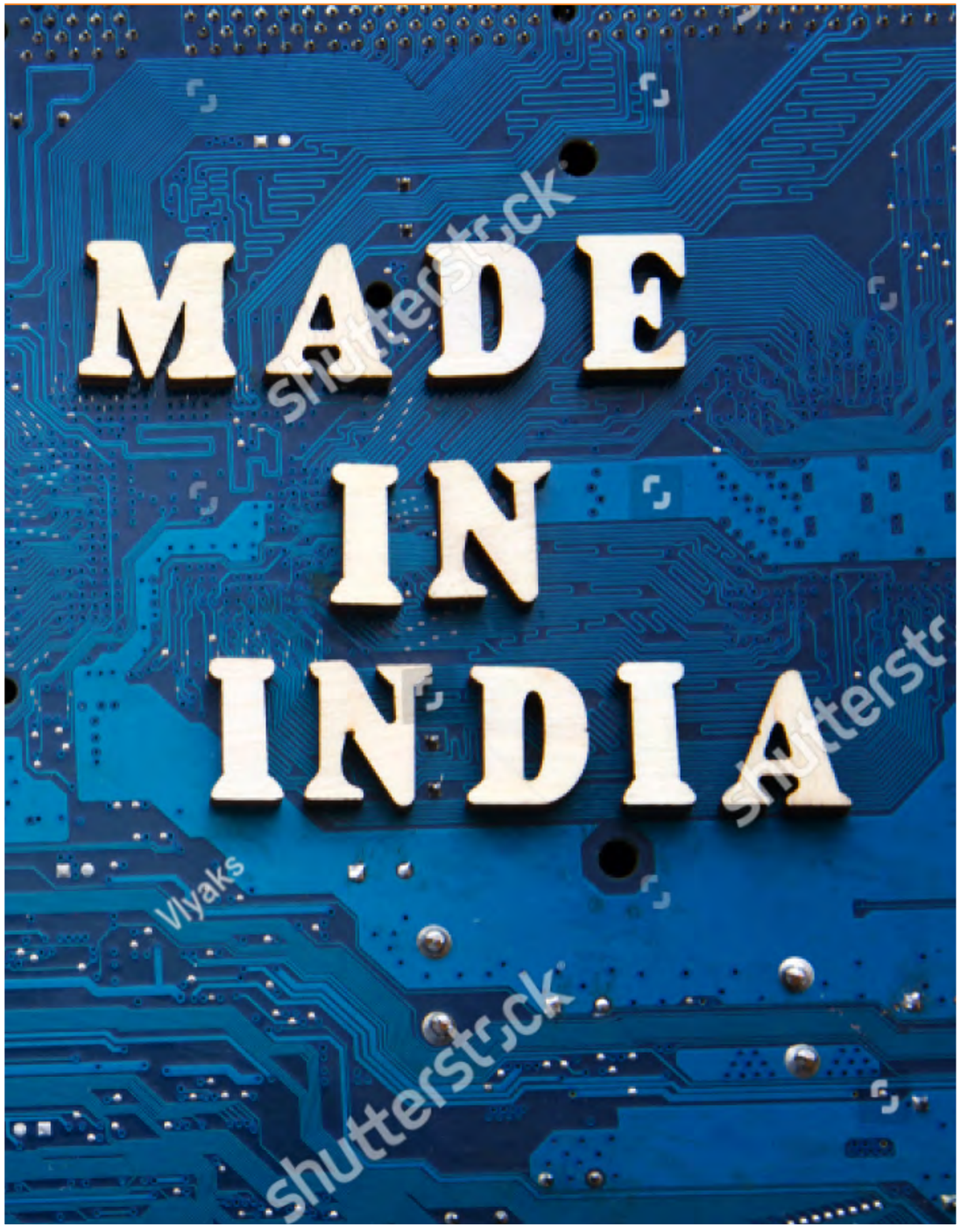
Introduction

Electronics sector is one of the fastest growing industries of the world that has its impact in transforming wide-array of applications that are fast enough to change the course of lives, businesses and overall economic dynamism across the globe.

The Fourth Industrial Revolution (IR4), with major emphasis on innovation and digital technologies (DTs), has vastly transformed the way people interact with each other across the world, especially since 2020, following the COVID-19 outbreak.

The COVID-19 pandemic has made the world focus on the power of technology and how its use has helped in expanding solutions in crucial segments like healthcare, food security, education and supply chains. Furthermore, with greater e-commerce penetration, prolonged Work from Home (WfH) and Learning from Home (LfH) modules since the pandemic, there is an increase in the demand for electronic products like laptops, tablets and smartphones.

India, with its notable track record of disseminating modern services and a large domestic market for electronic products, can aptly take a digital leap and bring in new opportunities in electronics segment. Besides, recent technology changes, such as proposed rollout of emerging 5G networks, will enable faster connectivity and usage of electronic products through Internet of Things (IoT), Artificial Intelligence (AI), robotics, etc. are sure to transform the industry in many ways.



Transformation of ESDM sector in India

In India, the electronics sector has been positioned as one of the 25 sectors covered under the "Make in India" campaign, because of which the sector, broadly classified as Electronic System Design and Manufacturing (ESDM) enjoys 100 percent FDI under the automatic route.

The government's focus on expanding the electronics sector is evident since the release of the first National Policy for Electronics (NPE) in 2012. The vision of this policy was to transform India into a global hub for ESDM so as to not just meet the domestic demand but also cater to international demand.

With a domestic production of USD 74.7 billion in FY2020-21[3], the electronics sector is more than double the level of FY16, recording a Compounded Annual Growth Rate (CAGR) of 17.9 percent during this period. Going forward, a huge consumer base (largest in the Asia-Pacific region); strong research and development ecosystem; goals set by India under its NPE 2019 (revised goal of USD 300 billion) that includes policy support by government; and aggressive efforts towards building a favourable environment for increased investment in the electronics manufacturing segment are some of the crucial advantages which Indian ESDM industry can benefit from.

Having realised the sector's potential, the NPE 2019 laid out a mission to strengthen India's linkages with global trade, integrate with global value chains and build facilitative programmes and an incentive framework to boost Indian Electronics exports[4].

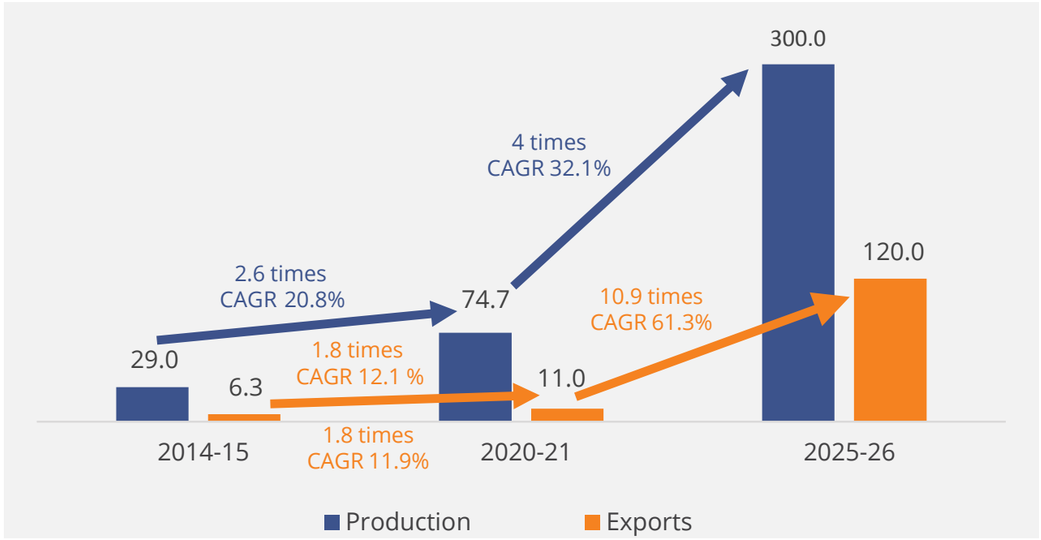
The policy also envisages India to become a global leader in the Electronics Manufacturing Services segment and achieve a turnover of USD 300 billion by 2025-26, in order to cater to both domestic and export demand. Meeting such target would require electronics production to increase more than four-fold between 2020-21 and 2025-26, translating into a CAGR of 34.8 percent. In the past, over the similar period between 2014-15 and 2020-21, electronics production had grown 2.6 times with a CAGR of 20.8 percent (Figure 1).

[3] Source: Annual Report, 2021-22, Ministry of Electronics and Information Technology (MeitY)

[4] Source: National Policy on Electronics 2019 (Para 3.2), Ministry of Electronics and Information Technology Notification, 25th February, 2019.

Further, of the total target of USD 300 billion, that for exports is set at USD 120 billion, which is 10.9 times the level in 2020-21 and would require a CAGR of 61.3 percent between 2020-21 and 2025-26. In contrast, for the similar past period of 5 years between 2014-15 and 2019-20, exports had grown only 1.8 times with a CAGR of 12.1 percent.

Figure 1: Meeting the target for 2025-26



Source: MeiTY and RBI

To meet this objective of aspirational 4.5 times surge in production and even more aspirational 10.8 times in exports, unless domestic production is given a strong boost in terms of scale, reliance on imports will result in huge foreign exchange outgo on electronics alone, possibly even exceeding our oil import bill. The latest data for FY21 shows that while India's electronics production was USD 74.7 billion in FY21 (Source: MeitY Annual Report, 2021-22), the value of imports of electronic goods was as high as USD 54.6 billion (Source: Imports of Principal Commodities, DGCI&S). The government's Production-Linked Incentive (PLI) scheme and its crucial role in 'increasing not only the scale of domestic manufacturing but also the level of global quality and efficiency, in manufacturing and exports has also helped electronics become one of key sectors for transformation in production.

In the long run, India cannot afford to continue to bear such an adverse impact on its Balance of Payments (BoP) and therefore, needs measures to promote a large eco-system for domestic manufacturing with special emphasis on exports which eventually leads to creation of domestic value addition in aggregate terms. Specific policy initiatives including, providing fiscal incentives and support for export led growth and favourable environment for increased investment will be required to meet these objectives.

03

Mapping Policy Interventions to Achieve NPE 2019 revised target of USD 300 BN

This study examines the current scenario of the electronics industry, especially mobile phones, IT hardware, hearables and wearables and proposes recommendations for policy interventions so as to meet the NPE goals to build export competitiveness in 1000 days, as per the Vision document released by Ministry of Electronics and Information Technology in November, 2021.The key objectives of proposing the roadmap are as follows:

1. To prepare a strategic action plan ("PLAN") to expand India's export competitiveness in the Electronics Sector in next 3 years. The action plan will largely focus on the mission, vision, objectives and revised goals of NPE 2019 and aim USD 120 Billion dollars of exports

2. Accelerate and advance India's presence in the Global Value Chain eco-system for trade and building export competitiveness.
3. Identify specific issues/bottlenecks impacting the export potential of Electronics Sector like areas impacting Export competitiveness:
    - Tariffs and Non-Tariff Barriers
    - Incentives and Subsidies to address cost disabilities
    - Export Financing
    - Ease of Doing Business
    - Labour Reforms
    - Logistics and Transportation Framework
    - Ease of supply chains
4. Provide actionable recommendations aimed at addressing the above bottlenecks. To make a conducive and competitive eco-system for export led manufacturing.
5. Research and highlight international best practices and comparative trends prevailing in other competing economies (China, Vietnam).

3.1. Indian Electronics Market

The global consumer electronics market size was USD 729.11 billion in 2019. The market is projected to grow from USD 689.45 billion in 2020 to USD 989.37 billion in 2027 at a CAGR of 5.3 per cent in the 2020-27 period[5]. The world-wide pandemic and subsequent lockdowns which led to carrying out all the activities through online mode as the only resort, also helped the electronics sector especially, the mobile segment.

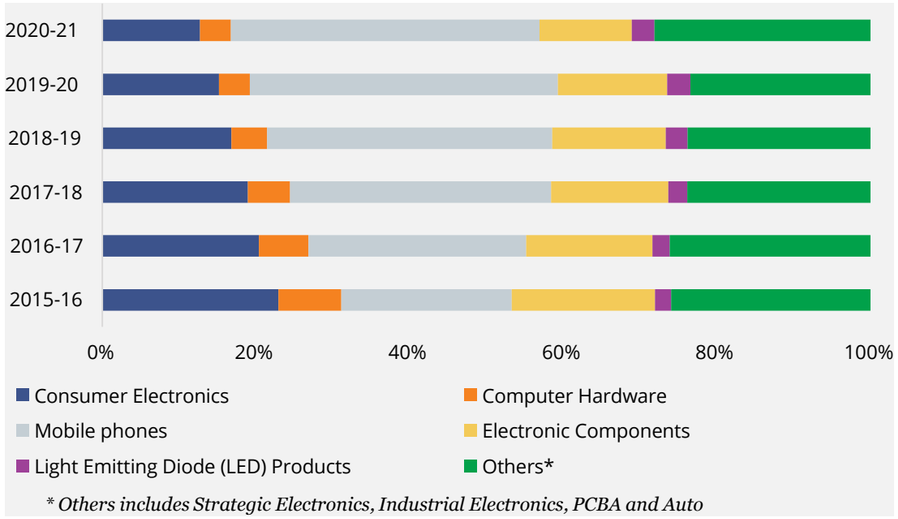
India's share of the global electronics market has grown impressively from 1.3 per cent in 2012 to 3.6 per cent in 2019[6]. Within electronics sector, the share of mobile

[5] https://www.fortunebusinessinsights.com/consumer-electronics-market-104693

[6] Source: https://www.investindia.gov.in/sector/electronic-syste

handsets production has been notable at 40.1 per cent in FY20, up from 22.2 per cent in FY15 (Figure 2). This share is estimated to have increased further to 44.2 percent in FY21. In terms of growth, production of mobile phones posted a CAGR of 41.1 percent in FY20 over FY16.

Figure 2: Share (%) of different segment of electronic products in total value of electronics production



*Source: Annual Report2021-22, MeitY (*Data for 2020-21 are estimated values)*

This rapid growth in production has been driven by fast growing demand, making India the second-largest country with a subscriber base of 1167.82 million, as on April 2022, (As per Telecom Subscription Data of Telecom Regulatory Authority Of India[7]). Mobile subscription, at 1142.66 million, is over 98 percent of overall telephone subscription while number of broadband connections stands at 760.94 million.

India is the second biggest market in the world with an average monthly sale of 10 million handsets. India's share in global mobile production rose to about 11 per cent from only 3 per cent in 2014. The total number of mobile manufacturing units increased to 268 in 2019 from just two in 2014 employing 0.67 million people[8].

The data on production also shows that Indian mobile phone manufacturing sector grew tremendously, with a CAGR 32 per cent between 2015-16 and 2020-21, while the overall Electronics sector grew at a CAGR of 15.4 percent over the same period (MeitY Annual Report2021-22). The data on exports also post the similar picture. While the overall Indian exports grew at a CAGR of 4.7 percent 2015-16 and 2020-21, corresponding growth in exports of mobile phones stand at 73.0 percent[9].

[7] Telecom Regulatory Authority of India, https://www.trai.gov.in/sites/default/files/PR_No.40of2022.pdf

[8] Choudhury, R (2020): India's mobile manufacturing sector charts a success story, Policy Circle, October 3, 2020.

[9] Export-Import Data-Bank, Ministry of Commerce and Industry

"India is the second biggest market in the world with an average monthly sale of 10 million handsets. India's share in global mobile production rose to about 11 per cent from only 3 per cent in 2014."

Table 1: Production of Electronics - Sector Wise (USD billion)

Items	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21*
Consumer Electronics	7.91	9.19	10.43	10.92	11.49	9.50
Computer Hardware	2.82	2.89	3.04	3.01	3.05	3.00
Mobile phones	7.66	12.77	18.73	24.12	30.36	30.00
Electronic Components	6.44	7.39	8.39	9.61	10.75	9.00
Light Emitting Diode (LED) Products	0.72	1.01	1.37	1.84	2.31	2.20
Others*	8.96	11.77	13.14	15.48	17.73	21.00
Total Electronics	**34.51**	**45.02**	**55.09**	**64.98**	**75.70**	**74.70**

Note: Others includes Strategic Electronics, Industrial Electronics, PCBA and Auto Electronics

Source: Annual Report, MeitY; INR to USD conversion @ Rs. 70.34 except for 2020-21

04

Factors impacting India's export competitiveness

4.1. Concentration of Electronics GVC in few countries

A larger scale of production improves competitiveness, increasing the ability to export and link up with GVCs. This in turn paves the way for creating a larger scale of production and exports. India's low export competitiveness is an effect of its low participation in the electronics Global Value Chain (GVCs), which are concentrated in a few countries in Asia, especially China and Vietnam. With an increase in scale over time, China and Vietnam have also managed to increase their Domestic Value Addition (DVA) ratios and thus the impact of the rise in exports on domestic value addition is larger with time[10]. Estimates for Vietnam show that its DVA ratio in electronics is about 23 to 25% in 2020 and the estimates of China's DVA ratio are higher at about 37 to 40%. About a decade ago, this average DVA ratio in China was below 30% for electronics devices[11].

[10] Vision document Vol 1: Increasing India's Electronics Exports and share in GVCs, November 2021

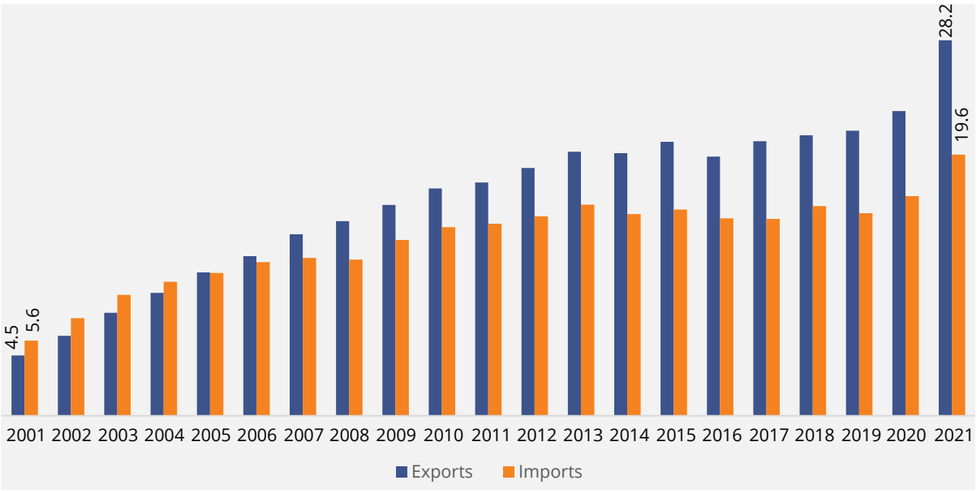
[11] https://www.ecb.europa.eu/home/pdf/research/compnet/DEVEC_1670.pdf?57a5265fab96f74f6f7a2ab0464575d3 (see for example)

China, on the other hand, is the most extensive and cost-effective electronics manufacturing ecosystem which houses most of the electronics supply chain. Also known as the "world's factory", China's exceptionally strong supply-chain infrastructure enables all the components required to manufacture a mobile phone, which are about 2000 in number, readily available within the country.

Furthermore, Vietnam benefitted from the complete relocation of foreign companies to Vietnam, owing to its Free Trade Agreements with several countries, corporate tax exemptions, incentives to R&D projects and the exceptional quality of labour. The country has now grown into a prominent manufacturer and also exporter for electronics by integrating itself into GVC.

China, on the other hand, is the most extensive and cost-effective electronics manufacturing ecosystem which houses most of the electronics supply chain. Also known as the "world's factory", China's exceptionally strong supply-chain infrastructure enables all the components required to manufacture a mobile phone, which are about 2000 in number, readily available within the country. China's share in world exports of electronic products increased from 4.5 per cent in 2001 to 28.2 per cent in 2021 . On the contrary, its share in world imports rose from 5.6 percent to only 19.6 percent over the same period (Figure 3).

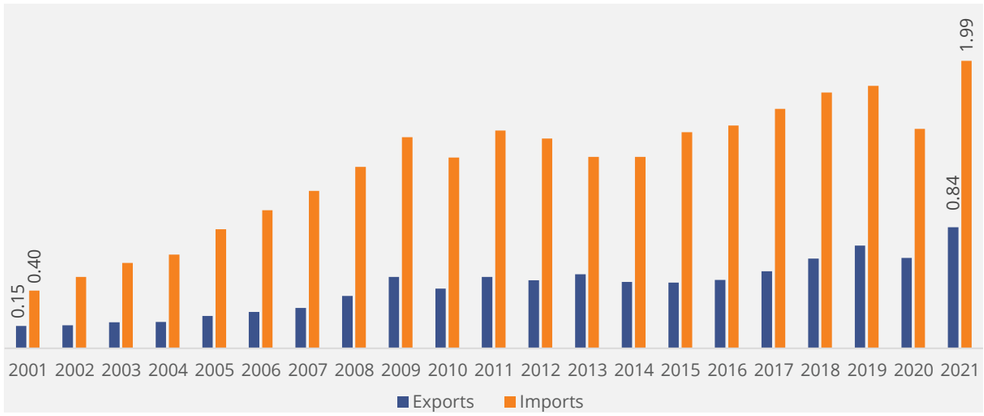
Figure 3: China's Share in the Global Trade of Electronics (%)



Source: The United Nations Commodity Trade Statistics Database (UN Comtrade)

In contrast, India's share in world exports of electronic products has risen from a meagre 0.15 percent in 2001 to just about 0.84 percent in 2021 whereas the same in world imports of electronic products increased from 0.4 percent to 1.99 percent. Several sophisticated components and sub-assemblies are still not produced in India, hence are imported despite hike in import tariffs (Figure 4).

Figure 4: India's Share in the Global Trade of Electronics (%)



Source: The United Nations Commodity Trade Statistics Database (UN Comtrade)

Further in the case of China, import-substitutive FDI as well as export-oriented FDI played an important role in its electronics industry. While the former was largely a result of the sheer potential of China's market, the latter was encouraged to export through regulations such as setting a ratio of export to total production for these foreign-funded enterprises or FFEs (Zhongxiu Zhao et al, 2007[13]). A regulation in 1998 made FFEs export a minimum of 60 percent of their total production, in order to qualify for obtaining import quota for components.

While China is the most important country in terms of competitiveness, the change in the global economic perspective since the US-China trade war and also outbreak of Covid-19 has led many large multinational companies shift their manufacturing base from China to other countries and also diversify their supply chains. This has brought in opportunities for India to entice these companies to set up their plants in India and hence enhance India's share in GVC. This requires massive policy support to build up capabilities in view of its economic strength that is going to enhance over the period.

The following sections present India's competitiveness as measured by its comparative advantage for both exports and imports. While India's export competitiveness has been on a rising trend since 2018, it still is far behind a number of other countries.

Revealed Comparative Advantage for Exports

The index of competitiveness or the Revealed Comparative Advantage (RCA) is derived to make a systematic assessment of the export competitiveness of a product for a country. RCA is an economists' tool that uses the trade pattern to identify the business sectors in which an economy has a comparative advantage when comparing the country of interests' trade profile with the world average[14].

A country is said to have an advantage in a given product i when its ratio of exports of product i to its total exports of all goods (products) exceeds the same ratio for the world as a whole. Hence, Index of competitiveness or Revealed Comparative Advantage (RCA) is defined as a country's exports of commodity in a particular sector relative to its total exports and to the corresponding exports of all countries in the world.

$$RCA = (Xi/Xc) / (Xni/Xnc)$$

where, X represents exports, i is a commodity sector in a country, c is a set of all commodity exports in that country and n is the entire set of countries (the world).

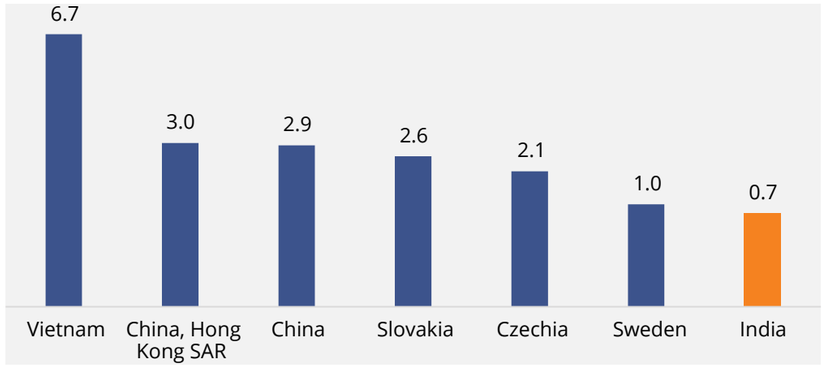
- When the RCA of a country for a given product is greater than 1 (RCA >1), it is inferred to be a competitive producer and exporter of that product relative to a country producing and exporting the same good at or below the world average.
- The higher the value of a country's RCA for product i, the higher its export strength in that product and vice versa

[13] Z. Zhao, X. Huang, D. Ye, P. Gentle, "China's Industrial Policy in Relation to Electronics Manufacturing", China & World Economy / 33 – 51, Vol. 15, No. 3, 2007

[14] K. Sanglimsuwan, S. Suanmali, V. Ammarapala, "The Export Growth And Revealed Comparative Advantage Of Thailand To India's Jewelry Sector", Proceedings of the 4th International Conference on Engineering, Project, and Production Management (EPPM 2013).

As per the latest available data for 2020, India is way behind in terms of competitiveness for communication equipment (proxy for mobile handsets), for which its index value is just 0.7, while it is as high as around 6.7 for Vietnam and 2.9 for China (Figure 5).

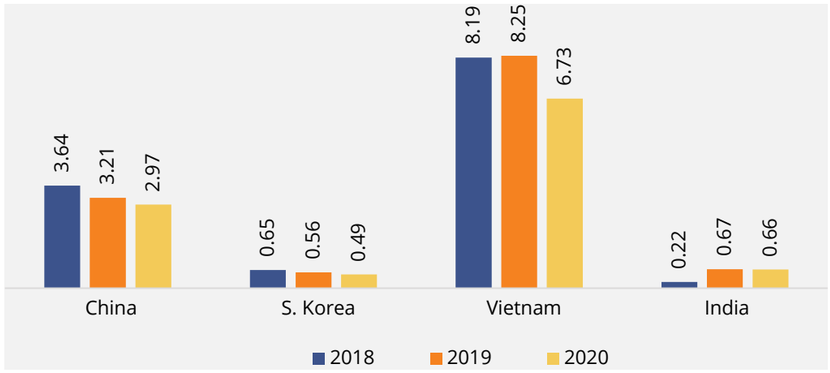
Figure 5: Competitiveness Index for communication equipment, 2020



Source: The United Nations Commodity Trade Statistics Database (UN Comtrade)

However, this index for previous 2 more years shows that India's competitive strength is increasing since 2018 while it is decreasing in some of the prominent competitive countries as depicted in the following figure (Figure 6). The competitiveness index for India improved from 0.22 in 2018 to 0.66 in 2020 while during the same period, China's index came down to 2.97 in 2020 from 3.64 in 2018.

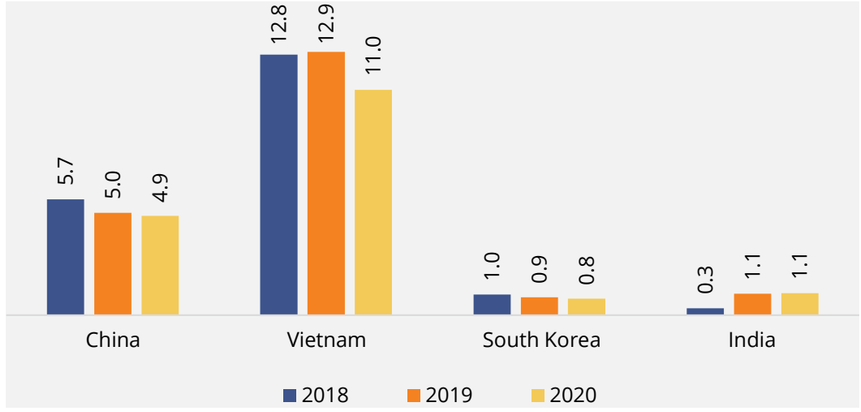
Figure 6: Competitiveness Index for mobile handsets (2018-2020)



Source: The United Nations Commodity Trade Statistics Database (UN Comtrade)

This is also reflected in the similar trend in the share of mobile handsets in total exports for each country, as given in Figure 7 below.

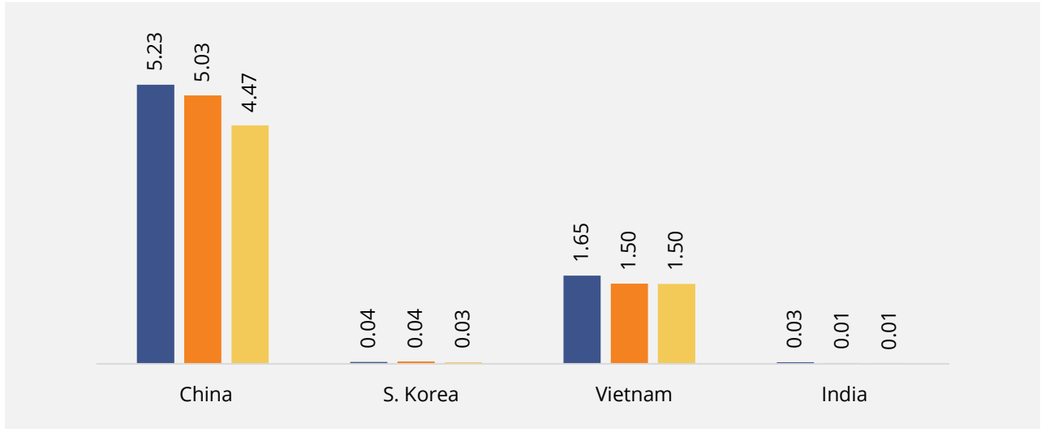
Figure 7: Share of mobile handsets in total export of the respective countries



Source: The United Nations Commodity Trade Statistics Database (UN Comtrade)

With regard to computers, which is another prominent electronic product in global trade, India barely has any comparative advantage. It has been almost zero since several years and shows no sign of improvement. On the other hand, RCAs of both China and Vietnam far exceed that of India's (Figure 8).

Figure 8: Competitiveness Index for computers (2018-2020)



Source: The United Nations Commodity Trade Statistics Database (UN Comtrade)

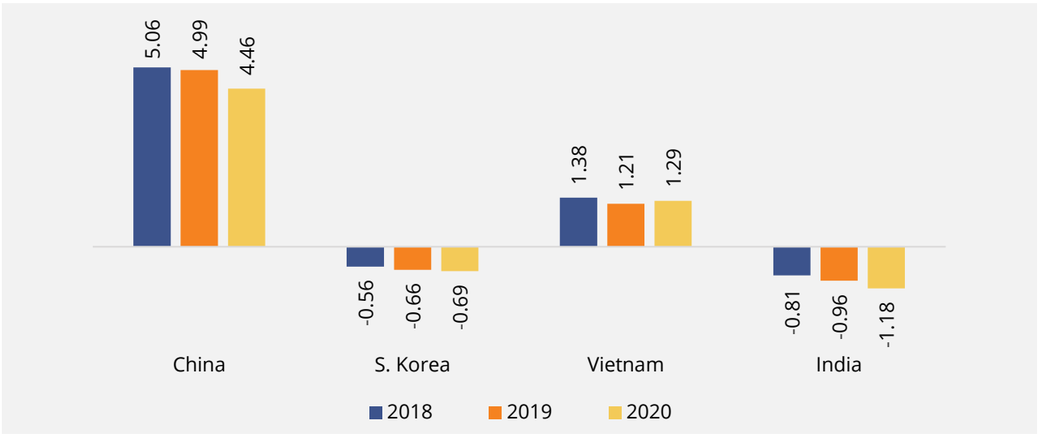
Revealed Comparative Advantage for Imports

Another index, RCA2, which also takes into account country's import advantage, indicates whether the trade is more skewed towards imports or exports[15]. RCA2 is the difference between RCA and Revealed import advantage (RMA), where RMA measures a country's imports of a commodity in a particular sector relative to its total imports and to the corresponding imports of all countries in the world.

Comparative advantage is revealed if RCA2 is greater than 0 (RCA2≥0).

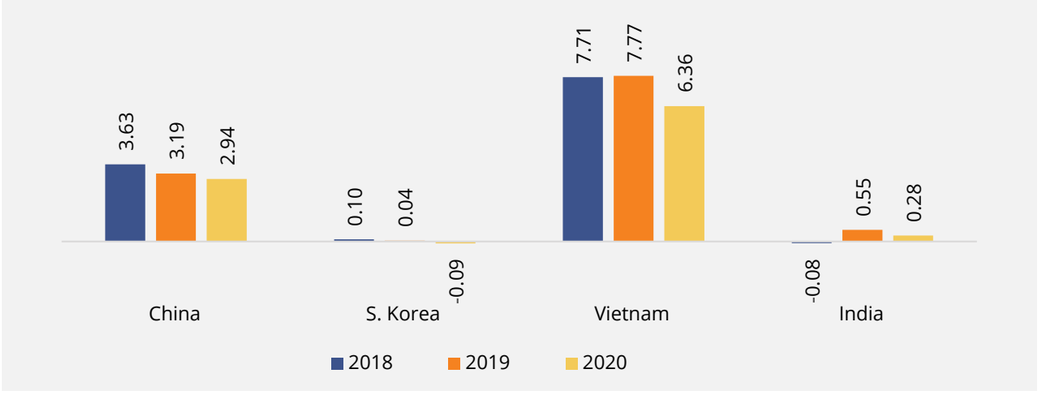
India's comparative advantage, as measured by RCA2, shows that India's policies have led to rising exports but also meant rising imports. The RCA2 values for computers have always been in red zone (Figure 9) but post a shift from negative to positive in the case of mobile handsets in 2019 and 2020 (Figure 10).

Figure 9: Competitiveness RCA2 Index for computers (2018-2020)



Source: The United Nations Commodity Trade Statistics Database (UN Comtrade)

Figure 10: Competitiveness Index RCA2 for mobile handsets (2018-2020)



Source: The United Nations Commodity Trade Statistics Database (UN Comtrade)

[15] Kashika Arora and Sonu Verma, "Competitiveness of Indian Exports in The Backdrop of Economic Reforms: A Brief Analysis", Working Paper CITT/WP/2015/01, Indian Institute of Foreign Trade

4.2. Tariff Barrier

Tariff barrier is another key limitation which the Indian electronics industry suffers from. The last six years noted increased tariff rates reflected through hike in Basic Custom Duties (BCD) on approximately one-third of the tariff lines linked to electronics manufacturing industries. In comparison to the tariff structure of some of the developing nations, India's tariff structure stands out to be skewed against the import of electronics items, intended to support value creation in favour of the domestic industries. In Vietnam, for instance, a vast majority of import tariffs for consumer goods in the EU were eliminated after the EU-Vietnam Free Trade Agreement (EVFTA).

However, much to the relief for local manufacturers, Budget-2022 proposed a concession on customs duty on components of mobile phone chargers, camera lenses of mobile phones and other parts of electronics devices including hearables and wearables. The clarity on concessions is still awaited. Nonetheless, this is expected to make domestic products more competitive against the finished goods imported from China and other countries.

The policies to curb the imports of electronic products, especially mobile handsets, and their input components in a phased manner and through tariff barrier offsets the intended benefits from incentives schemes like:

- Production Linked Incentives (PLIs) and
- Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS)
- Remission of Duties and Taxes on Exported Products (RoDTEP)

These initiatives have helped in a decline in the import of mobile handsets but have been counter-productive with regard to import of components and sub-assemblies.

As per NPE 2019 the approach needs to be of tariff stability with the aim for phase-wise reduction. Such unpredictability and uncertainty in tariffs discourage investments. The expensive imported inputs result in price rise and increased pressure on manufacturers, making them uncompetitive in an international market which thrives on cheaper similar products from China and Vietnam.

This is evident in the declining value added to output ratios for computer and electronic products (Source: National Accounts Statistics (NAS), Ministry of Statistics and Programme Implementation) (Figure 11). The NAS presents the data on computer and electronic products by three broad categories:

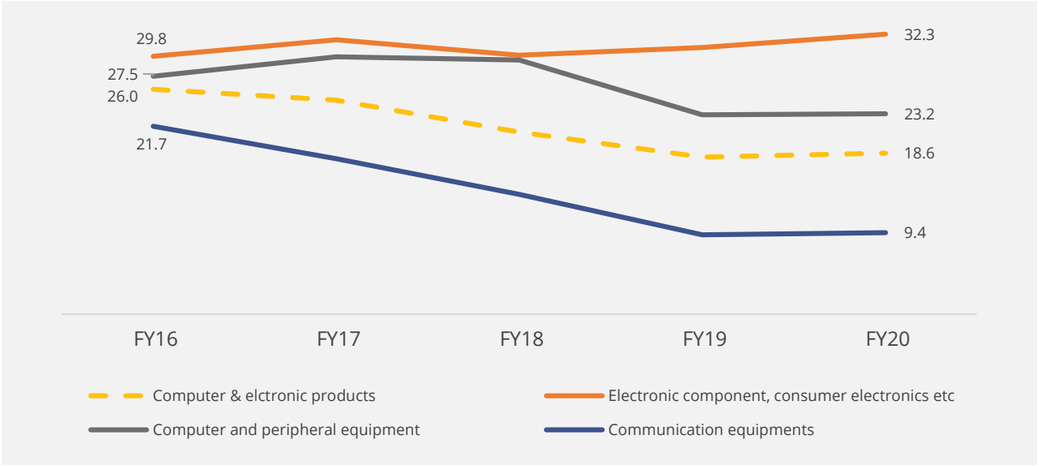
- Electronic component, consumer electronics, magnetic and optical media[16]
- Computer and peripheral equipment[17]
- Communication equipment[18]

[16] Manufacture of electronic components such as conductors, semiconductors, diodes, transistors, circuits, coils, capacitors and manufacture of consumer electronics such as televisions, radio receivers, audio recording and duplicating equipment, VCRs, CD and DVD players and other electronic consumer goods, Manufacture of domestic electrical appliances such as refrigerators, washing machines, vacuum cleaners, mixers, grinders; manufacture of domestic electro thermic appliances, electric fans, non-electric cooking and heating equipment and other domestic appliances.

[17] Manufacture of computers and peripheral equipment such as desktops, laptops, magnetic and optical storage devices, monitors, keyboards, all types of mice, joysticks, and trackball accessories, printers, scanners, smart card readers, virtual reality helmets, computer projectors, computer terminals, manufacture of other computers and peripheral equipment

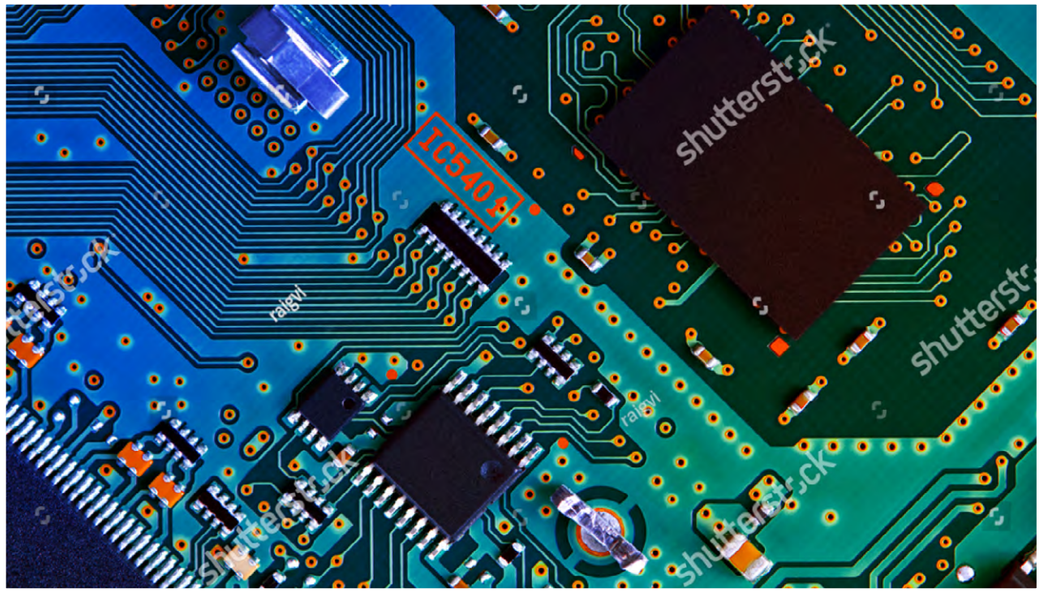
[18] Manufacture of Communication equipment such as broadcasting equipment, telephone and facsimile equipment, telephone answering machines, pagers, cellular phones, data communication equipment and other communication equipment

Figure 11: Value Added to Output Ratios



Source: National Accounts Statistics, 2021, Ministry of Statistics and Programme Implementation

For the overall "computer and electronics product" sector, the value added to output ratio fell from 26.0 percent to 18.6 percent between FY16 and FY20. During the same period, the ratio fell even more sharply for the communication equipment – from 21.7 percent in FY16 to 9.4 percent in FY20. This shows that the cost of inputs has been increasing over these years. While the NAS does not distinguish between imported inputs and indigenous inputs, the rising cost of inputs is most likely the resultant of expensive imported inputs, as the input components are not yet being produced domestically.



4.3. Low expenditure on R&D

Limited focus on R&D expenditure is another factor affecting India's global competitiveness. While the world R&D expenditure, as percent to GDP, averages at around 2 percent, India's corresponding share is just 0.65 percent, as per the latest data available for 2018 (Source: World Bank).

More worrying is the fact that while the world average has been on an increasing trend, rising from 2.0 percent in 2011 to 2.2 percent in 2018, India's share has been consistently falling (Figure 12). While this refers to the overall expenditure on R&D, a more disaggregated data from Research and Development Statistics, 2019-20, by the Ministry of Science and Technology reveals that of all the expenditure incurred on R&D activities, only about 40 percent is spent on the industrial sector. Of this, only about 5 percent is spent on Electricals and Electronics. China, on the other hand, invests heavily on R&D activities, including the adoption of advanced technologies, like smart robotics, cloud data and automated factory technologies which were initiated in China much earlier than in India.

Figure 12: Expenditure on R&D (as % to GDP)

Source: The World Bank Database

4.4. Sub-optimal quality of labour

Among the competing countries, Vietnam stands out with respect to quality of labour, with its engineers working in the electronics industry having fairly high qualifications as compared with other countries in the region[19]. It is because of this that Samsung has developed two of its largest R&D Centres in Vietnam.

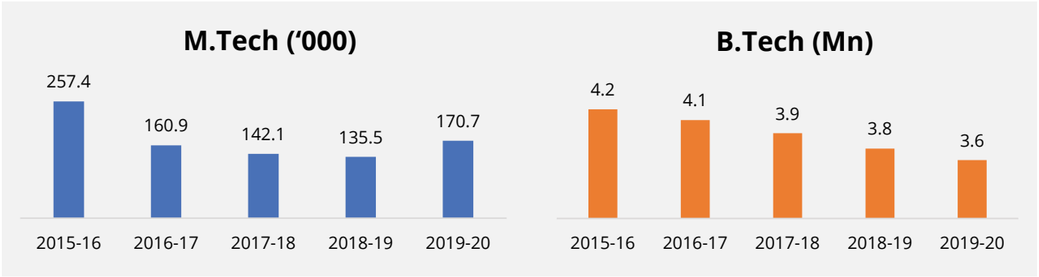
India, on the other hand, does not have enough skilled workforce, especially to produce complex parts and components. While it ranks second with respect to number of STEM (Science, Technology, Engineering and Mathematics) graduates (Source: World Economic Forum, as on 2016[20]), after China, there is a lack of readily available vocational training programmes, required for the electronics industry.

According to the All India Survey on Higher Education (AISHE-2019-20), enrolment in the undergraduate and post-graduate levels of technology related courses are seeing a decline over the last few years. Enrolment in M.Tech course fell from 257 thousand in 2015-16 to 171 thousand in 2019-20. Similarly, enrolment in BE and B.Tech courses fell from 4.2 million to 3.6 million over the same period (Figure 13).

[19] Vietnam's Electronics Industry: A Guide to Emerging Opportunities (vietnam-briefing.com)

[20] The Countries With The Most STEM Graduates [Infographic] (forbes.com)

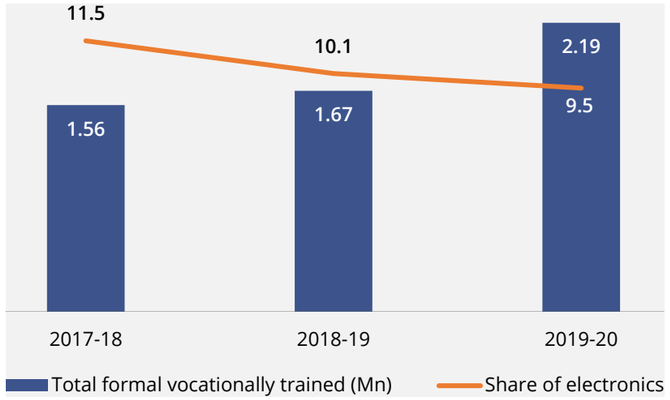
Figure 13: Enrolment in Engineering Courses



Source: All India Survey on Higher Education (AISHE-2019-20)

With regard to vocational training, number of persons who acquired vocational training through formal sources, like ITIs or other institutions, which are recognised by national certifying bodies, leading to diplomas/ certificates and qualifications, constitute only 2.9 percent of the total population in the age group of 12-59 years[21]. The number, however, has been increasing over years (Figure 14). However, those acquiring training in the field of electrical, power and electronics account for only about a tenth of these and this share has declined from 11.5 percent in 2017-18 to 9.5 percent in 2019-20.

Figure 14: Vocational training in the field of electrical, power and electronics



Source: Annual Periodic Labour Force Surveys, MoSPI

[21] Source: Annual Periodic Labour Force Survey conducted by Ministry of Statistics and Programme Implementation

05

Call to Action

India needs to grow its electronics sector and integrate into the global value chain to become export competitive, and at the same time be able to serve the domestic market at a level of efficiency obtained globally.

This will not just increase the exports but will also result in skill upgradation, generation of employment and an accelerated overall economic growth. Technology upgradation is another added advantage. Some of the recommendations are discussed below.

51. Invite large foreign companies to operate and manufacture in India (Encourage shifting / relocation of tier 1,2, 3 companies) for 1 – 5 years' time frame

Owing to the "China Plus One" strategy being adopted by several companies around the world to diversify the supply chain, India turns out to be an attractive destination, among other Asian countries. India's advantage lies in its strategic location, cheap and skilled labour, large domestic market and the recent policy offer, that is, Production Linked Incentive Scheme, which aims to attract foreign investors wanting to relocate or diversify their manufacturing activities to India, and thereby improve Indian domestic manufacturing capability.

Inviting large foreign companies to India can help scale up the volume of production and create

employment. Being one of the priority sectors, 100 per cent Foreign Direct Investment (FDI) is allowed in this sector under the automatic route.

However, India recently took a series of steps to safeguard the interests of its companies from the predatory foreign investment during the pandemic and prohibited the automatic route for investments from neighbouring countries. These defensive steps were undertaken to arrest the acquisitions of its pandemic-stricken companies, which fall under strategically significant sectors, by its neighbouring countries, particularly China. This followed from the similar steps taken by several other countries.

The Press Note 3 that was notified by the Department for Promotion of Industry and Internal Trade (DPIIT), under the Ministry of Commerce and Industry, on 17 April 2020, prohibited any FDI from countries sharing land borders with India, without government approval[22]. This applied to all the sectors, without exception. The same needs to be amended to provide clarity on the shifting of the eco-system to India.

5.2. Improvement in Ease of doing business reforms

India's digital leap will pick up speed because of policy alignments and realignments. In order to invite large foreign companies to set up their manufacturing units in India, India must make significant improvement in ease of doing business reforms, implementing investor-friendly policies, providing hand-holding support to investors and bringing transparency in the system.

Logistics is another key area for improvement. A significant number of days required for a consignment to reach a port, and for custom clearances, ground handling and loading in sea-ports, for what can be done in few hours, are major challenges impacting the ease of doing business. In India, it can take 7-10 days to reach a port whereas in countries like China, Vietnam and even Bangladesh,

[22] pn3_2020.pdf (dpiit.gov.in)

it takes less than a day[23] ("Targeting Ease of Doing Business in India", Economic Survey, 2019-20). While India takes 60-68 and 88-82 hours in border and documentary compliance for exports and imports respectively, Italy, the top ranker in "Trading across borders" takes only one hour for each. The time delays caused by procedural complexities, multiple documentation and multiple approvals push the cost of trade up, further impacting the level of competitiveness.

As announced by finance minister Smt. Nirmala Sitharaman in her budget speech on February 1, 2022 the next phase of reforms in ease of doing business, termed EoDB 2.0 will specifically focus on strengthening production and easing supply chains, and have a dedicated segment focusing on 'ease of living'. The new EoDB campaign is set to target improved production efficiency in line with Make in India targets.

To enhance the outcome of EoDB 2.0 and improve the production efficiency and exports, the following issues should particularly be addressed:

- Ensure single window clearance for setting up units and for dispute resolution.
- Getting land and power, which continues to be major bottlenecks for investors, should be ensured at a faster pace.
- Easing land acquisition for large corporates and offer plug and play model to MSME
- Setting up inland container depots near manufacturing centres to avoid delays
- Obtaining a Certificate of Origin is another major hindrance, especially for small-scale and medium-scale industries. Simplifying the process involved in obtaining this certificate can bring a huge relief to local manufacturers.
- Promote more self-regulation, deemed approvals among businesses.

It is recommended that an EoDB cell be created within the MeitY, which is the nodal ministry for Electronics. This will be an inter-ministerial committee with participation from industry and the aim will be to redress the issues and grievances of the electronic sector.

5.3. Skill Development

Skill development is another area which needs to be given a push. National Education Policy – 2019 aims to create a robust skill training ecosystem starting from the school level and hence lays special focus on imparting vocation training and skill development courses at an early stage during schooling. New courses relevant to the fast growing electronics industry may be developed so that pathways for students to enter the job market or take go for higher education are strengthened.

The NPE-2019 also envisages providing support for skill development in emerging technology areas by devising suitable schemes, in partnership with the Ministry of Human Resource Development, State Governments, National Skill Development Corporation, Electronics and Telecom sector Skills Council etc.

5.4. Expedite payment of overdue export subsidies

Payment of overdue export subsidies – The government should ensure prompt payment of export subsidies, although this is likely to be ensured through the scheme called "Remission of Duties and Taxes on Export Products (RoDTEP)", announced in January 2021. This scheme is meant to ensure that the exporters receive the refunds on the previously non-refundable embedded duties and taxes like Mandi tax, VAT, Coal cess, Central Excise duty on fuel etc. embedded taxes and duties previously non-recoverable.

While the refund will be issued in the form of transferable electronic scrips to ensure speed and accuracy, the benefits of the scheme must reach all big and small exporting units. Also, while the scheme was meant to cover all sectors but the guidelines and rules released in August 2021 kept the Electronic Hardware Technology Park outside the scope of the scheme. The list of exclusions may be reconsidered.

5.5. Develop electronics parks to become a manufacturing hub

In order to move from an assembling destination to a manufacturing hub, MeitY should facilitate the setting up of electronic components manufacturing near the finished product (say, mobile handset) manufacturing units. This would require developing electronics parks, rather than clusters, with full infrastructure development and assured power supply so that plug-and-play becomes the norm.

The recent launch (October, 2021) of an ambitious Rs 107 trillion Gati Shakti or the national master plan to expedite infrastructure project implementation is a step towards providing a multi-modal connectivity to more than 1200 industrial clusters in the country. Among several targets set to cut down logistic costs and improve supply chains, the plan aims to set up 38 Electronic Manufacturing clusters by 2024-25 to turn India into major electronic exporter. Among these, 23 clusters will have plug & play and Common Facility Centres (CFC). These initiatives, if accomplished as targeted, will benefit the electronics sector by leaps and bound.

5.6. Some more policy actions/ recommendations

- Move up the value chain from mobiles to computers/laptops and more advanced electronic items.
- While global firms are essential for providing the foundation for India's exports in electronics, domestic firms are essential for expanding the domestic ecosystem over time. For this a strategic beginning has to be made for the large scale growth of medium and small firms, in which large firms play the main role as engines of growth for the domestic champions.
- Given the shortage of chips, MeitY should focus on setting up of indigenous chip manufacturing facilities. The government recently allotted a budget of Rs. 76000 crore to boost semiconductor and display manufacturing in the country by attracting large chip manufacturers. It is expected that this will bring down the cost of manufacturing and will encourage large firms to set up their manufacturing units in India.
- The government may also extend some employment-linked incentives to the industry, given its employment generation potential.
- Special incentives on research and development (R&D) may be given. As of now, India spends a meagre 0.65 per cent of GDP on total R&D across all the sectors, while the advanced economies spend about 2 to 3 per cent of GDP on the same.
- Expensive imported inputs on account of tariff increase has an adverse effect on the competitiveness of manufacturers in international market. Therefore, it is important that the Government has a rational approach toward tariff increases.

[23] echap06_vol1.pdf (indiabudget.gov.in)

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Notes

Notes

Confederation of Indian Industry

The Confederation of Indian Industry (CII) works to create and sustain an environment conducive to the development of India, partnering Industry, Government and civil society, through advisory and consultative processes.

CII is a non-government, not-for-profit, industry-led and industry-managed organization, with around 9000 members from the private as well as public sectors, including SMEs and MNCs, and an indirect membership of over 300,000 enterprises from 286 national and regional sectoral industry bodies.

For more than 125 years, CII has been engaged in shaping India's development journey and works proactively on transforming Indian Industry's engagement in national development. CII charts change by working closely with Government on policy issues, interfacing with thought leaders, and enhancing efficiency, competitiveness and business opportunities for industry through a range of specialized services and strategic global linkages. It also provides a platform for consensus-building and networking on key issues.

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As India completes 75 years of Independence in 2022, it must position itself for global leadership with a long-term vision for India@100 in 2047. The role played by Indian industry will be central to the country's progress and success as a nation. CII, with the Theme for 2022-23 as Beyond India@75: Competitiveness, Growth, Sustainability, Internationalisation has prioritized 7 action points under these 4 sub-themes that will catalyze the journey of the country towards the vision of India@100.

With 62 offices, including 10 Centres of Excellence, in India, and 8 overseas offices in Australia, Egypt, Germany, Indonesia, Singapore, UAE, UK, and USA, as well as institutional partnerships with 350 counterpart organizations in 133 countries, CII serves as a reference point for Indian industry and the international business community.

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