A Study of Indian Electronic Industry in Domestic and Global Context

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Abstract
The current era is the era of technology, every activity from home to business is done with the help of technology. As per the increase in the use and application of technological devices whether computers, mobile devices, heavy machines, it is concluded that the domestic and global market can see the heavy demand forelectronic products. Also, the initiative of Digital India is promoted with great zeal by the government keeping in mind the need and dependency ontechnology and electronic products. This paper studies the current status of the Indian Electronic Industry concerning its production, employment, export, export potential, and the initiatives taken by the government. In this paper, it is highlighted that the production trend is positive for electronic goods but the trade balance is negative. Though, production is greater than their imports, still the country is lacking behind to increase their exports.Thus, to capture the big share of the market domestically as well as globally by becoming a giant in the manufacturing of electronic products, to make India 'AatmaNirbhar' which derive export-led growth, the Indian government has taken various initiatives, which have also been discussed in this paper.

Keywords: Electronic Industry, Import and Export of Electronic Industry, Export Potential

INTRODUCTION

Industrial Revolution 2.0 marked the introduction of electrical machines, added value to production, in terms of both cost and efficiency.With the continuousinvention, research, and development and manufacturing of a variety of electronic devices including transistors and integrated circuits, advancement in the electronic industry took place, resulting in Industrial Revolution 3.0. From era to era, social, technological, economic, political, and environmental changesled to technological disruptions, revolutionary changesinthe exchange of information and communication,booming Internet and Telecommunication industry, consequently resultinginthe paradigm shift in traditional production practices and the manufacturing industry on a whole. This merger of physical boundaries with the virtual worldhelped us usher into Industrial revolution 4.0. Today, lives, businesses, and economies have experienced revolutionary transformation driven by new, innovative, and upgraded technologies of IoT (Internet of Things), Artificial Intelligence and Machine Learning ushering a new era for electronic products,making the electronic industry one of the world's booming industries, showing a global market estimated to be over $ 2 trillion[1].

Pairing with the idea of Digital India, day to day activities of the individual, business, corporate have changed from manual to digital system. Also, the great promotion of this initiative by the government has led to consider all the electronic products as the necessity of every individual. The Indian electronics Industry provides employment toover 1, 30, 00,000 people via direct and indirect jobs[2]. Currently, the manufacturing industry has ability

[1] *Invest India,* Electronic Systems Design and Manufacturing in India: A $120 Bn Market Opportunity, Retrieved *from https://www.investindia.gov.in/siru/electronic-systems-design-and-manufacturing-india-120-bn-market*-opportunity

[2] *Invest India,* Electronic Systems Design and Manufacturing in India: A $120 Bn Market Opportunity, Retrieved *from*

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to employ more than 20,00,000 people in India, having the major share of providing employment from Manufacturing of Mobile devices covers jobs for over 6,00,000 jobs (Invest India).The domestic electronics market in India is estimated to reach $400 billion by 2025, attracting a pool of skilled labour in the industry, therefore leads to an increase in demand for more skilled labour. According to an IBEF report, by 2022, it is expected that employment in the IT industry will increase to about 20,00,000 directly and 7,60,000 indirectly.

Printed Circuit Board (PCB) - The Backbone of Electronic Devices

Printed Circuit Boards, the brain and backbone of electric devices are responsible for connecting all the components of a device. The drawback of big, heavy, and non-accessible devices lead to the evolution of miniaturization and sub-miniaturization in the design of electronic equipment. The process to develop and manufacture smaller mechanical, electronic, and optical products and devices make miniaturization trendy in the last fifty years. The whole process and transformation of giant products to miniature, led to the emergence of the component as a new technique of inter-component wiring and assembly that is responsible for providing a mechanical support structure and provide electrical connection to the circuit and known as a printed circuit board (PCB). In addition to providing connectivity, they are also used for providing mechanic support and enhance the efficiency of the device by reducing the size of the product making it cost-effective.

LITERATURE REVIEW

Hussain A. (2016) states the importance of the electronic industry in generating employment in the country. Moreover, according to him, more than 60-70% need for electronic products is met by import. He also laid focus on domestic manufacturing of electronic goods in India, losing completion due to dominance by foreign companies.
Ershova I. &Ershov A. (2015) emphasized on the problem of developing an importsubstitution strategy. He stressed upon the use of advanced technologies in Russian industries. According to him,an import substitution strategy can be used to improve the competitive quality and security of the economy.

Singh M.K et al (2018) laid focus on competition faced by the Indian electronic manufacturing industry. They studied the factors that formed the bedrock of the thecompetitiveness of the electronic sector in the country. The authors also emphasized that government should frame such policies that improve the performance of the industry in the view of the Make in India initiative.

Joshi P.A. (2015) referred to the performance of the electronic industry and he also states that major demand for electronic goods is met from imports whereas fewer marginsare covered by local markets. The Indian government is regularly making efforts to cope up with the potential electronic crisis. He highlighted the overview of the electronic industry that will be useful for business organizations, industry, and government.
Francis, S. (2018) mentioned that to achieve the target of zero net import, the government should make such strategic industrial development plan that will lead to coherence and

https://www.investindia.gov.in/siru/electronic-systems-design-and-manufacturing-india-120-bn-market-opportunity

coordination among FDI, trade, infrastructure, technology, education, taxation, skill development policies, infrastructure development, and environment protection.
In a report of Goldstein Market Intelligence (2020), it is mentioned that trends for smart offices and smart homes have been seen, makingelectronic products as an important part of life and also driving the demand for electronics goods due to an increase in disposable income and shifting of preferences towards smart technologies. Also, an increase in manufacturing costs in China along with the 'Make in India' initiative by the Indian Governmenthas shifted the investments to India, leads to becoming India as a manufacturing hub. But more initiatives are required for better infrastructure and testing facilities.

Goldstein Market Intelligence. (2020), another report predicted that the Indian electronic market would growin the next 2-3 years, to USD 125.05 billion and USD 400.25 billion by 2020. The report suggested that to create a balance between supply and demand, industry and government are required to work in collaboration. There are some factors that are hindering the growth of the industry like manufacturing cost, rising fuel cost, inflation, etc. But still, there is a hope that the electronic industry can help to achieve the common goal of development.

Raju. S. &Saradhi. R.V. (2021) focused on two important channelsi.e. import and productivity of firm and export and firm productivity. According to their analysis, Indian industry has a low technological capability, also purchasing of raw material from abroad is vital for both local manufacturers and export-oriented firms, and buying capital products from foreign companies is significant for only export-oriented firms. High imports are due to bad technological infrastructure and low expenditure on research and development. They suggested that the focus should be on accelerating domestic production and market

The "Make in India" program was launched by the Indian government to encourage Indianmanufacturing, increasing domestic and foreign investment, raising employmentopportunities, and enhancing the country's overall competitiveness. Also, severalinitiatives led by the Government, have shown commendable improvement in India'srank on Ease of Doing Business to 63rdpositions in the year 2020 from 130th position in 2016,but India failed to achieve its target of reaching 50th position. However, India still lagsbehind its competitors in several factors. It is an opportune time to draw a roadmap tocapacitate the domestic industries and to create a manufacturing hub in India considering the overall performance and potential of the sector.

Considering the pandemic and trade tensions with other counties, the Government has realized the relevance of giving domestic production a fresh kick in the form of "Atmanirbhar Bharat", promoting the "Swadeshi" movement of making India "self-reliant", by encouraging production by local manufacturers that will lead to the growth of the Indian economy through new businesses and new employment opportunities. Not only this, special emphasis is required to be made to increasing exports along with reducing dependence on imports.

OBJECTIVE OF THE STUDY

Following are the objective:

1. To study the production trend of electronic goods
2. To study the comparison between export and import of electronic goods along with

analyzing the export potential
3. To find out the main initiatives taken by the Indian Government for the growth of the electronic industry
4. To suggest some suitable measures.

RESEARCH METHODOLOGY

This study is secondary-based study. Secondary data is collected through Government Websites, Various Reports, Government Portals, and Papers. An overview of the electronic Industry has been taken that can help the government in designing the policies accordingly to achieve the objectives of growth.

NEED OF THE STUDY

After the pandemic, the government has realized the need of becoming self-reliant for the sustainable growth of the country, and in light of the same, a new campaign "Aatmanirbhar Bharat' is launched by the government to stimulate domestic production across various sectors in the country. Therefore, it becomes imperative to know the current production status of the electronic industry to formulate and mould the policies accordingly.

The emphasis of the study is on comparingthe import and export and urgency of encouraging exports to grab the opportunities arising as a result of the pandemic. Also, the strategy of increasing domestic production in light of domestic and global demand would be a net addition to the 'Make in India' efforts of GOI.

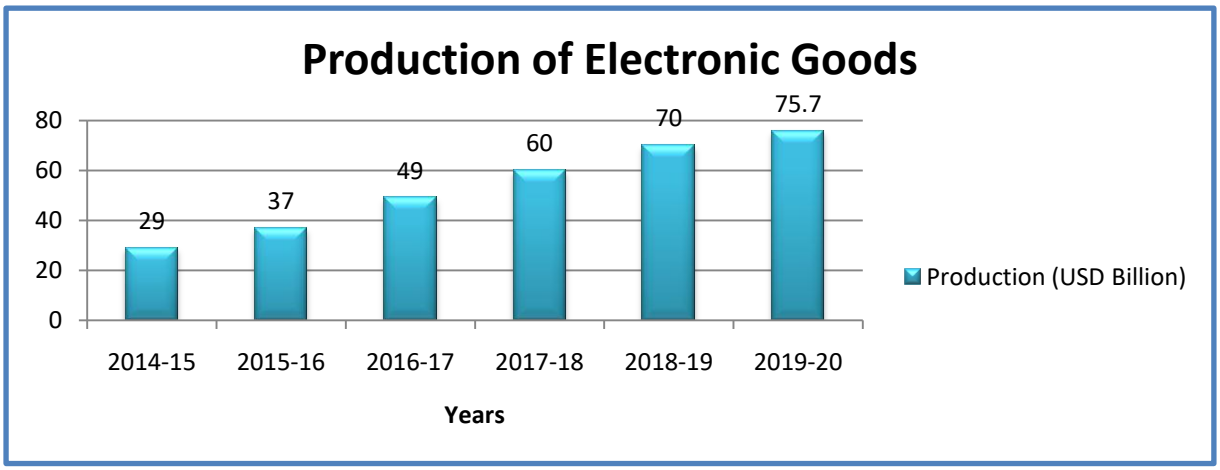
This study aims to identify expectations of the industry and their growth and export potential in contributing towards government's efforts at export promotion as a strategy to boost self-reliance

DATA ANALYSIS: PRODUCTION TREND, IMPORT-EXPORT, and EXPORT POTENTIAL

Production Trend of Electronic Goods

The scope ofthe electronics sector is vast and divided into several verticals named as industrial electronics, consumer electronics, strategic electronics, computer hardware, mobile phones, electronic components, etc.The Indian Electronic Industry's contribution towards India's GDP accounts 2.5% and According to the observation of Invest India, Share of India global electronic manufacturing has increased from 1.3% in the year 2012 to 3.6% in 2019[3]. Consequent to various initiatives taken by the government and efforts of industry to promote electronic hardware manufacturing in light of supporting "Make in India" and "Digital India", improvement in production has been seen, depicted by the figure below for the last five years.

[3]*Invest India,* Electronic Systems Design and Manufacturing in India: A $120 Bn Market Opportunity, Retrieved from https://www.investindia.gov.in/siru/electronic-systems-design-and-manufacturing-india-120-bn-market-opportunity



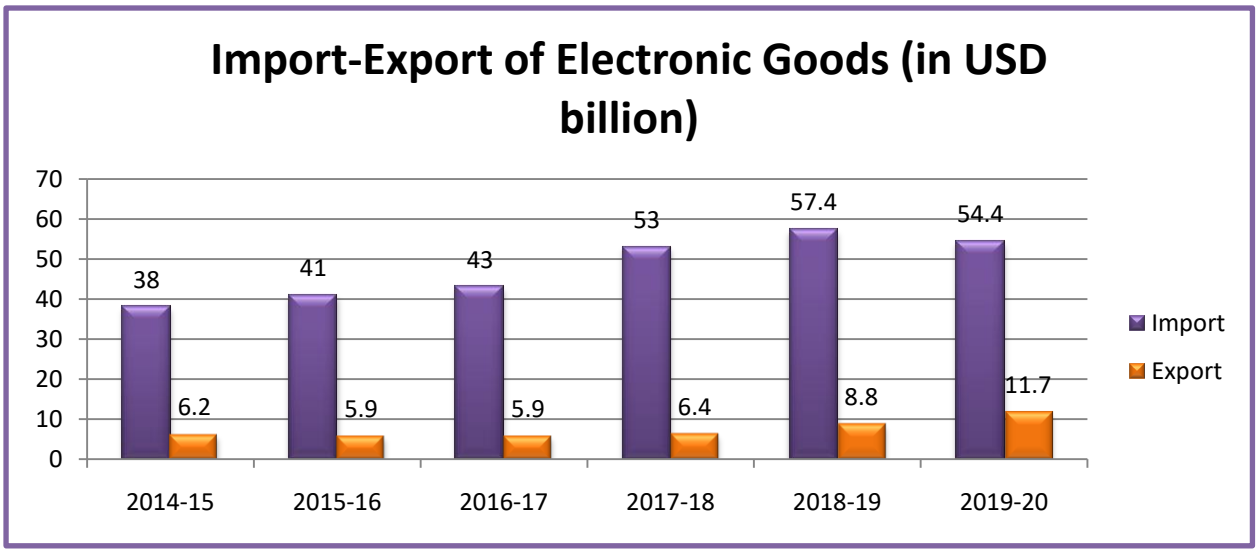
Source: (MEITY, 2019-20)

Findings

The above figure shows a positive trend in the production of electronic goods from $ 29 billion in the year 2014-15 to $70 Billion in the year 2018-19, evincing the various policies and schemes introduced for the promotion of domestic manufacturing. The optimistic effect on the demand for electronic goods is due to an increase in disposable income of the middle class, change in consumption pattern of the consumer, change in living conditions, up-gradation of the standard of living due to consciousness andsound fiscal and monetary. Moreover, an impetus to digitization though "Digital India" and robotic applications, surge in investments pushed by "Make in India", underpinning the electrical industry.

Import-Export of Electronic Goods

Though the domestic production is favorable but considering the current scenario of surviving in the competitive market, dealing with import dependence on other counties, emerged the need to become "Aatmanirbhar", not only to meet the demands domestically but globally also. The following data depicts the reality of the export of electronics goods of India. India lagsin its export as compared to imports as shown in the figure below. India's imports stood at $57 Billion for the year 2018-19.



Source:(MEITY, 2019-20)

Findings

- From the above figure we conclude that India is experiencing the major trade deficit in the electronics industry which has risen between the years 2014-15 and 2018-19, 31.8 USD Billion to 48.2 USD Billion respectively, as it is a significant importer of electronic goods and components.
- Also, for the year 2019-20, it was seen that there is a decrease in imports and increase in exports as compared to previous years.
- The major source of imports of electrical products is China followed by Vietnam, Singapore, andKorea.
- This is mainly due to the disabilities like higher taxation, cost of finance, and power which make production uncompetitive.
- The figure also indicates a rise in exports in the last 5 years from $ 6.2 billion in the year 2014-15 to $8.8 billion in the year 2018-19 with the main export destination, UAE preceded by USA, China, and Germany.
- Because of the rising demand for electronics products motivated by various initiatives introduced by the government, the manufacturing of electronic goods is of vital importance.

EXPORT POTENTIAL FOR EXPORT-LED GROWTH

Although India's export in electronic industry is not showing a sound picture as import exceeds exports, butan ecosystem of infinite opportunities and application development has been introduced, backed by growth in terms of the smartphone market globally with second-largest mobile handsets manufacturing nation globally and second-largest market for smartphone globally[4]
Growth in manufacturing of electronic productsdomestically has been seen with a compound annual growth rate of around 25% during the past 4 years,the reason being production domestically, touching $70 bn in 2018-19 for electronics hardware.The IT & electronics industry is growing expeditiously in terms of production and exports both. According to data by the United Nations Conference on Trade and Development (UNCTAD) India has USD 2.7 trillion untapped export potential in electronic exports.

India's production of electronic goods doubled in the last 4 years with a major contribution by mobile devices. India is undergoing a digital revolution by moving towards a digital economy, penetrating the market of electronic and consumer durables. In the segments like components for an electric vehicle, PCBs, computing devices, wearable devices, etc, a similar degree of success can be generated.

India is also ofthe third-largest economies in the world in sense of the quantity of consumers of digital technologies and it is anticipated that the current economy will be converted to a

[4]Annual report, 2019-20, Ministry of Electronics & Information Technology (MeitY), Retrieved from https://www.meity.gov.in/writereaddata/files/Annual_Report_2019%E2%80%9320.pdf

digital economy above $1 trillion by 2025[5]. Various government policies, adoption of digital practices (online payments, UPI, e-learning, etc.), shifting of global supply chain after the pandemic, continuous improvement in infrastructure, and the push by the government for EoDB (Ease of Doing Business) in the country, facilitation of cost-effective skilled manpower will spearhead the government mission- Make in Digital India, which is started by the government to promote digital use of digital products; Make for India to boost the manufacturing of goods in India and then capacitate the country to produce forthe world collectively.

GOVERNMENT POLICIES AND INITIATIVES

Taking forward the idea of developing India as the global hub for electronic manufacturing for becoming "Self-reliant" and alsoto strengthen export-led growth,the Indian Government took the following initiatives aiming at improving global trade connection, building conducive programs and incentive mechanisms, correlating global value chains for the promotion and value addition of domestic industries that will result in exports of electronic goods.

Previous Initiatives were (NPE) that stands for National Policy on Electronics, (MSIPS) in elaboration called as Modified Special Incentive Package Scheme, Electronics Manufacturing Clusters having short-form (EMC) Scheme, 100% FDI in ESDM Sector, Electronic Development Fund (EDF), Make in India (the scheme which received large attention to inculcate the behavior of manufacturing domestically and Digital India which marketed the digital products in India.

(EMC 2.0) named as Modified Electronics Manufacturing Clusters Scheme, The Production Linked Incentive Scheme called in a short form as (PLI), and SPECS that stands for Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors are the schemes that have been announced buildingSystem Designs of Electronics and Manufacturing of Electronics called as (ESDM) with the full form Electronics System Designs and Manufacturing and took forward the vision of the (NPE) called as National Policy on Electronics 2019[6].

1. To provide financial incentives and to accelerate domestic production of mobile phones, electronic components and ATMP(Assembly, Testing, Marking, and Packaging) units, along with attracting large investments in electronic value chains, (PLI) The Production Linked Incentive Scheme for large scale electronics manufacturing is introduced. Production linked incentives will be awarded over a period of 5 years of up to INR 40,951 crore. 4 percent to 6 percentof Incentive on incremental sales (over the base year) of goods manufactured in India.
2. The Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors called(SPECS) in shortis introduced with the aim to develop the ecosystem of production of electronic components and electronic semiconductors. All

[5] *Invest India,* Electronic Systems Design and Manufacturing in India: A $120 Bn Market Opportunity, Retrieved *from https://www.investindia.gov.in/siru/electronic-systems-design-and-manufacturing-india-120-bn-market-*opportunity

the dependent variables such as internal demand, value addition, and employment will get a boost in this sector. For over a period of 8 years, Incentives with a ceiling of INR 3,285 crore will be provided under this Scheme. An incentive of 25 percent will be provided on a reimbursement basis on Capital Expenditure related to equipment, machinery, associated utilities, and technologies, plant, including R&D, means Research & Development.

3. Infrastructure plays a pivotal role in the electronic industry, therefore (EMC 2.0), a full name, The Modified Electronics Manufacturing Clusters Scheme is launched to strengthen the infrastructure base and expand the value chain of electronic products for the electronics industry in India. It involves the building of industry-oriented facilities like Ready Built Factory, CentersforCommon Facility, Sheds/PlugFacility, and Play facilities. Along with making the supply chain responsiveness more powerful, it will also bolster the consolidation of suppliers on the one hand and also decrease logistics costs and time-to-market on the other. Therefore, to create high-quality infrastructure and develop common facilities and services for electronic product manufacturers, EMC 2.0 was introduced tohelp financial incentives. Over a period of 8 years, economic incentives of up to 3,762 million Indian rupees will be paid. A financial reward of up to 50 percent of the project cost will be awarded, with a maximum limit of 700 million rupeesper 100 acres of land.

CONCLUSION

Electronic Industry is one of the most emerging and growing industry having high dependence of every individual to do its common activities even. It is the industry showing a positive trend in its production from previous years but its negative trade balance depicts a different picture. As the production is increasing continuously in India but stillthere is a requirementto device such policies which not only focus on the domestic production but will drive the exports of the country also. Also, low exports may be due to incompetent products not acceptable by foreign markets and high imports due to non-availability of technological capability and less expenditure on research and development. This industry can increase their export if the policies have been made in line with the objective to increase domestic production by taking into account not only need and demand of domestic customers but also the need and demand of global customers. Though, the import of electronic goods is more than its exports, maybe due to the factors like unavailability of skill labour, finance, guidance, lack of resources, and assistance etc. Government should devisepolicies that not only leads to growth in production but also leads to growth in export in order to become ‘Self Reliant’.

SUGGESTIONS

The pandemic has left a serious impact on the economies, through trade interruptions, closing down of manufacturing units, reducing the production, postponement of the introduction of a new product, lowering the purchasing power of a consumer, subdued demand, etc. This will not only have a major but long-term negative impression on production, consumption and thus on economies.

The ESDM sector has been projected as the sunrise sector and the one to watch out, for a while now. Huge opportunities from foreign investors are expected due to the projection of

US$ 300 billion reduction in demand by 2020 which can attract investment to the industry of US $100 billion.

- More growth is expected to see in mobile devices in terms of value addition locally,as these are one of the key segments. The Make in India initiative and various schemes and policies in place, will make the country a preferred destination for electronics manufacturing.
- Smart living is another opportunity for ESDM Sector. Today our homes, vehicles and cities are increasingly sensors embedded for our personal and professional use. This requires extensive collaboration between various players spread across the ESDM-IT segments
- Electronics hardware manufacturing is rated as a high priority by the Government and considered as one of the most prime cornerstone of "Make in India" and "Digital India" schemes of Government of India
- The two options that can be taken into an account to formulate new policies: the first one for the growth-led export approach- a primarily importsubstitution-centered strategy and an export-led growth approach.If the measures promoting domestic production for growth are seen as necessary then to boost the production of electronics goods immediately become the primacy for areorientation towards exports in the medium to long run
- Due to the growing security concern, there is a need to focus on manufacturing of electronic hardware till the chip level or integrated circuit.
- Computer software has been identified as a major thrust area due to the availability of educated and technical manpower in India. To take advantage of this, special emphasis on software export needs to be given.

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