

India: A 21st century technology hub?

How US-China geopolitical rivalry could benefit New Delhi

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Executive summary

Geopolitics in the 21st century have handed India an historic opportunity.

Geopolitics in the 21st century have handed India an historic opportunity. Washington's technology cold war with Beijing has resulted in strategic decoupling, prompting manufacturing supply chains to shift to new locations.

India finds itself well positioned to absorb these supply chains. The government of Prime Minister Narendra Modi has responded by rolling out reforms to attract foreign direct investment (FDI), create new infrastructure, and promote special economic zones (SEZs) and technology clusters.

New Delhi aims to build up its local manufacturing capabilities. It is focusing on smartphones and other digital hardware, while also looking to spawn a new crop of national unicorns, which the government hopes will transform India into a technology export hub. Meanwhile, India's digital landscape appears to be on the verge of a fintech and e-commerce revolution which could fuel demand for new connected devices.

But India will not succeed unless its leaders fix systemic issues that have hampered efforts to grow the manufacturing sector.

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If it can overcome its main challenges, geopolitical developments bode well for New Delhi. India is growing in importance, for example, as a security partner for Washington and its allies. As a democracy, India's alignment on technology-related values also puts the country in a favorable position. All of this could draw in more global value chains.

Introduction

India has struggled to develop a solid manufacturing base within its economy. Despite the much-vaunted ‘Make in India’ campaign – an initiative by the Government of India to encourage companies to manufacture in India and incentivize dedicated investments into manufacturing – in terms of value added, manufacturing constituted just 13.6% of GDP in 2019.¹

This compares with 27.1% in China and 16.4% in Vietnam. Moreover, between 2010 and 2020, manufacturing as a percentage of India’s GDP, in real terms, actually decreased.²

India is regarded as having a particularly challenging business environment³ beset with structural challenges including poor infrastructure, an inefficient bureaucracy, and high taxation.⁴ This reality is seen as a major impediment to attracting inward foreign direct investment (FDI) and the technology and managerial know-how that it brings.

Geopolitical developments favor India

Firms from the US, the EU, Taiwan, South Korea, and Japan are looking to move geo-fenced operations to India.

Despite much maligned systemic issues, a combination of geopolitical and internal dynamics suggest that India now faces an historic opportunity to transform into one of the world’s most important technology hubs.

In 2021, an executive order⁵ signed by US President Joe Biden called for the creation of “China-free” supply chains in strategic industries, such as pharmaceutical and bio-pharma products, batteries, rare earths, and semiconductors. Firms from the US, the EU, Taiwan, South Korea, and Japan, all active players in these areas, are looking to move portions of geo-fenced operations to India.

As a member of the “QUAD,” New Delhi’s growing importance as an Indo-Pacific security partner to America is significant.

As a member of the “QUAD,” New Delhi’s growing importance as an Indo-Pacific security partner to America is also significant. Security covers a wide range of issues from joint military strategy to vaccine diplomacy. In early 2021, India, Australia, and Japan, along with the US, committed to stockpiling billions of surplus doses of COVID-19 vaccinations for distribution throughout Southeast Asia and beyond. This action was taken primarily to counter Beijing’s global vaccine diplomacy campaign.

These developments can be attributed to techno-nationalism: mercantilist-like behavior that links tech innovation and enterprise directly to the national security, economic prosperity, and social stability of a nation. A paradigm shift is underway as policy makers abandon “free trade” principles and pursue reciprocal measures aimed at China’s state-capitalist model.

India’s status as a democracy also gives it special appeal. Tech standards and values regarding privacy, surveillance, and censorship will favor India as the world’s democratic nations coalesce into blocs around rule-frameworks. Going

A paradigm shift is underway as policy makers abandon “free trade” principles and pursue reciprocal measures aimed at China.

forward, Chinese tech companies – often viewed as proxies of a techno-authoritarian government – could face mounting sanctions and export controls, which could hasten foreign firms’ efforts to shift operations to India.

Overview of paper

This paper seeks to answer the question of whether India in the 21st century will emerge as a technology manufacturing hub. Four key questions are identified and form the structure of this paper:

1. Is India’s economy and technology landscape ready to springboard to the next level? Key areas of analysis:

- Fundamentals of India’s economy
- Strategic manufacturing goals
- Decoupling from China
- India’s digital landscape: a “mobile-first” revolution
- Transition from software and engineering outsourcing center to making hardware
- Ease of doing business challenges

2. Can India avoid the mistakes and failures of past government-led initiatives? Key areas of analysis:

- Reasons for previous failures
- Signs of progress
- Overview of India’s 2014-2020 techno-nationalist policies

3. Can India’s smartphone manufacturing capabilities tilt the regional geopolitical balance? Key areas of analysis:

- Effect of trade barriers and FDI controls
- Building world class “Clusters”
- Chinese smartphone makers in India
- Importance of printed circuit board assemblies (PCBAs) and semiconductors

4. Do geopolitics present New Delhi with fresh options for techno-diplomacy? Key areas of analysis:

- Paradigm shift: from free trade to neo-mercantilism
- New Delhi’s increased bargaining power with Washington
- Attracting “China-free” supply chains
- India’s QUAD opportunity

1. India's economy and technology landscape

Middle and upper-income segments of India's population of some 1.3 billion will fuel strong market demand.

In 2019, India had the second-highest number of mobile internet users in the world, after China.

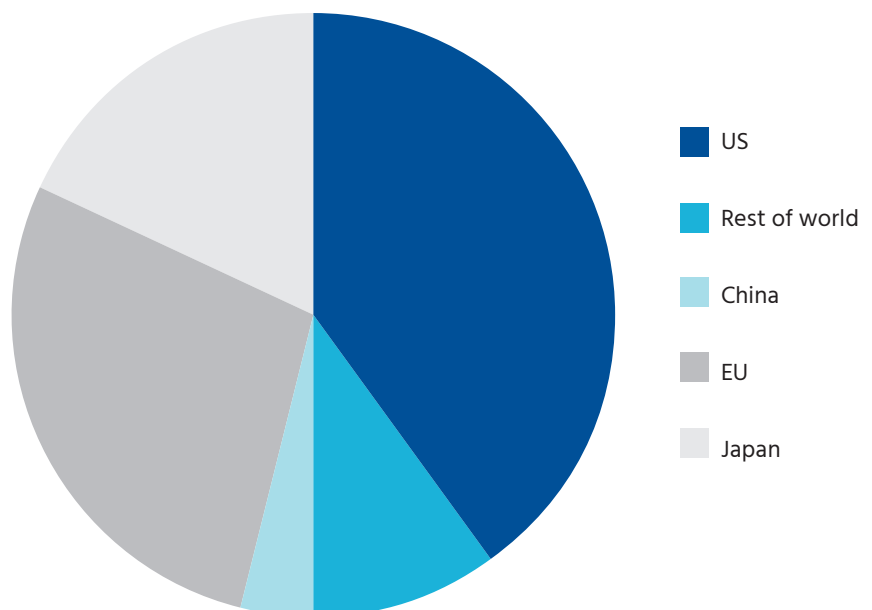
The Indian economy grew at an average of 6.6% per year over the past decade.⁶ Because of the large scale of its consumer base – despite significant wealth disparities across the economy – growth in the middle and upper-income segments of India's population of some 1.3 billion will fuel strong market demand for digital devices and online services.

In 2019, 560 million people had access to the internet, representing the second-highest number of mobile internet users in the world, after China.⁷ The COVID-19 pandemic, which forced closures of millions of business and schools, became a catalyst for increasing internet access. This meant that more people would need access to low-cost mobile devices: Smartphone usage in India is expected to rise from 468 million in 2017, to 829 million users by 2022.⁸

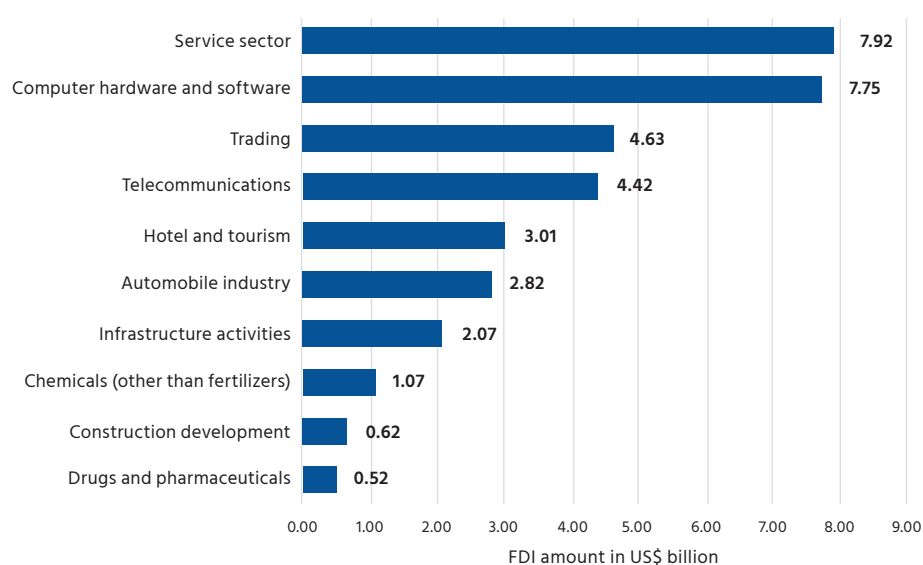
Indians already enjoy the world's least expensive internet access. In 2016, JIO, a subsidiary of Reliance Industries, the large conglomerate owned by famed Indian billionaire Mukesh Ambani, offered virtually free 4G internet access to millions across the Indian subcontinent.⁹

By 2020, 50% of India's population had access to the internet (up from 10% in 2010)¹⁰ and the value of the country's e-commerce market, for example, was estimated at approximately US\$64 billion. That number is expected to increase to US\$200 billion by 2027.¹¹

Figure 1 – India's top investors by region



Source: <https://www.makeinindia.com>

Figure 2 – FDI equity inflows distribution India FY 2020 by sector

Source: Department for Promotion of Industry and Internal Trade (India), Statista 2021

Approximate amounts

The US, the EU, Taiwan, and Japan are India's largest foreign investors in the technology sector. Services, computer hardware, software, and telecommunications represent the top categories of investment. Because the world's largest technology companies already have a significant presence in India, they are well positioned to participate in growing India's production capacity.

India aims to grow its electronics systems design and manufacturing (ESDM) capabilities.

Prime Minister Modi and his government understand the historic magnitude of the moment and have intensified efforts to build up India's manufacturing capabilities. India aims to grow, among other things, its electronics systems design and manufacturing (ESDM) capabilities and has adopted a range of policies, including the Electronics Development Fund (EDF) previewed below. Looking ahead, the government has placed special emphasis on smartphones, laptops, and other ubiquitous digital devices.

Taking a page out China's playbook, the Modi government hopes to absorb strategic FDI and technology transfer from global firms.

The idea is to increase production capacity in India's domestic market, and then expand that capacity to accommodate exports. Taking a page out China's playbook, the Modi government hopes to absorb strategic foreign direct investment (FDI) and technology transfer from global firms. From there, a crop of homegrown Indian firms can emerge, including original equipment manufacturers (OEMs) that could make parts and components, possibly for giant Indian brands such as Tata or Reliance, assuming they can expand into new areas of manufacturing.

Accelerated decoupling from China

In early 2021, less than a year after a deadly border clash between Indian and Chinese soldiers at Ladakh, India permanently banned more than 250 Chinese apps, including WeChat, Baidu, and TikTok.¹² In 2020, New Delhi had

Policy makers have accelerated efforts to wean India from Chinese supply chains and investment.

already passed a national security directive that effectively barred Chinese telecommunications companies such as Huawei and ZTE from India's future 5G wireless networks.

Policy makers have also accelerated efforts to wean India from Chinese supply chains and investment. In the first three years of the Modi government, for example, Chinese investors such as Alibaba and Tencent pumped US\$6.4 billion dollars into India's tech sector.¹³ This funded more than half of India's unicorns. New constraints, however, were placed on the "Automatic FDI Route," which had been established in 2015 to facilitate expeditious, free-flowing FDI into India. The action was aimed primarily at suppressing the influence of Chinese investment.

Regarding regional trade agreements, India's decision to stay out of the Regional Comprehensive Economic Partnership (RCEP) was based primarily on its contention that joining the free-trade agreement would perpetuate the country's reliance on Chinese imports, particularly in the smartphone and other ESDM related industries.

India's digital landscape

India has implemented the world's largest biometric ID system, known as AADHAAR, which is a testament to the country's technology prowess, despite the challenges of dealing with a poor, mostly agrarian and highly diverse populace. Under the AADHAAR, the Unique Identification Authority of India (UIDAI) collected iris, fingerprint, and facial data from 1.26 billion Indians, voluntarily, which resulted in the creation of a national data base of 12-digit individual identity numbers.

The AADHAAR ID number is used to dispense government services including financial assistance and other direct benefit transfers across the country. As Nandan Nilekani, co-founder of Indian tech firm Infosys and former Chairman of the UIDAI, wrote in *Rebooting India*, AADHAAR will revolutionize voting, digital medicine, banking and digital payments, tax collection, land, birth and marriage registry, small business management, and more.¹⁴ India's government has leveraged AADHAAR's identity and authentication network via APIs with United Payment Interface¹⁵ to create the *India Stack*, a milestone in a country where people lack conventional documents or proof of identity.

India is on the verge of commencing possibly the world's largest fintech boom, as millions of "unbanked" come online.

This financial inclusion and digitization wave has recorded 2.2 billion transactions monthly. India is on the verge of commencing possibly the world's largest fintech boom, as millions of "unbanked" come online in the platform economy. According to McKinsey, fintech-driven services in India could be worth US\$170 billion by 2025. Other directly related sectors such as education and job upskilling services could be worth another US\$130 billion.¹⁶

Regarding socio-political standards and the applications of technology, AADHAAR represents the polar opposite to China's state-dominated data administration. Therefore, as the world coalesces around rule-frameworks regarding AI ethics and standards, India will appeal strongly to proponents of the digital democracy model.

As a member of the Global Partnership on Artificial Intelligence (GPAI), New Delhi has become central to discussions regarding technology standards and values. The Nation's External Affairs Ministry recently formulated the New, Emerging and Strategic Technologies (NEST) division that aims to engage in [techno-diplomacy](#) to provide policy guidance on shaping international rules related to emerging technologies.

In 2013, the Indian Supreme Court ruled that no citizen should suffer for not participating in AADHAAR. In other words, one cannot be denied access to critical services and benefits that the system was intended to facilitate, even if one chooses not to enroll.¹⁷ This presents a striking contrast to China's Sesame (Zhima) social credit scoring system, which the NGO, Freedom House, has described as a tool of techno-authoritarianism.¹⁸

In 2017, the Indian Supreme Court went a step further and issued a landmark ruling which established that privacy was a fundamental right of Indian citizens.¹⁹

India is an ideal testing ground for market-driven technologies that can protect a citizen's privacy or prevent unwanted surveillance.

India, the world's largest and most complex democracy, is therefore an ideal testing ground for market-driven technologies that can protect a citizen's privacy needs or prevent unwanted surveillance. Consequently, with the right foreign investment, its innovation centers could be destined to produce the next generation of tech startups and corporate incubators focused on the "privacy economy."

Software & Engineering Research & Development (ER&D)

For decades, India has been known as an outsourcing center for software development, where companies such as Infosys, Wipro, Mphasis, and Tata Consultancy Services have become trusted service providers to the world's global firms. Beyond software development, however, there has been a steady rise in the number of "Global In-house Centers" (GICs). Multinational companies have been establishing GICs throughout India to test new ideas around digital transformation. Special emphasis has been on AI and machine learning, data sciences, the IoT, and Software-as-a-Service (SaaS).

One quarter of the world's Fortune 500 companies have set up shop in India, with some 1,750 GICs spread around the country's productivity hubs including Bengaluru, Hyderabad, Chennai, Pune, Mumbai, and Delhi-NCR.²⁰ In 2020, Goldman Sachs had approximately 10,000 analysts based in India²¹; Microsoft had 75,000 and IBM had 100,000.²²

This trend will continue as wage arbitrage draws businesses to the low costs of Indian engineers. India's IT labor pool is massive: More than one million new graduates with engineering degrees enter the work force each year.²³

No country, including China, has more engineering-focused educational institutions than India.

No country, including China, has more engineering-focused educational institutions than India. In 2020, the country boasted approximately 3,500 engineering colleges, 3,400 polytechnics, 4,000 management schools and an even larger number of vocational and training institutes.²⁴ Getting such a large pool of talent to focus on innovation will require outside assistance.

India has invested US\$20 million to create 'Innovation and Entrepreneurship' hubs in higher education institutions that bring American universities to its campuses.²⁵ Coordinated through the US-India Knowledge Exchange program²⁶, this could form a positive feedback loop involving the flow of topnotch Indian talent into American companies and institutions and the reciprocal flow of world-class academics and resources into India's universities.

Discerning economists have questioned India's ability to transition to a legitimate manufacturing hub.

Discerning economists have questioned India's ability to transition from a low-cost outsourcing location for software to a legitimate manufacturing hub. According to McKinsey, in 2000, manufacturing accounted for 15.3% of India's GDP, while in 2020, that number had only increased to 17.4%, despite years of industrial policies aimed at achieving higher exports.²⁷ Other reports show an overall decrease in manufacturing as a percentage of real GDP.²⁸

India continues to grapple with large trade imbalances in critical technology sectors.

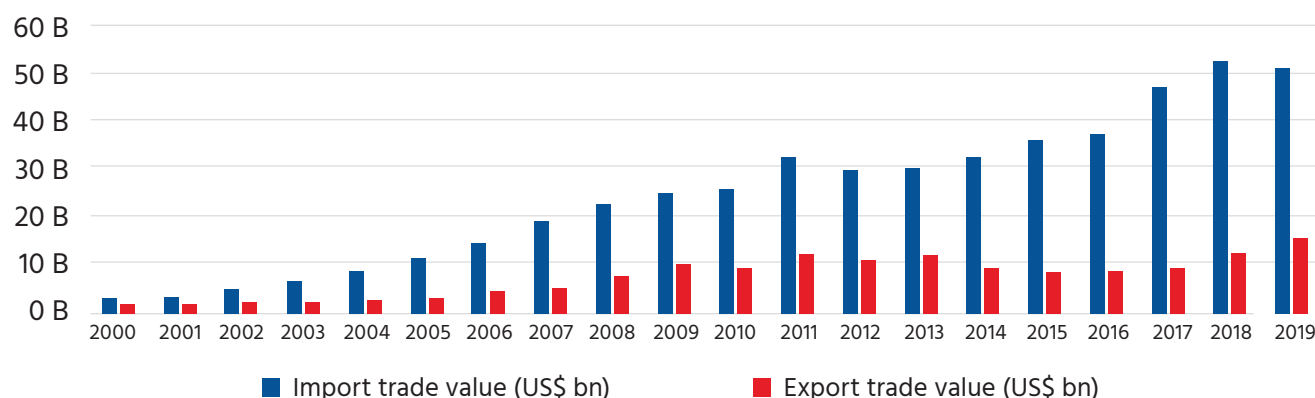
India continues to grapple with large trade imbalances in critical technology sectors. In 2019, it ran a US\$63.38 billion deficit on imports of electronic components in Chapters 84-85 of the Harmonized Tariff Schedule (HTS), which includes semiconductors, smartphones, laptops, and other electronics.²⁹ That same year, approximately half of India's consumer demand for electronics was satisfied by imports (39% of which were from China), while only 16% of locally produced electronics were exported.

The pain of doing business in India

Previous export-focused policies in India have faltered because of poor ease of doing business (EoDB) rankings. Excessive regulations, taxes, and a lack of coordination between central and state governments have prevented India from attracting and keeping investors.

From a governance perspective, state governments acting as "brokers" between multinational enterprises (MNEs) and the central government has been problematic. State-level politicians often engage in controversial land grabs which lead to legal challenges from local farmers, as about 60% of land in India

Figure 3 – India's import and export data: Chapter 85 HTS



Source: UN COMTRADE

Previous export-focused policies in India have faltered because of poor EoDB rankings.

is agricultural. Paralyzing litigation soon follows, or, if firms can eventually break new ground for their operations, local governments often engage in rent-seeking behavior which can spoil the chances of long-term relationships with foreign firms.

In 2014, for example, Nokia, the Finnish mobile phone company, employed some 40,000 workers at its component manufacturing plant in Sriperumbudur, Chennai (Tamil Nadu). When Nokia sold its global hand phone business to Microsoft, its plant in Chennai was left out of the deal because of the Tamil Nadu state government's refusal to agree to tax concessions. The plant closed in November of 2014 and India's exports of hand phones plunged 70%, from US\$1.86 billion in 2013 to US\$380 million in 2014.³⁰

2. Avoiding previous mistakes: India's new manufacturing initiatives

In just three years, India's World Bank Ease of Doing Business ranking jumped from 100th in the world to 63rd.

Despite a history of missteps and setbacks, policy-driven changes are beginning to take hold across India's business landscape. In just three years, for example, from 2017 to 2020, India's World Bank Ease of Doing Business (EoDB) ranking jumped from 100th in the world, to 63rd – a substantial improvement in such a short timeframe.³¹

Labor laws have been revised from 140 different codes to just four codes.³² Industrial clusters can now be located anywhere inside the country and enjoy Special Economic Zone (SEZ) status, which includes bonded warehouse manufacturing and tax-free importations for the manufacture of exports. Corporate tax for newly established manufacturing entities was slashed from 25% to about 15% (excluding surcharge and cess).³³ This is a good start, although the cess³⁴, which is a state tax that is levied on top of national taxes, remains problematic for foreign firms.

Prime Minister Modi's Bharatiya Janata Party has managed to take control of the political apparatus within key manufacturing hubs.



On another positive note, Prime Minister Modi's Bharatiya Janata Party (BJP) has managed to take control of the political apparatus within key manufacturing and innovation hubs in states such as Karnataka (Bengaluru), the Capital Territory (Delhi), Tamil Nadu (Chennai), and Maharashtra (Mumbai). These clusters hold the key to India's future and must be managed wisely.


Mr. Modi has also been successful in generating competition between India's states, in a scheme like China's, where state officials are nominated or replaced based on key performance indicators around industrial policies.

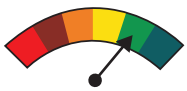
Painstaking changes in political culture and the streamlining of regulatory and tax regimes, therefore, is enabling more effective execution of India's technological agenda. A snapshot of key policies are captured in Figure 4, below, which, among other things, provides an assessment of the latest production incentives, subsidies on land and capital equipment, interest subvention, discounted land prices, GST reimbursements and funding for the upskilling.

Overall, results are breaking positive. In 2019, for example, India saw a simultaneous decline in electronics imports from the previous year and an increase in domestically produced electronics.

Figure 4 – Key initiatives and policies: technology, manufacturing, and exports

Program & administering agency	Objective and key steps undertaken	Progress	
Make in India campaign (2014)			
Department of Industrial Policy & Promotion; Ministry of Electronics & IT	Aimed at increased import substitution by enhancing the EoDB. Includes corporate income tax reductions, capital subsidy and capital availability, reduction in cost of power, etc.		
	Supporting policies:		
	1. Modified Special Incentive Package Scheme (M-SIPS)		Capital subsidy – 20% for investments in SEZs and 25% in non-SEZs across 15 electronic product categories
	2. Electronics Development Fund (2015)		Creation of an ecosystem for providing risk capital to industry to undertake Research and Development across electronics systems design and manufacturing (ESDM), nanoelectronics, and IT
	3. Foreign Direct Investment (FDI)		100% FDI: FDI up to 100% under the automatic route* permitted for electronics manufacturing <i>*Laws amended in 2020 to exclude countries sharing land border with India</i>
	4. Merchandise Exports from India Scheme (MEIS)		2%-4% reward on final price of goods to exporters to offset infrastructural inefficiencies. Discontinued from April 2021
	5. Electronic Manufacturing Clusters (EMC)		Creation of world-class infrastructure for attracting investments in ESDM under Greenfield and Brownfield clusters
6. National Policy on Electronics (2019)	Promote domestic manufacturing in the entire value chain of ESDM to a turnover of US\$400 billion by 2025; Position India as a global hub for ESDM with thrust on exports; Protection to the domestic ESDM industry from dumping of electronics goods		
Skill India campaign (2015)			
National Skills Development Corporation of India, Ministry of Skill Development and Entrepreneurship	Upskilling and training more than 400 million people in India in different skills by 2022		

Digital India campaign (2015)		
Ministry of Electronics & IT; Ministry of Finance	Digital empowerment and improved well-being of India's rural areas with high-speed Internet networks and improving digital literacy	
	Supporting policies:	
	National Digital Communications Policy (2018)	Ensuring digital sovereignty with US\$1 trillion digital economy by enhancing India's contribution to global value chains; Propelling India to the Top 50 Nations in the ITU ICT Development Index
		

Startup India (2015)		
Ministry of Commerce; Ministry of Human Resource Development; Department of Science and Technology	Hand-hold Indian startups by funding, incentivizing and incubation; Discard restrictive states government policies such as License Raj, Land Permissions and Foreign Investment Proposals	

Atmanirbhar Bharat plan (self-reliant India)*		
Ministry of Finance; Ministry of Electronics & IT; Ministry of Health; Ministry of Textiles; Department of Telecommunications; Ministry of New & Renewable Energies; Department of Heavy Industries	Building five pillars of self-reliance: economy, infrastructure, technology-driven systems, vibrant demography, and demand	
	Supporting policies:	
	1. Production linked incentive for strategic sectors	Production volume-based incentives for sectors such as: food processing, telecom, electronics, textiles, specialty steel, automobiles and auto components, solar photo-voltaic modules, and white goods such as air conditioners and LEDs
	2. 'Vocal for local', 'local for global' and 'make for world'	Pursuing policies that are efficient, competitive and resilient, and being self-sustaining and self-generating
TBD		

Emerging and Strategic Technologies (NEST)*		
Ministry of External Affairs	Collaboration with foreign partners in the field of 5G and artificial intelligence, while evolving India's external technology policy in line with national security goals	TBD

*COVID program/initiative in 2020

Source: Author's compilation from Government of India public resources

3. Smartphones and geopolitical influence

New Delhi has studied China's roadmap regarding the development, support, and promotion of technology ecosystems.

India recently surpassed Vietnam to become the world's second largest manufacturer of smartphones.

Smartphones are at the heart of India's technology-manufacturing plan. Government policy calls for one billion smartphones to be produced in India by 2025.³⁵ Meanwhile, the target for the overall electronics system design and manufacturing (ESDM) market in India is an astounding US\$251 billion by 2023.³⁶

New Delhi has studied China's roadmap regarding the development, support, and promotion of technology ecosystems, especially when it comes to the importance of well-functioning special economic zones (SEZ). Policy makers have come to understand the geopolitical advantages this formula has conferred to Beijing. Smartphones are "anchor" products that reside at the center of an ecosystem that also includes telecommunications infrastructure, AI and software systems. Combined, these elements form a powerful tool for the projection of economic and geopolitical power.

China's low-cost hand phone makers such as Xiaomi, Oppo, Realme and Vivo, for example, have penetrated India and other emerging markets in Africa and Asia by leveraging networks of Chinese state-backed firms such as Huawei, ZTE, Alibaba, Dahua, and SenseTime.

Consequently, India's smartphone strategy is focused on three key areas:

- Targeting phone-related imports with a tariff barrier to encourage local sourcing and production
- Enabling transition from foreign original equipment manufacturers (OEMs) to local OEMs
- Building national unicorns to compete locally and internationally

India recently surpassed Vietnam to become the world's second largest manufacturer of smartphones. China remains, by far, the world's largest. But India does not have to surpass China's production volumes, it simply needs its manufacturing ecosystem to draw in more companies that are looking to diversify or decouple their supply chains from China.

Tariff barriers

Under its Phased Manufacturing Program, India has sought to stem the inflow of foreign assemblies and sub-assemblies by imposing duties on batteries, chargers, and wired headsets. The idea is to encourage importers to leapfrog high tariffs and move manufacturing ecosystems inside India's ring-fenced SEZs.

Tariffs have had an impact. They have deterred the import of finished mobile phones and prompted a shifting of assembly operations to India, mostly by Chinese companies. In 2020, for example, almost all locally sold smartphones were assembled in India.

Apple has set out to move one-fifth of its global iPhones production out of China and into India's greater Chennai and Tamil Nadu region.

Samsung operates the largest hand phone assembly site in the world in Noida, Uttar Pradesh.

Building world-class clusters with local manufacturers

World-class manufacturing clusters are emerging from India's technology landscape. Apple, for example, has set out to move one-fifth of its global iPhones production out of China and into India's greater Chennai and Tamil Nadu region.³⁷ A fully functional ecosystem has now materialized: Apple's sub-contractors include Taiwan-based Foxconn, Pegatron, Wistron, and Luxshare all of which are producing and assembling key components for Apple in local facilities. Foxconn, alone, will invest US\$1 billion in the move.³⁸ Tata Electronics, a homegrown Indian company and iconic brand, is a key component manufacturer.³⁹

Samsung, the South Korean company, operates the largest hand phone assembly site in the world in Noida, Uttar Pradesh. It runs a vertically integrated business model, which means it relies on its own electronic manufacturing services (EMS), but a crop of locally grown Indian EMS players are emerging in this space.

Micromax, Intex, Lava, and Karbonn (the so-called "MILK" EMS companies) have been growing India's local capacity to build electronic components. Dixon, another Indian EMS firm, has a market value of US\$2.5 billion and, in 2021, had the capacity to produce 50 million smartphones.⁴⁰

Figure 5 – ESDM* landscape in India: key clusters & hubs

Delhi NCR

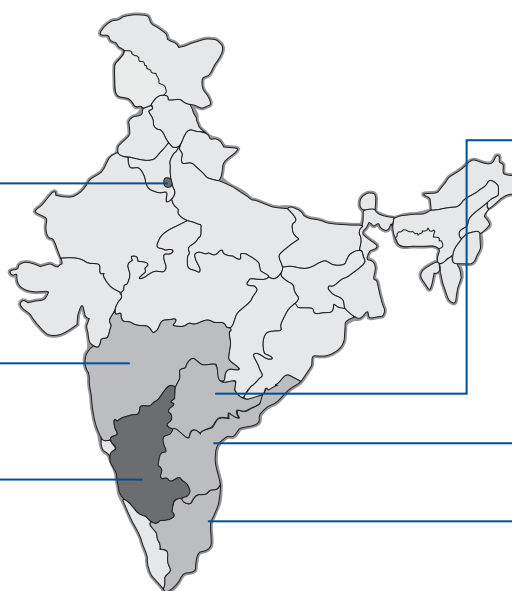
Delta
LG
Mi
Midea
Oppo
Panasonic
Samsung
TDK
Vivo

Maharashtra

Belden
Jabil
LG
NVIDIA

Karnataka

Broadcom
Huawei
Intel
Qualcomm
Samsung
Texas Instruments
Winstrom
Yuto



Telangana

Amazon
Google
Microsoft
Qualcomm

Andhra Pradesh

Celkon
Dixon
Foxconn
Lava
TCL

Tamil Nadu

Acer
Flex
Foxconn
Lenovo
Samsung

*Electronics systems design and manufacturing

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

India's smartphone manufacturing has been dominated by brands of Chinese origin.

India's smartphone manufacturing has been dominated by brands of Chinese origin. In 2020, Xiaomi, Oppo, Vivo and Realme accounted for about 70% of India's market. For example, Dixon, the Indian EMS company, derives a large portion of its EMS business from Xiaomi.⁴¹ In addition to making phones and televisions for Xiaomi, it is manufacturing washing machines for LG Electronics and lighting products for Philips.

Chinese smartphone makers in India

Chinese low-cost hand phone brands would seem the logical choice as partners for Indian firms. Under this scenario, firms like Dixon are well positioned for technology and knowledge transfer from Chinese counterparts. This would enable Indian firms to eventually breakaway as indigenous brands and compete directly with their former Chinese partners, at home and abroad. This is, in fact, the techno-nationalist model that has served Beijing so well.

But Indian policy makers have doubled down on strategic decoupling. Despite short term benefits, Indians have become increasingly wary of Chinese money.

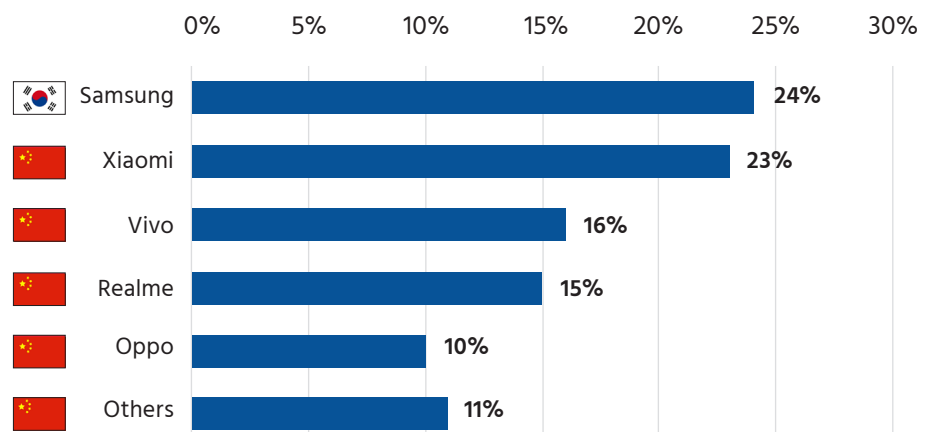
In 2020, for example, when the People's Bank of China (PBOC) increased its shareholding position in India's Housing Development Finance Corporation (HDFC), the Indian political establishment reacted swiftly with new restrictions aimed primarily at Chinese investors. India overhauled its "Automatic FDI Route," implemented in 2015, and mandated that all future foreign direct investment (FDI) transactions would require government approval.

How will India's unicorns fare without a pipeline to free-flowing Chinese money?

This begs the question: How will India's unicorns fare without a pipeline to free-flowing Chinese money? Between 2015 and 2020, for example, Tencent, Alibaba, Didi Chuxing, and other Chinese investors were instrumental in funding half of India's 30 unicorn companies including PayTM (an electronic payment platform)

Figure 6 – Chinese smart phone makers in India

Shipment share of smartphone market across India in 3rd quarter 2020, by vendor (The top 5 companies listed below are a part of the Make in India campaign)



Sources: Counterpoint Research; Statista 2021

and Flipkart (an e-commerce platform), which is now owned by Walmart.⁴² Going forward, the aim should be to capture Chinese investors as shareholders but not as controlling entities.

With India's leadership eschewing Chinese dollar-diplomacy, the search for the next round of investment and technology transfer has turned decidedly to the US, Taiwan, South Korea, and Japan. Singapore and Israel also figure to play a larger role as investors.

Printed circuit board assembly (PCBA) & semiconductors

One of the keys to expanding capacity as a smartphone manufacturing hub is to ramp up local production of PCBAs.

All computing devices, including smartphones, must have printed circuit board assemblies (PCBAs) to function. PCBAs are an integral part of global value chains because they drive upstream activities such as design and component assembly and downstream activities regarding the manufacturing of finished goods. One of the keys to expanding capacity as a smartphone manufacturing hub, therefore, is to ramp up local production of PCBAs.

In 2020, China produced almost 50% of the world's PCBAs. Now, as geopolitics compels firms to diversify their supply chains, India must work hard to capture new value chains. By 2026, the domestic and export markets for PCBAs in India are expected to reach about US\$87 billion and US\$109 billion, respectively.⁴³ As such, convincing established global PCBA manufacturers such as Jabil (US), Flex (Singapore), Foxconn (Taiwan), ELTK (Israel), and others to ramp up manufacturing in India will be critical.

PCBA manufacturing has already been shifting from China to Vietnam, Malaysia and Thailand. In the long-term, if India is to offer manufacturing advantages over smaller Southeast Asian countries, the Modi government (and subsequent governments) must continue to fix India's ease of doing business issues.

India imports all its semiconductors and has no manufacturing capabilities of its own.

In addition to the importance of PCBAs, India must have access to a steady supply of [semiconductors](#) (also called a micro-chips or "chips"). Microchips are necessary to run virtually any modern digital device. At present, India imports all its semiconductors and has no manufacturing capabilities of its own. It will remain highly vulnerable to shortages in global supply as well as geopolitically induced factors such as export controls and sanctions.

Having a semiconductor manufacturing plant on Indian soil is vital to India's long-term interests. New Delhi's immediate task, therefore, is to convince the likes of Taiwan Semiconductor Manufacturing Company (TSMC), the world's largest microchip contract manufacturer, to build a plant for backend packing (known as outsourced semiconductor assembly and test, or OSAT) in India. Building a semiconductor fabrication plant (a "fab" or "foundry") requires an investment of between US\$10 to 20 billion.⁴⁴ For now, therefore, this is a tall order: Such an endeavor will only materialize when the world is convinced that the Modi government reforms are both effective and long-term.

4. Techno-diplomacy: India's new options

Geostrategic rivalry between the US and China presents New Delhi with fresh options for conducting techno-diplomacy. Regarding its dependency on imported semiconductors, for example, it can lobby Washington to persuade TSMC and others to build printed circuit board assembly and outsourced semiconductor assembly and test capacity in India. After all, in 2020, Washington convinced TSMC to build a new semiconductor fab in Arizona, based purely on geopolitical and national security imperatives.

Positioning India as a kind of technology safe haven could provide New Delhi with newfound geopolitical leverage.

Positioning India as a kind of technology safe haven, far away from potential flashpoints in East Asia, could provide New Delhi with newfound geopolitical leverage. From Washington's perspective, India's successful transition to a manufacturing hub provides both economic and security-related benefits.

The new realpolitik

Under the current realpolitik, Washington and its allies are ready to embrace new approaches when it comes to countering Chinese techno-nationalism. The repercussions of abandoning neoliberal trading principles have become less of a concern than the long-term consequences of failing to check decades of well-orchestrated Chinese state-capitalism.

America plans to put geopolitical considerations ahead of any overarching ideological commitment to free trade.

The Biden administration has made it clear that America plans to put geopolitical considerations ahead of any overarching ideological commitment to free trade. After four years of the Trump administration's "America First" populism, the US is reinstating a multilateral approach to foreign affairs, but most of its efforts at alliance-building will be driven by Washington's new cold war policies.

President Biden's executive order to form "China-free" tech supply chains that focus on strategic sectors such as semiconductors, rare earth materials, batteries electronic, autonomous vehicles, and pharmaceuticals is a clear example of this new thinking.⁴⁵

Japan, South Korea, and Taiwan have been singled out as key strategic partners, but India also stands to gain enormously if it can achieve its manufacturing benchmarks and attract new value chains through its tech-scape. These must continue to involve big firms like Apple and Samsung.

New Delhi has an opportunity to work closely with Washington and its allies across Asia. Even if some upstream elements are spread around Southeast Asia, India can still pull downstream portions of those value chains into its orbit.

One potential negative facing the Modi government is its recent crackdown on media freedoms in the press and on the internet. It has also been accused of stoking Hindu nationalism. Freedom House has dropped India's status from a "Free" to a "Partly Free" country. The Biden administration is likely to seize upon these issues and link future manufacturing and investment deals with human rights.

Conclusion

This paper has sought to answer the question of whether India can become a global technology manufacturing hub in the 21st century. It finds that:

- India's economy and technology landscape remain well positioned for a quantum leap which could fuel further investment in electronics systems design and manufacturing.
- India continues to face challenges regarding policy execution, but recent economic incentives and bureaucracy-busting initiatives undertaken by the Modi government are starting to have a positive impact.
- Firms from the US, the EU, Japan, South Korea, Taiwan, Singapore, and elsewhere will look increasingly to India because of China strategic decoupling and the need for secure supply chains.
- Viable manufacturing clusters are growing as the world's largest tech brands, including Apple and Samsung, build fully functional ecosystems in India.
- India's transition to a tech manufacturer will depend on its ability to grow its smartphone and related hardware manufacturing capabilities. At present, it is a long way from challenging Chinese companies for market share, both locally and in other markets, and to do so will require sustained effort and outside assistance.
- The US-China rivalry has turned Washington and its key allies into strategic partners. This gives New Delhi added leverage as it works to garner support for its technology and manufacturing initiatives and attract much needed foreign direct investment from world-class firms.
- Increased cooperation through security arrangements such as the QUAD will enhance India's importance in strategic global value chains.

Geopolitics and internal reforms have created an historic opportunity for India. It is too early, however, to proclaim India's policies or initiatives a success. New Delhi's goal of transforming India into one of world's top technology manufacturing hubs, therefore, will constitute a work-in-progress for years to come.

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