

# Analysing India's Position on the Information Technology Agreement

A Qualitative Assessment of the Information Technology Agreement and India's ICT Production Goals

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Takshashila Discussion Document 2023-09 Version 1.0, June 2023 This discussion document re-examines India's stance on the Information Technology Agreement and the nature of its impact on the Indian domestic electronics manufacturing industry.

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# **Executive Summary**

The global trade in Information Communication Technology (ICT) products and the resultant value chains are dominated by countries like Taiwan and China. They have implemented liberal trade policies and low tariff regimes, primarily facilitated by the World Trade Organization's (WTO) plurilateral Information Technology Agreement (ITA-1), since 1996. The ITA-1 sought to eliminate tariffs on scheduled ICT products to maximise world trade and the development of information technology industries.

While India has been a signatory to the ITA-1 since 1997, its tariff treatment of ICT products has been inconsistent with its stated commitments under the ITA-1. Most recently, on April 17, 2023, a panel set up by the WTO Dispute Settlement Board ruled against India in the matter of a challenge to India's tariffs levied on certain ICT products covered in its schedule. India has maintained that its accession to the ITA-1 adversely affected its domestic ICT manufacturing capabilities and increased its import dependence on such products, particularly from China.

This discussion document compares India's ICT manufacturing performance with that of China, Malaysia, Vietnam, and Taiwan, countries that have leveraged ITA-1-enabled tariff regimes to become globally dominant exporters of ICT products. It finds that India's divergent position on the ITA- This document has been formatted to be read conveniently on screens with landscape aspect ratios. Please print only if absolutely necessary.

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#### Acknowledgments

The authors would like to thank their colleagues, Pranay Kotasthane, and Anupam Manur for their valuable feedback and comments. 1 is based on an incorrect correlation of increased ICT imports with the consequences of an absent complementary industrial and investment policy which hamstrung its ICT manufacturing sector.

Recent government initiatives suggest a growing cohesion in India's perspectives on Foreign Direct Investment (FDI), infrastructure development, and Production-Linked Incentives (PLI), and therefore, this paper proposes that India reiterate its commitment to its ITA-1 obligations, study the potential impact of joining the expanded ITA-2 on other manufacturing sectors, and negotiate Free Trade Agreements (FTAs) to consolidate its integration into global ICT value chains.

This document has been formatted to be read conveniently on screens with landscape aspect ratios. Please print only if absolutely necessary.

## Index of Abbreviations

ASEAN	Association of Southeast Asian Nations
CAGR	Compounded Annual Growth Rate
ECTA	Australia-India Economic Cooperation and Trade Agreement
ESDM	Electronics System Design & Manufacturing
EU	The European Union
FDI	Foreign Direct Investment
FTA	Free Trade Agreements
FTP	Foreign Trade Policy
GATT	General Agreement on Tariff and Trade
GVC	Global Value Chain
ICEA	Indian Cellular and Electronics Association
iCET	U.SIndia initiative on Critical and Emerging Technology
ICT	Information and Communications Technology
ITA	Information Technology Agreement
ITES	Information Technology Enabled Services
MEITY	Ministry of Electronics and Information Technology
MNEs	Multi-national Entities
PLI	Production Linked Incentive
ΡΤΑ	Plurilateral Trade Agreement
R&D	Research and Development
RCEP	Regional Comprehensive and Economic Partnership
RTAs	Regional Trade Agreements
SEZ	Special Economic Zone
TSMC	Taiwan Semiconductor Manufacturing Company Limited
VoIP	Voice Over Internet Protocol
WB	World Bank

WTO World Trade Organization

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# I. Introduction

In addition to a robust and enabling industrial strategy, infrastructure and logistics, trade policy is an indispensable element needed to integrate into Global Value Chains (GVCs), and India's Ministry of Electronics and Information Technology's (MEITY) vision document emphasises this need by calling for competitive tariff structures on electronic components, and regulatory certainty.<sup>1</sup>

The electronics and semiconductor industry operates within GVCs, which are networks of production processes that span across different countries and regions, where each stage adds value to the final product. GVCs require high levels of complexity, innovation and specialisation, and depend on free trade to move materials, equipment, intellectual property and products around the world to the optimal location for performing each activity.<sup>2</sup>

Therefore, trade policy measures that affect the cost and ease of trade can significantly affect a country's GVC participation. One such trade policy measure is a tariff, a tax imposed on imported or exported goods and services. Tariffs increase the cost of trade and reduce the competitiveness of domestic manufacturers, especially sectors like semiconductors in highly fragmented global production networks.<sup>3</sup>

## **New ICT Export Goals**

On 1st April 2023, the new Foreign Trade Policy 2023 (FTP) came into effect, marking an apparent shift away from India's previous incentive-based approach to one focused on proactively facilitating exports. Keeping in line with its goal to reach \$1 Trillion in exports by 2030, the FTP 2023 reflects India's lofty ambitions of increasing its share in Global Value Chains. The FTP also comes after a two-volume Vision Document for the electronics sector released by the Ministry of Electronics and Information Technology. The document details a 5year roadmap for India's transformation into \$300 billion electronics manufacturing and exports hub with sizeable shares in global value chains by 2026.

(Press Release, Ministry of Commerce and Industry)

Lowering or eliminating tariff barriers can reduce costs and increase access to intermediate inputs, final products, and enabling services essential for the ICT industry. More importantly, it can facilitate integration into GVCs by complying with the rules and standards of significant markets and trading partners who naturally gravitate towards optimising their operations for the comparative advantages offered in a host country's economy. It can also foster cooperation and coordination in areas such as investment promotion, technology transfer, intellectual property protection, and dispute settlement.<sup>4</sup>

Raising tariffs in a globalised world with international supply chains can have significant negative repercussions on economic activity, as they affect not only direct trading partners but also result in indirect impacts through inter-country and inter-industry linkages.<sup>5</sup> The Lerner Symmetry theorem has long since established that high *ad valorem* tariffs on manufacturing inputs will essentially act as a tax on the exports of the final product.<sup>6</sup> <sup>7</sup> Higher tariffs on intermediate components and inputs increase production costs, and thereby, prices of final products. Manufacturers are then faced with the prospect of either passing the cost of the tax on to the consumers in an export market or internalise those costs. The former course of action will reduce demand for the manufacturer's goods if competing exporters have lower priced goods, effectively pushing them out of the GVC. The latter will result in lower revenue for the manufacturer. Either way, their

#### **Lerner Symmetry Theorem**

This theorem establishes that ad valorem import tariffs will have the same effects as an export tax, reducing total goods exported. Therefore, tariffs on imports of factor inputs will effectively cancel out the economic impact of an identical subsidy on exports of final outputs. In order to subsidize and promote an exports-focused sector, policy makers can subsidize input imports. (National Bureau of Economic Research)

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ability to compete on the global market is significantly hindered. Cost considerations and profitability are significant drivers for Multinational Entities' (MNE) decisions to set up operations in a host economy, and by extension, potential integration of the economy in a GVC.<sup>8</sup>

Further, higher tariffs on final ICT products can reduce demand and market access for upstream industries that utilise them as inputs. For instance, raising tariffs on computing, server, and VoIP hardware will increase costs incurred by the Business Process Outsourcing (BPO) industry and lower the cost-competitiveness of their service exports. A similar case can be made for the IT-enabled software services (ITES) industry, which contributes significantly to India's service exports.

Suppose a country intends to kickstart its domestic electronics industry and wants to become part of ICT global value chains. In that case, it must adopt new trade policies conducive to attracting foreign investment or correct flaws in extant ones (such as the inverted duty structure for ICT input imports)<sup>9</sup>, enhancing domestic production capabilities, and fostering linkages with global markets.

India's singular focus on becoming a significant semiconductor and electronics manufacturing hub has been made clear over the past few years as it has launched multiple initiatives like the Indian Semiconductor Mission

#### **Inverted Duty Structures**

An inverted duty structure is said to exist when the duty rate for the overall finished good is lower than that of the component parts, thereby rendering such a product's final manufacture in the country an unprofitable prospect. While inverted tariff structures act as disincentives for global companies to set up their assembly units in India, they also put Indian manufacturers at a disadvantage vis-a-vis their foreign competitors, who can easily import boxed products to meet domestic consumption.

(Research Brief No. 131, India Exim Bank)

and Production-Linked Incentive (PLI) schemes for smartphone manufacturing and assembly, etc.<sup>10</sup> In this context, it becomes necessary to re-examine India's stance on the ITA-1, to assess whether implementing a trade policy as per its prescriptions could help India achieve its goals as mentioned above.

## History and Overview of the ITA-1

The Information Technology Agreement (ITA) is a plurilateral agreement enforced by the World Trade Organization (WTO) that aims to eliminate tariffs on information and communications technology (ICT) products among its participants. The ITA-1 was concluded in 1996 by 29 participants at the Singapore Ministerial Conference and entered into force in 1997. Since then, the number of participants has grown to 82, representing about 97 per cent of world trade in IT products.<sup>11</sup>

The ITA-1 covers a wide range of ICT products, such as computers, software, telecommunication equipment, semiconductors, scientific instruments, etc. The ITA-1 has been credited with boosting trade, innovation and productivity in the IT sector, as well as lowering prices and increasing access to IT products for consumers and businesses.<sup>12</sup>



However, the ITA-1 also faced some challenges and limitations over time, such as the emergence of new technologies and products not covered by the original agreement, the divergence in tariff classification and interpretation among participants, and the rise of non-tariff barriers that hampered trade in ICT products.<sup>13</sup> To address these issues negotiations were launched to expand the product coverage and membership of the ITA-1 in 2012.

After several rounds of talks, over 50 members concluded the expansion of the ITA-1 in 2015 at the Nairobi Ministerial Conference. The expanded ITA-2 covers trade in 201 product categories valued at over \$1.3 trillion annually<sup>14</sup>, such as new-generation semiconductors, optical lenses, GPS devices, medical equipment, etc.

The ITA-2 entered into force in 2016 for most participants, and is expected to be fully implemented by 2024.<sup>15</sup> The expanded ITA-2 is considered as "the most successful attempt at trade liberalization under the auspices of the WTO since its inception in 1995".<sup>16</sup>

## Assessing the impact of the ITA-1

The economic rationale for low or zero tariff agreements such as the ITA is based on the premise that free trade enhances welfare by allowing

exporters to sell their products at optimal prices and increasing market competition. On the other hand, tariffs create market distortions by raising prices, reducing consumer surplus, deterring foreign entry and lowering product quality. Plenty of literature provides empirical evidence for the positive effects of such agreements on various aspects of countries' economies.<sup>17</sup>

In particular, ITA-1-enabled tariff regimes have been linked to the boost in countries' participation in global value chains in the ICT sector, facilitating knowledge spillovers, human capital development and industrial upgrades. The figures below illustrate the difference in the growth of ICT exports and output between ITA and non-ITA countries.<sup>18</sup>

#### **Knowledge Spillovers**

Export-oriented economic policies lead to greater productivity gains over time because opening up to foreign trade and investment enables domestic partner firms interact with, and learn from foreign partners that have larger (or different) stocks of knowledge. (OECD)

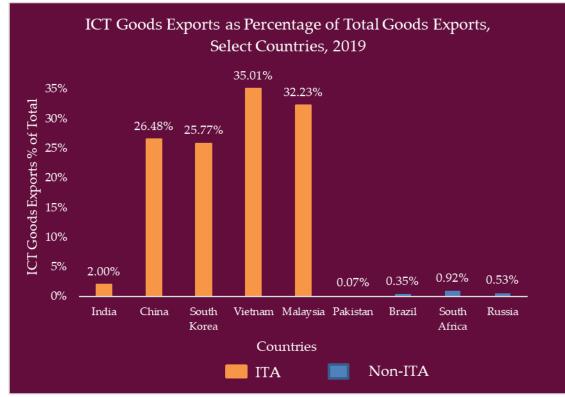


Figure No. 1 ICT Goods Exports as a Percentage of Total Goods Exports (Source: ITIF, World Bank)

Another benefit of ITA-1-enabled tariff regimes is the free cross-border movement of human capital amidst ICT value chain operations, resulting in the diffusion of knowledge and skills among the participating countries by attracting leading firms to invest in facilities and train the local workforce. These cascading effects can foster the development of domestic ICT hardware production and allied industries, thus enhancing their competitiveness over time. The figure above showcases the difference in the growth of ICT exports and output between ITA and non-ITA participants.

Zero-tariff regimes also enable access to lower-cost input materials and intermediate components for ICT manufacturing, which can leverage the comparative advantage of developing countries in labour-intensive production stages of GVCs, as is seen in economies like China and Vietnam.

At the same time, lower prices for boxed ICT products can increase domestic demand and spur the development of related industries such as IT-enabled services (ITES), software and e-commerce. However, the relationship between hardware and software industries may be complex, as evidenced in the case of India, which has a thriving software industry but a lagging hardware production sector. <sup>20</sup> The potential reasons for this are discussed later in this paper.

### **Boxed ICT Products**

Boxed ICT products are products that are fully made in another country and imported. Generally, governments issue tariffs on these to make local manufacturing more competitive.

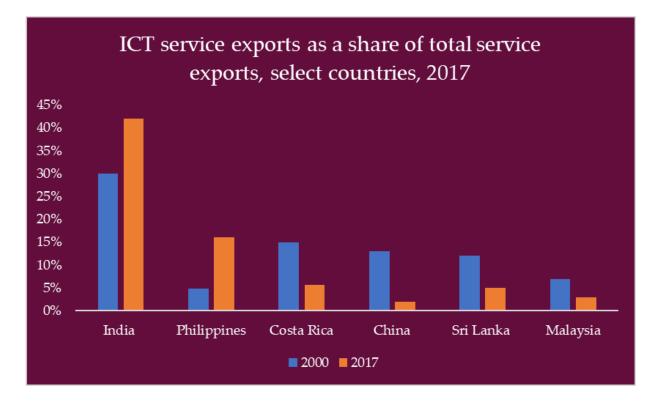


Figure No. 2 ICT Service Exports of Select Countries (Source: ITIF)

According to India's Ministry of Commerce and Industry, the ITA-1 has increased China's global market share in ICT goods from 2% to 14% between 2000 and 2011.<sup>21</sup> China has emerged as the worldwide leader in ICT goods production and export. Still, other countries have benefited from their accession to ITA-1 as well. In the following section, we analyse the experiences of China and other countries that have leveraged the ITA to enhance their ICT sectors.

The countries have been selected because of their significant presence in the global ICT value chains, and their proximate geographic presence to India.

## II. Case studies

## Malaysia

Malaysia is one of the original signatories of the ITA-1 in 1996 and has climbed from the 15<sup>th</sup> position in 1980 to the 9<sup>th</sup> position in electronics exports in 2020.<sup>22</sup> Its large and cheap labour force elicited the local establishment of manufacturing and assembly operations by MNEs. The ITA-1-backed low tariff regime has been directly linked to Malaysia's ability to import, assemble and export ICT products by ensuring they remain cost-competitive in the face of competing economies like China with low labour costs.<sup>23</sup> Concurrently, in a bid to complement local competency, it has also invested in its own state-owned semiconductor manufacturing company, SilTerra, with mixed results.<sup>24</sup>

Malaysia has become a key player in the semiconductor GVC, exporting intermediate products such as integrated circuits, transistors, diodes and printed circuit boards to countries like China.<sup>25</sup> A synchronised trade and

## SilTerra

SilTerra was founded by the Malaysian government in 1995 to promote frontend semiconductor manufacturing. It hasn't been as successful as the likes of TSMC, and also reported huge losses in 2018-20. In 2016, the government ordered its sovereign wealth fund to sell its stake to foreign investors, which was picked up by a Chinese company called CGP Fund. In recent years, it has started coming back on track and has made some profits.

(silterra.com)

industrial strategy has resulted in continued foreign direct investment from established MNEs such as Intel, AMD and Texas Instruments for offshore packaging, testing and assembly operations. Malaysia's electronics industry has driven its overall trade surplus, with its ICT equipment exports valued at \$103 billion in 2021.<sup>26</sup>

## Vietnam

Vietnam is a signatory to the ITA-1, which it joined in 2007 as part of its WTO accession.<sup>27</sup> Vietnam was a less developed economy in the 1980s and 1990s, contributing almost nothing to global electronics exports. Its growth into an ICT manufacturing and assembly hub correlates with numerous measures liberalise its trade policies via the ITA-1 and multiple FTAs. From zero exports in 1990, Vietnam became the 8<sup>th</sup> largest exporter of electronics products in the world by 2019.<sup>28</sup>

Vietnam hosts factories of many Japanese, Korean and Chinese MNEs and exports smartphones for some of the world's leading brands. Aside from being deeply integrated into the assembly, testing and packaging stages of the GVC, it is also concurrently investing in education and training to create an ecosystem of engineers for designing and manufacturing semiconductor chipsets.<sup>29</sup>



Vietnam's exports have grown exponentially, reaching \$131 billion worth of electronics and ICT equipment in 2021. Close to 40% of its total exports are ICT products.<sup>30</sup> Figures 3 and 4 at the end of this section chart the exponential increase in its exports. Vietnam remains a competitive option as a host economy, outstripping India in a geopolitical climate which encourages MNEs to diversify their supply chain operations.

## China

China's rise as an electronics manufacturing hub began even before it signed the ITA-1 in 2003,<sup>31</sup> when it was already exporting more than \$100 billion worth of ICT goods.<sup>32</sup> Alongside targeted elimination of tariffs, it also invested massively in its education, innovation policy, and scientific research and development infrastructure (maintaining an increase in research and development [R&D] spending of about 10% annually since 2000) to build manufacturing capacity for high-tech export industries.<sup>33</sup>

By 1996, China's trade policies had already situated it as an operating destination for major MNEs which set up their manufacturing and assembly plants in the country.<sup>34</sup> The ITA-1 further boosted China's industry by eliminating tariffs on both inputs and final products, notably in the semiconductor GVC, as well as GVCs for products dependent on semiconductors, such as smartphones, laptops, tablets and TVs. It became

## China's R&D Spending

China's innovation policy has played an important role in the country's rapid rise in the ICT industry. Since 2000, China has increased R&D spending roughly 10% each year - a pace the country has maintained during the recession. China's push to upgrade its high-tech exports industries through innovation has produced measurable results. The most recent data available from the OECD-WTO TiVA database for 2011 show that, for key export sectors (like ICT, electrical machinery and transport equipment), the domestic value added (DVA) content of exports has significantly increased, from 25% in 1995 to almost 50%. Specifically for ICT and electronics, the DVA share moved up from less than 30% in 1995 to almost 50% in 2011. (D. Ernst, 2016)

the world's largest assembler and exporter of these products and increased its semiconductor exports from 9% to 35% of its total goods exports between 1996 and 2014.<sup>35</sup> China also accounted for 15% of the global semiconductor market and 5% of the worldwide semiconductor foundry market in 2019.<sup>36</sup> It should be noted that China's ICT hardware exports are dependent on the import of intermediate components from other countries, especially Taiwan, South Korea, Japan and the USA.<sup>37</sup> These countries along with China are also enmeshed in Regional Trade Agreements (RTAs) like ASEAN, that additionally enable the reduction of non-tariff barriers (like customs clearances).<sup>38</sup> China's ICT exports reached \$708 billion in 2019, representing 27% of its total exports and 5% of its GDP.<sup>39</sup>

Notably, it has retained its zero-import tariff regime encouraging competition between domestic and international players in its manufacturing sector. Its comparative advantage in cheap labour has also resulted in the systematic creation of forward linkages in different stages of ICT manufacturing.<sup>40</sup> The deep integration of China's domestic players in multiple GVCs has since resulted in the emergence of some of the largest ICT hardware producers in the world, such as Lenovo, Huawei, Haier, Midea, ZTE and others.<sup>41</sup> In the ultra-competitive smartphone sector, homegrown companies like Lenovo, One Plus, Xiaomi, Oppo, and Vivo, etc., are now global brands that compete with and are global leaders in their

segments with significant market shares. Most of their foreign competitors, like South Korea's Samsung, also have factories in China.

As shown in the Figure No. 3, China's ICT exports continue to increase exponentially after its ITA-1 accession. Its liberal trade policies run concurrently with national strategies promoting robust domestic manufacturing and infrastructure as well as a favourable business and investment climate.<sup>42</sup>

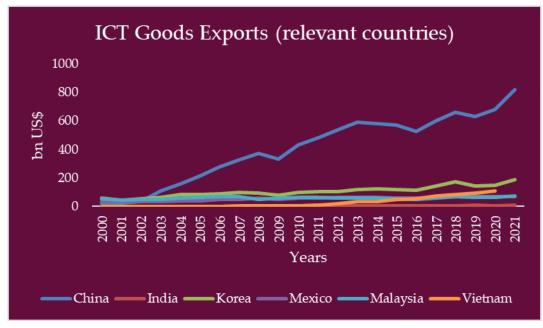


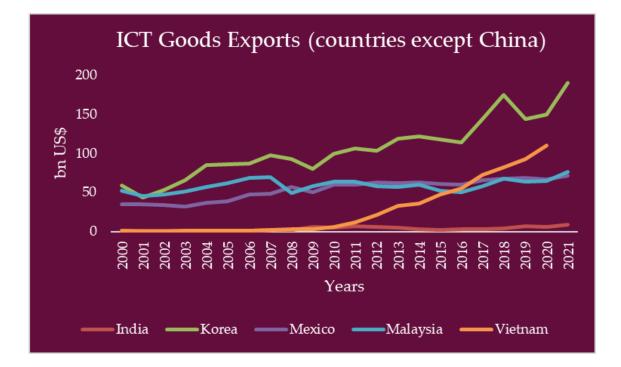
Figure No. 3 ICT Goods Exports of Selected Countries (Source: WB Open Database)

## Taiwan

Taiwan is the leading semiconductor manufacturer and the second biggest ICT hardware manufacturer globally. Taiwan adopted an export-oriented strategy during the 1980s and 1990s, investing heavily in its domestic ICT sector.<sup>43</sup> It established 'science parks' as special economic zones (SEZs) where foreign companies could set up their manufacturing plants. Taiwan's systematic approach ensured the development of domestic manufacturing capacity in the GVC for semiconductors.<sup>44</sup>

The most prominent company that emerged from this was the Taiwan Semiconductor Manufacturing Company (TSMC). Taiwanese trade policies and tax incentives attracted foreign companies, which consequently trained engineers and scientists in the highly capital-intensive and specialised stage of semiconductor chip fabrication. Domestic companies which employed these personnel also received government assistance to set up their factories in the country and export most of their production.<sup>45</sup> Concurrently, these companies also benefited from technology transfer agreements with firms from the USA.<sup>46</sup> Low import tariffs enabled by the ITA-1 allowed access to cheap input materials and Taiwan's significant exports today comprise of some of the most advanced semiconductor chips in the world. TSMC remains the biggest foundry for semiconductor chips in the world, with about 60 per cent of the global market share.<sup>47</sup>

Taiwan is an original signatory to the ITA-1 in 1996 but has also participated in the ITA (ITA-2) expansion involving over 50 WTO member countries in 2015 and covers an additional 201 product categories over \$1.3 trillion in exports per year. The expanded ITA-2 entered into force for Taiwan in 2016 and is expected to be fully implemented by 2024. The expanded ITA-2 covers new-generation products, such as advanced semiconductors, optical lenses, and medical equipment, etc., that enhance and build upon Taiwan's comparative advantages in fabrication as well as assembly.<sup>48</sup>





**Figure No. 4** ICT Goods Exports of Selected Countries excluding China (Source: <u>WB Open</u> <u>Database</u>)

# III. India's Position on the ITA-1

India became a signatory to the ITA-1 in 1997.<sup>49</sup> It had a comparatively small ICT manufacturing industry compared to other countries like China. At the same time, India's software and ITES export industry was gaining momentum exponentially due to a massive domestic demand for ICT goods. Also, as the country became wealthier, domestic consumer demand increased.<sup>50</sup> The resulting rise in imports to meet this demand occurred without a competent domestic manufacturing industry.

However, there were a few homegrown companies that did produce various ICT goods for domestic consumption. Major players were electronics appliances brands like Voltas, Bluestar and Godrej. Over the years, multiple ill-fated attempts to kickstart domestic semiconductor production failed.<sup>51</sup>

Nokia started a plant in Tamil Nadu to produce smartphones for the substantial Indian consumer market, but it had to be shut down because of unfavourable tax regulations and in some part, owing to its own inability to compete in the smartphone market. <sup>52</sup>

Firms like Micromax, Lava and Karbonn relied heavily on reselling rebadged and rebranded boxed mobile phones imported from China. As Chinese brands entered the Indian market following the same business model, they deftly priced out their Indian counterparts. The latter's failure to capture the Indian market post-2010 is attributable to its inability to invest in R&D and pivot to manufacturing their own brand of smartphones. <sup>53</sup>

What emerges is a picture of a siloed and non-strategic approach to liberalising tariffs as per ITA-1 commitments without any attempt to link it to a coherent long-term industrial policy for kickstarting the development of the domestic ICT manufacturing industry.<sup>54</sup> The evident lack of this cohesion resulted in many final ICT products attracting zero-tariffs, whilst input components continued to attract duties. Consequently, it had the effect of distorting manufacturing incentives despite the presence of a large domestic market, and therefore, even bypassing the potential of leveraging the benefits of tariff-jumping FDI.<sup>55</sup>

The Indian Government's decision to withdraw from the ITA-2 negotiations was conveyed by a press release issued by the Department of Commerce and Industry as thus:

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"India's experience with the ITA has been most discouraging, which almost wiped out the IT industry from India. The real gainer from the agreement has been China, which raised its world market share from 2% to 14% between 2000 and 2011. ... In light of the recent measures taken by the government to build a sound manufacturing environment in the field of electronics and information technology, this is the time for us to incubate our industry rather than expose it to undue pressure of competition."<sup>56</sup>

Concurrently India's tariff lines on multiple product categories under the ITA-1's attachments continue to attract duties, ostensibly because such products did not exist at the time of the commencement of the agreement. This approach has led to a somewhat absurd scenario where products such as Printed Circuit Boards (PCBs) are exempted from duties, but PCBs meant for smartphones attract a duty of 15%.<sup>57</sup> Aside from the fact that this approach lowers the certainty afforded by the rule of law, this argument has also not found purchase with the Dispute Settlement Board of the WTO.<sup>58</sup> This example specifically marks the divergence in India's commitment to its ITA-1 obligations in spirit vis-à-vis the letter.



# Understanding the ITA-1's Impact on India's ICT Hardware Production Capabilities

India's argument that joining the ITA-1 caused its domestic electronics manufacturing industry to lose out to China is based on the observation that since joining the ITA-1, India's share in global electronics production has declined from 3.2 per cent in 1996 to 2.7 per cent by 2014,<sup>59</sup> while China's share has increased dramatically in the same period. India also claims that joining the ITA-1 has resulted in a huge trade deficit in electronics, which reached \$41 billion in 2019-20, and has also prevented it from developing its own ICT hardware manufacturing capabilities amidst reduced policy space and bargaining power to protect its strategic interests in the sector.<sup>60</sup>

However, this argument assumes that joining the ITA-1 is the sole or proximate cause of India's poor performance and China's success in the electronics manufacturing industry, ignoring the possibility that other factors could have influenced manufacturing outcomes.

Government support, and the mode and degree of intervention in the electronics sector are likely variables. China has provided significant support and intervention to its electronics industry through various policies and programs, such as subsidies, tax incentives, preferential loans, R&D

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funding, infrastructure development, market access, technology transfer, and strategic planning. These policies and programmes have enabled China to attract FDI, develop domestic capacity through forward linkages, create economies of scale and scope, and move up the value chain in electronics manufacturing.<sup>61</sup>

On the other hand, India's electronics industry has faced various challenges, such as high costs of production, lack of infrastructure, absent incentives, and low economies of scale and scope. The policies and programmes that India has implemented to support and intervene in this industry, such as capital subsidies, tax exemptions, SEZs, and PLIs, have been inadequate, inconsistent, delayed, or ineffective in overcoming these challenges.<sup>62</sup> Initiatives like the Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS), PLI schemes with a targeted focus on Large Scale Electronics Manufacturing, and IT Hardware were only notified by the Union government as recently as 2020 and 2021.<sup>63</sup>

Comparative analyses between India, China, and other East-Asian countries suggest that the primary culprit for India's relative isolation from GVCs is its uncertain business and investment climate.<sup>64</sup> India's contention that the ITA-1 has primarily benefited China is also not consistent with the experiences of other countries in the same region such as Malaysia and Vietnam, both of which have capitalised massively on the diversification of

production networks in the specialised electronics and semiconductor sectors. These analyses also showcase that these countries combined a low or zero tariff regime enabled by the ITA-1 (and FTAs) with investment and industrial policy reforms that attracted established MNEs engaged in the GVCs. There is compelling evidence to suggest that initial success in attracting a dominant player's operations in the electronics and semiconductors GVC triggers a "*herd mentality*" process, where other players also evaluate the country and its local firms favourably as potential sites and partners.<sup>65</sup>

India's tariff policy was biased towards facilitating imports and encouraging tariff-jumping FDI in the electronics sector without paying enough attention to the development of the manufacturing segment<sup>66</sup>. Studies indicate that while tariff barriers used to encourage FDI in the imposing country in the past, this trend is not apparent in the electronics and ICT sectors. It is likely due to the nature of the GVCs, where MNEs establish operations in different countries to take advantage of cost differences and their respective comparative advantages.

India offers lower nominal labour costs than China and Vietnam,<sup>67</sup> but that advantage is eroded when considered alongside its lower labour productivity.<sup>68</sup> The additional burden imposed by high import tariffs makes attracting established players in ICT production GVCs to set up shop a

#### **Tariff Jumping FDI**

A process in which companies invest in a subsidiary in another country to avoid tariffs imposed by the government of the country.

(United States International Trade Commission)

#### **Labour Productivity**

Labour productivity essentially measures the contribution to GDP made by an hour of work by a median worker in a country. The indicator assesses GDP-to-labour input levels and its growth rates over time. This tells us about the efficiency and quality of human capital in the production process for a country and the inputs and innovations used in production. (International Labour Organization) difficult endeavour, even amidst encouraging reforms in current industrial policies.

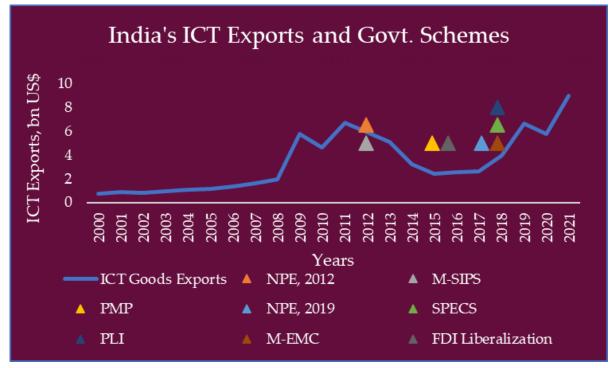
Industrial policies in the past did not create and sustain a culture of innovation, which is essential for competing in a global market. Therefore, India's major challenge regarding the ITA was not the zero-tariff regime itself but its premature membership to the ITA-1, which exposed it to a level of competition it was not ready for.<sup>69</sup>

However, India's industrial policy, even recently, has been heavily focused towards providing incentives (ex: the PLI scheme under the Semicon India Programme) which are negated significantly by its non-competitive tariff structures,<sup>70</sup> which industry body India Cellular & Electronics Association (ICEA) espouses in a recent report.<sup>71</sup> The financial benefits accruing from these incentives are often routed back to pay for high tariffs on imported input materials and intermediate products. Such is the case even in the smartphone assembly sector, where India lags only behind China globally. Consistent representations from firms such as Apple for competitive tariff structure for components utilised in smartphone assembly plants in India were finally given some credence early this year when specific components had their import tariffs eliminated.<sup>72</sup>



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Therefore, instead of linking the failure of the domestic ICT manufacturing sector to the accession of the ITA-1 specifically, it would be wiser to study the factors mentioned above that affect ICT hardware manufacturing outcomes.



**Figure No. 5** India's ICT Exports and Govt Schemes to boost domestic manufacturing (Source: WB Open Database, MEITy, DIPP, Ministry of Commerce and Industry, Govt. of India)



# Making a Case for India's Commitment to the ITA-1

According to a report by India Electronics & Semiconductor Association, the Indian Electronic System Design and Manufacturing (ESDM) market grew from \$76 billion in 2013 to \$400 billion by 2020.<sup>73</sup> The semiconductor market was estimated to grow from \$10.02 billion in 2013 to \$52.58 billion in 2020 at a Compound Annual Growth Rate (CAGR) of 26.72 per cent. However, India imports about 95 per cent of its semiconductor requirements, mainly from China, thus creating a significant trade deficit and dependency on foreign sources for critical components and technologies that power India's economy and security.<sup>74</sup>

India can benefit from the ongoing decoupling of the semiconductor GVC from China due to geopolitical tensions, trade wars, and supply chain disruptions <sup>75</sup>. The US-China tech war has prompted global semiconductor manufacturers to diversify their production, design and sales across multiple regions for security and resilience reasons. The COVID-19 pandemic has also exposed the vulnerabilities of relying on a single source or geographic area for semiconductors and related products. India's potential as an attractive destination for these companies and countries comes from its large domestic market,<sup>76</sup> trained workforce,<sup>77</sup> forward

## 'China + 1' Strategy

A strategy in which companies that have significant parts of their operations in China seek to establish additional sites of operations in other countries. Primary drivers of this phenomenon are geopolitical uncertainties such as the threat of a Chinese invasion of Taiwan, or natural disasters like the Covid-19 Pandemic; developments that can threaten and disrupt supply chains of strategically and economically important goods such as semiconductors. (Wikipedia) linkages with semiconductor design,<sup>78</sup> and strategic partnerships with the US and other allies.<sup>79</sup>

Therefore, India has an established strategic and national interest in becoming part of the semiconductor GVC at a time when companies and countries are creating supply chain redundancies as they move away from China. By reiterating its commitment to the ITA-1 and potentially joining the ITA-2, India can quickly and decisively enhance its integration into the global semiconductor market by reducing tariffs on imported semiconductors and ICT products, attracting MNEs' FDI and technology transfers. Alongside the long-term economic payoff, integration in GVCs would also assist in bridging the gap in technological continuity for strategic areas like semiconductor fabrication.

## Can Free Trade Agreements Replace the ITA-1?

Free trade agreements (FTAs) are bilateral or multilateral agreements that reduce or eliminate barriers to trade and investment between two or more countries. FTAs can offer some benefits that are similar to the ITA-1, such as lower tariffs, increased market access, and enhanced competitiveness



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for IT products.<sup>80</sup> However, these cannot fully replace the benefits of the ITA for several reasons:

Firstly, FTAs are not universal and only cover some significant ICT producers and consumers worldwide. For example, China and India are not part of an FTA dealing with ICT products but are signatories to the ITA.

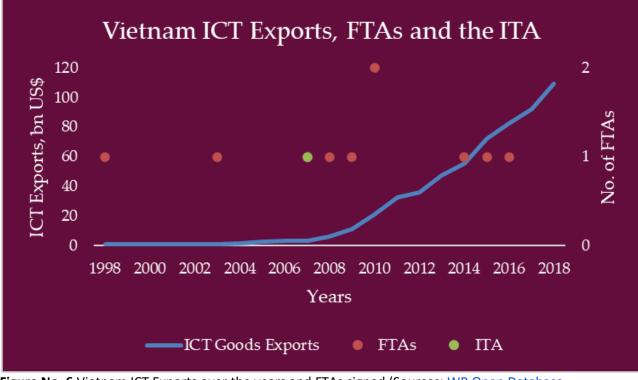
Second, FTAs may have different rules of origin, product coverage, and tariff schedules for ICT products, creating complexity and uncertainty for traders and investors. The ITA provides a harmonised and transparent framework for eliminating tariffs on ICT products among its participants.

Finally, FTAs often involve sensitive issues such as labour standards, environmental protection, intellectual property rights, dispute settlement, etc., which can generate opposition from various stakeholders.

Ideally, FTAs complement but do not substitute the benefits of the ITA for promoting trade and investment in IT products. Countries such as China, Malaysia, and Vietnam have leveraged the benefits of low-tariff regimes afforded by FTAs and the ITA-1.

### USMCA

An FTA between the North American countries of US, Mexico and Canada which eliminated tariff and non-tariff barriers on trade in between the countries. It replaced another previous agreement called NAFTA. (Office of the US Trade Representative)



**Figure No. 6** Vietnam ICT Exports over the years and FTAs signed (Sources: <u>WB Open Database</u>, <u>International Trade Administration (US Govt.</u>), <u>WTO</u>)



An outlier to this trend is Mexico, which has a booming electronics industry and was the world's 11th-largest exporter of ICT goods <sup>81</sup> in 2019. Although it is not a signatory to the ITA, it has FTAs and Preferential Trade Agreements with more than 50 different countries. It is also part of plurilateral agreements with many multilateral groups (USMCA, Pacific Alliance, CPA for Trans-Pacific Partnership etc). Its multilateral and bilateral arrangements involve other major trading partners such as the European Union (European Free Trade Area), Japan, Israel and countries in Latin America.

Over time, Mexico has evolved into one of the biggest exporters to the US, with 14% of all US imports originating from Mexico (\$459 billion, 2022) <sup>82</sup>. Mexico also exported more than \$87 billion worth of electronics equipment, <sup>83</sup> out of which \$76 billion went to the US <sup>84</sup>. Mexico's FTAs enable a low tariff regime for its domestic ICT manufacturing and exports sector without the backing of the ITA.



**Figure No. 7** Mexico's ICT exports and FTAs signed (Source: <u>WB Open Database</u>, <u>International</u> <u>Trade Administration (US Govt</u>). )



# IV. Modern Ambitions Require Modern Solutions?

Any governmental action related to tariff structures and trade policy must be evaluated in light of India's export and manufacturing ambitions. Additionally, policymakers should note that India has made considerable strides in revamping its infrastructure, logistics, investment and industrial policies since 1996. These include the National Integrated Logistics Policy,<sup>85</sup> initiatives under the Make in India Campaign,<sup>86</sup> implementation of the Trade Facilitation Agreement of the WTO,<sup>87</sup> Production-Linked Incentive Schemes,<sup>88</sup> and the National Infrastructure Pipeline<sup>89</sup> etc.

Therefore, our policy recommendation has been assessed based on the following criteria:

#### 1) Feasibility

This criterion includes financial costs that the government will incur as a direct or indirect result of the relevant alternative if implemented. In addition, each alternative also exists on a spectrum of political and social acceptability that takes on greater significance for actions taken on the international stage. Finally, it also assesses



the administrative capacity for implementing proposed measures under each alternative.

For example, a proposal to negotiate new FTAs or an RTA could have minimal costs for the government when considering fiscal outlay and revenue foregone. However, the administrative capacity to conduct negotiations may be severely limited. Simultaneously, the political will to be part of multilateral trade negotiations may also be low, considering India has previously pulled out of similar arrangements like the RCEP. Diplomatic overtures and foreign affairs considerations will have a bearing on such proposed measures.

#### 2) Effectiveness in meeting Economic Goals

This criterion aims to encapsulate the likelihood of policy action achieving the goals to reach \$300 billion in electronics and ICT production by 2026, as outlined by the MEITY vision document. It also accounts for whether a particular alternative complements and furthers the objectives and mechanisms implemented under existing initiatives to promote domestic manufacturing industries such as Make in India. As shown in the examples of countries like Taiwan, Vietnam, and Malaysia, cohesive industrial and trade policies are instrumental in achieving export production goals.

#### 3) Effectiveness in terms of creating Forward and Backward linkages

ICT and electronics manufacturing exist as highly complex GVCs fragmented across different countries. ICT hardware also operates as inputs for other allied sectors in downstream markets, such as IT-enabled services (ITES). This criterion seeks to capture whether a proposed alternative:

- a) Increases the availability and variety of foreign inputs for domestic producers: lowering costs, improving quality and stimulating technology transfer and learning.
- b) Increases the exposure and competition of domestic producers to foreign products, creating incentives for technology upgrading, efficiency improvement and demonstration and imitation effects. Conversely, increased foreign competition can drown out local capacity.
- c) Increases the attractiveness and feasibility of FDI in the sector, bringing capital, technology, skills and market access, creating positive spillovers and linkages for domestic producers and suppliers. It accounts for factors like stimulating or creating upstream markets for inputs and intermediate components due to measures such as local sourcing, etc.



#### 4) Effectiveness in terms of shoring India's strategic vulnerabilities

This criterion aims to capture whether a particular alternative:

- a) addresses any specific sources or types of vulnerabilities that affect the electronics and ICT sector, such as supply chain disruptions, dependence on foreign inputs or markets, exposure to geopolitical risks, lack of domestic capabilities or innovation, etc., and,
- b) enhances the sector's resilience, competitiveness and sustainability by supporting domestic production and promoting technology transfer and adoption.

After analysing the projected outcomes and trade-offs involved in pursuing each of the possible alternatives available to the Government of India, we propose a three-point course of action:

1) Short-Term Action (<2 Years): Reiterate India's commitment to the ITA-1 in spirit by revising tariffs on product categories it covers. For example, doing away with different tariff structures for printed circuits (duty-free) and printed circuit boards used in smartphones (15%) would comply with the definitions of product categories in Attachments A and B of the ITA-1. The Ministry of Commerce and Industry can implement this move relatively quickly. This course of



action aims to emulate the manner in which countries like Taiwan, Vietnam, and Malaysia commenced their zero-tariff regimes under the ITA-1, becoming attractive host economies for ICT product value chains. This also helps cement India's willingness to foster an enabling business environment as it embarks on FTA negotiations as proposed in Point 3 below.

- 2) Medium-Term Action (1-3 Years): Constitute a task force with MEITY and the Ministry of Commerce and Industry representatives to study the overall impact on India's manufacturing sector if it were to accede to the ITA-2. This would ensure that the objective of greater GVC integration in ICT products is considered holistically vis-a-vis the possibility of unintended consequences on other domestic industries. The task force's findings will inform the decision to recommend accession to the ITA-2; the study will also inform negotiating tactics for concessions if India participates in the ongoing ITA-3 negotiations.
- 3) Medium-Long Term Action (2-5 Years): India should aim for targeted integration into strategically important GVCs like semiconductors and initiate interest in FTA negotiations with countries that are dominant in the GVCs for specific ICT products which directly affect India's manufacturing and export ambitions. These products should

be identified by the MEITY, with inputs from the industry. Revamping tariff structures to comply with ITA-1 and strengthening the rule of law will bolster India's standing in ongoing FTA negotiations with jurisdictions like Taiwan and the EU. Reducing both tariff and non-tariff barriers through FTAs would help achieve this objective on an expedited basis. Similar measures under initiatives like the Quad and the iCET can be launched to strengthen supply chains and create export markets. (for example, duty-free imports of Lithium reserves from Australia under an India-Australia Economic Cooperation and Trade Agreement [ECTA] <sup>90</sup> would help India's domestic Li-Ion battery manufacturing capacity and export competitiveness.) FTAs and PTAs under this course of action must be initiated in the immediate aftermath of India's commitment to the ITA-1 to take advantage of the current geopolitical climate and ensuing "*China+1*" strategies of firms in partner countries.





Figure No. 8, Timeline showing the implementation of the Authors' proposed measures.

A detailed analysis of available alternatives, their projected outcomes, and trade-offs are included in the appendix of this paper.

## V. Conclusion

Indeed, the high import dependence of the Indian electronics and ICT industry can be attributed to the trade and investment policy liberalisation that occurred without adequate industrial policy measures to enhance the productivity of India's manufacturing sector. Passive industrial policies that aimed to attract foreign direct investment failed to stimulate domestic electronics manufacturing for an extended period. India's accession to the ITA-1 can only be considered the lynchpin of the domestic ICT

manufacturing industry's demise in a vacuum that ignores the aforementioned flaws.

However, recent policy initiatives suggest a growing cohesion in the state's perspectives on FDI, technology transfer, taxation, infrastructure development, skill development etc. With a targeted industrial incentives-focused approach to reinvigorating the ICT manufacturing and exports industry, it becomes necessary to re-examine India's tariff structures vis-à-vis its commitments to the ITA-1. As countries and companies seek to decouple their ICT supply chains from China, tariff barriers significantly lower India's cost-competitiveness and, consequently, its prospects as an ideal host economy.

These consequences take on a strategic hue when India's goals of becoming a semiconductor nation are considered in tandem. Integration into the global semiconductor value chain is also a strategic goal to reduce dependency on imports of products like semiconductors, not merely an economic one. It is also a value chain with highly capital-intensive stages, such as fabrication, as well as stages that operate on low margins, such as assembly and packaging. The former relies on a favourable business and investment climate, which would benefit from the legal certainty afforded by India's re-commitment to its ITA-1 obligations. The latter depends on



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affordable access to input materials and intermediate components, enabled by a revamped tariff structure.

It is imperative to recognise that the existing industrial-policy-led approach can benefit the Indian ICT and semiconductor manufacturing industry and should be developed further. However, it must also be remembered that in the presence of inefficiencies posed by tariff barriers created by India's divergence from its ITA-1 obligations, this narrow approach needs to be revised to achieve its lofty economic and strategic goals.



## VI. Appendix

Alternatives	Feasibility (admin capacity, financial costs, political will)	Benefits — Economic (export and domestic consumption)	Benefits — Creation of Forward and Backward linkages	Benefits — Reduces Strategic Vulnerabilities
1) Withdraw from the ITA-1 Agreement	High Negotiating with the WTO and other ITA-1 signatories to avoid retaliatory measures. Review and levy of new tariff structures on electronics are challenging to conduct. Undermines regulatory certainty and investment climate even further. Potential for high job losses as companies try to remain competitive.	Moderate to low It has the potential to galvanise domestic production but reduces export competitiveness. It will reduce foreign investment in the creation of manufacturing capacity. It will further erode comparative cost advantage over countries with lower labour costs.	Low Extremely ineffective as importing input and intermediate components becomes expensive. In low margin stages of the GVCs, like assembly and testing, uncertain and high tariff structures will discourage the establishment of facilities by MNEs.	Low Effectively isolates India from existing GVCs. Rebuffs the opportunity to usurp China's shares in GVCs, especially in the stages that play to India's comparative advantage in skilled labour such as assembly and testing. Undermines initiatives like the Quad and the iCET with the USA. Undermines FTA negotiations with countries like Taiwan by adding to an uncertain regulatory environment.

	Existing Tariff revenue is forgone. Low Political will to withdraw from a WTO agreement. It will negatively impact the ITES sector by raising costs of input ICT hardware. High tariffs will negatively impact initiatives like Make in India by negating PLI scheme benefits.			
2) Preserve Status Quo (maintain current trajectory with industrial and fiscal incentives based- approach)	Low to Moderate The existing outlay for initiatives like PLI schemes can be augmented with ease. Political will firmly supports Make in India and is distrustful of the ITA.	Moderate to Low Initiatives like smartphone PLI schemes have met with success. Two foreign players produce for exports. (Apple and Samsung).	Low It does not create adequate incentives for technology transfer from established MNEs like TSMC to domestic firms and bridge technological	Low It does not mount attempts to facilitate integration into GVCs proactively. India will continue not to be the 1st option for China+1 strategies for MNEs.



focus on maneeds cons factors like environmen impact of c hardware p operations. access to ch energy for s foundries is Administrat already est nodal agen SemiCon In Imports of will continu- high and ex- trade defici exports inc	obstacles as the anufacturingproducing for domestic market consumption, with Chinese players like Xiaomi dominating.sideration of the massivewith Chinese players like Xiaomi dominating.ntal and social sertain ICTWill likely achieve short- term export and production goals in specific sectors like smartphone assembly.tive capacity ablished with cies like ndia etc.smartphone assembly.ICT hardware ue to remain kacerbate the it even if rease. This is acity shortfall insmartphone assembly.	likelihood of fewer forward linkages.	Ineffective in building domestic capacity for strategically important semiconductor sector if no integration with GVC occurs.
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	component manufacturing areas.			
3) Realise the Full Potential of ITA-1		Moderate to High This will make export- oriented production more viable. Makes low-margin stages of GVCs like assembly and testing cost-competitive for investing MNEs. Enhanced regulatory certainty and business climate will incentivise foreign investment.	Moderate to High Induces confidence in investors making capital- intensive, long-term investments, especially with industrial policy initiatives like PLI schemes and fiscal and tax incentives. Investment in training workforce and partnership with domestic firms for innovation and R&D.	High It helps integrate Indian firms in ICT production GVCs directly. Offsets India's higher labour costs, which significantly impede MNEs' willingness to diversify operations and set up shop. Enhances India's standing in the WTO, Quad etc. It also enhances India's economic standing whilst negotiating FTAs (with Taiwan, for example).
	specific sectors. The political will to implement a measure starkly opposite to the Make in India and Aatmanirbhar	It also provides impetus to domestic producers, as cheaper and better- quality inputs allow them to maintain cost competitiveness in the domestic market and		

		<i>Bharat</i> campaign is shaky at best.	compete with foreign players.		
4)	Acceding to ITA-2, and	Moderate to High	Moderate	Moderate	Moderate
	Negotiating	Potential to lose out on a	It could provide the	Potentially encourage	Similar to alternative #3 in most
	ITA-3	lot more tariff revenue as	impetus for	investment in emerging	respects, but has the added
		expanded product	manufacturing in	areas like 3D Printers.	potential of integration in GVCs for
		categories become exempt	completely new ICT		products and services like drones,
		from duties.	sectors by making input	Similar benefits as	telecommunication satellite parts
			and final products	alternative #3, but might	etc., and emerging green
		It may negatively affect	cheaper to import.	incentivise more	technologies.
		domestic production for		investments in ICT-	
		multiple manufacturing	Similar benefits as	enabled services by	
		sectors (medical	alternative #3, but	making more input	
		equipment production	potentially greater	hardware cheaper (ex:	
		etc.).	impact on technology	printers and cartridges). It	
			diffusion. Cheaper	also signals a long-term	
		The political will to cede	access to emerging	commitment on the	
		tariff control over such a	technologies can	government's part to	
		wide variety of products is	invigorate domestic	maintain a healthy	
		very low, especially when	innovation.	business and investment	
		there is negligible data to		climate.	
		projecting outcomes.			
				Can create forward and	
				backward linkages in new	

				ICT-enabled technologies or deep-tech (e.g. 3D printing)	
5)	Wield FTAs/RTAs/	High	Moderate to High	Moderate to High	High
	PTAs	Negligible tariff revenue is	India has prior	Strong backward linkages	Strategic sectors like
	strategically with countries	foregone.	experience lowering import costs of final	for input materials with negotiating countries will	semiconductors would benefit the most from close negotiations with
	dominant in GVCs	Extensive administrative	products via FTAs (South	be a direct result.	countries with MNEs seeking to
	GVCS	capacity is required,	Korea- TVs and cars). It	Especially important in	reduce operational dependency on
		especially in terms of	is the easiest way to	areas like semiconductor	China.
		negotiation capability, and	create an assembly or	manufacturing where	
		coordination between	boxed product imports-	domestic production	It enhances supply chain resiliency
		multiple government	focused domestic	capability in highly	and helps integrate with GVCs that
		departments, since	industry.	specialised equipment	are identified to be vital to India's
		reduction of non-tariff		does not exist.	interest.
		barriers is also	Easier for movement of		
		concomitant.	human capital between	Potential to become an	
			the countries.	extension of the partner	
		The political will to amend		countries' specialisation	
		existing agreements and	Easier pathway to	in GVCs. (for example, an	
		negotiate new ones is	acquiring leading-edge	FTA with Taiwan can be	
		present. However, it is not	technologies, as terms	laser-focused on enabling	
		the easiest prospect to re-	related to tech transfer	the creation of local	
		enter trade arrangements	can be negotiated better	capacity for	
		in the aftermath of India's			

exit from foreign trade	in a bilateral or smaller	semiconductor	
negotiations like with the	plurilateral setting.	fabrication).	
RCEP.			
	It could encourage	High potential for positive	
Low negotiating power	bilateral industrial	spillovers as partner	
may result in unfavourable	partnerships that	countries improve their	
terms for India as it	augment or create	technology and	
attempts to acquire	domestic manufacturing	production processes,	
leading-edge technology.	capacity in the	which can be shared with	
	electronics and ICT	India.	
Similar financial costs as	sectors.		
alternative #3, contingent		Training and Technology	
on the number of FTAs,	It will reduce tariffs on	demonstration by partner	
and their product	specific products but can	country MNEs can be	
coverage.	have a similar impact as	specifically encouraged in	
	the alternatives #3 and	sectors like	
	#4, like in the case of	semiconductor	
	Vietnam. Reduction of	manufacturing.	
	non-tariff barriers such		
	as customs clearance,		
	and shared investment		
	in infrastructure can		
	streamline cooperation.		

### **Courses of Action Available to India**

#### 1) Withdraw from the ITA-1 Agreement

The Ministry of Commerce and Industry squarely blames the ITA-1 for wiping out the IT industry from India. It seeks to protect the recently galvanised domestic Electronics and ICT manufacturing sector against "undue competitive pressures" from imports. To implement this plan of action, the following steps are proposed:

- a. Invoke Article XV of the Agreement Establishing the World Trade Organization, and notify the Director-General of India's intent to withdraw from the ITA-1. This shall take effect within 6 months from the date of notification.
- b. Constitute a task force with stakeholders from both government, and domestic industry to review and recommend tariff structures without ITA-1 commitments to be implemented within that period, aiming to protect India's nascent electronics production industry.



c. Conduct negotiations with identified jurisdictions like the EU to avoid significant retaliatory tariff measures and to inform the task force's recommendations.

#### 2) Preserve Status Quo (Do Nothing)

In line with India's existing industrial incentives-based approach to kickstart its domestic electronics and ICT manufacturing sector, the following steps are proposed:

- a) Reiterate on fiscal incentives, as well as initiatives like manufacturing PLI schemes that have already been proposed, and implemented.
- b) Re-evaluate and revise import tariffs on components and inputs needed for ICT manufacturing when the need arises by consultation with industry stakeholders.

#### 3) Realise the full potential of ITA-1

Other countries like China have successfully exploited the duty-free imports enabled by the ITA-1 commitments to become the world's largest electronics exporter and manufacturer. India's obligations under the ITA have been qualified by its frequent and ad hoc revisions of tariff structures



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on ICT hardware, input components and products like smartphones. This prohibits the Indian electronics sector from accessing competitively priced imports of inputs and intermediate parts and the opportunity for GVC integration available to China.

Therefore, reiterating our commitment to the tariff structure envisaged by the ITA-1 in both spirit and the letter and revamping India's tariffs on the scheduled product categories will enable us to reap both the economic and strategic benefits of a free-trade regime. The following steps are proposed under this alternative:

- a. Amending the Schedules to the Customs Tariff Act, 1975, to fully bring India's trade policy in line with its ITA-1 obligations.
- b. Invoke Article-4 consultations at the WTO to amicably settle disputes arising from its erstwhile tariff structures and reservations with the ITA Products Transposition from HS2002 to HS2007.

#### 4) Acceding to ITA-2 and negotiating ITA-3

o benefit from the substantial trade in the 201 product categories covered under the ITA-2 (1.3 Trillion \$/year), India can accede to the ITA-2 expansion. This also enables it to gain a seat at the negotiating table for ITA-3, where it can leverage its vast domestic market for ICT products and its



leadership in ICT-enabled software exports to get favourable outcomes for its domestic industry. The following steps are proposed:

- a. Amend the Schedule to the Customs Tariff Act, 1975, to reflect the tariff exemptions for product categories envisaged in the ITA-2 expansion.
- b. Negotiate the ITA-3 to ensure concessions and mechanisms to lessen the impact of asymmetric trade deficits, technology transfer, and other exemptions.
- 5) Wield FTAs/RTAs/ PTAs strategically with countries dominant in GVCs

To preserve the policy space of the government to support domestic manufacturers to the maximum possible extent whilst attracting foreign investment, India can identify countries that are strategic to its manufacturing and export goals, as well as dominant in existing GVCs for electronics and ICT and negotiate FTAs/RTAs with them. This also involves augmenting existing FTAs and PTAs if negotiating with other developing countries. FTAs also allow concurrent cooperation on complementary factors such as infrastructure, logistics clearance etc., which form significant non-tariff barriers. The following steps are proposed:

a. The Ministry of Commerce and Industry must identify trade opportunities with countries offering tangible short to medium-term

advantages per our economic and strategic goals. This necessarily involves inputs from both industry and government stakeholders from the countries involved.

- b. Identify tariff lines that will need to be incorporated into any such agreement to comprehensively cover all sectors of trade that are sought to be given impetus.
- c. Post negotiations, inform the WTO of the decision to enter into an FTA/PTA under GATT Article XXIV.
- d. Bring domestic legislation and policies in line with commitments made in agreements.



### **VII. References**

<sup>1</sup> Ministry of Electronics & IT Releases 2nd Volume of Vision Document on Electronics Manufacturing." n.d. Www.pib.gov.in. Accessed May 22, 2023.

https://www.pib.gov.in/PressReleasePage.aspx?PRID=1792189 and

"A CALL to ACTION for BROADENING and DEEPENING ELECTRONICS MANUFACTURING by the HON'BLE PRIME MINISTER NARENDRA MODI Vision Document Volume 2." n.d. Accessed May 22, 2023.

https://static.pib.gov.in/WriteReadData/specificdocs/documents/2022/jan/doc20221247801. pdf.

<sup>2</sup> Review of Global Value Chain Development Report, 2019.World Trade Organisation. https://www.oecd.org/dev/Global-Value-Chain-Development-Report-2019-Technological-Innovation-Supply-Chain-Trade-and-Workers-in-a-Globalized-World.pdf.

<sup>3</sup>"Trade Policy Implications of Global Value Chains." 2013. https://www.oecd.org/sti/ind/Trade\_Policy\_Implications\_May\_2013.pdf.

<sup>4</sup> Dabla-Norris, Era, and Romain Duval. 2016. Review of How Lowering Trade Barriers Can Revive Global Productivity and Growth. IMF Blog (blog). 2016. https://www.imf.org/en/Blogs/Articles/2016/06/20/how-lowering-trade-barriers-can-reviveglobal-productivity-and-growth.

<sup>5</sup> Bank, European Central. n.d. "The Effects of Tariff Hikes in a World of Global Value Chains." European Central Bank. https://www.ecb.europa.eu/pub/economic-bulletin/focus/2019/html/ecb.ebbox201908\_01~da0137b70b.en.html.

<sup>6</sup> Costinot, Arnaud , and Iván Werning. 2017. Review of THE LERNER SYMMETRY THEOREM: GENERALIZATIONS and QUALIFICATIONS. NATIONAL BUREAU of ECONOMIC RESEARCH. https://www.nber.org/system/files/working\_papers/w23427/w23427.pdf.

<sup>7</sup> Chen, Xin , and Kwang Jae Sung. 2014. Review of Lerner Symmetry Theorem and Lerner Neutrality Theorem. Duke University. https://sites.duke.edu/econ567\_01\_s2013/files/2014/05/ECON567-Midterm-Project-Final-Chen-Sung.docx

<sup>8</sup> Burkacky, Ondrej, Marc de Jong, Ankit Mittal, and Nakul Verma. 2021. "Value Creation: How Can the Semiconductor Industry Keep Outperforming? | McKinsey." Www.mckinsey.com. October 15, 2021. https://www.mckinsey.com/industries/semiconductors/our-insights/value-creation-how-can-the-semiconductor-industry-keep-outperforming.

<sup>9</sup> Veeramani, C. 2021. Review of Back Fix Inverted Tariff Structures to Boost Industrial Growth in India. LiveMint, January 27, 2021. https://www.livemint.com/budget/opinion/fix-inverted-tariff-structures-to-boost-industrial-growth-in-india-11611764193419.html.

<sup>10</sup> Awasthi, Anurag . 2023. Review of India's Key to Becoming a Global Semiconductor Hub: Skilled Manpower in Semiconductor Manufacturing. Outlook India, March 23, 2023. https://www.outlookindia.com/business/india-s-key-to-becoming-a-global-semiconductorhub-skilled-manpower-in-semiconductor-manufacturing-news-272441.

<sup>11</sup>"WTO | Information Technology Agreement." n.d. Www.wto.org. https://www.wto.org/english/tratop\_e/inftec\_e/inftec\_e.htm.

<sup>12</sup> "WTO | Information Technology Agreement." n.d. Www.wto.org. https://www.wto.org/english/tratop\_e/inftec\_e/inftec\_e.htm.

<sup>13</sup>"WTO | ITA Introduction." n.d. www.wto.org. https://www.wto.org/english/tratop\_e/inftec\_e/itaintro\_e.htm.

<sup>14</sup>"WTO | Information Technology Agreement." n.d. Www.wto.org. https://www.wto.org/english/tratop\_e/inftec\_e/inftec\_e.htm.



<sup>15</sup> "WTO | Information Technology Agreement." n.d. Www.wto.org. https://www.wto.org/english/tratop\_e/inftec\_e/inftec\_e.htm.

<sup>16</sup>WINSLETT, GARY. 2017. "Critical Mass Agreements: The Proven Template for Trade Liberalization in the WTO." World Trade Review 17 (3): 405–26. https://doi.org/10.1017/s1474745617000295.

<sup>17</sup>Radcliffe, Brent. 2021. "The Basics of Tariffs and Trade Barriers." Investopedia. 2021. https://www.investopedia.com/articles/economics/08/tariff-trade-barrier-basics.asp.

<sup>18</sup>"How an Information Technology Agreement 3.0 Would Bolster Global Economic Growth and Opportunity." n.d. Itif.org. https://itif.org/publications/2021/09/16/how-an-information-technology-agreement-3-0-would-bolster-global-economic-growth-and-opportunity/.

<sup>19</sup> "How an Information Technology Agreement 3.0 Would Bolster Global Economic Growth and Opportunity." n.d. Itif.org. https://itif.org/publications/2021/09/16/how-an-information-technology-agreement-3-0-would-bolster-global-economic-growth-and-opportunity/.

<sup>20</sup> "How an Information Technology Agreement 3.0 Would Bolster Global Economic Growth and Opportunity." n.d. Itif.org. https://itif.org/publications/2021/09/16/how-an-information-technology-agreement-3-0-would-bolster-global-economic-growth-and-opportunity/.

<sup>21</sup> Review of Information Technology Agreement. n.d. Department of Commerce. Ministry of Commerce and Industry. Accessed May 26, 2023. https://commerce.gov.in/international-trade/india-and-world-trade-organization-wto/information-technology-agreement/.

<sup>22</sup> China, India, Vietnam, Thailand, and Mexico. n.d. "A Comparative Study of Import Tariffs in Electronics." Accessed May 22, 2023. https://icea.org.in/blog/wp-content/uploads/2022/01/Report-by-ICEA-on-Detailed\_Tariffs-Drive-Competitiveness-and-Scale\_06022022.pdf.

<sup>23</sup> "Information Technology Agreement (ITA) Xiaobing Tang Market Access Division, WTO Xiaobing.tang@Wto.org." n.d. Accessed May 23, 2023.
 https://www.miti.gov.my/miti/resources/fileupload/Rev\_APEC\_Workshop\_ITA\_TangX.pdf.

<sup>24</sup> "SilTerra MEMS Foundry Case Study | OnScale Engineering Simulation." n.d. OnScale. Accessed May 22, 2023. https://onscale.com/case-studies/silterra/.

<sup>25</sup> "SilTerra MEMS Foundry Case Study | OnScale Engineering Simulation." n.d. OnScale. Accessed May 22, 2023. https://onscale.com/case-studies/silterra/.

<sup>26</sup> "Malaysia - Economic Indicators." n.d. Tradingeconomics.com. https://tradingeconomics.com/malaysia/indicators.

<sup>27</sup> Perspective, Asia. 2022. "Electronics Manufacturing in Vietnam - an Introduction." Asia Perspective. May 5, 2022. https://www.asiaperspective.com/vietnam-electronics-manufacturing-sourcing/.

<sup>28</sup> China, India, Vietnam, Thailand, and Mexico. n.d. "A Comparative Study of Import Tariffs in Electronics." Accessed May 22, 2023. https://icea.org.in/blog/wpcontent/uploads/2022/01/Report-by-ICEA-on-Detailed\_Tariffs-Drive-Competitiveness-and-Scale\_06022022.pdf.

<sup>29</sup> VIR, Vietnam Investment Review-. 2022. "Vietnam Ready to Embrace Semiconductor Manufacturing." Vietnam Investment Review - VIR. October 4, 2022. https://vir.com.vn/vietnam-ready-to-embrace-semiconductor-manufacturing-96846.html.

<sup>30</sup> "Vietnam Exports by Category." n.d. Tradingeconomics.com. https://tradingeconomics.com/vietnam/exports-by-category.



<sup>31</sup> The World Bank. 2023. "World Development Indicators | DataBank." Worldbank.org. 2023. https://databank.worldbank.org/source/world-development-indicators#.

<sup>32</sup> Ernst, Dieter. 2016. "The Information Technology Agreement, Manufacturing and Innovation China's and India's Contrasting Experiences." SSRN Electronic Journal. https://doi.org/10.2139/ssrn.2737082.

<sup>33</sup> Ernst, Dieter. 2016. "The Information Technology Agreement, Manufacturing and Innovation China's and India's Contrasting Experiences." SSRN Electronic Journal. https://doi.org/10.2139/ssrn.2737082.

<sup>34</sup> Ernst, Dieter. 2016. "The Information Technology Agreement, Manufacturing and Innovation China's and India's Contrasting Experiences." SSRN Electronic Journal. https://doi.org/10.2139/ssrn.2737082.

<sup>35</sup> Ernst, Dieter. 2016. "The Information Technology Agreement, Manufacturing and Innovation China's and India's Contrasting Experiences." SSRN Electronic Journal. https://doi.org/10.2139/ssrn.2737082.

<sup>36</sup> Wong-Leung, Jenny. 2022. "Seismic Shifts Underway in Global Semiconductor Market as US Accelerates Decoupling from China." The Strategist. October 19, 2022. https://www.aspistrategist.org.au/seismic-shifts-underway-in-global-semiconductor-market-as-us-accelerates-decoupling-from-china/#:~:text=In%202020%2C%20Taiwan%20(22%25).

<sup>37</sup> Gereffi, Gary, Hyun-Chin Lim, and Joonkoo Lee. "Trade Policies, Firm Strategies, and Adaptive Reconfigurations of Global Value Chains." Journal of International Business Policy 4, no. 4 (March 16, 2021): 506–22. https://doi.org/10.1057/s42214-021-00102-z.

<sup>38</sup> Briefing, ASEAN. 2017. "ASEAN's Free Trade Agreements: An Overview." ASEAN Business News. December 7, 2017. https://www.aseanbriefing.com/news/aseans-free-trade-agreements-an-overview/.



<sup>39</sup> "China Exports by Category." 2020. Tradingeconomics.com. 2020. https://tradingeconomics.com/china/exports-by-category.

<sup>40</sup> Su, Qingyi, and Chengwei Zang. 2020. "How Will the Implementation of Zero Tariffs Affect Employment in China?" China & World Economy 28 (2): 123–42. https://doi.org/10.1111/cwe.12324.

<sup>41</sup> Beutler, Ben. 2007. "Electronic Business' Top 100 Chinese Electronics Companies." EDN. September 18, 2007. https://www.edn.com/electronic-business-top-100-chinese-electronics-companies/.

<sup>42</sup> China, India, Vietnam, Thailand, and Mexico. n.d. "A Comparative Study of Import Tariffs in Electronics." https://icea.org.in/blog/wp-content/uploads/2022/01/Report-by-ICEA-on-Detailed\_Tariffs-Drive-Competitiveness-and-Scale\_06022022.pdf.

<sup>43</sup> Team, Internet. n.d. "ICT Development in Taiwan." Taipei Trade Office in the Federal Republic of Nigeria 駐奈及利亞聯邦共和國臺北貿易辦事處. Accessed May 22, 2023. https://www.roc-taiwan.org/ng\_en/post/416.html.

<sup>44</sup> "How Taiwan Created TSMC." n.d. Www.youtube.com. Accessed May 22, 2023. https://www.youtube.com/watch?v=9fVrWDdll0g&t=622s.

<sup>45</sup> "How Taiwan Created TSMC." n.d. Www.youtube.com. Accessed May 22, 2023. https://www.youtube.com/watch?v=9fVrWDdll0g&t=622s.

<sup>46</sup> "STUDIES IN TECHNOLOGY TRANSFER - Selected Cases from Argentina, China, South Africa and Taiwan Province of China," n.d. https://unctad.org/system/files/official-document/dtlstict2013d7\_en.pdf.

#### Takshashila Discussion Document 2023-09

<sup>47</sup> The Economist. 2023. "Taiwan's Dominance of the Chip Industry Makes It More Important." The Economist. March 6, 2023. https://www.economist.com/specialreport/2023/03/06/taiwans-dominance-of-the-chip-industry-makes-it-more-important.

<sup>48</sup> "WTO | Information Technology Agreement." n.d. Www.wto.org. Accessed May 22, 2023. http://www.wto.org/english/tratop\_e/inftec\_e/inftec\_e.htm

<sup>49</sup>"WTO | Legal Texts - Ministerial Declaration on Trade in Information Technology Products." n.d. Www.wto.org. https://www.wto.org/english/docs\_e/legal\_e/itadec\_e.htm.

<sup>50</sup>The World Bank. 2023. "World Development Indicators | DataBank." Worldbank.org. 2023. https://databank.worldbank.org/source/world-development-indicators#.

<sup>51</sup>Ranade, Ajit. 2020. "Nokia Was a 'Made in India' Success Story but We Allowed It to Flounder." National Herald. November 29, 2020. https://www.nationalheraldindia.com/opinion/nokia-was-a-made-in-india-success-story-but-we-allowed-it-to-flounder.

<sup>52</sup> Ranade, Ajit. 2020. "Nokia Was a 'Made in India' Success Story but We Allowed It to Flounder." National Herald. November 29, 2020. https://www.nationalheraldindia.com/opinion/nokia-was-a-made-in-india-success-story-butwe-allowed-it-to-flounder.

<sup>53</sup> Gurnaney, Tina, and Khan, Danish, 2020. "What Went Wrong with the Indian Handset Makers and How Can It Be Fixed - et Telecom." ETTelecom.com. Accessed November 20, 2022. https://telecom.economictimes.indiatimes.com/news/what-went-wrong-with-the-indianhandset-makers-and-how-can-it-be-fixed/65381732.

<sup>54</sup> Francis, Smitha, and Murali Kallummal. "The Impact of FTAs on India's Electronics Manufacturing." ResearchGate, September 28, 2020.

https://www.researchgate.net/publication/344889548\_The\_Impact\_of\_FTAs\_on\_India's\_Elect ronics\_Manufacturing

<sup>55</sup> Blonigen, Bruce A., KaSaundra Tomlin, and Wesley W. Wilson. 2004. "Tariff-Jumping FDI and Domestic Firms' Profits." The Canadian Journal of Economics / Revue Canadienne D'Economique 37 (3): 656–77. https://www.jstor.org/stable/3696010.

<sup>56</sup>"Information Technology Agreement." n.d. Mcommerce. https://commerce.gov.in/international-trade/india-and-world-trade-organizationwto/information-technology-agreement/.

<sup>57</sup> "Tariff 2021-22 (as on 01-02-2022)." n.d. Old.cbic.gov.in. Accessed May 26, 2023. https://old.cbic.gov.in/htdocs-cbec/customs/cst2023-010523/cst-idx.

<sup>58</sup> "WTO | Dispute Settlement - DS582: India - Tariff Treatment on Certain Goods in the Information and Communications Technology Sector." n.d. Www.wto.org. https://www.wto.org/english/tratop\_e/dispu\_e/cases\_e/ds582\_e.htm.

<sup>59</sup>"IMPACT of TRADE LIBERALISATION on the INDIAN ELECTRONICS INDUSTRY: Some Aspects of the Industrial Policy Dynamics of Global Value Chain Engagement Smitha Francis Institute for Studies in Industrial Development." 2016. https://isid.org.in/wpcontent/uploads/2022/09/WP192.pdf.

<sup>60</sup> Banga, Rashmi. 2020. "Implications of Signing Information Technology Agreement (ITA-1) and Expansion of ITA (ITA-2)." https://wtocentre.iift.ac.in/workingpaper/WP%20Implications%20of%20signing%20IITAI%20a nd%20ITA%20Expansion.pdf.



<sup>61</sup> Ernst, Dieter. 2016. "The Information Technology Agreement, Manufacturing and Innovation China's and India's Contrasting Experiences." SSRN Electronic Journal. https://doi.org/10.2139/ssrn.2737082.

<sup>62</sup> Ernst, Dieter. 2016. "The Information Technology Agreement, Manufacturing and Innovation China's and India's Contrasting Experiences." SSRN Electronic Journal. https://doi.org/10.2139/ssrn.2737082.

<sup>63</sup> "Export of Electronic Goods." n.d. Pib.gov.in. Accessed June 3, 2023. https://pib.gov.in/PressReleaselframePage.aspx?PRID=1814031.

<sup>64</sup>Athukorala, Prema-chandra. 2018. "Joining Global Production Networks: Experience and Prospects of India." Asian Economic Policy Review 14 (1): 123–43. https://doi.org/10.1111/aepr.12248.

<sup>65</sup> Athukorala, Prema-chandra. 2018. "Joining Global Production Networks: Experience and Prospects of India." Asian Economic Policy Review 14 (1): 123–43. https://doi.org/10.1111/aepr.12248. and China, India, Vietnam, Thailand, and Mexico. n.d. "A Comparative Study of Import Tariffs in Electronics." https://icea.org.in/blog/wpcontent/uploads/2022/01/Report-by-ICEA-on-Detailed\_Tariffs-Drive-Competitiveness-and-Scale\_06022022.pdf.

<sup>66</sup> "IMPACT of TRADE LIBERALISATION on the INDIAN ELECTRONICS INDUSTRY: Some Aspects of the Industrial Policy Dynamics of Global Value Chain Engagement", Smitha Francis, Institute for Studies in Industrial Development." 2016. https://isid.org.in/wp-content/uploads/2022/09/WP192.pdf.

<sup>67</sup> Das Gupta, Surajeet. 2022. Review of China plus One: Low Labour Costs and Growing Workforce Give India the Edge. Business-Standard, November 28, 2022. https://www.business-standard.com/article/economy-policy/india-s-low-labour-costskey-in-wooing-firms-to-move-production-from-china-122112700419\_1.html.

#### Takshashila Discussion Document 2023-09

<sup>68</sup> "Labour Productivity." 2021. ILOSTAT. 2021. https://ilostat.ilo.org/topics/labourproductivity/.

<sup>69</sup>Khanderia, Saloni. 2018. "The Information Technology Agreement and the 'Make-In-India' Initiative." Foreign Trade Review 53 (2): 98–115. https://doi.org/10.1177/0015732517734749.

<sup>70</sup>China, India, Vietnam, Thailand, and Mexico. n.d. "A Comparative Study of Import Tariffs in Electronics." https://icea.org.in/blog/wp-content/uploads/2022/01/Report-by-ICEA-on-Detailed\_Tariffs-Drive-Competitiveness-and-Scale\_06022022.pdf.

<sup>71</sup> China, India, Vietnam, Thailand, and Mexico. n.d. "A Comparative Study of Import Tariffs in Electronics." https://icea.org.in/blog/wp-content/uploads/2022/01/Report-by-ICEA-on-Detailed\_Tariffs-Drive-Competitiveness-and-Scale\_06022022.pdf.

<sup>72</sup>"India's Customs Duty Change to Dial up Local Phone Production-Tax Official." 2023. HT Tech. February 4, 2023. https://tech.hindustantimes.com/tech/news/indias-customs-duty-change-to-dial-up-local-phone-production-tax-official-71675452564178.html.

<sup>73</sup> "Semiconductor Industry in India, Indian Semiconductor Association: IBEF." n.d. www.ibef.org. https://www.ibef.org/industry/semiconductors.aspx.

<sup>74</sup> "Strengthening the Global Semiconductor Supply Chain in an Uncertain Era." BCG Global. March 28, 2021. http://www.bcg.com/publications/2021/strengthening-the-globalsemiconductor-supply-chain.

<sup>75</sup>"India Big Beneficiary as Companies Move towards 'China plus One' Strategy." n.d. NDTV.com. Accessed May 22, 2023. https://www.ndtv.com/india-news/india-on-cusp-of-huge-change-as-world-looks-beyond-china-3715930.

<sup>76</sup> "India's next 'Big Push' towards Semiconductor Industry." n.d. Www.investindia.gov.in. Accessed June 3, 2023. https://www.investindia.gov.in/team-india-blogs/indias-next-big-push-towards-semiconductor-industry.



<sup>77</sup> Awasthi, Anurag . 2023. Review of India's Key to Becoming a Global Semiconductor Hub: Skilled Manpower in Semiconductor Manufacturing. Outlook India, March 23, 2023. https://www.outlookindia.com/business/india-s-key-to-becoming-a-global-semiconductorhub-skilled-manpower-in-semiconductor-manufacturing-news-272441.

<sup>78</sup> Kumar, Mamidala Jagadesh. 2021. "Is India Going to Be a Major Hub of Semiconductor Chip Manufacturing?" IETE Technical Review 38 (3): 279–81. https://doi.org/10.1080/02564602.2021.1916166.

<sup>79</sup> Kharpal, Arjun. 2022. Review of "India Has a Big Role to Play": New Delhi Is Trying to Turn the Country into a Chip Powerhouse. CNBC, September 25, 2022. https://www.cnbc.com/2022/09/26/how-india-is-trying-to-turn-itself-into-a-semiconductor-powerhouse.html.

<sup>80</sup> Barone, Adam. 2022. "Free Trade Allows the Free Movement of Imports and Exports." Investopedia. June 4, 2022. https://www.investopedia.com/terms/f/free-trade.asp.

<sup>81</sup> China, India, Vietnam, Thailand, and Mexico. n.d. "A Comparative Study of Import Tariffs in Electronics." https://icea.org.in/blog/wp-content/uploads/2022/01/Report-by-ICEA-on-Detailed\_Tariffs-Drive-Competitiveness-and-Scale\_06022022.pdf.

<sup>82</sup> "United States Imports by Country." 2018. Tradingeconomics.com. 2018. https://tradingeconomics.com/united-states/imports-by-country.

<sup>83</sup> "Mexico Exports by Category." n.d. Tradingeconomics.com. https://tradingeconomics.com/mexico/exports-by-category.

<sup>84</sup> "Mexico Exports of Electrical, Electronic Equipment to United States - 2023 Data 2024
 Forecast 1990-2021 Historical." n.d. Tradingeconomics.com. Accessed May 23, 2023.
 https://tradingeconomics.com/mexico/exports/united-states/electrical-electronic-equipment.

<sup>85</sup> Invest India. "National Logistics Policy in India," September 20, 2022. https://www.investindia.gov.in/team-india-blogs/national-logistics-policyindia#:~:text=The%20NLP%20thus%20aims%20to,8%20per%20cent%20by%202030.

<sup>86</sup> "Initiatives Taken by the Government to Boost Manufacturing," n.d. https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1882145.

<sup>87</sup> "Trade Facilitation." n.d. Mcommerce. Accessed May 22, 2023. https://commerce.gov.in/international-trade/india-and-world-trade-organization-wto/trade-facilitation.

<sup>88</sup> "Production Linked Incentive (PLI) Schemes in India." n.d. Www.investindia.gov.in. https://www.investindia.gov.in/production-linked-incentives-schemes-india.

<sup>89</sup> "National Infrastructure Pipeline: Invest in Infrastructure Projects in India | IIG." n.d. Indiainvestmentgrid.gov.in. https://indiainvestmentgrid.gov.in/national-infrastructure-pipeline.

<sup>90</sup> The Hindu. 2023. "India Mulling to Discuss Mechanism with Australia under FTA for Smooth Supply of Critical Minerals," March 12, 2023, sec. India. https://www.thehindu.com/news/national/india-mulling-to-discuss-mechanism-withaustralia-under-fta-for-smooth-supply-of-critical-minerals/article66610288.ece.





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