

Mr. Vipin Malik  
(Chairman, Infomerics Ratings)

Dr. Manoranjan Sharma  
(Chief Economist)

Ms. Priyansha Pushkar  
(Officer - Economic Analysis)

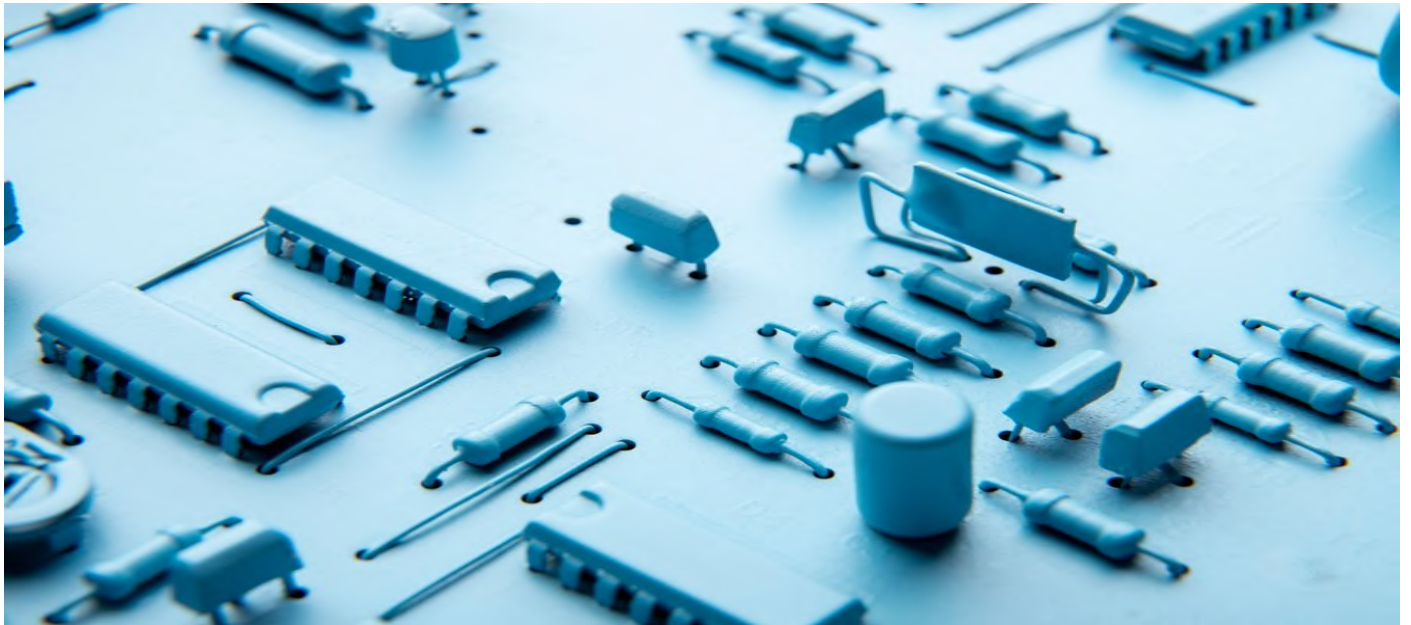
## INDUSTRY OUTLOOK

### **THE INDIAN ELECTRONICS INDUSTRY: A GATEWAY TO GLOBAL SUPPLY CHAINS**

06 September 2024

#### Introduction

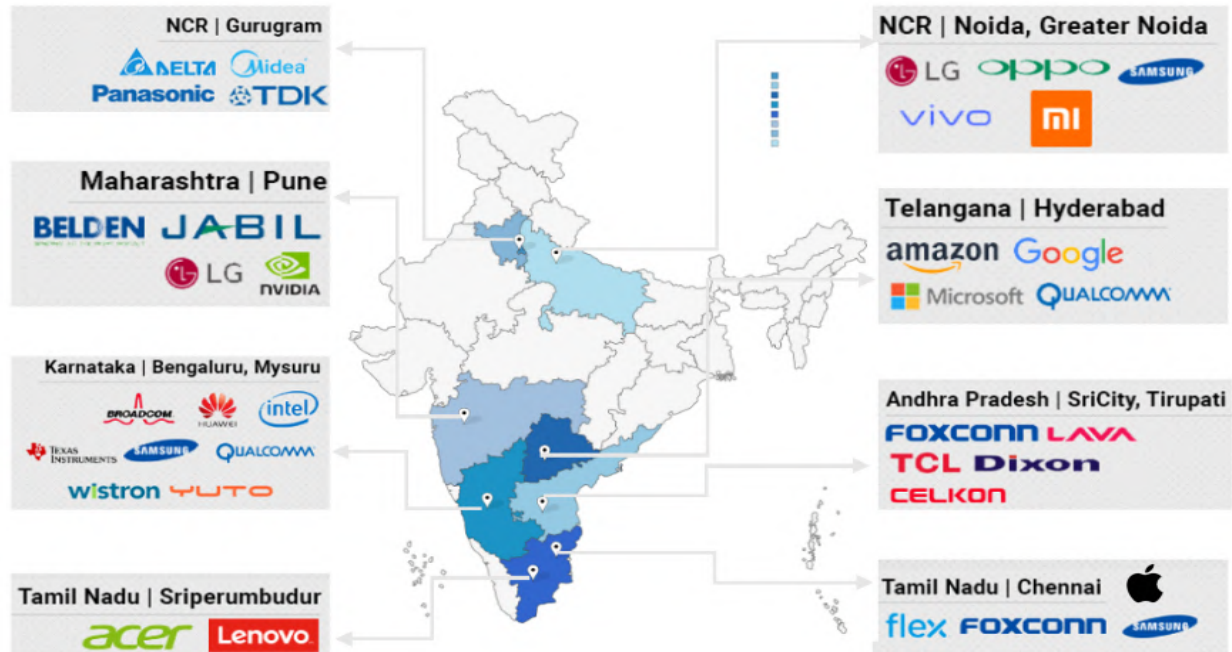
With rising per capita disposable income and private consumption doubling between FY12 and FY21, India has emerged as one of the largest markets for electronic products in the world. Electronic products cover a wide spectrum and come in many shapes, sizes, forms, and levels of sophistication. Driven by multiple factors including a growing customer base, a robust startup eco-system, and government programs aimed at promoting domestic manufacturing, India's Electronics System Design & Manufacturing (ESDM) industry has emerged as a symbol of innovation and opportunity. The government efforts and production linked scheme (PLI) schemes, like Made in India, smart city projects, and Digital India, drive the sector's rapid expansion.



The current value of India's electronics production stands impressively at US\$ 101 billion as of FY23. This figure comprises US\$ 86 billion in finished goods production and US\$ 15 billion in components manufacturing. During the same period, exports aggregated US\$ 25 billion, reflecting India's increasing role in the global electronics market. With regards to domestic value addition, the sector has also contributed, ranging between 15 to 18 per cent, and has generated approximately 1.3 million jobs. Despite these advances, India's electronic market represents just 3.3 per cent of the global market, which constitutes a small part.<sup>1</sup>

The outlook for India's electronics manufacturing industry is favorable with projections aiming to reach US\$ 540 billion in demand and the ESDM is forecasted to achieve US\$ 220 billion by FY25.<sup>2</sup> The technological transitions such as the arrival of 5G networks and the Internet of Things (IoT), are accruing to the growth in this sector. The large-scale electronics and IT hardware, automobiles and auto components, infrastructure, and pharma have accounted for most of the allocation under the PLI scheme in the interim budget.

## Key Players



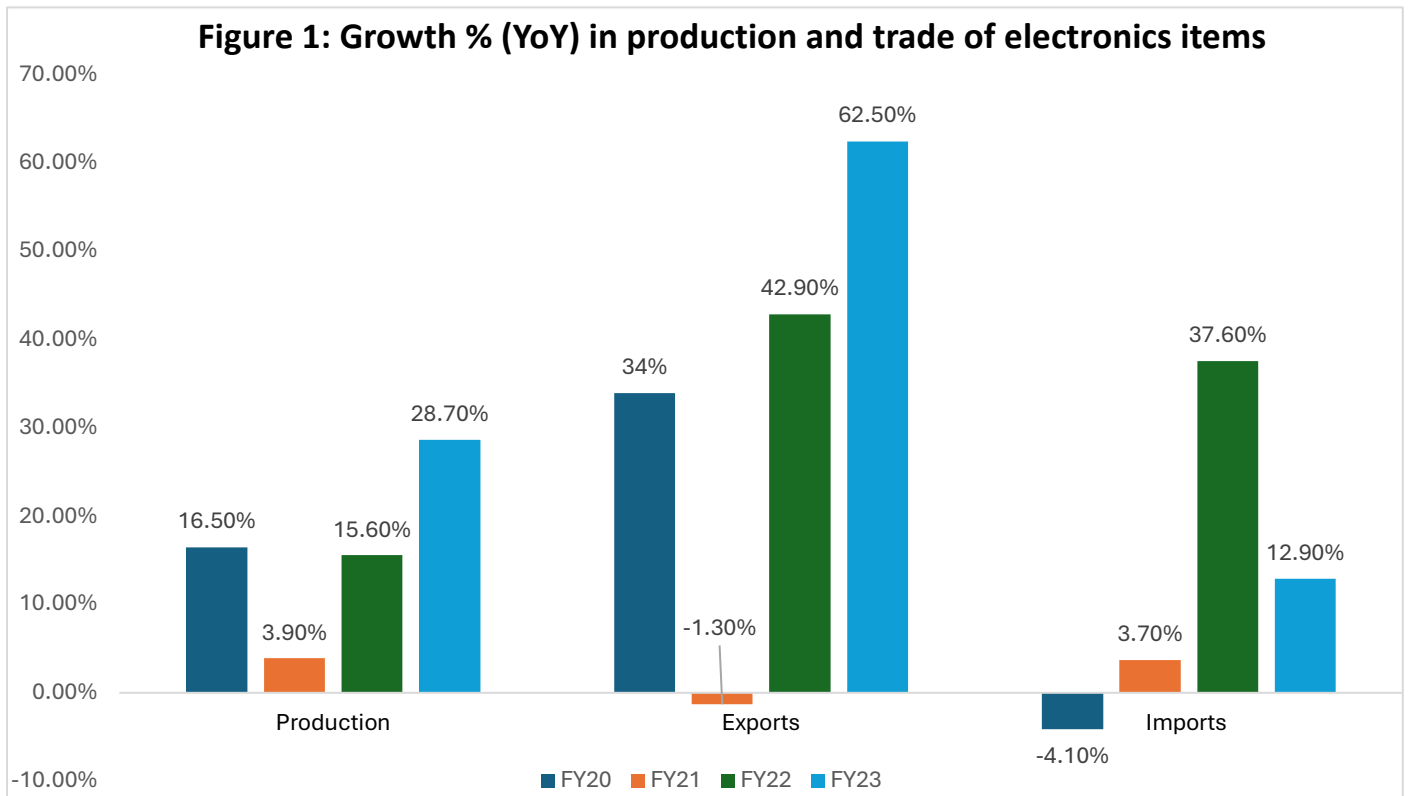
Source: [https://sicci.in/pdf/reports/663b5403c4659Indian%20Electronics%20Industry%20-%20Final%20Report%20\(2\).pdf](https://sicci.in/pdf/reports/663b5403c4659Indian%20Electronics%20Industry%20-%20Final%20Report%20(2).pdf)

## Domestic Market

### Growth-Drivers of Change

India's electronics manufacturing sector has experienced significant growth since 2014, accounting for an estimated 3.7 per cent of the global market share in FY22. At the same time, the industry contributed 4 per cent to India's total GDP in FY22, which fell down to 3.4 per cent in FY23<sup>3</sup> and 3 per cent to FY24<sup>4</sup>. As per the RBI Bulletin, July 2024, the value of production in electronic industry surged from US\$ 37 billion in 2015-16 to US\$ 115 billion in 2023-24. The goal is to triple it by 2025-26.

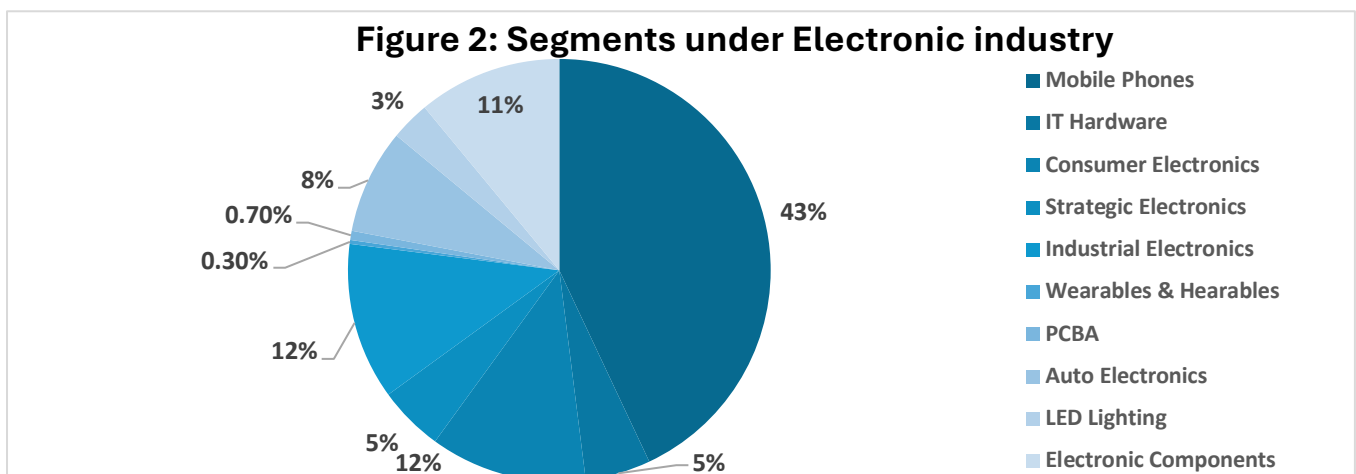
India has seen a significant increase in domestic value addition (DVA), employment, wages, and salaries in mobile manufacturing segment since FY17. The direct workforce in the production of mobile phones has more than tripled between FY17 to FY22, particularly benefiting female blue-collar workers. Wages and salaries increased by 317 per cent and the share of DVA in mobile phone output rose from an average of 8.7 per cent in FY17 to FY19 to 22 per cent in FY20 to FY22, indicating considerable rise in local participation.<sup>5</sup>



Source: Ministry of Electronics and Information Technology (MEITY)

In FY23, the domestic production stood at US\$ 101 billion (in value) and is segmented as mobile phones, IT hardware, consumer electronics, strategic electronics, industrial electronics, wearables & hearables, printed circuit board assembly (PCBA), auto electronics, led lighting, and electronic components. The CAGR in the production of electronics goods from FY18 to FY23 was 16.19 per cent, while the exports increased by 35.7 per cent in the same period.<sup>6</sup> As per the Ministry of Electronics and Information Technology (MeitY), India's electronics production is projected to reach US\$ 300 billion in value terms by FY26.

The Niti Ayog Report of July 2024 demonstrated that India's electronics sector has experienced rapid growth, reaching US\$ 155 billion in FY23. The production nearly doubled from US\$ 48 billion in FY17 to US\$ 101 billion in FY23, driven primarily by mobile phones, which now constitute 43 per cent of total electronics production<sup>7</sup>.



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

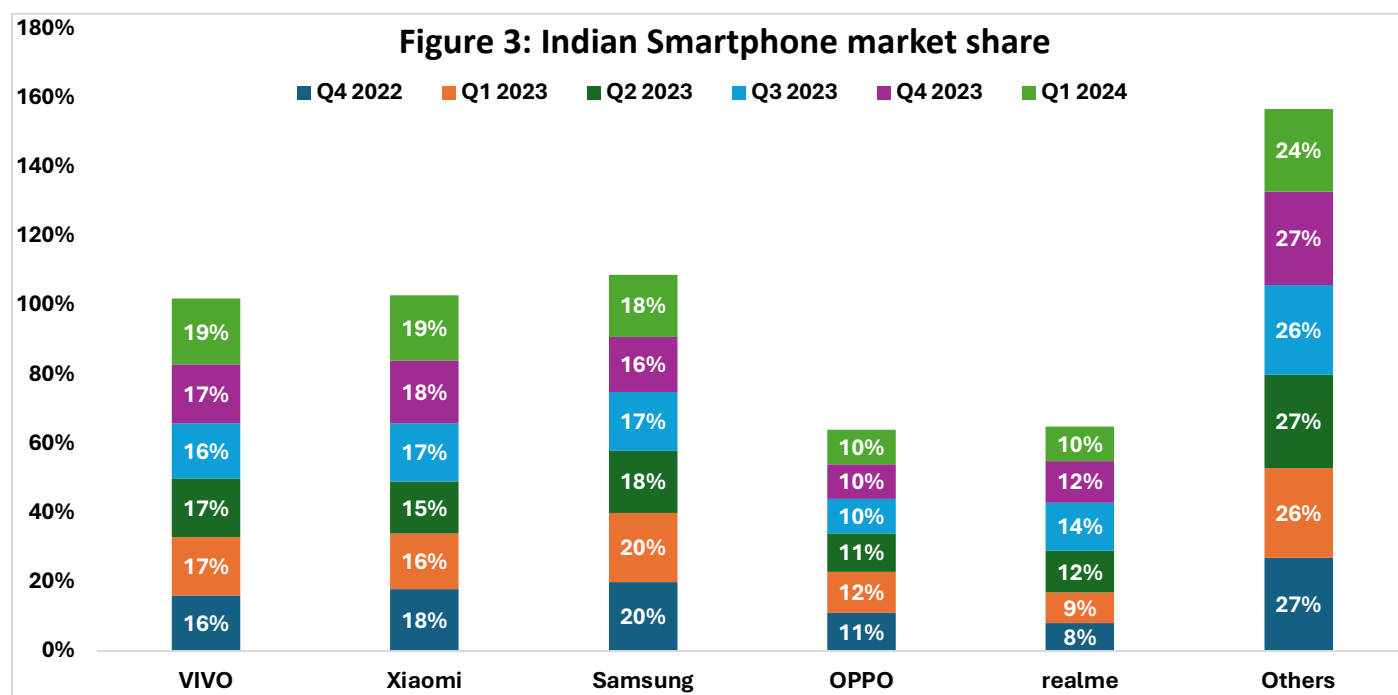
## Mobile Phone market

As seen in the figure above, the production of phones makes up nearly half of India's electronics industry. India's smartphone shipments in Q1 2024 (January-March) grew 8 per cent YoY in terms of volume and 18 per cent in terms of value. The volume growth was primarily driven by healthy inventory levels and the low base of Q1 2023.<sup>8</sup>

In 2015-16, India imported almost four-fifths of its phones. India has majorly reduced its import dependence in terms of mobile phones and producing 99 per cent of it domestically. In 2023-24, it exported US\$ 15.6 billion of mobile phones, out of which US\$ 1.5 billion in April 2024. For instance, Apple sources about one in seven of its iPhones from India, double what it did a year ago. Samsung, a South Korean rival, has its largest phone-making facility in India.<sup>9</sup>

In the June 2024 quarter, smartphone sales slowed down amid heatwaves and the general elections, building an inventory pileup even as the shipments fell by one to two per cent during the period, according to market trackers. The sales in June 2024 were only better because brands aggressively provided discounts and promotions.

The 5G smartphone shipments captured their highest-ever share of 71 per cent in volume terms. The premium segment (> ₹ 30,000) reached 20 per cent volume share, its highest ever. During Q1 2024, the offline share reached 64 per cent, marking the highest quarterly post-COVID figure. India Q1 2024 smartphone market share rankings (based on shipments) are provided in the following image.<sup>10</sup>



Source: Counterpointresearch.com

During the Union Budget FY25, the Finance Minister, Smt. Nirmala Sitharaman, announced a reduction in the basic custom duties (BCD) from 20 per cent to 15 per cent, for smartphones, chargers, and printed circuit boards (PCBs). She said, "With a three-fold increase in domestic production and almost 100-fold jump in exports of mobile phones over



the last six years, the Indian mobile phone industry has matured”. This reduction of 5 per cent will lead to more production domestically and reduce prices for the consumers.<sup>11</sup> But the experts believe that this would only create a markup of 1-2 per cent on the final price.

### Snapshot

- Countries like China, Taiwan, the USA, South Korea, Vietnam, and Malaysia make up the US\$ 4.3 trillion global electronic market. India’s electronic market represents just a 3.3 per cent of the global market, which is very small.
- As per the RBI Bulletin, July 2024, the value of production in electronic industry surged from US\$ 37 billion in 2015-16 to US\$ 115 billion in 2023-24 with the goal of tripling it by 2025-26.
- The CAGR in the production of electronics goods from FY18 to FY23 was 16.19 per cent, while the exports increased by 35.7 per cent in the same period.
- Production nearly doubled from US\$ 48 billion in FY17 to US\$ 101 billion in FY23, driven primarily by mobile phones, which now constitute 43 per cent of total electronics production.
- During June 2024, electronic goods exports were recorded at US\$ 2.82 billion as compared to US\$ 2.42 billion during June 2023, registering a growth of 16.91 per cent.
- In 2015-16, India imported almost four-fifths of its phones. India has majorly reduced its import dependence in terms of mobile phones and producing 99 per cent of it domestically.
- During the Union Budget FY25, the finance minister Smt. Nirmala Sitharaman, announced a reduction in the basic custom duties (BCD) from 20 per cent to 15 per cent, for smartphones, chargers, and printed circuit boards (PCBs).
- India's electronic exports to the US have transitioned from a trade deficit of US\$ 0.6 billion in FY17 to a trade surplus of US\$ 8.7 billion in FY24.
- Presently, electronic components constitute 10 per cent of the India’s electronic exports as compared to 30-50 per cent for China and Vietnam.

### Production

The domestic production of electronic items increased significantly to ₹ 8.22 lakh crore, while exports rose to ₹ 1.9 lakh crore in FY23. The rise in India's domestic smartphone demand is also a key factor in companies' decisions to invest, e.g., Apple assembled 14 per cent of its global iPhones in India in FY24. Foxconn invested in the states of Karnataka and Tamil Nadu to set up new manufacturing plants for components. Asia is the primary beneficiary of shifting supply chains, where India has received the most benefit from firms (28 out of 130 firms) regarding setting up or expanding production facilities, followed by Vietnam, Mexico, Thailand, Malaysia, and Indonesia. Countries like China, Taiwan, the USA, South Korea, Vietnam, and Malaysia make up the US\$ 4.3 trillion global electronic market.

In the electronics sector, there is a focus on smartphone manufacturing and assembly. The Government's PLI scheme, including tax breaks and subsidies, plays a significant role in attracting companies. For instance, India's electronic exports to the US have transitioned from a trade deficit of US\$ 0.6 billion in FY17 to a trade surplus of US\$ 8.7 billion in FY24, underscoring a significant increase in value addition. Within the electronics sector, the mobile phones category experienced the most growth, with exports to the US rising from US\$ 2.2 billion in FY23 to US\$ 5.7 billion in FY24.<sup>12</sup>

**Table 1: Production of Consumer Electronics (2011-12 to 2023-24)**

Year	TV set	Telephones and mobile instruments	Watches, automatic/quartz	Watches, scientific/digital & special purpose	Electronic games & toys
	'000 nos.	'000 nos.	'000 nos.	₹ million	₹ million
2011-12	6,446.10	22,788.90	28,284.00	307.8	354.7
2012-13	6,561.50	35,611.10	29,732.30	292	463
2013-14	6,068.00	42,561.80	27,851.60	379	491
2014-15	7,097.90	41,715.90	26,503.20	465	541
2015-16	6,280.90	53,939.40	26,457.90	410	792
2016-17	5,849.00	65,087.10	29,449.00	350	946
2017-18	5,260.40	67,205.80	33,390.80	420	974
2018-19	3,315.80	65,918.70	39,843.20	519	997
2019-20	2,252.30	73,124.30	40,540.30	535	929
2020-21	2,200.10	58,886.40	19,533.20	309	74
2021-22	2,904.50	55,330.00	27,165.30	575	107
2022-23	2,880.00	56,773.30	31,989.40	765	117
2023-24	2,759.70	47,313.50	33,030.60	793	116

Source: CMIE (Centre for Monitoring Indian Economy) data base

## Trade

Since the initiation of the process of extensive economic reforms and Structural Adjustment Programme from 1991, efforts were made at tariff liberalisation, relaxing industrial licensing and reducing excise duties. Such measures, however, failed to discernibly enhance competition and productivity in the electronic hardware industry<sup>13</sup>. A report entitled 'Globalise to Localise: Exporting at Scale and Deepening the Ecosystem are Vital to Higher Domestic Value Addition' by Indian Council for Research on International Economic Relations (ICRIER), in collaboration with India Cellular and Electronics Association (ICEA) explored and examined the possibility of India reaching electronics production target of US\$300 billion and exports of US\$ 120 by 2025-26<sup>14</sup>. But we have still to traverse a fair way to go to accomplish this objective by much higher public fund outlay for research and development (R & D) aimed at subsidising the cost of commercialising new innovations and expanding the market for domestic electronics products by interlinking the demands of upstream industries with downstream manufacturers through incentives.

During June 2024, electronic goods exports were recorded at US\$ 2.82 billion as compared to US\$ 2.42 billion during June 2023, registering a growth of 16.91 per cent.<sup>15</sup> India's share in world electronics exports (captured by incorporating HS chapters 84, 85, and 90) has improved from 0.63 per cent in 2018 to 0.88 per cent in 2022<sup>16</sup>. The share of electronics goods in merchandise exports of India rose from 2.7 per cent in FY19 to 6.7 per cent in FY24.

India's enhanced global supply chain participation is manifested in increased investment by foreign firms in electronics. In the last five years, there has been a radical shift in the global manufacturing landscape. Big multinational corporations (MNCs), such as Apple, have made

it their mission to "de-risk" their supply chains in China, which was formerly referred to as the "world's factory."

This shift is primarily due to disruptions caused by Covid-19, growing tensions between the US and China, and rising costs of doing business in China. Evidently, India has reaped the benefit of this situation in the post covid era.

## Industry Risk

### High Import dependency

It has been demonstrated *"the Indian electronics industry's high dependence on imports can be directly linked to trade and investment policy liberalisation, in the absence of vertical industrial policy measures to improve productivity and capabilities"* <sup>17</sup>. Accordingly, the Union Cabinet chaired by the Prime Minister, Shri Narendra Modi approved the introduction of the Production-Linked Incentive (PLI) Schemes for Large Scale Electronics Manufacturing and IT Hardware for Enhancing India's Manufacturing Capabilities and Enhancing Exports as a part of the Atmanirbhar Bharat mission. The Ministry of Commerce and Industry, in a Press Note dated December 15, 2021, stressed *"to support and expand domestic capacities, Government has implemented policies to promote domestic manufacturing like the production linked incentive (PLI) schemes in line with Atmanirbhar Bharat policy."*

The Confederation of All India Traders (CAIT) brought out that the core sectors, where Chinese goods have been replaced by Indian goods are FMCG goods, consumer durables, toys, consumer electronics, electrical appliances, kitchen articles and accessories, gift items, personal consumables, confectionary items, home furnishing, tapestry, utensils, footwear, watches, furniture and fixtures, garments, etc. In response to the strident calls for the 'boycott of Chinese goods', and to position India as a global hub for Electronics System Design and Manufacturing (ESDM), the PLI Scheme for Large Scale Electronics Manufacturing, Production Linked Incentive Scheme (PLI) for IT Hardware, Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS) and Modified Electronics Manufacturing Clusters Scheme (EMC 2.0) have been notified.

PLI Scheme for Large Scale Electronics Manufacturing provides an incentive of 4 per cent to 6 per cent to eligible companies on net incremental sales (over base year) involved in mobile phone manufacturing and manufacturing of specified electronic components, including Assembly, Testing, Marking and Packaging (ATMP) units, for a period of five years. PLI for IT Hardware provides an incentive of 4 per cent to 2 per cent / 1 per cent on net incremental sales (over base year) of goods manufactured in India and covered under the target segment, to eligible companies, for a period of four years. The Target Segments under PLI Scheme include (i) laptops (ii) tablets and (iii) all-in-one PCs.

In this overall context, several companies have adopted a **‘China plus one strategy’** to reduce their reliance on China for high-tech electronic products and components to reduce concentration risk, the element of skew and as a measure of abundant caution.

This approach involves supply chain decisions to decrease their risk exposure to China. Similar to, how East Asian economies did in the past and following suit with Brazil, Türkiye, and many European nations<sup>18</sup>, focusing on foreign direct investment (FDI<sup>i</sup>) from China rather than just integrating into China's supply chain or creating a balance between the two approaches seem more promising for boosting India's exports to the US. This is also because China is India's top import partner, and the trade deficit with China has been growing. As the US and Europe shift their immediate sourcing away from China, it is more effective to have Chinese companies invest in India and then export the products to these markets rather than importing from China, adding minimal value, and then re-exporting them.



## Institutional Initiatives - Recalibrating Growth

The levels of electronic industry are sequential and interrelated. Accordingly, there have been a slew of initiatives by the Government, State Governments, industry associations and

<sup>i</sup> 100% FDI is allowed under the automatic route. In the case of defence electronics, FDI up to 49% is allowed through automatic route and beyond 49% requires government approval.



other stakeholders to propel the electronic industry in India to a higher and more sustainable growth trajectory by measures all along the line <sup>19</sup>. Salient features of some of the strategically significant industry Schemes are highlighted below.

The Semicon India Program with an incentive outlay of ₹ 10 billion was launched to develop India as a global hub for semiconductor and display manufacturing, promote self-reliance, strengthen resilience in global supply chains, and pave the way for India's technological leadership in the industry.

The Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS) provides financial incentive of 25 per cent on capital expenditure for the identified list of electronic goods that comprise downstream value chain of electronic products, i.e., electronic components, semiconductor / display fabrication units, ATMP units, specialized sub-assemblies, and capital goods for manufacture of these goods. Electronics Manufacturing Clusters (EMC) Scheme was notified in 2012 to provide support for creation of world-class infrastructure along with common facilities and amenities for attracting investment. Under the Scheme, 19 Greenfield EMCs and 3 Common Facility Centres (CFCs) measuring an area of 3,464 acres with total project cost of ₹ 3,732 crore including Government Grant-in-aid of ₹ 1,529 crore have been approved.

Modified Electronics Manufacturing Clusters (EMC 2.0) Scheme provides support for creation of world class infrastructure along with common facilities and amenities, including Ready Built Factory (RBF) sheds / Plug and Play facilities for attracting major global electronics manufacturers along with their supply chain to set up units in the country. The Scheme provides financial assistance for setting up of both EMC projects and Common Facility Centres (CFCs) across the country.

The Union Cabinet approved the comprehensive program with an outlay of ₹ 76,000 crore (> US\$ 10 billion) on 15 December 2021 for the development of robust and sustainable Semiconductor and Display ecosystem in India.

As per extant Foreign Direct Investment (FDI) policy, FDI up-to 100 per cent under the automatic route is permitted for electronics manufacturing (except from countries sharing land border with India), subject to applicable laws / regulations, security, and other conditions.

Electronics Development Fund (EDF) has been set up as a "Fund of Funds" to participate in professionally managed "Daughter Funds" which in turn will provide risk capital to startups and companies developing new technologies in the area of electronics and Information Technology (IT). This fund is expected to foster R&D and innovation in these technology sectors.

Phased Manufacturing Programme (PMP) has been notified to promote domestic value addition in mobile phones and their sub-assemblies / parts manufacturing. Hence, India has rapidly started attracting investments into this sector and significant manufacturing

capacities have been set up in the country. The manufacturing of mobile phones has been steadily moving from Semi Knocked Down (SKD) to Completely Knocked Down (CKD) level, thereby progressively increasing the domestic value addition.

Tariff Structure has been rationalized to promote domestic manufacturing of electronic goods, including, inter-alia, Cellular mobile phones, Televisions, Electronic components, Set Top Boxes for TV, LED products and medical electronics equipment.

Notified capital goods for manufacture of specified electronic goods are permitted for import at “NIL” Basic Customs Duty.

The import of used plant and machinery with a residual life of at least five years for use by the electronics manufacturing industry has been simplified through the amendment of Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 in 2018. The Department of Revenue amended the provision relaxing the ageing restriction from 3 years to 7 years for specified electronic goods manufactured in India and re-imported into India for repairs or reconditioning.

In an attempt to encourage “Make in India” and to promote manufacturing and production of goods and services in India with a view to enhancing income and employment, the Government has issued Public Procurement (Preference to Make in India) Order 2017.

In this context, MeitY has notified mechanism for calculating local content for 13 Electronic Products viz., (i) Desktop PCs, (ii) Thin Clients, (iii) Computer Monitors, (iv) Laptop PCs, (v) Tablet PCs, (vi) Dot Matrix Printers, (vii) Contact and Contactless Smart Cards, (viii) LED Products, (ix) Biometric Access Control / Authentication Devices, (x) Biometric Finger Print Sensors, (xi) Biometric Iris Sensors, (xii) Servers, and (xiii) Cellular Mobile Phones, for procurement to be made from local suppliers.

MeitY has notified “Electronics and Information Technology Goods (Requirement of Compulsory Registration) Order, 2012” for mandatory compliance to ensure safety of Indian citizens by curbing import of substandard and unsafe electronic goods into India. 63 Product Categories have been notified under the CRO and the order has come into effect for all the notified product categories.

The project for “Establishment of Gallium Nitride (GaN) Ecosystem Enabling Centre and Incubator for High Power and High Frequency Electronics” has been approved. The project is being implemented by Society for Innovation and Development (SID), Centre for Nano Science and Engineering (CeNSE), IISc Bengaluru.

### **The Diagnosis and the Prognosis**

The National Policy on Electronics (NPE, 2019) aims to make India a global hub of electronic system design and manufacturing (ESDM). It estimates that about 10 million jobs will be created as a result of the implementation of NPE. The NPE 2019 has set some ambitious targets: production of 1.0 billion mobile phones by 2025, valued at US\$ 190 billion including 600 million (approx. \$ 110 billion) for export.

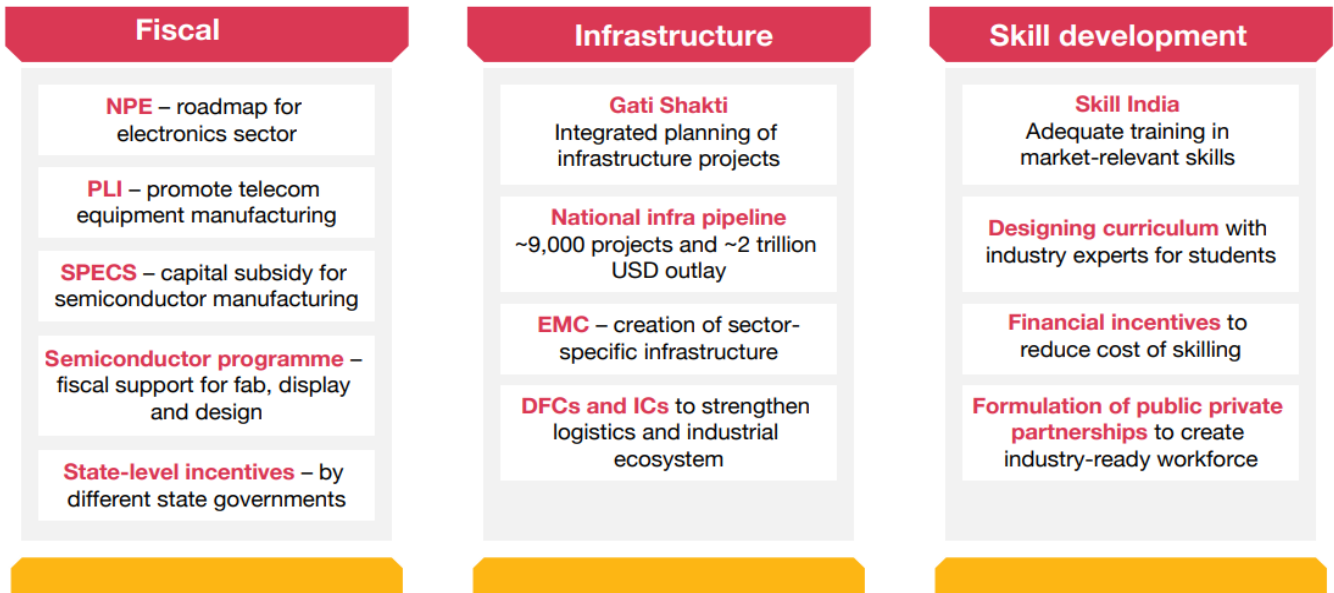
Risks	Institutional support by Gol
<p><b>Component shortage/Import dependency</b> - supply chain interruptions causing a scarcity of electronic components and stopping component production in a number of industries, including healthcare and automobile.</p>	<p>The government of India and MeitY have developed a program called 'Semicon' - a program aimed at attracting semiconductor companies, such as Intel, AMD, etc., to fabricate and manufacture electronic chips in India under 'make in India' scheme.</p> <p>DIR-V program - partnership between startups, academia, and MNCs to support shortage of RISC-V server development.</p> <p>Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS)</p>
<p><b>Increasing demand for skilled labour</b> - to support the semiconductor manufacturing units, there is a demand for 10,000-13,000 skilled semiconductor engineers, which is to be met by 2027.</p>	<p>The Indian government, through various incentive schemes, has also provided an outlay of ₹ 760 billion for electronic manufacturing in India.</p> <p>The PLI scheme for Large Scale Electronics Manufacturing, IT Hardware, SPECS, Semicon, and Modified Electronics Manufacturing Clusters Scheme (EMC 2.0).</p> <p>Cabinet approves Production Linked Incentive Scheme – 2.0 for IT Hardware. budgetary outlay - ₹ 17,000 crore. Tenure - 6 years. Application of 27 IT Hardware manufacturers have been approved in May 2024. IT Hardware of well-known brands such as Acer, Asus, Dell, HP, Lenovo, etc. will be manufactured in India.</p>
<p><b>For specified telecom and networking products</b> - These are allied services needed to support the ESDM industry.</p>	<p>Gol introduced another PLI scheme for goods such as core transmission equipment, 4G/5G, next generation radio access network and wireless equipment, access, and customer premises equipment (CPE), IoT access devices and other wireless equipment and enterprise equipment (switches and routers)</p>
<p><b>Ease of doing business</b> - Initiatives like Make in India and Digital India, improved infrastructure, and ease of doing business, supported by various incentives, have stimulated domestic manufacturing, and attracted foreign investments. Despite these strides, India's electronics market</p>	<p>To enhance competitiveness, India needs to localize high-tech components, strengthen design capabilities through R&amp;D investments, and forge strategic partnerships with global technology leaders.</p>

<p>remains relatively moderate, accounting for only 4 per cent of the global market. India was ranked 63rd in the rank of Ease of doing business index in the latest report of 2020.</p>	
<p><b>High capital cost</b> - the increase in import duty has worked for the final products but not for the components as its scale of production cannot be met just by domestic demand. Also, India has a vast variety of tax slabs along with a variety of surcharges making the capital cost to go even higher at times.</p>	<p>During the Union Budget 2024-2025, the finance minister Smt. Nirmala Sitharaman, announced a reduction in the basic custom duties from 20 per cent to 15 per cent, for smartphones, chargers, and printed circuit boards (PCBs). Currently, imported smartphones sold in India attract 18 per cent GST and 22 per cent customs duty (20 per cent basic and 2 per cent surcharge). The surcharge, which is 10 per cent of the basic customs duty, will remain. After the cut, the total customs duty is now 16.5 per cent (15 per cent basic and 1.5 per cent surcharge). For India-made phones, only GST at 18 per cent is levied.</p>
<p><b>Inadequate Infrastructure facility</b> - Indian ESDM market is lagging its Asian counterparts, in terms of logistics, underdeveloped inner roads &amp; delays at ports, high cost of land leases, etc.</p>	<p>In 2024, Prime Minister Narendra Modi laid the foundation for three semiconductor plants worth over ₹ 1.25 lakh crore. - PM Modi laid the foundation stone of the chip fabrication unit of Tata- Powerchip Semiconductor Manufacturing Corp at Dholera. It is India's first commercial semiconductor fabrication facility. He also inaugurated the CG Power – Renesas outsourced assembly and test (OSAT) facility at Sanand (Gujarat) and the Tata OSAT unit at Morigaon (Assam).</p> <p><b>Modified Programme for Semiconductors and Display Fab Ecosystem (M-SIPS)</b>- Fiscal support of 50 per cent of Project Cost on pari-passu basis for all technology nodes under Scheme for Setting up of Semiconductor Fabs in India, Fiscal support of 50 per cent of Project Cost on pari-passu basis under Scheme for Setting up of Display Fabs, Fiscal support of 50 per cent of Capital Expenditure on pari-passu basis under Scheme for Setting up of Compound Semiconductors / Silicon Photonics / Sensors Fab and Semiconductor ATMP /OSAT facilities in India. Additionally, target</p>

	<p>technologies under the Scheme will include Discrete Semiconductor Fabs.</p> <p>Some of the most significant uses of technology have been through PM Gati Shakti, Bhuvan, Bharat Maps, Single Window Systems, PARIVESH portal, National Data Analytics Platform, Unified Logistics Interface Platform, Pro-Active Governance and Timely Implementation (PRAGATI), India Investment Grid (IIG) and many similar dashboards and data stacks for almost all ministries.</p> <p>The Government, in August 2023, approved the extension of the Digital India programme with a total outlay of ₹ 14,903.25 crore during the period of the 15th Finance Commission i.e., 2021-22 to 2025-26.</p>
<p><b>Lack of innovation - India's expenditure on R&amp;D is below 1 per cent of GDP.</b></p>	<p>Electronics Development Fund (EDF) has been set up as a "Fund of Funds" to participate in professionally managed "Daughter Funds," which in turn will provide risk capital to startups and companies developing new technologies in the area of electronics and Information Technology (IT). By March 2023, ₹ 409 crore has been committed through EDF to nine Daughter Funds with a targeted corpus of ₹ 2,626 crore.</p> <p>The three-day GPAI Summit in New Delhi; More than 150 startups and major tech companies displayed their AI applications and products in the Global AI Expo.</p> <p>The GoI is also encouraging R&amp;D in high value segments of the value chain, such as AMOLED displays, OLED lighting, and OPV products. Projects such as 'Next Generation AMOLED displays, OLED lighting and OPV products: Development of disruptive technologies' aim to enable cost effective electronic component manufacturing in India. The initiative is being implemented by IIT Madras with a total budget of ₹ 356.3 million.<sup>20</sup></p>



## Three pillars under the integrated approach undertaken by the Gol in the electronics sector



Source: PwC report July 2023.

The pathway to the future requires significantly enhancing the proportion of Indian electronics products in relation to global brands, manufacturing related cost disabilities compared to rival economies like China, Vietnam and Mexico (10-20 per cent), reducing tariffs on import of components for electronic products in line with competing electronics hubs like China and Vietnam, the need for big domestic manufacturing corporations, developing a robust ecosystem, including domestic design ecosystem, of locally manufacturing components, ancillary suppliers required for electronic products and reducing procedural land acquisition hassles in quickly establishing a manufacturing unit.

Striking the right notes aimed at promoting enabling initiatives, e.g., buildings and dormitories to manufacturers, and governmental support in meeting the regulatory compliances, signing Free Trade Agreements with developed countries, reduced duty structures and tax levies, considering income tax holidays like Vietnam, promoting chip manufacturing in a big way, emulating global quality, making products repairable and upgradable and factoring in the entire lifecycle of a product in the decision-making matrix are manifestly needed. There are also issues of an enabling ecosystem for the components and sub-assemblies, minimizing waste, maximizing resource efficiency, cyber-security, lean capabilities to maintain inventory with changing demand, integrating components of the value chain with technological know-how, integrating into global value chains (GVCs) and cooperative collaboration with the state governments and the private sector to increase production and exports and high R&D investment for salubrious development of the sector.

## Way Forward - Transcending Frontiers

The goal of achieving US\$ 150 billion in component production by FY30 is ten times higher than the actual production value. Lately, India has prioritized increasing assembly capacity, but the next stage of the country's electronics manufacturing industry should push

manufacturers into value chain localization of component manufacturing to increase their skills and capture value. Presently, electronic components constitute 10 per cent of the India's electronic exports as compared to 30-50 per cent for China and Vietnam.<sup>21</sup>

Furthermore, at every stage of inter-governmental or foreign investor negotiations, it is important for the government, both the Centre and state, to ensure that manufacturers do not look at India merely for assembling products, but leverage policy incentives in the country to integrate Indian firms into their value chains to help meet their current and future production goals with improved efficiency or quality. These and other measures will strengthen India's electronics manufacturing capabilities, enabling it to be self-sufficient and deeply integrated into GVCs and help to successfully meet transformative changes in conformity with transforming eco-system, technology, price points, and customer needs and expectations. *“Don't get excited about a new technology; instead, get excited if your particular technology addresses customer problems better than any other solution.”*

International firms should also be encouraged to actively engage with Indian start-ups in their India activities to foster the fundamental building blocks of innovation, digital transformation, e-commerce sustainability, and support the localization of value chains. Surging consumer electronics, industrial sector, power electronics, renewable energy sector, automotive sector, telecom, work-from-home sector, digital infrastructure, strategic manufacturing, components, medical electronics, etc. provide tailwinds to electronics manufacturing. While new disruptive technologies, such as, artificial intelligence, machine learning, Internet of things (IoT) and edge computing will create demand for new products, leveraging such opportunities requires enhanced efficiency, precision, and reliability with cutting-edge technology designed to meet a more customizable and real-time domain solution that may not be easily available in the market.

Given the magnitude of the formidable challenge, there cannot be a business as usual or a more of the same approach but there has to be a paradigm shift in the electronics sector ecosystem from an 'import dependent assembly led manufacturing' to 'component level value-added manufacturing'. A report by Confederation of Indian Industry (CII) brought out that in 2023, the demand for components and sub-assemblies stood at US\$ 45.5 billion to support US\$ 102 billion worth of electronics production. This demand could surge to US\$ 240 billion to support the US\$ 500 billion worth electronics production by 2030. The priority components and sub-assemblies including PCBAs (Printed Circuit Board Assembly), are projected to grow at a robust CAGR (Compounded Annual Growth Rate) of 30 per cent, reaching US\$ 139 billion by 2030.

The report recommended the government to initiate a slew of action, including a scheme to provide fiscal support, introduction of SPECS 2.0 (Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors), rationalization of import tariffs on components like camera modules, and signing of FTAs with European and African countries. The Report identified 5 priority components/sub-assemblies of batteries (lithium-ion),

camera modules, mechanicals, displays, and PCBs (Printed Circuit Board). These items cumulatively accounted for 43 per cent of the components demand in 2022 and are expected to grow to US\$ 51.6 billion by 2030. These components have either nominal production in India or are heavily import-dependent. Similarly, PCBA is a high potential category since most of the demand is met by imports. Steady development of the components and sub-assemblies' ecosystem could lead to job creation of about 2.8 lakhs by 2026, increase in domestic value addition from the current levels, reduction in import dependency, and increase in GDP in India.

The time is now apposite for India to bolster its electronics hardware manufacturing capabilities in tandem with software development to emerge as a factory of the world. This is a tall order and necessitates *inter-alia* coordination and collaboration with other growth sectors to significantly upscale production and exports in volume and value terms as partners in development. Such practical strategies and cutting-edge knowledge can transform the growth strategy focused on maximizing both production and productivity and bring about a paradigm shift from mere production to high value productions and from outlay to outcome.

*Where do we go from here?* Leveraging firm-specific and industry-wise data, greater real-time visibility, streamlining the production and distribution process and progressively greater use of cutting-edge technologies are of considerable contemporary significance in this disruptive time—a time of tectonic shift, churn, and volatility. It is also necessary to effectively adopt new capabilities requiring collaboration with IT and data management and precisely forecast future sales to raise the bar by optimized speed, efficiency, and production savings to reach the inflection point.

Creating exciting new possibilities in the electronics space is a tall order and requires synchronized measures on multiple fronts, including investing in multiple products ahead of the curve and creating the foundation for future growth. Such fronts include trade, FDI, technology, taxation, infrastructure development, enterprise resource planning (ERP), SWOT (strengths, weaknesses, opportunities and threats) analysis, accelerated time to market and effecting mid-course corrections, as and when necessary to discover new perspectives, to enhance consumer protection and better customise their products to meet varying customer needs and expectations.

In the ultimate analysis, the process of technological modernisation, generation of new and stable revenue streams, and convergence has to be pursued in the broader context of changes in products, structure, processes, top-of-the-line customer service, productivity, environmental protection, and education and skill development, transformed mind-set, and introduction of advanced management practices to move to a higher and more sustainable growth path and firmly position India as a global hub for electronics manufacturing. As Neil Armstrong, Astronaut stressed, *“it’s human nature to stretch, to go, to see, to understand. Exploration is not a choice, really; it’s an imperative.”*

## References

- <sup>1</sup> [https://www.niti.gov.in/sites/default/files/2024-07/GVC%20Report\\_Updated\\_Final\\_11zon.pdf](https://www.niti.gov.in/sites/default/files/2024-07/GVC%20Report_Updated_Final_11zon.pdf)
- <sup>2</sup> [https://sicci.in/pdf/reports/663b5403c4659Indian%20Electronics%20Industry%20-%20Final%20Report%20\(2\).pdf](https://sicci.in/pdf/reports/663b5403c4659Indian%20Electronics%20Industry%20-%20Final%20Report%20(2).pdf)
- <sup>3</sup> [https://www.ibef.org/exports/electronic-and-computer-software-industry-in-india#:~:text=Introduction,Gross%20Domestic%20Product%20\(GDP\).](https://www.ibef.org/exports/electronic-and-computer-software-industry-in-india#:~:text=Introduction,Gross%20Domestic%20Product%20(GDP).)
- <sup>4</sup> Monthly bulletin of RBI, July 2024. Link: <https://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs/0BULLETINJULY18072024C1D39FE2E7AB4F8893C8E207C7818398.PDF>
- <sup>5</sup> Veeramani, C. (2024 forthcoming) "Gains from Mobile Phone Manufacturing in India through Backward Participation in Global Value Chains", Centre for Development Studies (CDS), Thiruvananthapuram, India
- <sup>6</sup> <https://www.indiabudget.gov.in/economicsurvey/doc/eschapter/echap10.pdf>
- <sup>7</sup> [https://www.niti.gov.in/sites/default/files/2024-07/GVC%20Report\\_Updated\\_Final\\_11zon.pdf](https://www.niti.gov.in/sites/default/files/2024-07/GVC%20Report_Updated_Final_11zon.pdf)
- <sup>8</sup> <https://www.counterpointresearch.com/insights/india-smartphone-share/>
- <sup>9</sup> Monthly bulletin of RBI, July 2024. Link: <https://rbidocs.rbi.org.in/rdocs/Bulletin/PDFs/0BULLETINJULY18072024C1D39FE2E7AB4F8893C8E207C7818398.PDF>
- <sup>10</sup> <https://www.counterpointresearch.com/insights/india-smartphone-market-q1-2024/#:~:text=In%20Q1%202024%2C%20India's%205G,highest%20quarterly%20post%2DCOVID%20figure.>
- <sup>11</sup> <https://www.timesnownews.com/technology-science/budget-2024-smartphone-prices-in-india-set-to-decrease-heres-what-the-industry-experts-say-article-111953542>
- <sup>12</sup> Economic survey 2024, link: <file:///C:/Users/priyansha.pushkar/Downloads/Economic%20Survey%20Complete%20PDF.pdf>
- <sup>13</sup> Majumdar, Rumki (2010): "Indian Electronics Hardware Industry: Growth and Productivity (1993–2004)," *Economic & Political Weekly*, Vol 45, No 14, pp 72–77.
- <sup>14</sup> Deepak Mishra & Neha Gupta & Sanya Dua & Sanjna Agarwal, 2022. "Globalise to Localise: Exporting at Scale and Deepening the Ecosystem are Vital to Higher Domestic Value Addition in Electronics," Indian Council for Research on International Economic Relations (ICRIER) Report 22-r-07, Indian Council for Research on International Economic Relations (ICRIER), New Delhi, India.
- <sup>15</sup> <https://www.investindia.gov.in/sector/electronic-systems>
- <sup>16</sup> Based on ITC trade map.
- <sup>17</sup> Francis, Smitha. (2018). "India's Electronics Manufacturing Sector Getting the Diagnosis Right". *Economic & Political Weekly (EPW)*, August 25. Volume 111, no 34
- <sup>18</sup> 'Europe's Response to China Shock 2.0: Hold China Closer', *Wall Street Journal*, 23 June 2024 <https://tinyurl.com/j8trksxv>
- <sup>19</sup> NITI Aayog (2016): "Make in India Strategy for Electronic Products," Government of India, New Delhi.
- <sup>20</sup> MeitY Annual Report 2022-23.
- <sup>21</sup> [https://www.niti.gov.in/sites/default/files/2024-07/GVC%20Report\\_Updated\\_Final\\_11zon.pdf](https://www.niti.gov.in/sites/default/files/2024-07/GVC%20Report_Updated_Final_11zon.pdf)