India Exim Bank

REORIENTING TRADE POLICY :
TOWARDS A SYNCHRONIZED TRADE AND INVESTMENT FRAMEWORK FOR INDIA

Study on Reorienting Trade Policy: Towards a Synchronised Trade and Investment Framework for India

This Study has been undertaken by Export-Import Bank of India (EXIM Bank) in collaboration with a Team comprising Dr. Harsha Vardhana Singh, former Deputy Director General of the WTO; Mr. Rajeev Kher, former Secretary, Department of Commerce, Govt. of India; Dr. Jayant Dasgupta, former Ambassador of India to the WTO; Dr. Veena Jha, Former Head of UNCTAD India; and Mr. Ramesh Abhishek, former Secretary, DPIIT, Govt. of India.

February 2022

Table of Contents

Executive Summary

Introduction

India's current policy reform is driven by the Atmanirbhar Bharat (AB) initiative announced by the Prime Minister in 2020. Trade and investment policies are prominent part of the tools for achieving the objectives of AB. Though the objectives are not clearly specified as such, they could be inferred from the speeches of the Prime Minister and the Commerce and Industry Minister. The policy of Atmanirbharta includes improving India's domestic production levels and capabilities, raising employment, encouraging foreign direct investment (FDI), improving technological capabilities, increasing exports and more substantive and greater links with global value chains (GVCs) based on a competitive domestic ecosystem. Since the background of this major initiative is the Covid-19 crisis, important objectives also include resilience of value chains, mitigation of risks, as well as building coalitions or economic partnerships with like-minded nations for achieving common objectives.

The growth of FDI and GVCs has resulted in both expanding the scope of trade-related issues and a re-orientation of national trade and investment policies to become a prominent part of industrial policies. The relevant topics include a range of issues relating to trade and investment, including border measures, facilitation or ease of doing business, sustainable and social standards, and digital trade. In this context and in response to CoVID 19, states and firms have changed their approaches and strategies on trade and investment policies including through their bilateral, regional and multilateral initiatives. This was especially the case in the second quarter of 2020, when global merchandise exports declined by -21% compared to the previous year. According to WTO, global merchandise trade fell by 5.3% in 2020; it is likely to grow by 8% in 2021 and 4% in 2022. However, India's merchandise trade fell by 7.8% nearly 50% higher fall than the global average. The adverse impact on global FDI was even larger. In 2020, global FDI was down -42% compared to the previous year, and the prospects for 2021 are weak. However India's FDI increased by 13%. This led to a re-orientation of government approaches including increasing trade restrictions in some cases and liberalizing it in others (very few).

Globally, in Covid times, Central banks and monetary authorities have intervened in financial markets and national governments have put in place a series of fiscal policy measures focused on supporting the health sector, households and firms. Fiscal and monetary policy measures implemented include a wide range of policies such as tax cuts and deferrals, wage and income supplements, expanding unemployment insurance and direct payments to households and businesses, interest rate cuts, preferential loans and loan guarantees, increased liquidity, new lending and financing programmes, asset purchases, foreign exchange swaps and the easing of prudential regulations and capital buffers. However, the problem is so large that nations or firms

cannot deal with it alone. A collective effort is required, with clarity of information, and actions taken by various countries through regional and multilateral institutions.

In this background the report focuses on India's trade policy, investment policy, and the overlap between the two in the broad context of its economy. The same exercise is carried out at sectoral levels. Finally on the basis of the analysis at both levels, some recommendations have been drawn.

India's Trade Policy

India's trade policy has focused on relatively high tariff and low non-tariff measures compared to comparator economies. Both tariffs and non-tariff measures in India have become more restrictive in recent years. These restrictive trade policies introduce inefficiency in domestic production, thus affecting competitiveness, which in turn, adversely affects exports, links to GVCs, and imports. This chain of causation is evident from the evolution of India's export and import shares in global trade. India's merchandise export to GDP have ranged between 1.6% to 1.7% from 2011-2020, and import shares have been between 2.2% to 2.5% The sharp increase in export share in the previous decade of 2001-10 has not manifested itself in the decade of 2011-20. Thus any policy which reduces exports would in many cases limit the scale of operations and competitiveness in many sectors. Further, with a relatively high tariff regime, India would be at a disadvantage when entering into FTAs. Meanwhile, India's competitor countries are going ahead with their FTAs, creating an advantage for their exporters and driving export market share away from India.

To the extent that tariffs are being used to encourage FDI and domestic investment, trade restrictive schemes must be recognized also as affecting competitiveness. Competitiveness is at the heart of an ability to achieve and sustain several objectives of Atmanirbhar Bharat. This is evident from the experience of China and Vietnam compared to India. Both these countries managed to convert their trade deficits into surpluses over time. India remains with a trade deficit which is a major area of concern for its policy-makers. Moreover, India's middle class will continue to grow in the future with its rising demand adding to import requirements unless met domestically by competitive production. Since tariffs are being justified on the grounds of creating domestic investment and production opportunities, it is essential to realize the attendant lack of competitiveness cannot be allowed to overwhelm short-term perceived benefit of higher domestic production. Therefore, restrictive trade policies should be time-bound and temporary, so as to bring in competitive pressures to incentivize greater competitiveness.

Trade facilitation is a policy with beneficial effects for all objectives of Atmanirbhar Bharat, through its impact on competitiveness, enhancing the ability to create better capabilities for accessing both domestic and export markets and to improve links with GVCs. Trade facilitation is an area of special focus of India, and the country is making steady progress in improving its operational conditions. However, to give more focus to these efforts, it is important to not only compare the country's performance on a global scale but more so in terms of key comparator economies. Such a comparison shows that India needs to improve in certain specific areas where it is in the last quartile of the smaller group of comparator economies.

Impact of Covid 19

The experience with Covid-19 has changed the policy orientation and risk-awareness in several economies. Efforts are being made to reduce reliance on single sources as the major provider of inputs, especially for strategic products. Moreover, greater scrutiny of investment has begun across nations in general and within major economies in particular. Partnerships for diversification of sources for inputs and enhanced supply chain

opportunities are seen as a new emphasis for increasing the resilience of supply chains. Thus, diplomacy and coalition-building is now an important part of the trade policy tool box.

India's FDI Policy

India's FDI inflows increased from relatively low levels in 2000 to over USD 60 billion in 2021. A significant part has come to services, telecommunications, and computer services and hardware. A comparison with other countries shows that in addition to investment incentives and facilitation, what has gained prominence are security-related concerns, resilience of supply chains,[1] and strategic objectives that are leading to more inward-looking investment. These generally emphasised objectives are similar to those given importance by India, though with some significant differences. India relies on trade restrictions much more than others. Further, it has only recently begun to focus more on global firms and specific priority sectors in a way that China and Vietnam have done for several years. Other nations are keener than India to create opportunities through FTAs and bilateral investment agreements. Vietnam is not as focused on producing key inputs or strategic products domestically as others including India; and China relies also on outward FDI while that is not the case for India.

It is important to learn from investment policy strategy of countries that have done comparatively well in terms of attracting FDI. Other countries such as China and Vietnam conduct a strategic evaluation and based on the priorities identified, a comprehensive approach is taken to improve operational conditions. Implementation is monitored to examine areas for improvement.

A major lesson from the experience of other countries is that support for effective implementation of policies is crucial. Feedback from Indian industry suggests that this is a particularly important area to address and improve. It also shows that not only is there an apparent conflict at times between trade and investment policies, but that the overall impact requires a consideration of whether or not the product of a protected sector (e.g. electronics) is an important input into other sectors. For sectors whose products are linked to other sectors, the overall aggregate adverse effects can submerge any positive sectoral effects. The crucial role played by technology and scale of operations for creating and maintaining cost-competitiveness in several sectors emphasised by India. Other key areas of special focus show a major significance of reducing delays for achieving better competitiveness, larger links with GVCs, improving exports, reducing imports, and increasing domestic value addition. In the context of reducing delays, the practice of deemed approval after a specified period of time for approvals, is an approach that could be adopted on a wider scale.

Improving Coordination between trade and Investment policy

India has initiated a structured subsidy programme in its Production Linked Incentive (PLI) schemes. This policy while encouraging investment is also meant to be trade promoting. So in a sense PLI is a bridge between trade and investment policy and is meant to promote both. However there have been two problems with this policy. First there appears to be a sentiment that 'One size Fits all', viz apply this policy in a broadly similar manner several sectors. However this policy was initially designed for some products in the electronics sector with a particular structure of firms so that a relevant system of checks and balances could be instituted. Applying it to other sectors with multiple players would be an administrative nightmare. Secondly, PLI was introduced in a Covid year, which by no means was the best year to test its efficacy.

[1] See for example, https://www.whitehouse.gov/briefing-room/statements-releases/2021/02/24/fact-sheet-securing-americas-critical-supply-chains/

The impact of the PLI gets diluted with restrictive trade policies such as tariff increase. Tariff hikes will increase cost of inputs particularly if they are not manufactured in India. This will reduce India's competitiveness and hence its exports. It will also increase domestic prices of final products. Hence support being given through PLI will be indirectly withdrawn through tariff hikes. In fact some sectoral studies have shown that with current tariff hikes in 2020 and 2021 the support provided by PLI is reduced to near zero levels by tariff hikes. Counter intuitively, it may be cheaper to import battery chargers with a 20% tariff rather than procure them domestically as their inputs now have high tariffs. Further, policies which reduce incentives to improve competitiveness should not be adopted. Alternatively, if there a need to use them, they should be temporary and phased out after a limited period of time.

Greater granularity and understanding of trade and investment policy conflicts and resolution can be obtained through sectoral studies. This report has studied seven sectors to understand these conflicts. These sectors range from traditional exports like textiles and leather products, to established industries like Pharmaceuticals and Automobiles to emerging industries like Medical devices, electronics and the solar sector.

Sectoral Issues

Traditional sectors- Leather, Textiles and Garments

Leather is a sector in which India has steadily been losing its export competitiveness with a year on year fall of an average of 5%. In terms of physical raw materials, the leather sector primarily requires an abundant supply of leather, chemicals for tanning, and easy availability of components and accessories required for shoes, leather goods and apparel. It has an average shortage of 2 billion square feet of leather. The shortage is made all the more acute because of tariffs. The import duty on wet blue chrome tanned leather, crust leather, finished leather of all kinds, including splits and sides has been raised to 10%. These tariffs would make Indian export products more expensive as the price of leather accounts for roughly 60% of the cost of a leather product. It can be argued that exporters can always use the Advance Authorisation Scheme (AAS) route to source raw hides and skins from abroad. However, most exporters of shoes, apparel and leather goods do not have an in-house tannery. Moreover, for every kind of product, the Standard Input Output Norm (SION) laid down by the DGFT may not account for all the wastage involved in making the product, in which case an exporter has to get a specific SION fixed for his export product, which takes a lot of time. Hence tariffs need to be reduced.

While most chemicals are produced in India, some specialty chemicals (not produced in India) under ITC HS Chapter 32 (Heading 3201 and 3204) and Chapter 38 are imported from Italy, Germany, Spain, Peru, Chile, Argentina, Brazil etc. but the amounts involved are not large. The import tariffs on these chemicals is a uniform 10%. Further the exemption of 5% available for footwear components and embellishments for leather garments and leather goods has been removed. These tariffs need to be eliminated.

The lack of scale in operations, principally on account of disinclination to raise capital from the market, has proved to be an obstacle in servicing large orders from global brands and large chain stores. India's major exports are that of footwear. But it has hardly made a dent in the children's market and also lack of design capabilities has limited its foray in the garments area. Finally, the turnaround times for orders have also shrunk from 90+ days to 60 days in most cases. India's supply chain and logistics infrastructure have to be nimble and world class if we have to effect exports growth

On the investment side, the Mega Cluster sub-scheme of IFLADP needs to be implemented quickly and more Leather Parks with common infrastructure, including a Common Effluent Treatment Plant, need to be set up near existing manufacturing clusters. Some of these projects could be linked up with the Sagarmala

project so as to benefit from the proximity to ports. The export basket needs to be diversified to include casual and sports shoes for men, women and children and greater emphasis on increasing India's share of the global market in women's shoes and children's shoes. In leather garments, greater emphasis must be laid on the design element and collaboration with high fashion global brands so that we could move up the value chain and improve our value realisation. Attractive incentives, including Income Tax benefits, need to be given to individual enterprises, to improve their design capabilities. The Central Leather Research Institute and NIFT could jointly act as centres of excellence to this end. Both trade and investment policies need to be implemented together with neither contradicting the effects of the other.

In the textiles sector, the import tariff of 10% imposed recently on Extra Long Staple Cotton needs to be removed. The 3% duty-free import entitlement scheme, for import of trimmings and embellishments for made-ups and clothing, needs to be restored. A level playing field needs to be provided with respect to MMF products and natural fibre products in terms of the tax structure. Also imports of MMF fibre and yarn need to be liberalised and recourse to frequent use of anti-dumping duties needs to be dispensed with in the near term. In the medium term, domestic capacity-building for MMF production needs to be encouraged through appropriate incentives.

The FTAs in most cases have eroded India's competitiveness by getting in cheaper imports in this sector. Hence renegotiating the textile concessions in India's FTAs with ASEAN, Korea and Japan and conclusion of the India-EU BTIA may lead to improvements in market access.

It is imperative for the textile industry to modernise (especially weaving and processing), build up scale and leverage R&D to create innovative products to increase our penetration of foreign markets. For this the Hank Yarn Obligation should be reduced from 30% to 15% and the reporting obligations on spinning mills should be reduced.

The setting up of large weaving units, and consolidation of several smaller weaving units into one to build up scale, need to be incentivised. The incentive could be given in the form of supply of electricity at the same concessional rates as powerloom units in a state.

The setting up of large Process Houses needs to be incentivised. One of the ways of doing it is to allow a longer payback period for bank loans in view of the fact that the life of a Process House is around 20 years.

There has to be dual emphasis on import substitution in technical textiles and greater export penetration under the National Technical Textiles Mission. This has to come through more focused R&D effort and building up successful public private partnerships.

The implementation of ATUFS needs to be streamlined significantly, inspections need to be outsourced to third parties, and disbursement of subsidies needs to be fast tracked.

The Established sectors- Automobiles and Pharmaceuticals

Lack of competitiveness in the automobile sector arises from the fact that the cost of importing auto-components from Asian countries into India is lower than local procurement. Around 27 percent of automotive parts are imported from China, including important components. Switching to alternate suppliers is a long-term process especially as India needs to prepare to meet BS6 standards. Lack of funding in Research and Development has meant dependence on low technology Internal Combustion vehicles and transitioning into electronic or renewable resources has proven difficult. Making the right powertrain technology choices that will define the future of the automotive trade requires policy plus monetary support from the government. On the services side new forms of mobility require adequate infrastructure for example in mass transit, vehicle pick-up, vehicle drop-off, and in non-motorized transport which limits the adoption of cycle-sharing.

In this sector as well while the PLI scheme focuses on promoting products with great import substitution potential, especially with respect to auto components being imported from China, developing such capacity takes time. Hence in the interim tariffs on these components should be implemented only gradually. In other words if a particular component or final product is eligible for a PLI, tariffs on its components should not be increased till domestic capacity is developed in India. Further other domestic policies should support domestic production for products being granted PLI. For example if GST on such products is very high they should be reduced to a uniform 18%. In fact to boost demand, GST rates on all automobiles and auto components should be reduced to a uniform 18%. Inverted GST structures can reduce the benefits of the PLI.

For boosting trade, investment policy, especially PLI should focus on increasing the manufacturing capacity and exports in commercial vehicles segment where demand may increase because of expenditure on infrastructure, vehicle scrappage policy and other growth drivers. To boost exports or substitute imports, regulation should provide a level-playing field amongst different technologies, such as EV, xEV, ICE, hydrogen fuel cell technology. Regulations should target outcomes, such as increased vehicular safety standards, reduced particulate matter emissions and not what kind of vehicle is to be promoted. There should be an emphasis on promoting Future-ready technologies like hydrogen fuel cells through private sector and Government by investing heavily in R&D activities geared towards the future. PLI should also target increased manufacturing of vehicles which are longer than 4 metres, as the demand for bigger cars is greater in the global automotive market. This would be a key step towards ensuring India becomes an export hub for the world. Lastly on the trade front, FTAs with key export markets should be explored. Further export credit options with these markets should be a part of the FTA. FTAs should also provide for Investment facilitation especially in the maintenance of vehicles.

In the pharmaceuticals sector, there are large segments of the market which actually depend on the versatility of the sector in providing affordable and responsible healthcare products. India has a global responsibility in that sense, but it can discharge this responsibility only when it keeps up with developments at the world stage, and continues to produce the best at the least cost. This challenge when disaggregated, throws up many smaller ones in the areas of investment, fiscal management, industrial development, trade promotion, education, regulation and technology-related policies.

The restriction on 100% investment in the brownfield segment of the sector for foreign direct investment should be taken off as it does not stand to reason any more. Instead, the Government should link investment in pre-identified technologies, establishment of R&D, or products with fiscal incentives such as tax exemptions, IGST reimbursements, and other similar instruments.

Contract Manufacturing and Research has huge prospects of growth as the IPR remains with the owner and India's low-cost manufacturing and knowledge base provides appropriate incentives for such investment. Therefore, the Government must review relevant trade, regulatory, and tax policies to align them with the objectives of growth in investment in this segment and also promote investment by creating the right ecosystem for this segment.

While price control may have served the social objectives of the country, it has done equal harm in disincentivising innovation. Therefore, the Government should reduce the National List of Essential Medicines (NLEM) to only core products, keep control dosage form or Novel Drug Delivery systems out of price control and leverage its own position as the largest bulk buyer to get optimum prices. In order to get competitive prices, several state governments or the central and willing state governments could establish unified buying mechanisms. All government buying must shift to E-platforms such as GEM over a stipulated period of time.

The Government must bring in appropriate legislation to regulate distribution margins and code of ethics among members of the distribution business and medical practitioners to optimise margins to them and make available opportunities for investment to the industry.

Recognising the value involved in the size of operations as well as disadvantages inherent in the smaller size of some segments of business and its impact on areas such as compliance, quality, access to knowledge, and business practices, the Government may constitute a committee of experts to look into the merits and demerits of consolidation and suggest policies which will help in optimisation of size with the objectives of different segments of the sector. This recommendation should not be construed to mean discouragement of smaller enterprises but a means to bring in a strategic insight into size, performance and nature of business.

The new paradigm of the sector can only be responded to by promoting investments in all aspects of R&D covering both innovations and drug discovery. Since private investments are constrained and in some areas because of the vastness of scope of required investments, there is complete justification for the Government to make adequate investments. The Government must establish a programme to set up Innovation Parks independently as well as in the Pharma Parks under development, on the lines recommended in the study carried out by the Department of Commerce and referred to, extensively, in the chapter on pharmaceuticals.

To support specialised financing needs of the sector, particularly in the technology segment, the Government must promote a venture capital fund through a special purpose vehicle to be created by two or more banks and the Exim bank in accordance with the recommendations of the study referred to here.

Government must avoid all pressures for increase of tariffs on any product stream as the sector is closely knit with global supply chains and any such increase is bound to initiate a ripple effect. In all existing FTAs and future FTAs, India must negotiate a regulatory and market access protocol with its preferential trade partners. Even without entering into FTAs, India must develop sector cooperation agreements with major countries of its interest to ease market access, particularly by securing commitments to regulatory processes and simplification of procedures to facilitate market access.

The regulatory organisation in the Centre and the States needs harmonisation in terms of distribution of responsibilities based on their respective capacities and the gravity of these responsibilities. The central institution needs to harmonise interpretations and enforcement practices to create a regulatory environment for growth. The same holds true for other regulations such as environment and labour-related regulatory practices.

Newly Emerging Export Sectors- Electronics, Solar Sector, and Medical Equipment

In the electronics sector, basic raw materials still need to be imported from other countries on which there are high import and custom duties. Many tedious processes need to be followed to avail benefits under Customs Notification 25/99 (duty drawback for exports) on the inputs for the manufacture of components. The existing component manufacturing ecosystem in the country lacks global scale and capabilities, and thus remains uncompetitive. FTA with ASEAN and CEPAs with Korea and Japan also reduced the efficacy of BCD. M-SIPS disbursement was very low.[2] Approval process was tedious and only about 20% of the total projects were approved, and an even lower percent was disbursed. Despite supportive policies the disability of the Indian industry vis a vis other countries, especially mobile phones still remains in double digits. Tariff Increase on key components and products reduces the effects of supportive policies such as PLI.

[2] See chapter on electronics.

The PLI, SPECS, and EMCs schemes are the new generation of policies which merge trade and investment objectives. The PLI scheme is meant to particularly benefit high value phones which are mostly exported from India. SPECS and EMCs would also benefit both domestic producers and exporters. However restrictive trade policy in terms of higher tariffs on components, sub-assemblies and final products would increase costs making domestic electronics uncompetitive. Hence it would negate the effects of positive support policies such as PLI. Hence a rational approach to tariffs is required to maintain consistency between trade and investment policies in the electronics sector.

In the Solar Photovoltaic sector India's annual demand for solar cell manufacturing is 20 GW, its current average annual capacity is just 3 GW. India has been one of the largest exporters of solar modules till 2011 but subsequently lost its competitive edge to China. Nearly 80% of India's demand for modules, cells and wafers are met by Chinese imports. By and large, Indian solar industry has been dependent on imports of critical raw materials such as ethylene vinyl acetate (EVA), back-sheet, reflective glass, balance of system (BOS) for Solar Thermal and PV as also core machinery. Domestic PV suppliers contribute only 30-35% share of all utility-scale solar installations. However, the situation is reversed in the commercial and industrial (C&I) and distributed segment of the market where domestic PV suppliers cater to nearly 60% of the market. But, utility scale solar accounts for 76% of the total market. Producing solar power using domestic modules costs between 10-25% more than that using Chinese modules. Most of the jobs in the solar sector are also in the downstream industry, i.e. connecting modules etc. Hence there appears to be a trade-off between producing cheaper solar power and using domestically produced PV modules.

In this sector as well there is a clear conflict between generating solar power and investment and trade restrictive policies on solar PVs. Because it is more expensive to generate solar power with domestic modules, investment by utilities will not be encouraged if forced to use domestic modules.

Basic Customs Duties (BCD) on solar cells, modules and inverters, were introduced in 2021. But, it is possible that a 40% and 25% BCD on the import of solar modules and solar cells respectively may be levied in future. There is however an exemption of Custom Duties on Raw Material for Domestic Manufacturers.

In February 2020, MNRE requested that solar PV manufacturers provide a list of machinery/capital goods (required for setting up of units for the manufacture of solar PV modules, cells, polysilicon, wafers and ingots) that the manufacturers deem fit to be included in the BCD exemption list. This is an encouraging step and may promote module manufacture, particularly because EPCG has to be phased out, like MEIS, because of the WTO Panel ruling.

In order to merge investment and trade policies, the government should formulate plans to support backward integration and plan initiatives to set up cell, wafer and ingot manufacturing facilities as well as module manufacturing. For this all inputs should be kept duty free. Further input sources need to be diversified away from China.

Given the trade-off between deploying solar power and domestic solar modules, tariffs on modules should be kept low till domestic capacity covers at least 60% of demand. In any case increasing tariffs may be WTO incompatible as these are ITA 1 listed products.

State governments can intervene at these junctures by providing land, utilities, etc. at concessional rates and various regulatory approvals and permissions in a more timely and efficient manner if competition vs China is to be successful over the long term.

Further, sustained innovation should be the core of all the government's new plans. Government should focus on setting up new R&D facilities and institutes to support this high growth sector. The market is

experiencing a huge shift to higher efficiency products and with global technological advancements in the PV manufacturing sector, India should also focus on spending more on R&D to build a long term, sustainable segment.

Imposition of safeguard duties and basic custom duties can help the domestic players remain competitive with imported modules in the short run. However, this is only a partial solution that will only create demand in the local market. Moreover China with its huge economies of scale can lower prices neutralising the effects of SGD. This has been seen in the steel sector.

The planned initiatives should not be limited to boosting the domestic market. The focus should also be on helping players expand their horizons to be globally competitive. Hence India needs to leapfrog the current technologies and in its FDI plans include foreign collaborations and schemes for technology transfer. Schemes with other governments to develop collaborative ventures in next generation Solar PVs are needed. At the same time restrictive trade policy interventions should be time bound and limited.

The medical devices industry in India consists of large multinationals as well as small and medium enterprises (SMEs) growing at an unprecedented scale. The domestic industry is growing well at the lower end of the technology ladder and has achieved good market access abroad in a short span of time. While volumes will come from lower end of consumable and disposables the value will come out of implants, diagnostics and electrical and electronic products. The MSME segment is unlikely to commercially propel the technology engine by themselves.

To get the right scale of investments the inverted tariffs of this sector need to be corrected. There are two types of products as far as tariffs are concerned- the spares and components, and the final products. Most of the first category are imported and a few of the second category are made in India. The first should be duty free and the second could entail duties. However, with the fall of nominal tariff rates for some components, some Indian players resort to the practice of importing Chinese products and then re exporting them labelled as Indian medical devices. The reduction of tariffs to a minimum has resulted in almost complete import dependence in some cases. This is partly aggravated due to the inertia to invest by Indian manufacturers given the option of cheaper imported components, completely avoiding the huge capital outlay.

Apart from tariffs, to attract investment it is important to create a legal and regulatory framework outside the Drug and Cosmetics Act, and set up a dedicated regulatory institutional framework for medical devices. The sector has enormous diversity and the covered products range from simple surgical gloves, thermometers and syringes to highly complex technology products covering physical sciences, biosciences and material sciences at the frontiers of those respective technologies. This diversity is further reflected in the multitude of regulations that the sector faces including atomic energy regulations. The sector is regulated by 12 regulators which means it is simply impossible to be regulated unless a multidisciplinary regulatory architecture is established. The human resource inadequacy with the drug regulator for this sector is glaring.

The importance of standards cannot be overemphasized. As the implementation of the new rules on standards unfolds overtime investments in a sound testing infrastructure will be of great importance. Further, conformity assessment procedures through third party certification will become the imperative for a fast- moving sector in order to improve its credibility and therefore its brand equity, and also to provide consumer satisfaction.

India's e-procurement initiatives for government do not include medical devices and health insurance mechanisms are underdeveloped. The issue of price control may also discourage the industry. To develop the ecosystem of the industry, technology choices and collaboration will be of vital importance. The registration of patents and difficulties with the system also need to be addressed. This would also encourage investment.

While investment policies have been formulated to help the development of this industry, like other sectors trade policies, especially tariff policies continue to be regressive. As far as investment policy is concerned, investments by the government itself in institutions for technology development and promotion is required. In addition, creation of fiscal instruments for promotion of R&D in the private sector should go hand in hand with government investment. The Departments of Science and Technology (DST) and Biotechnology (DBT) have created an effective mechanism for growth of startups and technology incubation involving reputed technical institutions such as the IITs. The results will be visible only after 5 to 10 years. Foreign investments are necessitated to keep the present momentum particularly in the higher technology segments of the sector. This will require two types of interventions namely facilitation in setting up businesses and providing regulatory frameworks in line with the best in the world, and adopting trade and industrial policy instruments which should expand market opportunities to sustain manufacturing in India at a global scale. The sector distinguishes itself from some other promising sectors in its multifaceted character. On the one hand existing products and technologies are simple and pervasive, but on the other hand new complex technologies make manufacturing within the country difficult in the short run. A growth strategy which combines PLI (Production Linked Incentives) and PPO (Public Procurement opportunities) with rational trade, particularly tariff policies is required for this sector.

General Conclusions and Recommendations

The China factor

India is heavily dependent on Chinese imports of components in a number of sectors as identified above. Geopolitical considerations may deter investment from China. Addressing China's large role In the Indian economy must include a strategic approach that include trade and investment policy changes. In this context, there is a need to focus on strategic sectors and new technologies. Wherever inputs and investment are needed and available mainly from China some laxity in investment policies is required. If there is a possibility of producing these strategic products domestically – import substitution policies should be encouraged. Trade and investment policy should recognize that there would be security related concerns regarding Chinese Investment in India and these should be appropriately addressed through joint ventures and some stipulations on skill transfer. There should be an emphasis on coalition building with nations other than China, which will in turn become a basis of international collaborative initiatives. However, these coalitions should not be anti-China, but rather seek opportunities for leapfrogging technologies in almost all sectors studied in this report. While US- China trade tensions are likely to continue, India's strategy for taking advantage of them should be one that is based on technology advancement. New US tariffs on China are likely to continue, but tariffs may be applied to some Indian exports and hence India must prepare for that eventuality. New trade regulatory regimes are likely to develop through regional and multilateral regimes, which may or may not exclude China. India must make efforts to be part of these regimes.

Likely Situation in WTO and FTAs

(a) India is part of or closely following the negotiations at the WTO on Digital trade, Fisheries Subsidies, Investment Facilitation. Work on Subsidies and State Enterprises is likely to develop and India should prepare for that. The Appellate Body may become functional in the near term, and hence WTO-inconsistent policies should be avoided. To the extent that India takes a political decision of staying out of a negotiated agreement, it must nonetheless create its domestic policy and operational ecosystem to function under the new trade regulations agreed by a large number of countries, so as to remain an active part of the global value chains that reflect the new rules.

(b) With regard to FTAs, an important factor to realize is that global trade will be determined by recent FTAs or those currently under negotiations, e.g. AfCFTA, CPTPP, RCEP, EU-Vietnam, EU-Mexico,US-Kenya, US-UK, and EU-Australia. Significantly, existing FTAs like CPTPP are attracting new members. India should be prepared for these with a full analysis of the likely impact on Indian trade and investment of such agreements and policies that would limit the adverse impact if India is not a member of the more recent significant agreements.

In this background, India should review its approach to Regional Trade Agreements (RTAs). RTAs should be seen as instruments facilitating onboarding of global/regional value chains with a view to achieving global competitiveness and the desired market share of selected product/service areas within the region. A number of policy suggestions have been made in the chapter on specific sectors. Some of the salient points, including those which are not commonly focused but are given importance in the feedback from industry are discussed below for trade and investment policy.

Recommendations on Trade Policy

Chapter 1 of the Report provides a framework for analysing the consistency or lack of it between trade and investment policy. It shows clear instance where policies consistently add to the positive impact of each other, or work against each other thus reducing their individual impact. It also shows that in some cases, a number of supplementary policies need to be part of a package to achieve the relevant objectives.

It has to be understood that competitiveness is the only way to sustain achievement of the objectives of Atmanirbhar Bharat over the medium term. In this context, restrictive trade policies, such as an increase in tariffs and NTMs reduce competitiveness. The cost increase or operational constraint because of any trade or investment policy that limits scale of operations, reduces competitiveness. It may also reduce rather than increase the scope of value addition in the economy if the production of parts and components that are integrated in GVCs, gets more costly or delayed. If a tariff is to be increased on inputs in a supply chain, it is important to make certain that the input would be produced domestically. Therefore, for tariff increase a prior condition could be that some companies provide a plan of investment to produce the product in the near term. Only then should the tariff increase be implemented, for a temporary period. A restrictive trade policy, if implemented, should have a time limit after which that policy should be withdrawn.

Timely implementation and support is crucial for maintaining competitiveness. For instance, RoDTEP should be implemented expeditiously and at rates where there is correct zero rating of exports, i.e. all indirect taxes are remitted or refunded. Also, experience suggests that there is a need for a robust Trade Promotion Agency, together with a practical target-oriented functional trade promotion programme.

When considering the impact of tariffs, it is important to examine the impact of price of the product and a possible shift away of the demand for product produced using the components and machinery subject to tariffs, e.g. in the PV sector. Also, feedback from the industry suggests that certain concerns relating to tariffs should be addressed before raising tariffs because:

(a) Two different products could have the same nomenclature, e.g., different items imported under “connectors”, “microphones”, “camera”;

(b) Customs notifications should not be with retrospective effect.

Simple principles should be followed to create efficient, consistent and simple regulations. For example, if a sale results in receipt of foreign currency payment for it, the GST on the sale should be refunded similar to exports (a case of certain engineering products). In view of the receipt of foreign currency, such a sale should be classified as deemed exports and given the benefits provided to these exports. These and other

concerns such as treatment of external consultant that create export opportunities are mentioned in more detail in the Report.

India should review its approach to Regional Trade Agreements (RTAs). RTAs should be seen as instruments facilitating onboarding of global/regional value chains with a view to achieving global competitiveness and the desired market share of selected product/service areas within the region.

In the area of quality related NTMs an attempt at solution-oriented sector-specific mechanisms could be established with other nations as stand-alone initiatives and not only through RTAs. This should include MRAs and a process to address bilateral/regional market access obstacles created by NTMs.

Recommendations on Investment Policy

First of all a flexible and consistent approach should be adopted for investments. Such an approach should take account of issues such as CoVID-19 and global economic trends should be followed in policies such as PLI. If COVID19 is treated as Force Majeur by one part of government, then all other government departments should treat it as such.

The timelines for disbursement of subsidies should be clearly established, e.g. in the Guidelines of PLI. The effectiveness of trade and investment facilitation depends on time bound approvals. To create greater certainty, the practice of deemed approval should be more widely implemented, and verification and disbursement of funds under incentives should be handled by third parties to increase efficiency.

Policies under Ease of Doing Business such as the current drive by the Government to reduce the burden of regulatory compliances, are very welcome. These initiatives must be completed in a time bound manner. Incentive policies should not be changed mid-way.

A Comprehensive Approach for Synchronising Trade and Investment Policies

A comprehensive strategic evaluation should be an integral part of preparing policy response. For example, lessons from EU and US initiatives on reducing dependence on China, while maintaining the necessary policy/ commercial engagement should be the guiding approach. Building coalitions should become a regular part of the trade and investment policy toolbox, particularly to address resilience of value chain and seeking additional markets (e.g., pharmaceuticals).

Other important steps include removing duplication of agencies to provide clearance/approvals for the same issue (e.g., Trusted Electronics Value Chain). Clarifying conditions impacting operations, e.g., if a scheme has a penalty clause, the amount of penalty should be made clear (e.g., plastic waste regulation). Further, there is a need to use a medium-term assessment approach to capture need for technology adaptation to remain competitive in sectors where technology changes are imminent. Such technology changes are occurring in several sectors like Solar Panel, Pharmaceuticals, and Automobiles.

In the context of GVCs, the important issue is to work co-operatively with other countries to create mechanisms and approaches to support individual initiatives through:

- **Ensuring transparency**: Ensuring transparency regarding trade-related measures associated with medical supplies, such as through sharing information with the WTO, can play an important role in maintaining confidence in global supply. This would be similar to AMIS, created in the wake of the food price crisis of 2007-08 for governments to share the relevant information in a timely manner. In this context, countries could explore a WTO initiative (including plurilateral) to remove tariffs on an agreed list of essential medical supplies.

- **Disciplines on export restrictions**: These could range from agreement to prohibit export bans for certain kinds of goods, or to codify strict conditions on their use, building on the current G20 agreement.[3]
- **Upfront investments in co-operative solutions**: The creation of stockpiles of essential medical supplies could include co-operative arrangements for creation of such stockpiles, including on a regional basis.
- **Addressing the needs of the most vulnerable countries**: Measures, for example, in relation to export restrictions and creation of regional stockpiles, could include specific exemptions or assistance to address the needs of the poorest countries.

Approaches for Creating a Large Impact

Two different approaches may be required:

- A Mission Approach (e.g., for Pharmaceutical, Medical devices) where a comprehensive set of policies which address trade and investment should be developed.
- Focus on Top Five or Six Policy Areas that are limiting performance or creating obstacles to higher export performance (for most other sectors). These should be identified based on consultations with industry.

In addition:

- The Foreign Trade Policy of India should be adopted by the Cabinet, to give it a focus by the entire Government and not only a single Minister.
- Government should set up a National Mission for making Indian Businesses Competitive. All public policies and government/regulatory decisions should be judged on the criterion whether they are making businesses more competitive or less.
- National Mission on Quality: A time bound program (say, five years) should be launched to improve quality and make technical regulation coherent with standards in large global markets
- State Governments should establish a Department of Trade, to sensitise policy makers there about trade policy issues.

Suggestions for EXIM Bank

The Bank should create a Permanent Mechanism for feedback from Industry clients (say every 6 months) on concerns relating to exports, imports, domestic regulations and non-tariff barriers, which require government intervention. It should provide a feedback at regular intervals on such industry concerns to Ministries. It should develop a programme to learn from success cases in India and to share experiences from such cases.

Since pharmaceutical industry has long gestation period, a long term funding programme is required. EXIM Bank could help develop such a funding programme.

It should initiate a Study on how technological leapfrogging can restore India's competitiveness in selected sectors, especially vis-a-vis China.

[3] In particular the part which states that: "emergency measures designed to tackle COVID-19, if deemed necessary, must be targeted, proportionate, transparent and temporary, and that they do not create unnecessary barriers to trade or disruption to global supply chains, and are consistent with WTO rules". See paragraph 5 of https://www.wto.org/english/news_e/news20_e/dgra_30mar20_e.pdf

► Chapter 1

Major Objectives and Policies of India

Introduction

India's current policy reform is driven by the Atmanirbhar Bharat (AB) initiative announced by the Prime Minister (PM) in May 2020. The objectives include improving India's domestic production levels and capabilities, raising employment, increase in foreign direct investment (FDI), improving technological capabilities, raising exports, developing stronger links with global value chains (GVCs), and improving efficiency or competitiveness of Indian producers. Since this major initiative was conceptualized during the Covid-19 crisis, additional important objectives include resilience of value chains, mitigation of risks, and building coalitions or economic partnerships with like-minded nations to achieve common national goals.

Trade and investment policies are prominent tools for achieving the objectives of AB, based on a wider industrial policy framework. It is important to ensure that the different policy measures implemented to achieve the objectives of AB work in synergy and not in conflict. There is no common definition of industrial policy. In certain instances, it focuses largely on investment policy, with trade policy considered as a supplementary policy to achieve priority objectives.[4] In other instances, industrial policy is defined more comprehensively and includes trade policy within it.[5] Whatever is the coverage of the term "industrial policy", it is clear that both investment and trade policies are important instruments for bringing about growth and development.

This Report examines trade and investment policies to clarify the areas where policy measures have synergy between them, and those where there could be a potential conflict between these policies. In summary, the policies could:

[4] See, for example, pages 4 to 7 of Vinod K. Aggarwal and Andrew W. Reddie (2020), "Economic Statecraft in the 21st Century: Implications for the Future of the Global Trade Regime", World Trade Review, 1-15. Published online in 2021.

[5] See, for example, pages 3 and 4 of https://www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_315664.pdf

(a) conflict with each other in terms of the impact of any specific objective,

(b) be supportive or complementary to each other by enhancing the effect of each policy on the objective achieved, or

(c) supplement each other, in that the two policies may not normally be considered as connected or complementary, but one of the policies is used to reduce the negative impact of the other on the achievement of a particular objective.

An important aspect of trade and investment policies is that several of them overlap, i.e. they are considered as both a trade policy and an investment policy. In this case, there is no conflict amongst them. In other cases, the policies may work against each other or support the impact of each other on the objective that is emphasised. To better understand such linkages, it is important to clarify the objectives to be achieved by using the policy concerned.

Section 1.1 provides a summary of the main features and objectives of Atmanirbhar Bharat. Though there are multiple objectives, four of them have wider implications and greater significance than the others. These are: increasing competitiveness, expanding links with GVCs, improving domestic technological capabilities, and a focus on strategic sectors. The various trade and investment policies used to achieve these objectives are discussed in Section 1.2. The scope of both trade and investment policies has expanded over time to include a more detailed toolbox for each. Sections 1.3 and 1.4, respectively, discuss the evolution of trade policy and investment policy over time. Section 1.5 provides a summary picture of the overlap between trade and investment policy, and the conflict or synergies between some of the key policies in that context.

A noteworthy feature is that both trade policy and investment policy now emphasise ease of doing business or facilitation policy, as well as the objective of expanding links with GVCs. This is a direct consequence of the growth of FDI being a major contributor to the rapid increase in GVCs. According to an assessment by UNCTAD, "TNC[6]-coordinated GVCs account for some 80 per cent of global trade".[7] These GVCs have contributed to an increase in both FDI and international trade.

Table 1.1: Inward Global FDI Stock and World Merchandise Exports (USD billion)

	1990	2000	2010	2020
Global Inward FDI Stock	2,078	7,377	19,899	41,354
World Merchandise Exports	3,490	6,454	15,304	17,583

Sources: UNCTAD and WTO.

1.1 Atmanirbhar Bharat

The background of the initiative on "Atmanirbhar Bharat" or self-reliant India is the massive economic impact of Covid-19 and the increase in uncertainty and risk due to the large disruption in international trade. The severe impact of Covid-19 on India can be seen from March 2020 onwards (Table 1.2),[8] from the sharp fall in the country's merchandise trade during the two months before the announcement on Atmanirbhar Bharat by the Indian Prime Minister.

[6] Transnational corporations.

[7] Page x in "Key Messages" section of UNCTAD, World Investment Report 2013.

[8] The first lockdown (one-day) in India was announced on 19 March 2020, followed by a 21-day lockdown from 25 March 2020.

Table 1.2: Merchandise Exports and Imports of India from March to May 2020 (USD, % change compared to the same month in the previous year)

	March 2020	April 2020	May 2020
Exports	-34.31%	-60.98%	-35.57%
Imports	-28.02%	-59.7%	-51.05%

Source: Department of Commerce, Government of India.

1.1.1 Main Features of Atmanirbhar Bharat

Though the concept of self-reliance normally denotes an inward-looking policy approach, the Indian PM has emphasised that the call for self-reliance does not advocate self-centric arrangements.[9] The PM's vision includes:

(a) Five pillars of self-reliant India, namely, the economy, infrastructure, a system that is technology-driven, a vibrant demographic dividend (i.e. skills-and-knowledge empowered population), and the demand for domestic products accompanied by empowering every stakeholder in our supply chains.

(b) Bold reforms that create a rational tax system, simple and clear rules-of-law, good infrastructure, capable and competent human resources, and building a strong financial system.

(c) Important aims of the initiative are to encourage business, attract investment, and strengthen the Make in India initiative and convert it into a Make for the World programme.

(d) Thus, an important focus of the PM is to prepare "the country for a tough competition in the global supply chain. And today it is the need of the hour that India should play a big role in the global supply chain. … [through] increase the efficiency of all our sectors and also ensure quality."[10]

An important thrust of the PM's approach is summarised as follows: "self-reliance will prepare the country for tough competition in the global supply chain, and it is important that the country wins this competition. … Now, it's time to be vocal about the local products and help these local products become global."[11]

A specific example of this approach is provided in the PM's speech focusing on the Indian defence sector. In that context, the Prime Minister stressed boosting defence production through development of new technology, and providing a greater role to the private sector. FDI, co-production through joint ventures with foreign partners, and exports are important parts of the strategy,[12] accompanied by policy steps that support the domestic industry through domestic procurement and other programmes such as Production Linked Incentives (PLI) initiatives, improvement in the licensing process, creating a level playing field, and simplification of the export process.[13]

---

[9] English Rendering of Prime Minister Shri Narendra Modi's Address to the Nation on 12.5.2020. https://pib.gov.in/PressReleseDetail.aspx?PRID=1623418

[10] Ibid.

[11] Summary Report of the Indian Prime Minister's speech of 12 May 2020, on the PM's website. https://www.pmindia.gov.in/en/news_updates/pm-gives-a-clarion-call-for-atmanirbhar-bharat/

[12] https://www.pmindia.gov.in/en/news_updates/pm-addresses-seminar-on-atmanirbhar-bharat-in-defence-manufacturing/.

[13] https://www.pmindia.gov.in/en/news_updates/pm-addresses-seminar-on-atmanirbhar-bharat-in-defence-manufacturing/. The Prime Minister also referred to major reforms underway in areas of Intellectual Property, Taxation, Insolvency and Bankruptcy, and Space and Atomic Energy.

The emphasis on FDI, technology, competitiveness and productivity, and links with international trade (in particular the global value chains) comes out very clearly also in the speeches of India's Minister of Commerce and Industry CIM).

For instance, a report on his speech states that India "must look to leverage Free Trade Agreements (FTAs) with countries with whom we have a transparent trading mechanism, working with transparent business systems, whom you can engage with from a position of strength for certain products. … India should focus its energy on doing FTAs with developed countries who are looking for market access in the large Indian markets, but who can also provide us with high technology products while opening the doors in their countries for products where India has strength. … Prime Minister intends to prepare India to become a global player in resilient supply chains. … India should emerge as a trusted partner, when like-minded countries are looking to expand trade or looking for alternate sources for the manufacture of their goods and provision of services. … in manufacturing and production, we are looking at high quality and high productivity levels. … We are working in close partnership with Industry to define and determine areas where India has competitive advantage and has the capability to make for the world.**"**[14]

Likewise, the Minister has said that, "we are encouraging import of high-tech products, encouraging people to bring technologies, skills, better qualities of healthcare and education to India. The effort to increase the presence of both domestic and international companies in manufacturing space, will help us increase the income levels of the people of India, expand the economy, de-regulate and remove investment barriers and help our economy to grow. … the Hon'ble Prime Minister has been very focused on bringing more and more flexible and open government to introduce a greater degree of FDI in India and attract manufacturing**."**[15]

1.1.2 A Closer Look at The Main Objectives and Areas of Focus

In its Report on industrial policy and investment policies, UNCTAD (2018) states that: "Countries at all levels of development are using targeted industrial policies, not only for economic development purposes, but also to respond to myriad contemporary challenges, such as creating jobs and reducing poverty, participating in the technological revolution and in global value chains (GVCs), promoting efficient and clean energy and greening the economy."[16]

The various statements of the PM and the CIM on "Atmanirbhar Bharat" suggest some key objectives and areas of focus. They include:

(a) Increase the competitiveness of Indian producers

(b) Improve domestic technological capabilities

(c) Increase FDI

(d) Increase exports

(e) Decrease imports

(f) More extensive connections with GVCs

---

[14] See https://commerce.gov.in/press-releases/aatmanirbhar-bharat-is-about-opening-indias-doors-wider-so-that-india-engages-with-the-world-from-a-position-of-strength-on-equal-fair-reciprocal-terms-shri-piyush-goyal/?hilite=%27TMANIRBHAR%27%2C%27BHARAT%27.

[15] https://commerce.gov.in/press-releases/india-and-sweden-should-work-together-to-build-a-more-resilient-strong-partnership-shri-piyush-goyal/?hilite=%27TMANIRBHAR%27%2C%27BHARAT%27

[16] See page 128 of UNCTAD (2018), World Investment Report 2018: Investment and New Industrial Policies, https://unctad.org/system/files/official-document/wir2018_en.pdf

(g) Identify and develop strategic sectors, e.g. pharmaceuticals sector

(h) Increase resilience of, and reduce operational risks for, GVCs, exports and strategic sectors

Key objectives

Among the list of objectives, four are particularly significant, with a large overlap with other objectives, including each other. These are improving competitiveness, expanding links with GVCs, improving domestic technological capabilities, and identification and development of strategic sectors.

(i) Competitiveness

Improvement in competitiveness is an important basis for:

- Higher domestic production and employment
- Increasing exports
- Decreasing imports
- More extensive connections with GVCs
- Creating increasing number of export hubs
- Greater resilience of GVCs
- Increasing domestic capabilities in strategic sectors, e.g. pharmaceuticals

Sustaining competitiveness would require, inter alia:

- Improving technological capabilities
- Reducing costs across the supply chain
  - ➢ including through better conditions for ease of doing business
- Policy to be determined keeping in mind the likely changes in technology over the medium term (about five years ahead)
- Learning from the policies and strategies of competing countries on how to achieve better results

(ii) GVCs

Increasing links to GVCs or establishment of export hubs requires for example:

- FDI by major global firms which are "lead firms" in their sector
- Development of the domestic ecosystem for improving domestic content in the GVC
- Upgradation of technology
  - ➢ Adoption of, or moving towards, frontier technology
- Improving design capability
  - ➢ This is one of the ways in which greater links could be developed between technological upgradation and greater commercial opportunities

(iii) Technological capabilities

Technological capabilities cover a range of activities, from technical R&D to design to skills that improve the capability to adopt/adapt machinery and equipment or work on machinery with new technologies. Upgrading technological capabilities is crucial for maintaining competitiveness and to create an increasingly larger base for connecting with GVCs and efficient operations of global firms.

(iv) Development of strategic sectors

Similarly, the development of strategic sectors requires:

- Larger investment and domestic production in these sectors
- Increasing domestic competitiveness in these sectors over time
- Incrementally raising domestic content in these sectors
- Building supportive coalitions with like-minded countries to develop:
  - trade and investment links with countries that could be alternate sources of goods and services
  - regional/international mechanisms or systems that would help build resilience of GVCs and domestic supply of strategic sectors

1.2 The Major Significance of Investment and Trade Policy

Industrial policy comprises a number of policy areas.[17] Most countries however focus on investment and trade policies as the main tools within the context of industrial policies, especially to acquire new technological capabilities and to improve competitiveness and trade opportunities in global markets. UNCTAD (2018) shows that investment policies have been a very important part of the policies to promote economic objectives of developed and developing economies. It states that: "Over the past 10 years, at least 101 economies across the developed and developing world (accounting for more than 90% of global GDP) have adopted formal industrial development strategies. The last five years have seen an acceleration in the formulation of new strategies. … **About 90% of modern industrial policies stipulate detailed investment policy tools**, mainly incentives and performance requirements, special economic zones (SEZs), investment promotion and facilitation and, increasingly, investment screening mechanisms."[18] (emphasis added)

Similar to investment policies, trade policies too are a major part of the policy efforts to improve competitiveness of domestic producers and to enable them to link up more efficiently with global value chains. A relevant insight emphasised by UNCTAD (2018) in this context is: "For developing countries, despite recent evidence that a singular focus on manufacturing in most industrial policies may be too narrow (IMF, 2018), most economists have recognised for some time that very few countries have developed successfully without passing through a manufacturing-based, and **often export-driven,** industrialization phase."[19] (emphasis added)

The significance of investment and trade policies is also evident from the evolution of industrial policy from post-World War II to the present. In this period, the views about trade policy in particular have changed very significantly. With the experience of Covid-19 this year, there has been a further addition and some re-orientation of the objectives emphasized (Table 1.3 below).

[17] See K. Aiginger and D. Rodrik (2020), "Rebirth of Industrial Policy and an Agenda for the Twenty-First Century", Journal of Industry, Competition and Trade, 20, 189-207, https://doi.org/10.1007/s10842-019-00322-3

[18] https://unctad.org/press-material/wir-adoption-new-industrial-policies-accelerates-response-economic-shift-united. See also page 146 of UNCTAD (2018).

[19] See page 129 of UNCTAD (2018).

Table 1.3: Evolution in goals and key elements of Industrial policies and International policy environment

	Until the 1970s	1980s-1990s	2000s and ongoing	Recent/emerging themes
Policy Goals	Creating market diversification	Market-led modernisation	Specialisation and increased productivity	Modern industrial ecosystem development; Resilience and stability of value chains and greater self-sufficiency
Key Elements	- Import substitution - Infant industry protection - Sector development - Gradual and selective opening to competition	- Limited government involvement - More horizontal policies - FDI opening - Exposure to competition	- Targeted trade and investment policy strategies in open economies - Enabling business environment - Digital development (IT) and ICT diffusion - Participation in global production networks (GVCs) - FDI promotion combined with protection of strategic industries - SME support - Skills development	- Technical capabilities development - Innovation in production (operational technologies) - Learning economy - SDG sector development - Public-private knowledge/tech development institutions - Acquisition of foreign technology - Entrepreneurship development
International Policy Environment	High political legitimacy for national development strategies	- Low political legitimacy for interventionist development strategies - Limitations to policy space through international commitments	- Regained legitimacy for national development strategies - Moderate policy space in selected areas	- More policy space in new fields - More emphasis on inclusiveness

Source: Based on Table IV.1 of UNCTAD (2018).

1.3 Evolution of Trade Policy: From a Focus on Goods and Border Measures to include Inside-the-Border Measures and Trade-Related Areas

For a large part of the post-war period after 1950, international trade was characterised by a focus on trade in goods, and within that mainly on border measures and a few measures such as subsidies that impacted goods trade. This is illustrated by the text of the Havana Charter,[20] whose provisions in Chapter IV include, among others, tariffs, quantitative restrictions (quotas, import or export licenses, or other measures)[21], subsidies, state trading, freedom of transit, marks of origin, and formalities connected with importation and

[20] See the text at https://www.wto.org/english/docs_e/legal_e/havana_e.pdf

[21] See Article 20 in Chapter IV of the Havana Charter.

exportation.[22] Significantly, Chapter V of the text covers services under the section on restrictive business practices, an area which was not taken up in detail under the GATT.[23]

The primary focus of Chapter IV of the Havana Charter, which relates to "commercial policy" and largely became a basis for GATT in 1948, is on importation and exportation of **goods**. Trade in services was formally incorporated with its own set of trade disciplines in 1995, as a result of the Uruguay Round negotiations, under the General Agreement on Trade in Services (GATS).

Another important feature of the early framework of international trade policy was a focus on border trade policies (mainly tariffs), because these measures were seen as the primary mechanism for restricting trade.[24] This focus on border policies is also evident from the topics addressed during the various negotiating Rounds under the GATT.[25]

With the advent of time, as tariffs of many developed countries decreased under GATT negotiations, the incidence of non-tariff measures started increasing. With the increased possibility of trade in **services** due to inter alia technological changes, regulatory regimes relevant to services became a key part of trade policy. Likewise, with social and sustainability objectives occupying centre-stage in major markets, **standards and other regulatory provisions** became an important part of trade policy discussions. The opening up of erstwhile monopoly markets in services and scrutiny of the practices of multinational enterprises led to a special focus on competition-related issues.[26]

During the eighties, the discussion on trade policy included a consideration of certain measures which have a wider ambit than international trade but, at the same time, were considered as impacting the conditions of international trade. These are the **"trade-related" measures**, for example, intellectual property rights. They also became part of the trade policy measures considered by different regulatory regimes, including those covered by the WTO and regional trade agreements.

---

[22] The main actions specified in the Havana Charter, Article 36, include several items which were later incorporated in Article VIII of GATT 1947. These were: (a) consular transactions, such as those relating to consular invoices and certificates; (b) quantitative restrictions; (c) licensing; (d) exchange control; (e) statistical services; (f) documents, documentation and certification; (g) analysis and inspection; and (h) quarantine, sanitation and fumigation.

[23] Article 53.1 of the Havana Charter states that: "Special procedures with respect to Services". To quote, it states that: "The Members recognize that certain services, such as transportation, telecommunications, insurance and the commercial services of banks, are substantial elements of international trade and that any restrictive business practices by enterprises engaged in these activities in international trade may have harmful effects similar to those indicated in paragraph 1 of Article 46. Such practices shall be dealt with in accordance with the following paragraphs of this Article. …"

[24] GATT 1947 is based on both the Havana Charter as well as the results of another important initiative which involved: "15 countries [that] had begun talks in December 1945 to reduce and bind customs tariffs. With the Second World War only recently ended, they wanted to give an early boost to trade liberalization, and to begin to correct the legacy of protectionist measures which remained in place from the early 1930s. …This first round of negotiations resulted in a package of trade rules and 45,000 tariff concessions affecting $10 billion of trade, about one fifth of the world's total. The group had expanded to 23 by the time the deal was signed on 30 October 1947. The tariff concessions came into effect by 30 June 1948 through a "Protocol of Provisional Application". And so the new General Agreement on Tariffs and Trade was born, with 23 founding members (officially "contracting parties")." https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact4_e.htm

[25] "In the early years, the GATT trade rounds concentrated on further reducing tariffs. Then, the Kennedy Round in the mid-sixties brought about a GATT Anti-Dumping Agreement and a section on development. The Tokyo Round during the seventies was the first major attempt to tackle trade barriers that do not take the form of tariffs, and to improve the system."https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact4_e.htm

[26] The Telecom Reference Paper, for instance, focuses mainly on maintaining competitive conditions through regulatory regimes. See, for instance, https://www.wto.org/english/tratop_e/serv_e/telecom_e/tel23_e.htm

Over time, another significant change was the growing importance of Global Value Chains (GVCs) in international trade. GVCs involve inputs being processed in stages by production facilities located in different nations. By definition, a competitive GVC depends on three important operational conditions: quick turnaround of inputs after processing, for subsequent processing or sale in another nation; consistent quality of inputs so that the chain of activities can continue in a rapid manner; exporters meeting the other requisite standards (including technical and product-related standards) required for acceptance by the importing country.

International trade of inputs for further processing and onward export thus became a major part of production processes linked to international trade, highlighting the importance of facilitating conditions favourable to trade and investment, as well as predictable and stable conditions for developing strategic business relationships across a range of countries.[27]

To reduce operational cost, and improve competitiveness and export opportunities, it is very important to **reduce the time taken in trade-related processes and in the turnaround period of products processed for international trade.** This has led to an emphasis on **trade facilitation** for enabling a rapid turnaround. In addition, this process also brought out the significance of the co-ordination of each GVC by a major firm (termed as the "lead firm" in the GVC) to monitor operations, facilitate consistency of quality and other standards, and enable further trade-related transactions in global markets.

Experience with GVCs shows that countries which have been able to absorb technologies and create stronger domestic ecosystems to support the GVCs within their economy, have performed more competitively in international trade, and have also climbed up the value chain to create larger domestic value addition over time.

These developments have brought about some very important changes in the context of international trade and investment policy, namely:

- Trade policy now includes many more measures than earlier.
- Over time, with the large volume of FDI (see Table 1.1 above), the continued significance of GVCs in trade, and an emphasis on ease of doing business or behind-the-border trade policy measures, the scope of international trade policy has come to significantly overlap with that of investment policy.
- Due to the proliferation and significance of these various behind-the-border measures, the impact and incidence of non-tariff measures on trade is double that of customs tariffs.[28]
- Lead firms in GVCs are recognised to be of major significance in strategies adopted by a number of countries to improve their trade opportunities.
- GVCs require trade facilitation, i.e. facilitation of imported inputs as well as facilitation of exports, implying an emphasis on timely and cost-effective processes.
- Countries recognise that international trade is not only about present capabilities. It includes a longer-term focus to develop domestic capabilities and an operational ecosystem.
- These factors imply that the policy framework needs to have a broader scope to improve international trading conditions, with trade and investment policies given prominent significance, while recognising the overlap between these two policy areas.

[27] See, for example, A. Andrenelli et al. (2019), "Micro-Evidence on Corporate Relationships in Global Value Chains: The Role of Trade, FDI and Strategic Partnerships", OECD Trade Policy Papers, No. 227, OECD Publishing, Paris. http://dx.doi.org/10.1787/f6225ffb-en

[28] See https://www.unescap.org/sites/default/files/publications/APTIR2019-H%3DN.pdf

The wide range of trade policy measures is shown, to some extent, in topics covered by WTO and, even more so, in the coverage of more recent regional trade agreements such as the Comprehensive and Progressive Trans Pacific Partnership (see, for example, Table 1.4 below). These developments show an increasing overlap between the so-called domestic policies and the conventionally understood international trade policy. The progression of this policy coverage also shows the **growing complexity of international trade, which now covers international trade, investment, goods, services, and technology**.

Table 1.4: Topics Under Comprehensive and Progressive Trans Pacific Partnership (CPTPP)

National Treatment and Market Access for Goods (focus on tariff liberalisation, while addressing other non-tariff related issues)	Temporary Entry for Business Persons	Competitiveness and Business Facilitation
Rules of Origin and Origin Procedures	Telecommunications	Development
Textile and Apparel Goods	Electronic Commerce	Small and Medium Sized Enterprises
Customs Administration and Trade Facilitation	Government Procurement	Regulatory Coherence
Trade Remedies	Competition Policy	Transparency and Anti-Corruption
Sanitary and Phytosanitary Measures	State-owned Enterprises and Designated Monopolies	Administrative and Institutional Provisions
Technical Barriers to Trade	Intellectual Property	Dispute Settlement
Investment	Labour	Exceptions and General Provisions
Cross-border Trade in Services	Environment	Final Provisions
Financial Services	Co-operation and Capacity Building	Side instruments and Annexes to Chapters

Source: https://www.international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/agr-acc/tpp-ptp/text-texte/toc-tdm.aspx?lang=eng

1.4 Evolution of Investment Policy: From Restrictive Policy to Promotion, Linking Up with GVCs, Technology Acquisition and an Enabling Business Environment

Similar to trade policies, the tool box of investment policies includes many more initiatives than the earlier tool box of investment policy about four to five decades ago.

Conventionally, investment policies are linked with conditions of entry and operation of FDI. The issues involved in this process, however, cover many different areas of policies which come under the rubric of investment policy. As explained by UNCTAD's World Investment Report 2018:

"Investment policies generally govern the entry and establishment of foreign investors, the treatment of foreign investors relative to that of domestic firms, the regulation of foreign investors' operations and the protection of their assets. Policies stipulate investment promotion measures (e.g. incentives) and investment facilitation approaches (e.g. single windows for investors), and influence operating conditions for investors by improving the ease of doing business. Investment policy includes efforts to maximize positive spillovers from the activities of foreign affiliates, e.g. by stimulating the dissemination of technology and know-how and by promoting linkages with domestic suppliers, and to minimize potential negative effects, e.g. through social

and environmental safeguards. Taking a broader perspective, aspects of investment policy play an integral role in a host of closely interlinked policy areas, including trade, competition, tax, intellectual property, labour and other policies. … More recently horizontal investment facilitation measures and investor targeting have become more prominent."[29]

The evolution of investment policy can be categorised in terms of three overlapping phases, focusing on the operating conditions, in general, as well as specific sectors targeted for development. From regulation of markets with restrictive domestic and trade policies in the initial phase, the objectives and policy orientation cover several additional areas of focus (Table 1.5 below).

Table 1.5: Examples of investment policies across industrial policy models

	Approach	Restrictions/Regulations	Promotion/Support
Horizontal Industrial Focus	Phase 1		
	Phase 2	- Performance requirements (e.g. for technology and know-how dissemination) - Investor screening	- Promotion of investor behaviours (including through incentives) - Public investment in enabling factors, infrastructure, joint research, education
	Phase 3		- Enabling investment environment and investment facilitation **- Building country coalitions and partnerships for improving GVC resilience** **- Risk mitigation in strategic areas**
Sector-specific	Phase 1	- Regulation of market access; entry and establishment rules - Joint-venture obligations - Combined with trade restrictions and TRIMS	
	Phase 2		- Selective/targeted investment promotion - Fiscal and financial incentives
	Phase 3		- Focus on resilience of global value chains - Ensuring security of supply of strategic products

Source: Adapted from Table IV.2 of UNCTAD (2018).

Note: The policy goals in the Table are emphasised particularly in light of the experience during the Covid-19 crisis.

Though certain policies may be horizontal in their impact, they may initially be implemented only in some priority sectors because of the shortage of personnel, time and experience. After a period of learning, leading to improvements in the efficiency of these policies, they could be extended at the horizontal level, across sectors.

The main investment policy measures according to the UNCTAD database are investment incentives and investment facilitation/liberalisation.[30] These are discussed below.

[29] See page 132 of UNCTAD (2018).

[30] Figure IV.7 of UNCTAD (2018).

1.4.1 FDI Incentives

FDI incentives can be considered under two broad categories, i.e. regulatory incentives,[31] and financial and fiscal incentives. Financial and fiscal incentives provide support in kind or in pecuniary form for infrastructure, job training, relocation and/or establishment of a new subsidiary, temporary wage assistance, administration assistance, credit to investors, land acquisition/use, R&D, sharing of certain costs, reduced direct/indirect tax (including tax holidays, special tax privileged zones), fiscal incentives for installing equipment, machinery and construction (including in the form of investment allowance, tax credits, or easier tax-reinvested profits), lower tax on movement of goods and employees of FDI, and reduced border taxes for machinery and inputs.[32]

The incentive policies used most often are fiscal incentives. "In 80 selected schemes benefiting the manufacturing sector across 50 countries, fiscal incentives accounted for more than half of all incentives, with corporate income tax breaks alone representing 26 per cent. Customs duty reductions or exemptions, at 20 per cent of the total, are also important."[33]

Two important features of investment incentives are noteworthy. One, they are linked to criteria based on which the incentive is provided. Two, they are periodically reviewed and revised, normally after a three to five year period. Annex Table A1.1 illustrates the performance criteria based on which the incentives are provided and examples of the manner in which the fiscal or financial advantage is transmitted to the investor.[34]

1.4.2 Facilitation Measures

Facilitation measures are of special interest to India, given the major focus on improving "ease of doing business" for investors. Investment facilitation measures focus on transparency of investment measures, simplification of administrative procedures and requirements, digitalisation, measures that directly increase the development contribution of FDI, coordination and co-operation, and enhancing international co-operation.[35]

---

[31] See also Figure IV.11 of UNCTAD (2018).Regulatory incentives are policies of attracting foreign-owned enterprises by means of offering them derogations from national or sub-national rules and regulations. See OECD (2003), Checklist for Foreign Direct Investment Incentive Policies, Paris, at https://www.oecd.org/daf/inv/investment-policy/2506900.pdf

[32] For more detail, see OECD (2003).

[33] UNCTAD (2018), page 150.

[34] Further detail on the practices could be seen from the practices in various countries. See, for example, page 23 of https://www.un.org/esa/ffd/wp-content/uploads/2018/02/tax-incentives_eng.pdf; https://taxsummaries.pwc.com/malaysia/corporate/tax-credits-and-incentives; https://www.treasury.gov.my/index.php/en/tax/itemlist/category/208-tax-incentives.html; https://taxsummaries.pwc.com/thailand/corporate/tax-credits-and-incentives; https://www.boi.go.th/index.php?page=press_releases_detail&topic_id=125600; https://taxsummaries.pwc.com/vietnam/corporate/tax-credits-and-incentives; http://documents1.worldbank.org/curated/en/400351586323809041/pdf/Vietnam-2019-Investment-Policy-and-Regulatory-Review.pdf; https://assets.ey.com/content/dam/ey-sites/ey-com/en_vn/topics/advisory/ey-invest-in-vietnam.pdf; https://taxsummaries.pwc.com/indonesia/corporate/tax-credits-and-incentives; https://www5.investindonesia.go.id/en/how-we-can-help/incentives; https://www.aseanbriefing.com/news/indonesias-new-tax-incentives/;https://www.boi.go.th/index.php?page=incentive;http://bida.gov.bd/;
https://investmalaysia.mida.gov.my/incentives/Login.Login.aspx;
https://www.edb.gov.sg/en/how-we-help/incentives-and-schemes.html;
https://www.bkpm.go.id/images/uploads/file_siaran_pers/Press_Release_BKPM_02112020_Tax_Allowance_Incentive_Favorably_Used_by_Investors.pdf; https://www.beza.gov.bd/investing-in-zones/incentive-package/

[35] For details, see Karl P. Sauvant, Matthew Stephenson, Khalil Hamdani and Yardenne Kagan (2020), An Inventory of Concrete Measures to Facilitate the Flow of Sustainable FDI: What? Why? How?, Geneva and Bonn, International Trade Centre (ITC) and German Development Institute / Deutsches Institut für Entwicklungspolitk (DIE), https://www.intracen.org/uploadedFiles/intracenorg/Content/Redesign/Events/IFD%20Inventory%20as%20of%2026%20Nov.%2020%20rev.pdf

These measures are important also because many of them are part of the concept of "good governance" which is emphasised by both investors and trading partners. Good governance or good regulatory practice is an important part of the more recent trade agreements, and is the core of "ease of doing business". This will become clear from some more detail on investment facilitation measures shown in Table 1.6 below.

Table 1.6: Further details of investment facilitation measures

Main Facilitation Category	Areas addressed by the Investment Facilitation Category
Transparency of measures	Publication and information on investment measures; Publication of information on authorisation requirements and procedures; Update on new rules and procedures; Proposed measures; Focal points; Clarity of regulations.
Simplification of administrative procedures and requirements	Consistent administration and interpretation of regulations; Single window mechanism; Clear criteria for administrative procedures; Clear criteria for investment incentives; Simplification of procedures and reduction of documentation requirements; Processing of applications; Acceptance of applications; Rejection of applications; Time limits; Communication with potential investors; Fees and charges; After care.
Digitalisation	E-government; Online single window; Improving organisational efficiency through the application of digital technologies; Digitalisation of investor onboarding; Data protection issues.
Measures that directly increase the development contribution of FDI	Responsible and sustainable investment; Linkages with host economy; Building of constructive stakeholder relationships; Evaluating development impact; Evaluating large-scale investment projects; Public-private partnerships; Home-country measures.
Coordination and co-operation	Dispute prevention; Ombudsman; High-level national coordinating body; Domestic regulatory coherence; Cross-border co-operation.
Enhancing international co-operation	Co-operation with multilateral organisations; Needs assessments; Sharing of experiences and mutual learning; Technical assistance and capacity building.

Source: Sauvant et al. (2020).[36]

Table 1.6 shows that a number of investment facilitation policies is under the ambit of the State Government. For creating efficient synergy across policies at the Centre and State, a targeted coordination programme should be initiated among the Centre and the States. This should include creation of some institutional mechanisms such as establishing a Council for Trade and Investment with high-level representation from the Centre and the States. Since trade (or GVCs) is an important objective, it would be useful to get the States to focus on this significant objective of the nation that is an important part of the States' initiatives but also operates beyond the limited scope of State jurisdiction. For this, all States should establish a Department of Trade within their system.

The list of measures in Table 1.6 is extensive and prioritisation among them has to be developed based on policies which investors focus on in terms of ease of doing business.

1.5 Factors Emphasised by Foreign Investors

Much of international trade and investment policy now focuses on efficiently connecting with and maintaining the resilience of global value chains (GVCs). These value chains arise to a major extent due to the foreign

[36] Ibid.

direct investment and operations of the multinational firms.[37] FDI focuses on producing for both the domestic and global markets. With an emphasis on GVCs and exports under Atmanirbhar Bharat, such an overlap becomes even more significant. The factors considered important by foreign investors are discussed below based on three different relevant initiatives.

1.5.1 Survey of European Investors

A recent survey of European investors considering/operating projects in India shows[38] that in addition to issues relating to easier conditions for capital flows, the main policy matters include "good governance"[39], tax regimes, factors affecting adoption/usage of technology, standardisation, protection of data and IPR related issues.[40]

1.5.2 A Survey of Investors by ICEA[41]

Another approach to key policy areas of relevance to foreign investors is summarised in Table 1.7 below. Two different considerations become relevant for them. One relates to the operational conditions which would discourage investment ("Investment Chill/Freeze"). The other pertains to conditions after investment has taken place.

Table 1.7: Factors which affect investment and competitiveness

Serial No.	Importance Given to Individual Factor (%)	Factors Important for Investment Decision	Investment "Chill"/"Freeze"	Affecting Competitiveness
1	15%	Tax Policies and Administration	√	√
2	14%	Attractiveness and Credibility of Special Package		√
3	14%	Logistics		√
4	10%	Manpower		√
5		- Cost of Labour		√
6		- Availability of Labour		√
7	10%	Leadership and Stability	√	√
8	10%	State Bureaucracy and Administration (approach towards ease of doing business and stability and timeliness of policy)	√	√
9	9%	Infrastructure (regular supply of adequate power, water, transport, quick clearances, efficient ports/ airports)	√	√
10	7%	Land	√	√

[37] See for instance, https://www.oecd-ilibrary.org/docserver/f6225ffb-en.pdf?expires=1606694035&id=id&accname=guest&checksum= 58035D14B84F9C5C0D124D531DDE6864.
See also, Figure 1 of https://voxeu.org/article/global-value-chain-transformation-decade-ahead

[38] EBG Position Paper 2020. See also https://www.theweek.in/wire-updates/business/2020/12/02/pwr11-ebg-federation.html

[39] Good governance includes transparency, timely decisions, consultation before formulation/change in policy, providing an appeal process with timely resolution of disputes, simple procedures and procedural requirements.

[40] The other areas emphasised by European business include rules of data management, storage and localisation; dealing with IPR infringements; fair royalty regime; and improvements in the financial market policies and practices.

[41] Indian Cellular and Electronics Association.

Serial No.	Importance Given to Individual Factor (%)	Factors Important for Investment Decision	Investment "Chill"/"Freeze"	Affecting Competitiveness
11	6%	Industrial Relations Scenario		√
12	5%	Social Infrastructure		√

Source: Based on feedback from ICEA of results of its survey and discussions in 2019.

The policy areas mentioned in Table 1.7 can be summarised in terms of a few key policy initiatives, such as:

(i) Ease of doing business (for example, items 2, 3, 7, 8, 9, 10 of Table 1.7)

(a) Predictability and stability of policy (including not changing policy arbitrarily, or changes in policy to be made after consultation and due consideration of comments of stakeholder);

(b) Clarity on disputable provisions and timely resolution;

(c) Uniform interpretation across business laws (and across different parts of the country);

(d) Fast track approvals, registration and licensing; effective single widow and simple processes for setting up and for operations;

(e) Use of electronic documents; integrated logistics policy;

(f) Improve Centre-State coordination.

(ii) Standards (items 2, 8, 9 and 10 of Table 1.7)

(a) The standards regime should not create difficulties in operations (especially for exports). These difficulties would affect the credibility of the policy initiatives.

(b) Align with global standards for interoperability and testing rather than create country standards which enhance costs and restrict access; these include:

- ❑ Health, safety and environmental standards in line with global benchmarks
- ❑ Use of accepted global standards of technology and rules to enhance interoperability

(iii) Tax regime, and fiscal incentives for long-term projects and those in priority sectors to stimulate capital flows (items 1 and 2 of Table 1.7)

(a) Rationalise tax schemes

(b) Address inverted duty structures

(c) Provide tax exemption or low rates of tax as incentives

(d) Equitable tax regime for Indian and foreign companies operating in India

(e) Fiscal incentives such as the PLI scheme introduced by India.

1.5.3 Feedback on factors emphasised by "lead firms", i.e. firms which manage GVCs

Another illustration of the overlap is to consider the objective of increasing exports and expanding the links with GVCs. For both these objectives, especially GVCs, the "lead firms" which manage GVCs are very important. These firms manage different parts of the GVC, with inputs coming from different sources and the product being sold abroad. If the factors emphasised by lead firms are not addressed effectively, then both exports and links with GVCs would be adversely affected.

The key areas managed by lead firms and their relevant concerns in that context are shown by Table 1.8 below. The main concerns relate to cost competitiveness, and timeliness or quick turnaround of products and approval processes. Any policy which delays the turnaround and exports adversely affects participation in GVCs. Examples include not just the time taken in the approval or clearing processes but also insistence on adoption of domestic standards that are significantly different from global standards for imported inputs and exports.

This implies a need to re-orient the mindset of the policy-makers from being focused on import protection or being defensive about trade, to one which focuses on exports. If Global Value Chains are part of the objectives of Atmanirbhar Bharat, then policy-makers need to recognise the fact that these chains involve both imports and exports, and that there are associated policy chains for each part of the GVC. Table 1.8 shows the factors which are required for a positive impact.[42]

Table 1.8: Activities overseen/managed by lead firms and policies relevant for consistency among different parts of an export value chain

Factors emphasised by Lead Firm in GVC	Policies Affecting Domestic Input	Policies Affecting Imported Input	Policies Affecting Exports
Transport →	Internal Transport - Cost competitiveness - Time taken	International/ Internal Transport - Cost competitiveness - Time taken	Internal/ International Transport - Cost competitiveness - Time taken
Quality →	Quality of domestic inputs consistent with global requirements	Quality of imported inputs consistent with global requirements	Quality of exported products consistent with requirements in export markets
Standards →	Standards of domestic inputs consistent with global requirements	Standards of imported inputs consistent with global requirements	Standards of exported products consistent with requirements in export markets
Labelling Requirement →	Labelling Requirement for domestic inputs consistent with global requirements	Labelling Requirement for imported inputs consistent with global requirements	Labelling Requirement for exported products consistent with requirements in export markets
Other Regulatory Conditions →	Regulatory Requirement - simple and not burdensome - cost effective - timely approvals	Regulatory Requirement (for imported inputs) - simple and not burdensome - cost effective - timely approvals	Regulatory Requirement (for exports) - simple and not burdensome - cost effective - timely approvals
Regulatory Clearances: → - Production - Transport - Other Approvals	Regulatory Clearances: Cost and Time Taken (domestic inputs)	Regulatory Clearances: Cost and Time Taken (imported inputs)	Regulatory Clearances: Cost and Time Taken (for export market)

[42] The relevant policy package identified by the World Bank for promoting GVCs are shown in Annex Table A1.2. These policies too show the importance of facilitation and liberalisation policies combined with good regulatory practices or good governance.

1.6 Summary of Impact of Policy Options on Objectives of Atmanirbhar Bharat, and Synergies between these Objectives

1.6.1 Synergy, conflict and other features of the impact of policies on key objectives:

Taking account of the discussion above, Table 1.9 illustrates the likely impact of selected policies and objectives. The impact is shown through four different symbols: "+" and "-", respectively, show a positive and negative impact of the policy on the relevant objective. In certain cases, the impact is indicated by "?", which shows that it is difficult to anticipate the result, and also that if a definite positive impact is to be achieved then it is necessary to implement another policy measure which promotes or supports the particular objective. In one case, the symbol "*" qualifies the likely result. This symbol shows that the policy in question will result in the FDI focusing mainly on the domestic market for its sales.

Table 1.9: Likely impact of policy on objectives of Atmanirbhar Bharat

Objective → Policy ↓	FDI	Improve Competitiveness	Exports	Import Substitution	GVC	Improve Domestic Capabilities	New Technologies
1. FDI Incentive	+	+	+?	+	+?	?	+?
2. FDI Facilitation	+	+	+?	+	+?	?	+?
3. Trade Facilitation	+	+	+	+	+	+?	?
4. Increase in Customs Duty:							
4 (a) On product of FDI unit	+	–	–?*	+	?	?	?
4 (b) On input of FDI	-	–	–	–	–	?	?
5. Impose Domestic Standards different from Global Standards:							
5 (a) on exports	-	–	–	–	–	?	?
5 (b) on imports which are inputs for GVCs	-	–	–	-?	–	-?	-?
5 (c) on imported inputs for products sold in domestic markets	-	–	–	–	–	–	?

Notes:* = Domestic markets and not exports will be the focus of the FDI producing in India.

? = This symbol indicates that a substantive positive impact would require that some additional policy is used to directly promote or support the objective, or that the impact could be the opposite of the symbol it accompanies (positive or negative).

Table 1.9 suggests that incentives and facilitation policies would in general have a positive impact, while a tariff increase or insistence of a domestic standard different from the international standard would result in a negative impact in several cases. This "+" sign shows a supportive policy while a "-" sign suggests a conflict with the policy which has a "+" sign in the same column of Table 1.9. This will become clear from Table 1.10, which compares a tariff increase with a subsidy (or incentive).

Table 1.10: Comparison of the impact of tariffs and subsidies

Policy Measure	Reduces ↓	Increases ↓	Impact on Competitiveness ↓
Tariffs →	Imports	Domestic price, Domestic output	**Reduces** Competitiveness→ **Reduces** ability to export **Reduces** possibility of large-scale investment
Subsidy →	Imports, Domestic price	Domestic output	**Increases** Competitiveness→ **Increases** ability to export **Increases** possibility of large-scale investment

Two objectives that have become very significant in the post Covid-19 period, need to be separately highlighted. One is to identify and develop strategic sectors (e.g. the pharmaceuticals sector). The other is to increase the resilience and reduce operational risks for priority sectors. Practices adopted by other countries in this context are useful for providing ideas for the steps that may be appropriate for achieving strategic objectives.

1.6.2 Some implications:

Six lessons from Tables 1.9 and 1.10 are noteworthy.

(a) For certain objectives, such as improving domestic capabilities or adoption of new technologies, specifically targeted policy initiatives focused on achieving these objectives, would have to be adopted.

(b) Policies to encourage FDI on their own do not guarantee the objective of increasing exports or linking up with GVCs. More would need to be done to promote the capabilities to increase exports and to link up with GVCs.

(c) The policies which result in a positive impact for most objectives should be emphasised and implemented as priority.

(d) The policies which are likely to have a negative impact on most of the objectives should be adopted only if necessary, and if adopted they should be phased out in the not too distant future.

(e) In certain instances, policies used to achieve a particular objective could lead to a multiplier effect and help achieve many other objectives as well. An example is that achieving the objective of improved competitiveness would also result in a positive effect on increasing domestic production, rise in exports, import substitution, more extensive connections with GVCs, greater resilience of GVCs, enabling the creation of export hubs, and increasing domestic capabilities in strategic sectors.

(f) In most cases, a number of targeted policies have to be used together to achieve a single important objective. An example is that to achieve a stronger link with GVCs, policies have to focus on promoting FDI by lead firms in GVCs, improving the domestic ecosystem to provide greater resilience for supplying inputs in the supply chain, improving design capabilities, upgrading technology, investment facilitation, and facilitation of trade.

Thus, whichever combination of policies we use, a primary consideration should be the policies which increase competitiveness. If the impact of a policy on competitiveness is negative, then that policy should either not be adopted, or if it must be adopted, it should be phased out within a short period of time. The discussion above makes it clear that one of the policies which will adversely impact competitiveness is an increase in tariffs, particularly higher tariffs on inputs within a supply chain. While the preference should be to not

adopt such a policy, but if adopted it should normally be phased out over a period such as five years. The reason for choosing this period is that several recent PLI schemes seem to be based on the presumption that assistance is required for five years or so.

Further, since multiple policies are required to achieve the relevant objectives, and administratively the expertise, personnel and time are limited, careful consideration should be given to distinguish between industries which need a comprehensive or mission-mode approach, and others for which a set of five or six priority policy measures could achieve the desirable goals. Subsequent chapters in this Report show that such a distinction is possible.

Conclusions

This chapter has shown that the Atmanirbhar Bharat initiative focuses on several objectives, among which the most important ones are: increasing competitiveness, greater participation in global value chains, upgrading technological capabilities, and developing strategic sectors. These four objectives embody within themselves a number of others as well.

Experience has shown that trade and investment policies are among the most important policies to help achieve these objectives. These policies have a wide scope, with a much larger coverage than conventionally considered in policy discussions. Further, there is a significant overlap between trade and investment policies, i.e. the same policy can be both a trade policy as well as an investment policy. The common policies are mostly facilitating policies (ease of doing business) and incentives such as subsidies through direct funds transfer or tax exemption/rebate. There are, however, also trade policies which reduce the positive impact of investment policies, e.g. an increase in tariffs, in particular higher tariffs on inputs in a supply chain. This chapter provides examples of the potential synergy between trade and investment policies, and in some cases conflicts amongst them.

The discussion also distinguishes between horizontal policies and sector-specific policies. Given the shortage of experience, personnel, and time available for comprehensive implementation, the horizontal policies could be initially implemented for specific priority sectors. Improvements could be made based on the experience of implementing these policies, and their coverage could be increased to other sectors as well so that they become more horizontal in their impact across sectors.

Some of the policies covered by investment facilitation are primarily implemented at the State level. Therefore coordination between the Centre and the States should be improved through institutional mechanisms that help build synergy between trade and investment policies.

Juxtaposing these insights with the factors emphasised by foreign investors provides the policy-makers with a method of identifying priority areas of action. The main areas of focus relate to good regulatory practices (timely decisions/clearances, transparency, stability and predictability of the policy), investment incentives and facilitation, and easy access to inputs so that quicker and more effective participation in GVCs is enabled.

The final section of this chapter illustrates the synergy and conflict situations that may arise through implementation of different policies, and concludes with some lessons on the important aspects comprising the framework of policies to efficiently achieve the objectives of the Indian Government.

Annex 1.1

Table A1.1: Criteria linked to fiscal/financial investment incentives and methods for providing the incentives

Criteria used for providing the incentive:	Significant part of incentive provided through:
Investment above a specified threshold level	Corporate Income Tax exemption/reduction
Employment above a specified threshold level	Subsidy for Machinery and Equipment
Providing advanced technology training	Partial or full funding for R&D
Providing advanced technology training	Reduction in cost of power
Development of local suppliers	Industrial land development support
Location in specified geographical zones	Exemption/reduction of land rental
Production of priority/targeted products or performing a specified type of activity	Labour/wage subsidy
R&D	Tax exemption/rebate; Interest subvention on working capital
Supplying inputs for targeted/priority industry or activities	Duty free imports for creating fixed assets, and of inputs not available domestically
Establishing global or regional headquarters	Providing factory building (or “plug and play”)
Achieving specified national objectives, e.g. achieving environmental criteria	Financial support for improving product or package design
Reducing logistics costs	Reduced tax for expatriate workers/foreign experts
Linked to export performance	Reinvestment tax allowance
Developing Industry Parks/Eco Parks and other similar priority areas	Exemption of stamp duty

Table A1.2: Policy Initiatives for Promoting GVCs

Policy Issue	Policy Priority	Policy Issue	Policy Priority
Governance	Promote political stability; improve policy predictability; pursue deep trade agreements	Trade infrastructure	Reform customs; liberalise transport services; invest in ports and roads
Foreign Direct Investment	Adopt supportive investment policy and improve the business climate	Market access	Pursue trade agreements; deepen trade agreements to cover investment and services
Finance	Improve access to banks and equity finance	Technical and managerial skills	Educate, train, and open to foreign skills
Labour Costs	Avoid rigid regulation and exchange rate misalignment	Advanced skills	Educate for innovation and open to foreign talent
Access to Inputs	Reduce tariffs and NTMs; reform rules for trade in services	Advanced logistics services	Invest in multimodal transport infrastructure
Standardisation	Harmonise or mutually accept standards	Basic ICT connectivity	Liberalise ICT services; invest in ICT infrastructure
Standards Certification	Establish conformity assessment regime	Advanced ICT connectivity	Expand high-speed broadband
Intellectual Property Rights	Ensure protection	Contracts	Enhance enforcement

Source: Based on Table O.4 of World Bank (2020).[43]

[43] World Bank (2020), World Development Report, available at https://openknowledge.worldbank.org/handle/10986/32437

► Chapter 2

Bilateral, Regional and Multilateral Initiatives

Introduction

The growth of FDI and GVCs has resulted in the expansion of the scope of trade-related issues becoming a part of bilateral/regional and international trade agreements. These initiatives cover a range of issues relating to trade and investment facilitation, sustainable and social standards, digital trade, and a re-orientation of national trade and investment policies.

This chapter provides information on policy actions taken by individual countries, including through their bilateral, regional and multilateral initiatives with respect to trade and investment policies. The discussion provides an overview of the main features of existing approaches as well as those under negotiation in multilateral organisations. These policy initiatives and approaches have taken on a new meaning due to the increase in risks and disruptions caused by Covid-19. The chapter summarises the changes occurring in both policies and the strategies of firms to stabilise GVCs. However, the problem is so large that nations or firms cannot deal with it alone. A collective effort is required, with clarity of information on actions taken by various countries through regional and multilateral institutions. This chapter provides a summary discussion of these points and indicates the paths forward for both the policy-makers and firms.

2.1 Developments in International Trade Regulation Reflecting the changes in Trade and Investment Policies: Bilateral, Regional and Multilateral Trade Agreements, WTO and Other Regional/ Multilateral Institutions

2.1.1 Bilateral, Regional and Multilateral Trade Agreements

These agreements recognize the overlap between trade and investment policies. The scope and depth of these agreements in terms of disciplines and obligations have been increasing over time, both for developed

and developing countries (e.g. NAFTA, EU- Vietnam, EU-Japan, CPTPP, RCEP and the African Continental Free Trade Area (AfCFTA)). The FTA obligations are deeper in FTAs between developed and developing countries, e.g. EU-Vietnam,[44] RCEP, or USMCA, and even more so for FTAs among developed countries (EU-Japan, EU-Canada).[45]

One indication of the large expansion in the number of FTAs with both trade and investment-related issues would be the agreements concluded after the WTO came into effect because by then there was considerable focus on investment issues as part of a trade agreement. The WTO came into effect on 1 January 1995, and by the end of that year there were 46 FTAs in force as notified to the WTO (Table 2.1). By June 2021, there were 334 FTAs in force.[46] The topics covered by ongoing FTAs, such as US-Kenya, include both trade and investment policy.[47]

Table 2.1: Number of FTAs in Force, 1990 to 5 July 2021 (Notifications to WTO)

Year	Number of FTAs in Force	Year	Number of FTAs in Force
1990	22	2016	284
1995	46	2017	292
2000	82	2018	296
2005	136	2019	301
2010	213	2020	305
2015	274	2021 (July 5)	350

Source: http://rtais.wto.org/UI/charts.aspx

The topic of investment is addressed in a number of different ways. For instance, many countries have bilateral investment agreements that may be a part of the FTA or separate from it. A recent example is the investment agreement concluded between the EU and China[48] — one of the large number of international investment agreements, comprising more than 3,200 Bilateral Investment Treaties (BITS) and above 380 Treaties with Investment Provisions (TIPS).[49] In the case of the EU's Economic Partnership Agreement (EPA) with Eastern and

[44] https://wtocenter.vn/chuyen-de/12778-eu-vietnam-trade-and-investment-agreements.

[45] For example, https://trade.ec.europa.eu/doclib/docs/2018/august/tradoc_157228.pdf and http://trade.ec.europa.eu/doclib/docs/2014/september/tradoc_152806.pdf

[46] A large increase is also due to several FTAs notified by the UK, as a result of leaving the EU. UK's agreements notified to the WTO include those with Japan, Ecuador and Peru, Canada, CARIFORUM States, Chile, Central America, Colombia, Cote d'Ivoire, Eastern and Southern African States, Faroe Islands, Georgia, Israel, Kenya, Norway and Iceland, Kosovo, Lebanon, Morocco, Palestinian Authority, Republic of Korea, Tunisia, Ukraine, Cameroon, Egypt, Moldova, North Macedonia, Singapore, Turkey, and Vietnam.

[47] The list of topics according to the list released by the US is at https://ustr.gov/sites/default/files/Summary_of_U.S.-Kenya_Negotiating_Objectives.pdf. Kenya's list of topics is at https://www.tralac.org/documents/resources/external-relations/us-agoa/3787-proposed-kenya-us-fta-agreement-negotiating-principles-objectives-and-scope-22-june-2020/file.html. Both these lists include investment as a specific topic under the FTA.

[48] For key features, see https://trade.ec.europa.eu/doclib/docs/2020/december/tradoc_159239.pdf. The ratification process of this Agreement has been stopped by the EU.

[49] See, for example, pages 16, 17 and 19 of https://unctad.org/system/files/official-document/wir2020_overview_en.pdf

Southern African (ESA) States, the agreement includes creating a supporting and co-operative environment for investment in ESA countries.[50] In certain agreements such as the EU's EPA with Central Africa (Cameroon), investment is not yet included but the agreement has a provision to be extended later to include trade in services and investment; there is, however, a platform to find solutions to trade and investment problems.[51]

2.1.2 International Organisations / Institutions:

Regulatory provisions/discussions on trade and investment could be considered under three categories. One, those policies which are common to both trade and investment, such as ease of doing business, trade facilitation, and Mode 3 (FDI) under trade in services.[52] The second category is agreements that focus primarily on trade-related policies, and the third is the agreements that focus primarily on investment-related issues.

The role of FDI is explicitly acknowledged for trade in services under Mode 3 of the WTO's General Agreement on Trade in Services (GATS). However, the significance of FDI in trade in goods is also considered highly relevant, given the importance of multinational enterprises and GVCs in trade. As noted by the OECD, "One-third of world production is done by multinational enterprises and they account for [over] half of world trade."[53] An explicit recognition of Mode 3-type classification of goods trade, however, is as yet not formally a part of a comprehensive approach to goods trade. Nonetheless, issues relevant for FDI and GVCs are dealt with in different parts of the trade agreements, such as trade facilitation, good governance,[54] standards, principle of fair and less burdensome regulation, and inclusion of regulatory provisions on investment in FTAs. In the context of GVCs, two distinct areas of policy focus have been identified.

One, GVCs require some major global firm to manage the process so that consistent and timely activities can take place under different parts of the value chain (including in different geographical regions). Without this, the GVC cannot operate efficiently and competitively in global markets. These major firms are referred to as "lead firms", and they particularly emphasise rapid approvals and fast turnaround of imported products processed for further exports, as final products or inputs for the next stage of the value chain.[55] This implies giving priority to interaction with lead firms.

The policy areas relevant for GVCs, shown in Annex Table A1.2 of Chapter 1, are covered by regional and multilateral agreements on trade and investment. The regional or multilateral organisations develop commonly-agreed frameworks with a range of options from soft law (Guidelines, agreed principles) to hard law (legally-binding obligations), to give stability and predictability to policies impacting GVCs. In addition, these organisations provide support to improve the capacities of member countries in these policy areas.

---

[50] See, for example, Article 39 of the Agreement, at https://trade.ec.europa.eu/doclib/docs/2020/october/tradoc_158984.pdf

[51] See, for example, https://trade.ec.europa.eu/doclib/docs/2020/october/tradoc_158984.pdf. For a list of EU's FTAs and weblinks, see https://ec.europa.eu/trade/policy/countries-and-regions/negotiations-and-agreements/

[52] Mode 3 involves FDI taking place for trade in services, i.e. transfer of capital to another country.

[53] Fifty five per cent of global exports are multinational enterprises (MNEs), as shown by Figure 5 of https://www.oecd.org/industry/ind/MNEs-in-the-global-economy-policy-note.pdf

[54] This includes transparency, timeliness, consultation, due process and review of policy decisions/actions, and inclusiveness of stakeholders in policy-making.

[55] See, for example, pages 31, 43, 70, 118, and Table O.4, Box 2.1 in World Bank (2020). See also the discussion in UNESCAP (2019), "Asia-Pacific Trade and Development Report". https://www.unescap.org/sites/default/d8files/knowledge-products/APTIR2019-H%3DN.pdf . For an importance of lead firms in GVCs for India, see Saon Ray and Smita Miglani (2019), "India's GVC integration: An analysis of upgrading efforts and facilitation of lead firms", at https://icrier.org/pdf/Working_Paper_386.pdf

At the WTO, negotiations are going on in the areas of investment facilitation. Additionally, specific steps are taken under the Aid for Trade programme to improve the capabilities of developing countries to more efficiently participate in trade and investment transactions.[56] Likewise, the World Bank and Regional Development Banks provide assistance for a wide range of activities oriented towards trade and investment facilitation. OECD and UNCTAD discuss and develop supporting initiatives for improving trade and investment-related insights and capacities amongst their member countries. UNCTAD examines a large number of issues related to trade and investment, and is a repository of information on Bilateral Investment Treaties. It also provides technical support to countries for improving their regulatory capabilities in the areas of trade and investment. Other international groups such as APEC and G20 also address these areas,[57] and focus on arrangements that would help improve skills and operational conditions to increase trade and investment opportunities.[58]

2.2 Impact of Covid-19

The Covid-19 crisis has been devastating in many respects, causing a historically sharp decline in production, trade and investment, combined with a major adverse impact on health and productivity.

According to a recent forecast by the World Bank, **global GDP** declined -4.2%. It is likely to rise 4% in 2021.[59] However, as summarised by the World Bank: "Although the global economy is emerging from the collapse triggered by the pandemic, the recovery is projected to be subdued. Global economic output is expected to expand 4 percent in 2021 but still remain more than 5 percent below its pre-pandemic trend. Moreover, there is a material risk that setbacks in containing the pandemic or other adverse events derail the recovery."[60] The legacy of the Covid-19 pandemic is expected to be long lasting, particularly for low income economies.[61]

The adverse impact of decline in output is usually larger on **international trade** compared to changes in overall economic activity. With the imposition of lockdown and major restrictions on movement of goods and people, global trade has fallen sharply. This was especially the case in the second quarter of 2020, when global merchandise exports declined -21% compared to the previous year.[62] According to WTO, global merchandise trade fell by 5.3% in 2020; it is likely to grow by 8% in 2021 and 4% in 2021.[63] The adverse impact on **global FDI** was even larger. In 2020, global FDI was down -35% compared to the previous year,[64] and the prospects for 2021 are weak.[65] The impact of a reduction in FDI is likely to continue for a long time, even up to the end of the decade.[66]

---

[56] For example, see Figure 2 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/COMTD/AFTW81R1.pdf&Open=True

[57] See, for example, paragraph 12 of the G20 Leaders' Declaration at Riyadh, which addresses "Trade and investment". http://www.g20.utoronto.ca/2020/2020-g20-statement-0326.html . The Leaders' Declaration at the APEC meeting in 2020 also addresses the issue of trade and investment together in the section on "Improving the Narrative of Trade and Investment". https://www.apec.org/Meeting-Papers/Leaders-Declarations/2020/2020_aelm

[58] See, for example, the various areas covered by "Topics" in the website for APEC at https://www.apec.org/

[59] See Table 1 on page 4 of https://www.worldbank.org/en/publication/global-economic-prospects

[60] Ibid., page xvii.

[61] For an analysis of the situation of Low Income Countries, see in particular the discussion on pages 28 to 32 of https://www.worldbank.org/en/publication/global-economic-prospects

[62] https://www.wto.org/english/res_e/statis_e/daily_update_e/merch_value_latest.pdf

[63] https://www.wto.org/english/news_e/pres21_e/pr876_e.htm

[64] Annex Table 1 of https://unctad.org/system/files/official-document/wir2021_en.pdf

[65] https://unctad.org/system/files/official-document/diaeiainf2021d1_en.pdf

[66] See Figure 4.4 of https://unctad.org/system/files/official-document/osg2020d1_en.pdf

2.2.1 *Specific Initiatives and Approaches to Address the Impact (Including Insights from work of Regional and International Organisations):*

The disruption in trade and FDI has brought into focus a need to reduce risks arising due to a high level of dependency on a single source for inputs of medical supplies, and to focus on more stable access to strategic products. Table 2.3 shows the main problems faced by firms during the Covid-19 period. This experience will affect both the policy focus and the strategies of firms with respect to giving greater stability to supply chains (Table 2.4).[67]

Table 2.3: Firms' response to the question "Since the outbreak of the Covid-19 crisis, what are the challenges that most impacted your business?" (Percentage share of 232 respondents that were part of the survey)

During Covid-19 crisis, which challenges most impacted the business	Percentage
Disrupted supply chains (lockdown measures, market closures, transport)	62%
Disrupted logistics due to restrictions on movement	53%
Broadband internet costs not reduced	50%
E-commerce not prioritised by Government	49%
High transport and delivery costs	44%

Source: Figure 4.6 of https://unctad.org/system/files/official-document/osg2020d1_en.pdf. Note: A maximum of 10 choices was allowed to the respondent in the surveys.

Table 2.4: Immediate and longer-term impacts of Covid-19, including acceleration of ongoing trends that will impact the future policy focus

Trends That Got Accelerated		Immediate Impact of Covid-19	Longer Term Impact of Covid-19
New technologies; new industrial revolution →	Changing the economics of international production	Production and supply chain disruptions	Imperative to increase supply chain resilience
Rising protectionist tendencies →	New hurdles for international production	Global recession → Supply and demand shock	Pressure to increase national/ regional autonomous productive capacities
Sustainable (environmental) imperatives	Rethinking international impact of operations of multinational enterprises	Coalition-building; shift to greater use of digital technologies	Change in existing commercial relationships amongst countries toward more stable engagement

Source: Based on Figure IV.1 of https://unctad.org/system/files/official-document/wir2020_en.pdf

Notes: For more detail on these mega-trends, see Table IV.7 on page 138 of https://unctad.org/system/files/official-document/wir2020_en.pdf

Greater use of trade restrictive measures: The WTO's Report on the "Overview of Developments in the International Trading Environment" that covered the period from mid-October 2018 to mid-October 2019, found that: "WTO Members implemented 102 new trade-restrictive measures during the review period. The trade coverage for the import-restrictive measures was estimated at USD 746.9 billion. **This is the highest**

[67] For changes in the functioning of business, see https://www.mckinsey.com/business-functions/risk/our-insights/Covid-19-implications-for-business?cid=other-eml-alt-mip-mck&hdpid=ac2c2468-0a78-4bb6-9ecf-721f9f654493&hctky=3164146&hlkid=32b83c6fb778468c900b47755c8089e0

recorded since October 2012 and represents an increase of 27% compared to that in the previous annual overview (USD 588.3 billion). **The trade coverage of import-restrictive measures recorded in the last two annual overviews has soared**."[68] (Highlight added)

However, the disruptions due to Covid-19 in 2020 have also resulted in liberalising trade policies. No single nation has the capability to efficiently supply all the so called "Covid-19 goods" or the entire set of inputs in the value chain of a Covid-19 product[69] (see Annex Tables A2.1 and A2.2). Thus, trade liberalisation becomes essential for smooth value chains in these products and for providing adequate access to medical goods to the population. However, in certain instances, trade restrictions may be imposed, because countries want to domestically keep certain products for their citizens or to reduce the dependence on international trade to lower GVC risks. Overall, however, the focus on facilitating trade and enabling imports at lower costs to the citizens was more dominant, and there was more liberalisation than import restriction during 2020.

Stimulus packages and relief measures: A whole range of measures have been put in place to address the major concerns arising due to Covid-19. As stated by WTO,[70] "Central banks and monetary authorities have intervened in financial markets and national governments have put in place a series of fiscal policy measures focused on supporting the health sector, households and firms. Fiscal measures implemented include tax cuts and deferrals, wage and income supplements, expanding unemployment insurance and direct payments to households and businesses. Monetary policy measures include interest rate cuts, preferential loans and loan guarantees, increased liquidity, new lending and financing programmes, asset purchases, foreign exchange swaps and the easing of prudential regulations and capital buffers. A non-exhaustive list of such measures is included in the original language of the submission on the WTO Covid-19 webpage."[71]

A change in commercial strategies of firms with respect to GVCs: The focus to revive international trade and FDI inflow, and to revise the policy approaches for addressing the new concerns (reducing risks, improving strategic capabilities), imply that nations will reconsider their trade and investment policy approaches. Since major changes will arise in particular with respect to GVCs, firms will revise their commercial strategies to focus on[72]:

- Shorter and less fragmented value chains
- More concentrated value added
- More platform-driven and asset-light value chain governance
- A shift from global to regional and sub-regional value chains
- Downward pressure on global efficiency-seeking FDI in favour of regional market-seeking FDI
- Downward pressure on global trade in intermediate goods, less on trade in final products
- A shift in some industries from large-scale investment to smaller-scale distributed manufacturing
- Continued growth and fragmentation in services value chains
- Resilience and national security concerns as key drivers of GVC diversification

---

[68] Page 4 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV22.pdf&Open=True. See also https://voxeu.org/article/trade-policy-responses-covid-19-pandemic-new-dataset

[69] See http://www.oecd.org/coronavirus/policy-responses/trade-interdependencies-in-Covid-19-goods-79aaa1d6/and https://voxeu.org/article/trade-and-Covid-19-crisis-developing-countries

[70] Quoted from Box 2.2 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV23.pdf&Open=True

[71] See https://www.wto.org/english/tratop_e/covid19_e/trade_related_support_measures_e.htm

[72] https://voxeu.org/article/global-value-chain-transformation-decade-ahead

The main features of the various strategies have been summarized by UNCTAD in terms of four types of adjustment patterns for GVCs,[73] namely:

(a) Reshoring, i.e. shorter, less fragmented value chains and a higher geographical concentration of value added. It will primarily affect higher-technology GVC-intensive industries. Implications include increased divestment and a shrinking pool of efficiency-seeking FDI.

(b) Diversification, i.e. wider distribution of economic activities, primarily affecting services and GVC-intensive manufacturing industries. This will increase opportunities for new entrants (economies and firms) to participate in GVCs. Reliance on supply chain digitalisation will imply these GVCs will be more loosely governed, platform-based and asset-light.

(c) Regionalisation, i.e. reduction in the physical length but not the fragmentation of supply chains. The geographical distribution of value added parts of the chain will increase. This will affect regional processing industries, some GVC-intensive industries and the primary sector.

(d) Replication, i.e. shorter value chains and a re-bundling of production stages. It will lead to more geographically distributed activities, but more concentrated value added. It will be especially relevant for hub-and-spoke and regional processing industries.

A detailed analysis by UNCTAD has linked these four patterns of GVC adjustments to the characteristics of different industries, shown in Table 2.5 below. Based on this assessment, the Government could consider the policy initiatives likely to be required, and confirm their validity in consultation with industry and lead firms of GVCs.

Table 2.5: Relevance of the adjustment for industries with different production/GVC characteristics

	Extent of Relevance of the Type of Adjustment Required ↓			
Sectors/industry ↓	**Highest Level**	**Medium or High**	**Some Relevance**	**Not Relevant**
1. Primary Sector - Agro-based; Extractive industry	- Regionalisation		- Re-shoring - Diversification	- Replication
2. Manufacturing— **GVC-intensive industries (#)** Textiles and apparel	- Diversification	- Re-shoring - Regionalisation - Replication		
3. Manufacturing— **GVC-intensive industries (*)** Automotive; Electronics; Machinery and equipment	- Re-shoring	- Regionalisation (high) - Diversification	- Replication	
4. Manufacturing— **Geographically distributed industries (@)** Pharmaceuticals	- Replication		- Diversification - Re-shoring - Regionalisation	
5. Manufacturing— **Geographically distributed industries (##)** Food and beverage; Chemicals	- Regionalisation	- Diversification	- Re-shoring - Replication	

[73] See https://unctad.org/system/files/official-document/wir2020_en.pdf

	Extent of Relevance of the Type of Adjustment Required ↓			
Sectors/industry ↓	**Highest Level**	**Medium or High**	**Some Relevance**	**Not Relevant**
6. Services — Concentrated higher value added services Financial services; Business services	- Diversification		- Re-shoring - Regionalisation	- Replication
7. Services — Distributed lower value added services Wholesale and retail trade; Transportation and logistics	- Re-shoring	- Diversification	- Regionalisation	- Replication

Source:https://voxeu.org/article/global-value-chain-transformation-decade-ahead

Notes: (1) The symbols in the Table are as follows: # = Medium to low technology intensity; * = High-technology intensity; @ = Global hub and spokes; (##) = Regional processing.

(2) For more detail on the GVC structures of these industries, see Figures IV.6 and IV.7 on pages 136 and 137 of https://unctad.org/system/files/official-document/wir2020_en.pdf

2.3 Policy Options Highlighted by Regional and Multilateral Organisations

Regional and international organisations/groupings have taken a number of initiatives to address the impact of Covid-19.[74] These efforts include increasing information available to better understand and, singly or collectively, address the problems faced by the nation. This could include collaborative efforts to identify the impact of Covid-19 on trade and investment, and to develop strategies to mitigate the adverse effects. For example, the WTO has produced a number of Reports on Covid-19-related issues,[75] covering topics such as vaccines, medical goods, trade in services and Covid-19, agriculture and Covid-19, standards/regulations and Covid-19, TRIPS and Covid-19, e-commerce, helping micro, small and medium enterprises, cross-border mobility, export prohibitions and restrictions, and impact on women.

Policy principles and collaborative efforts suggested by multilateral organisations: A number of policy suggestions have come from multilateral organisations.[76] Some key principles highlighted include:

- **transparency** – including the terms of any support provided through the financial system;
- **non-discriminatory** policy amongst similarly affected firms;
- **targeted** at those experiencing the most disruption, while avoiding rescue for those who would have failed even in the absence of the pandemic;

[74] For example, https://www.un.org/sites/un2.un.org/files/un-comprehensive-response-to-Covid-19.pdf; https://unctad.org/programme/Covid-19-response;https://www.worldbank.org/en/who-we-are/news/coronavirus-covid19; https://www.imf.org/en/Topics/imf-and-covid19; https://www.adb.org/what-we-do/covid19-coronavirus;https://blogs.worldbank.org/voices/2020-year-review-impact-Covid-19-12-charts; https://read.oecd-ilibrary.org/view/?ref=134_134302-ocsbti4mh1&title=Covid-19-and-Global-Value-Chains-Chains-Policy-Options-to-Build-More-Resilient-Production-Networks;https://unctad.org/system/files/official-document/osg2020d1_en.pdf; https://www.apec.org/Covid-19; http://documents1.worldbank.org/curated/en/136631594937150795/pdf/World-Bank-Group-Covid-19-Crisis-Response-Approach-Paper-Saving-Lives-Scaling-up-Impact-and-Getting-Back-on-Track.pdf; http://www.g20.utoronto.ca/2020/2020-g20-leaders-declaration-1121.html; http://www.g20.utoronto.ca/2020/2020-g20-statement-0326.html. See also the links under the section "Institutions" at https://home.kpmg/xx/en/home/insights/2020/04/government-response-global-landscape.html

[75] https://www.wto.org/english/tratop_e/covid19_e/covid_reports_e.htm

[76] See, for example, https://www.unescap.org/covid19/policy-briefs; https://www.wsbi-esbg.org/Covid-19/Pages/Worldwide-Policy-Responses.aspx; https://www.global-solutions-initiative.org/global-table/Covid-19-stabilizing-the-world-economy/; and https://www.wto.org/english/tratop_e/covid19_e/covid19_e.htm.

- **time bound, and reviewed regularly** to ensure that it is benefiting its target group and remains necessary;
- **leaving the consumers to decide how to spend any financial support provided to them**, rather than tying the support to consumption of specific inputs and final goods and services.

Based on an assessment of the policy measures used by various countries (see Annex 2.1 for an illustration), multilateral organisations have suggested certain collaborative principles to create mechanisms and approaches to support individual initiatives through:

- **Ensuring transparency**: Ensuring transparency regarding trade-related measures associated with medical supplies, such as through sharing information with the WTO, can play an important role in maintaining confidence in global supply. This would be similar to AMIS, created by G20 in the wake of the food price crisis of 2007-08 for governments to share the relevant information in a timely manner.
- **Cutting tariffs on essential medical products**: Countries could explore a WTO initiative (including plurilateral) to remove tariffs on an agreed list of essential medical supplies.
- **Disciplines on export restrictions:** These could range from agreement to prohibit export bans for certain kinds of goods, or to codify strict conditions on their use, building on the current G20 agreement.[77]
- **Upfront investments in co-operative solutions**: The creation of stockpiles of essential medical supplies could include co-operative arrangements for creation of such stockpiles, including on a regional basis.
- **Addressing the needs of the most vulnerable countries**: Measures, for example, in relation to export restrictions and creation of regional stockpiles, could include specific exemptions or assistance to address the needs of the poorest countries.

2.4 Policy Steps the Governments could take to address the New Situation

Tables 2.6 and 2.7 show the types of actions that the Governments could take to improve operational conditions. The main emphasis is on facilitation of trade, reducing trade restrictions on key imports, encouraging investments, creating predictable and stable regulatory conditions, identifying and addressing the major obstacles in supply chains, promoting diffusion of digital technologies, addressing the concerns of MSMEs, priority steps for crisis-affected industries, national security and public health.

Table 2.6: Important policy steps that Governments can take for resilience of GVCs

Crisis	Recovery	New normal
Maintain operations of essential GVCs and increase supply	Help to restart GVCs	Promote robustness and resilience in GVCs
Facilitate trade by removing trade barriers and by ensuring the smooth functioning of international transport and customs	Maintain an open trade and investment environment to reduce the time to recover and continue to support trade facilitation	Create a stable regulatory environment (including through trade and investment agreements that can include provisions for the smooth operations of GVCs)

[77] In particular the part which states that, states that: "emergency measures designed to tackle Covid-19, if deemed necessary, must be targeted, proportionate, transparent and temporary, and that they do not create unnecessary barriers to trade or disruption to global supply chains, and are consistent with WTO rules". See paragraph 5 of https://www.wto.org/english/news_e/news20_e/dgra_30mar20_e.pdf

Crisis	Recovery	New normal
Prioritise shipments for essential goods and adapt rules for movement of key personnel	Address financial and other issues of firms that can delay the recovery of GVCs and support MSMEs	Promote standards and certification procedures including risk awareness; review transport, logistics and customs clearance regulations to better mitigate disruptions
Increase supply of essential goods by facilitating investment and operation permits and by expediting certification procedures	Adapt health measures to the needs of firms operating in an international environment	Develop stress tests for critical supply chains and include criteria for robustness of supply chains in government procurement procedures on a non-discriminatory basis
		Promote the diffusion of digital technologies that can improve information systems for risk management (e.g. Internet of Things)

Source:https://read.oecd-ilibrary.org/view/?ref=134_134302-ocsbti4mh1&title=Covid-19-and-Global-Value-Chains-Chains-Policy-Options-to-Build-More-Resilient-Production-Networks

Table 2.7: Investment policy instruments for responding to the pandemic

Investment Policy Area	Examples of Policy Measures
Policy actions at the national level	
Investment facilitation	- Alleviation of administrative burdens and bureaucratic obstacles in firms
Investment retention and aftercare by investment promotion agencies (IPAs)	- Covid-19-related information services
Investment incentives	- Financial or fiscal incentives to produce Covid-19-related medical equipment - Incentives for enhancement of contracted economic activities - Incentives for conversion of production lines
State participation in crisis-affected industries	- Acquisition of equity in companies - Partial or full nationalisation
Local small and medium enterprises (SMEs) and supply chains	- Financial or fiscal support for domestic suppliers (such as SMEs)
National security and public health	- Application and potential reinforcement of FDI screening in Covid-19-relevant industries
Other State intervention in the health industry	- Other State intervention in the health sector - Export bans/ restrictions - Import facilitation
Intellectual property (IP)	- General authorisation of non-voluntary licensing to speed up research and development (R&D) - IP holder-specific non-voluntary licensing to enable imports of medication
Policy actions at the international level	
International support measures for	- International pledges in support of cross-border investment
International Investment Agreements (IIAs)	- Reform of IIAs in support of public health policies and to minimise ISDS risks

Source: Table 1 of https://unctad.org/system/files/official-document/diaepcbinf2020d3_en.pdf

Note: In https://unctad.org/system/files/official-document/diaepcbinf2020d3_en.pdf,

see (1) Boxes 2 to 4 for examples of incentives provided by countries, and (2) pages 7 and 8 for protecting national security and public health through foreign investment screening.

2.5 Steps that could be taken by the Private Sector

For reducing risks and creating resilient value chains,[78] the **private sector** too could take certain important steps, taking forward the operating environment created by Government policy.[79] The private sector would have to implement better risk management strategies at the firm level, with an emphasis on risk awareness and agility of response. The types of responses include:[80]

identification and evaluation of the likely impacts of different risks, including using an index to assess risk and recovery options even at the stage of initial investment get information on risk at the different stages, using digital technologies to the extent possible design the risk management strategies: avoidance, postponement, hedging, and better control of the operating conditions to reduce risks, including based on the inventory levels; and use of processes and a management structure that allow for a quick shift to alternatives (including through options specified in Table 2.6 above) increase the number of input suppliers (even building some supplier redundancy).

Conclusions

This chapter has provided a quick overview of the policy actions taken by various countries, individually as well as through their bilateral, regional and multilateral initiatives. The discussion is useful for policy-makers to identify relevant information sources and specific major steps taken by countries to address situations similar to those faced by them, including the remedial actions required through trade and investment policies.

The chapter provides examples of the policies adopted by countries as well as international organisations. Important principles, that will be required for efficient outcomes, are identified. In addition, the insights gained by multilateral organisations are discussed, that are based on their assessment of the various steps needed to address the most pressing areas for action. The importance of collective and collaborative effort is highlighted in most cases. This shows a need to emphasise a new policy area, namely of coalition-building with like-minded nations. The discussion in this chapter has focused on improving resilience and operational conditions, and reducing risks. It also highlights the changes in the strategies of private firms in order to create a more stable and less risky environment for their GVCs. In that context, the likely strategies applied by or suitable for different industries are identified. Thus, the chapter provides a basis for the Government to re-orient its trade and investment policy taking account of these new developments.

[78] There is a difference and even a trade-off at times between robustness, resilience and efficiency. See pages 6 to 9 of https://www.unescap.org/sites/default/d8files/knowledge-products/Policy_brief_supply_chain.pdf

[79] For more details, see https://read.oecd-ilibrary.org/view/?ref=134_134302-ocsbti4mh1&title=Covid-19-and-Global-Value-Chains-Chains-Policy-Options-to-Build-More-Resilient-Production-Networks

[80] Another framework focuses on: identifying risks; conducting a threat and risk analysis; developing continuity strategies; implementing the strategies and adjusting business policies, infrastructure, human and financial resources, and material assets accordingly; and, reviewing and updating the continuity plan. See pages 10 and 11 of https://www.unescap.org/sites/default/d8files/knowledge-products/Policy_brief_supply_chain.pdf.

Annex 2.1

Table A2.1: Types of Covid-19 products by broad category

Test Kits / Instruments and Apparatus in Diagnostic Testing	Protective Garments	Disinfectants and Sterilisation Products	Oxygen Therapy Equipment
Diagnostic re-agents based on PCR nucleic acid test or on immunological reactions.	**Face and Eye protection**: Textile face-masks, gas masks, protective spectacles and goggles	**Alcohol solution** (ethyl alcohol)	**Medical ventilators** (machine and ventilation bags, ECMO, CPAP units, BPap units, and oxygen concentrators)
Instruments used in clinical laboratories for **in vitro diagnosis**	Gloves: **Plastic gloves, surgical rubber gloves**, knitted or crocheted gloves, textile gloves	**Hand sanitiser and other disinfectant preparations;** **Medical, surgical or laboratory sterilisers**	**Oxygen delivery devices to supply oxygen (oxygen masks, Venturi masks, nasal prongs and catheters)**
Swab and Viral transport medium set	Other: Disposable hair nets, **protective garments for surgical/medical use**	**Hydrogen peroxide** in bulk, as medicament or in disinfectant preparations	**Oxygen humidifiers** for oxygen therapy applications
		Other chemical disinfectants	**Flowmeters, flowsplitters, and pulse oximeters**

Table A2.1, continued

Other Medical Devices	Medical Consumables	Vehicles	Other Items
Computed **tomography scanners,** ultrasound machines, **electrocardiograph machines,** patient monitoring stations	**Medical oxygen; Wadding, gauze, and similar articles, surgical tape, adhesive plasters**	**Wheelchairs**	Medical or surgical **furniture**
Laryngoscopes, CO_2 detectors, intubation forceps, **intubation kits**	**Syringes**, metal needles, Paper bedsheets, hazardous waste disposable bags, urine bags	**Mobile clinics vehicles**	**Pressure Swing Adsorption (PSA) oxygen plant**
Infusion pumps, medical suction pumps, medical drills for vascular access	Disposable emergency **cricothyrotomy set**	**Mobile radiological vehicles**	**Medical gas cylinders, for oxygen**
Electronic drop counters, infrared thermometers, kidney basins, stethoscopes	**Soap;** conductive gel, lubricating jelly		

Source:http://www.oecd.org/coronavirus/policy-responses/trade-interdependencies-in-Covid-19-goods-79aaa1d6/

Table A2.2: Top five Exporters in various product categories (trade shares based on 2018 trade data)

Test kits / instruments and apparatus in diagnostic testing		Protective garments		Disinfectants and sterilisation products		Oxygen therapy and other medical equipment		Medical consumables		Vehicles		Other items	
Exports (country; percentage share in world exports, 2018)													
DEU	21.0	CHN	41.0	DEU	15.3	USA	17.6	CHN	16.5	DEU	15.0	DEU	18.4
USA	16.3	MYS	10.1	CHE	13.0	DEU	13.5	DEU	12.4	USA	14.5	CHN	11.9
CHE	13.7	DEU	5.2	IRL	8.9	CHN	9.0	USA	9.8	CHN	13.0	USA	9.6
IRL	10.4	VNM	4.2	USA	8.1	MEX	8.8	MEX	4.5	ITA	11.4	MEX	6.1
NLD	5.7	THA	3.7	FRA	5.7	JPN	5.7	NLD	4.4	FRA	4.6	GBR	5.1
Above Total	**67.2**	**Above Total**	**64.2**	**Above Total**	**50.9**	**Above Total**	**54.6**	**Above Total**	**47.5**	**Above Total**	**58.5**	**Above Total**	**51.1**

Table A2.2, continued

Test kits / instruments and apparatus in diagnostic testing		Protective garments		Disinfectants and sterilisation products		Oxygen therapy and other medical equipment		Medical consumables		Vehicles		Other items	
Imports (country; percentage share in world imports, 2018)													
USA	12.9	USA	28.2	USA	19.6	USA	22.9	USA	14.7	USA	9.2	USA	15.7
DEU	9.6	DEU	7.4	DEU	8.0	DEU	8.0	DEU	9.1	CAN	7.8	DEU	11.9
NLD	8.8	JPN	6.3	NLD	4.8	CHN	7.1	NLD	5.7	FRA	6.3	CHN	5.3
BEL	5.8	FRA	4.7	CHE	4.8	NLD	6.8	CHN	5.1	DEU	5.2	GBR	4.4
ITA	5.8	GBR	4.0	GBR	4.7	JPN	5.1	FRA	4.7	GBR	4.4	CAN	3.9
Above Total	**42.8**	**Above Total**	**50.7**	**Above Total**	**41.9**	**Above Total**	**49.9**	**Above Total**	**39.2**	**Above Total**	**32.9**	**Above Total**	**41.0**

Source:http://www.oecd.org/coronavirus/policy-responses/trade-interdependencies-in-Covid-19-goods-79aaa1d6/

Annex 2.2

Policy Initiatives Examined by Multilateral Organisations and Suggestions for Collaborative Work among Nations

The data base of multilateral organisations shows a long list of policy options used by various nations. They include:[81]

- Fiscal and social policy related initiatives,[82] such as fiscal stimulus, transfers in kind and cash, waivers/ postponement of taxes, wage subsidies, reduced interest rates, lending support;
- Increase the reach of cost-effective digital infrastructure;
- Improve trade facilitation to minimise scope for disruptions related to face-to-face processes:
  - Minimise the need for physical interaction between Customs and other border officials and traders at borders, by digitising processes to the extent possible;
  - Speed up border checks for medical products and food.
- Avoid imposing further costs, including through:
  - Policies that add to costs (like tariffs and taxes), and
  - Unnecessary policy uncertainty through ad hoc or quick changes in tariff and/or regulatory policy.
- Urgently boost investment to raise production capacity, in co-operation with the private sector.
- Trade is essential, especially for countries that are not able to produce their own medical supplies in sufficient quantities or cost-effectively.
- Special arrangements aimed at specific supply chains for strategic goods such as medical equipment.
  - However, this should not necessarily be equated with re-shoring of production.
  - Alternative, effective and more cost-efficient solutions may involve development of strategic stocks or upstream agreements with companies enabling rapid conversion of assembly lines during crises.
- Avoid export restrictions on essential goods, such as medical equipment and, especially, food products.
  - If export restrictions on medical supplies cannot be avoided entirely in the current political context, agreements to place strict conditions on their temporary use are vital. An important point in this context is the lack of significant impact of export restrictions and the collateral damage they create in a world with GVCs.[83]
  - A critical need to increase the overall global supply of essential medical supplies for combatting Covid-19 such as ventilators and masks.
- Help medical researchers co-operate on Covid-19 through enabling data flows.
- Make it cheaper and easier for people to stay connected to jobs, markets, and each other by:
  - Reducing tariffs on information-and-communication-technology goods and measures affecting access to digitally-enabled services;

[81] See https://www.un-page.org/Policy%20Responses and http://www.oecd.org/coronavirus/policy-responses/Covid-19-and-international-trade-issues-and-actions-494da2fa/

[82] For country-level responses, see for instance https://www.ey.com/en_gl/tax/how-Covid-19-is-causing-governments-to-adopt-economic-stimulus--

[83] See, for example, https://voxeu.org/article/new-ebook-Covid-19-and-trade-policy-why-turning-inward-wont-work and https://voxeu.org/article/trade-and-Covid-19-crisis-developing-countries

- Temporarily increasing *de minimis* thresholds to cut delays in cross-border e-commerce; and
- Keeping trade moving without physical contact through enacting regulations to enable e-payments, e-signatures and e-contracts.

- Support efforts of firms to build more resilient GVCs by:[84]
  - Collecting and sharing information on potential concentration and bottlenecks upstream,
  - Developing stress tests for essential supply chains,
  - Working with the private sector to address such issues, and
  - Creating a conducive regulatory environment which is not a source of additional, policy-related, uncertainty.

[84] See https://read.oecd-ilibrary.org/view/?ref=134_134302-ocsbti4mh1&title=Covid-19-and-Global-Value-Chains-Chains-Policy-Options-to-Build-More-Resilient-Production-Networks.

► Chapter 3

Evolution of Trade Policy in India

Introduction

The different parts of India's trade and investment policy have not evolved similarly across time, as illustrated by the qualitative illustration shown in Table 3.1 below. India began liberalisation of both tariffs and non-tariff measures (NTMs), a process which continued for a considerable period of time. Then a couple of years ago there was a reversal and now there is an active consideration of using tariff increases for raising investment and domestic production, linking tariff policy with parts of investment policy. There is nonetheless, a consistent focus on easing and simplifying regulatory conditions for goods and services.

Table 3.1: India - Illustration of the Direction of Change in the Post-1991 Period for Different Policy Areas

1	2	3	4	5
Liberalisation of Tariffs	**Liberalisation of Non-Tariff Measures**	**Trade Facilitation: Simplifying Inside-The-Border Trade Measures**	**Services Liberalisation**	**Facilitating Investment**
		↗	↗	↗

This chapter has two main parts. The first part (sections 3.1 to 3.6) discusses India's trade policies and compares its key features with other selected economies. Section 3.1 provides a summary of India's current trade policy approach. Section 3.2 shows the evolution of tariffs in India and how the current tariff rates have registered an increase since 2018. Section 3.3 discusses the incompatibility of tariff increase as an appropriate policy with raising exports and links with GVCs. Section 3.4 compares India's non-tariff measures (NTMs) with selected other economies, and shows that the incidence of NTMs in India is much lower than a number of other economies. It also makes the point that while India's NTMs have a comparatively lower incidence, the restrictiveness of this trade measure has been increasing in recent times. One way to mitigate the impact of restrictive trade policies is to improve trade facilitation. Section 3.5 shows that India is emphasising this policy and is making steady progress in this area. However, if a comparison is made with other comparator economies, data indicates that India's rank is quite low compared to others in a number of

trade facilitation-related areas that would need priority attention. Those areas where India has a relatively low rank are identified for specific focus. In addition, since an important policy objective is to increase exports, a suggestion is made for targeted efforts to improve policy performance in certain areas that impact exports. Specific categories from international indices are identified for this purpose. Section 3.6 provides a summary overview of trade policy approaches in India, China, EU, US and Vietnam.

The second part of this chapter covers sections 3.7 and 3.8. Section 3.7 compares India with China and Vietnam in terms of three important trade-related objectives of India, namely exports, imports and trade surplus or deficit. In this background, section 3.8 makes the important point that improving competitiveness is key to sustaining the possibility of achieving the objectives of Atmanirbhar Bharat over time. Certain summary statistics are used to indicate India's comparative competitiveness over time, namely, India's shares in global merchandise exports and imports, and evolution of its trade surplus or deficit. During the previous decade, India has registered a small surplus for manufactures trade in certain years (2013, 2014 and 2016). In contrast, it has registered a significant merchandise trade deficit each year during this past decade, which shows inter alia the importance of oil imports for India.

In this context, the discussion also notes that any policy which reduces exports would in many cases limit the scale of operations, thus adversely affecting competitiveness in many sectors. Section 3.9 gives the main conclusions of this chapter.

3.1 Current Trade Policy Approach of India

The current trade policy approach of India is part of the Atmanirbhar Bharat initiative, together with investment policy as a major part of the overall strategy. Atmanirbhar Bharat was announced in the specific context of Covid-19. Particular difficulties were seen due to risks on account of a large reliance on imports (especially from China) for the supply chains of several products, including some strategic products like medicines, defence production, and certain electronics. This took place within an ongoing strategy of encouraging investment with an increase in tariffs for certain sectors, e.g. the Phased Manufacturing Programme (PMP) of the electronics sector.

Merchandise trade deficit has long been a concern for Indian policy-makers, and is among the main reasons for the current efforts focus on increasing domestic production to decrease imports and also raise exports. The concerns from 2018 onwards and the recent experience of India in 2020 both in global trade and as a result of the border tensions with China have led to:

(a) A sharper focus on China and its trade-related policies in the area of goods and services. This includes banning a number of apps from China, and establishing processes to assess the security of value chains, in particular for the electronics sector.[85]

(b) Greater emphasis on increasing tariffs for creating incentives for domestic production or domestic value addition.[86]

(c) Adoption of increasingly restrictive policy in terms of standards and other non-tariff measures with a specific focus on China, but the impact of which also impinges on trade in general.

(d) Aversion to Free Trade Agreements (FTAs), especially with China or regional groups which include China.

[85] See, for example, https://pib.gov.in/PressReleasePage.aspx?PRID=1565285

[86] See https://pib.gov.in/PressReleasePage.aspx?PRID=1700431 and https://www.thehindu.com/business/Industry/nitin-gadkari-urges-auto-component-manufacturers-to-increase-localisation-to-100/article33930277.ece

(e) Emphasis on improving the operational conditions for those operating in the domestic market, through initiatives which identify specific obstacles to efficient operations and international trade.

(f) Developing partnerships with other nations for increasing the resilience of GVCs as well as creating additional opportunities for Indian producers to be more active in global markets.[87]

(g) New incentives/subsidies linked to investment and sales under the Production Linked Incentives (PLI) schemes.[88]

(h) For some time now, India has seen the need to emphasise new and advanced technologies.[89] This has become far more urgent and crucial as competitiveness in several sectors in this decade will be determined by new and emerging technologies. This is one of the reasons for China, US and the EU to develop their domestic technological capabilities within a structured and strategic approach (see Chapter 4). Chapter 4 provides a more detailed discussion of India's investment policy.

3.2 Tariff Policy – A Recent Change in Emphasis

India's average MFN tariffs were about 13% for much of the past decade, with significantly higher tariffs for agriculture products compared to non-agriculture products (Table 3.2 below). India has applied a combination of both increased and decreased tariffs on various items each year under its Make in India initiative.[90] Over time, this has evolved into an explicit approach to increase tariffs to encourage domestic production. In 2018, the Indian Finance Minister stated in the Budget speech for the Financial Year 2018-19 that: "**In this budget, I am making a calibrated departure from the underlying policy in the last two decades**, wherein the trend largely was to reduce the customs duty. There is substantial potential for domestic value addition in certain sectors, like food processing, electronics, auto components, footwear and furniture. **To further incentivise the domestic value addition and Make in India in some such sectors, I propose to increase customs duty on certain items.** I propose to increase customs duty on mobile phones from 15% to 20%, on some of their parts and accessories to 15%, and on certain parts of TVs to 15%. This measure will promote creation of more jobs in the country."[91] (emphasis added)

This change in the policy approach led to a significant increase in average MFN tariffs of India in 2018 (Table 3.2). In 2019, India's MFN applied tariffs were considerably higher than other comparator economies (Table 3.3). Another feature of India's tariff regime is that in comparison to several other competing economies, India has a relatively smaller proportion of its tariff lines with zero MFN applied tariffs (Table 3.4).[92]

---

[87] See https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/12/fact-sheet-quad-summit/ and https://www.whitehouse.gov/briefing-room/press-briefings/2021/03/12/press-briefing-by-press-secretary-jen-psaki-march-12-2021/

[88] Till now, PLI schemes have been announced for Large Scale Mobile and Components, Pharma Products KSM/DI and APIs, Medical Devices, Auto and Auto Components, Batteries, Pharma Drugs, Telecom and Network Products, Food Products, Textiles, Specialty Steel, White Goods, Electronic/technology Products, Solar Modules and IT Hardware.

[89] See, for example, the section on "Salient features of NPE 2019" in https://pib.gov.in/PressReleasePage.aspx?PRID=1565285

[90] This was initially mentioned in the speech of the Finance Minister on the Budget 2015-16. See, for example, page 36 of https://www.indiabudget.gov.in/budget2015-2016/ub2015-16/bs/bs.pdf

[91] Paragraph 160 of https://www.indiabudget.gov.in/budget2018-2019/bspeecha.asp

[92] For more detailed sector-level tariff information, see https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/SpecialPublications/Main-Report-Relooking-Indias-Tariff-Framework-120121.pdf

Table 3.2: India - Simple Average MFN Applied Tariffs (%)

	Agriculture	Non-Agriculture	Total
2010	31.4	9.8	12.6
2011	32.7#	10.2#	13.4*
2012	33.5	10.4	13.7
2013	33.5	10.2	13.5
2014	33.4	10.2	13.5
2015	32.8	10.1	13.4
2016	32.8	10.2	13.4
2017	32.8	10.7	13.8
2018	38.8	13.7	17.1
2019	38.8	14.2	17.6

Source: WTO; * = World Bank; # = Estimates

Note: WTO database does not have Indian tariff data for 2011

Table 3.3: Average Applied MFN Tariffs in Selected Countries in 2019 (%)

Product Categories	India	Bangladesh	China	EU	Indonesia	Malaysia	Thailand	US	Vietnam
Total	**17.6**	**14.0**	**7.6**	**5.1**	**8.1**	**5.6**	**10.2**	**3.3**	**9.6**
Agriculture	38.8	17.5	13.9	11.4	8.7	7.7	29.0	4.7	17.2
Non-Agriculture	14.1	13.4	6.5	4.2	8.0	5.3	7.2	3.1	8.4

Source: WTO, World Tariff Profile 2020.

Table 3.4: Percentage of Tariff Lines With Zero MFN Applied Tariffs, 2019 (%)

Product Categories	India	Bangladesh	China	EU	Indonesia	Malaysia	Thailand	US	Vietnam
Agriculture	3.1	9.0	7.2	31.7	8.5	74.7	12.3	30.6	15.0
Non-Agriculture	1.8	3.9	7.4	27.6	13.8	65.0	40.2	49.4	38.6

Source: WTO, World Tariff Profile 2020.

FTAs: The discussion above compares MFN tariffs for India and comparator economies. These are not the actual tariff rates for imports from countries with which India has Free Trade Agreements or Regional Trade Agreements (henceforth, both referred to as "FTA"). The FTAs of India and selected comparator countries show that India has relatively fewer "deep" FTAs, i.e. FTAs with a large proportion of tariff lines with zero tariffs (Table 3.5). The extent of tariff decrease under others' agreements such as CPTPP is much more[93] than for India's deep agreements with Japan and South Korea.[94] Notably, the deeper FTAs also provide more

[93] See, for example, Table 2 of http://www3.weforum.org/docs/WEF_White_Paper_Whats_in_and_whats_new.pdf. Though this Table shows tariff declines under TPP, it is relevant also for CPTPP because CPTPP incorporates the tariff outcomes contained in the original TPP Agreement. See, for example, https://www.international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/agr-acc/cptpp-ptpgp/tariff-elimination-droits_de_douane.aspx?lang=eng

[94] See, for example, Tables 5 and 6 of V. S. Seshadari (2016), "India-Japan CEPA. An Appraisal of Progress", ASEAN-India Center at RIS and RIS, New Delhi. http://www.ris.org.in/sites/default/files/India-Japan%20CEPA%20Report_2016.pdf

provisions that address non-tariff measures, by facilitating trade and providing specific mechanisms to address problems related to bilateral exports arising due to non-tariff measures.[95]

Thus, both due to its MFN tariffs and FTAs, India's tariffs are higher than comparator countries. This has implications for achieving the combination of objectives emphasised by Atmanirbhar Bharat.

Table 3.5: Examples of "Deep" FTAs of India and Selected Comparator Countries

India	China	Vietnam	EU	US
ASEAN Countries, Japan, South Korea	ASEAN Countries, Australia, Japan, New Zealand, South Korea	ASEAN Countries, Australia, Canada, Chile, EU, Japan, Mexico, New Zealand, Peru, South Korea	Canada, Chile, Japan, Mercosur countries; # Mexico,* Norway, Peru, South Korea, Singapore, Switzerland, UK	Australia, Canada, Chile, Colombia, Japan, Mexico, Peru, Singapore, South Korea

Source: WTO.

Notes:

= Argentina, Brazil, Paraguay and Uruguay. This agreement will result in 91% of goods exported by EU and 92% of goods exported by Mercosur countries to be duty-free in bilateral trade.

* = Previous Agreement signed in 1997 replaced by "agreement in principle" that will result in 98% tariff lines becoming duty-free on the date of implementation.

3.3 Multiple Objectives to be Achieved by Tariff Policy under Atmanirbhar

Tariff policy under Atmanirbhar Bharat has included additional objectives such as promoting exports and increasing links with global value chains (GVCs). For example, in the Budget speech of 2021, the Indian Finance Minister clarified that:

"Our Custom Duty Policy should have the twin objective of promoting domestic manufacturing and helping India get onto global value chain and export better. The thrust now has to be on easy access to raw materials and exports of value added products."[96]

This shift from a focus on a single objective (domestic value addition) to a larger set of objectives (exports and GVCs) creates an inherent conflict of trying to achieve multiple objectives through tariff increases. A higher tariff would increase domestic production of the protected product and reduce its imports, but it is likely to adversely affect exports and reduce links with GVCs because tariffs lead to a rise in domestic prices, costs of production, and inefficiency. Exports and GVCs require improved competitiveness, while tariff increase tends to reduce competitiveness. An increase in domestic value addition on its own does not lead to an increase in exports/GVC connection.

Further, the rise in costs due to higher tariffs erodes the benefits of support policies such as tariffs or facilitation. This is significant because India is making an effort to achieve the additional objectives through subsidies. The aim is to attract FDI and domestic investment, and achieve the objectives of exports and GVCs through the global market links of FDI.With this in mind, the Government has introduced some subsidy

[95] See, for example, Article 2.9.2 of CPTPP Agreement. https://www.mfat.govt.nz/assets/Trade-agreements/TPP/Text-ENGLISH/2.-National-Treatment-and-Market-Access-for-Goods.pdf

[96] Paragraph 177 of https://www.indiabudget.gov.in/budgetspeech.php . See,also, paragraphs 135 and 136 of https://www.indiabudget.gov.in/budget2019-20/budgetspeech.php

programmes, the most prominent being Production Linked Incentives (PLI)schemes in 2020 and 2021. In addition, India's emphasis on facilitation policies has continued, and progress is being made in that context. It is too early to see the impact of subsidies on exports and GVCs. The initial response to some of the PLI schemes has been a significant expression of interest together with planned investment increase; one of the qualification criteria for PLI is to make investment above specified threshold levels for incremental investment.

However, continued investment and exports require timely and effective implementation of support schemes, an area which needs much more attention. Feedback from domestic industry suggests that policies are not effectively implemented in several cases.[97] Any policy change involves multiple stakeholders, both in Government and the private sector. Effective implementation requires careful coordination and monitoring. Unanticipated problems require timely and supportive solutions. In contrast, the change in approach for both tariffs and non-tariff measures has begun to alter the approach from facilitative to more time-consuming processes in several cases. For example, industry feedback shows that "Equipment Type Approval" from Wireless Planning Coordination Cell (WPC) for the mobile phone sector earlier took one week but now takes several weeks with no clarity on turnaround time. Likewise, approval from the Bureau of Indian Standards (BIS), which earlier took 15 days now takes two months or more. Another recent change which has brought in uncertainty and delays in certain instances is the regulation with respect to certification of origin.[98] These changes lead to longer time periods for approvals and turnaround, inefficient operations, loss of competitiveness and business opportunities.

This shows the overlap between tariff and non-tariff policies and their potential synergy or conflict for simultaneously achieving the two objectives of increasing domestic value addition and raising exports.

3.4 Non-Tariff Measures (NTMs)

The incidence of NTMs is assessed in different ways. Three important criteria for this measurement are coverage ratio, frequency index and prevalence score, defined as:[99]

(a) Coverage ratio: This ratio measures the percentage of trade subject to NTMs.

(b) Frequency index: This index indicates the percentage of imported products to which NTMs apply.

(c) Prevalence score: This measures the average number of NTMs applied to imported products.

Incidence of India's NTMs is lower than a Number of Comparator Economies: In comparison to China, EU and Vietnam, the incidence of NTMs is lower for India (Tables 3.6 to 3.8). It is noteworthy that for the US, the prevalence score, i.e. average number of NTMs applied to imports, is lower than India. However, compared to India, the NTMs of the US cover a large percentage of trade, and a higher percentage of its imported products are subject to NTMs.

A smaller share of India's trade is subject to NTMs compared to the other countries, primarily for the reason that other countries rely on a relatively larger number of technical barriers to trade (TBT) and sanitary and phytosanitary measures (SPS). A comparatively significant portion of India's trade is affected by other types of NTMs, particularly by quantity/price control measures. However, India's overall incidence of NTMs is comparatively lower.

---

[97] See https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/SpecialPublications/Report-on-Domestic-Constraints-on-Exports-of-Selected-Sectors-new.pdf

[98] See, for example, section 5 onwards in https://www.cbic.gov.in/resources//htdocs-cbec/customs/CarotarBrochure_8thOct2020.pdf

[99] https://ferdi.fr/dl/df-pwFsQKwSBf2Djde77ELncfwt/ferdi-p218-non-tariff-measures-data-and-quantitative-tools-of-analysis.pdf

Table 3.6: Coverage Ratio of NTMs in Selected Economies
(The coverage ratio measures the percentage of trade subject to NTMs.)

Coverage Ratio (%)	India	China	Vietnam	EU	US
Overall	69	92	92	89	83
1. By Sector					
(1.a) Agriculture	100	100	100	98	100
(1.b) Manufacturing	62	90	91	89	80
(1.c) Natural Resources	80	98	94	86	100
2. By Type of NTM Measure					
(2.a) Sanitary and Phytosanitary	8	39	17	15	12
(2.b) Technical Barriers to Trade	59	91	92	88	81
(2.c) Pre-Shipment Inspection	45	47	9	4	7
(2.d) Quantity Control Measures	51	75	49	66	28
(2.e) Price Controls	30	23	17	0	14
(2.f) Export-related Measures	39	81	61	5	32

Source: https://unctad.org/topic/trade-analysis/non-tariff-measures/NTMs-data

Table 3.7: Frequency Index of NTMs in Selected Economies
(The frequency index indicates the percentage of imported products to which NTMs apply.)

Frequency Index (%)	India	China	Vietnam	EU	US
Overall	47	90	89	92	77
1. By Sector					
(1.a) Agriculture	100	100	100	98	100
(1.b) Manufacturing	44	89	89	92	74
(1.c) Natural Resources	59	90	57	64	100
2. By Type of NTM Measure					
(2.a) Sanitary and Phytosanitary	10	36	17	22	14
(2.b) Technical Barriers to Trade	41	88	86	90	72
(2.c) Pre-Shipment Inspection	32	14	11	3	4
(2.d) Quantity Control Measures	41	54	34	53	20
(2.e) Price Controls	11	17	16	0	15
(2.f) Export-related Measures	47	73	49	3	23

Source: https://unctad.org/topic/trade-analysis/non-tariff-measures/NTMs-data

Table 3.8: Prevalence Score of NTMs in Selected Economies
(The prevalence score is the average number of NTMs applied to imported products.)

Frequency Index (%)	India	China	Vietnam	EU	US
Overall	4.9	6.8	5.0	6.3	4.1
1. By Sector					
(1.a) Agriculture	23	22.8	17.6	15.5	16.1
(1.b) Manufacturing	3.9	5.4	3.8	5.0	2.6
(1.c) Natural Resources	5.2	4.7	4.3	4.0	2.4
2. By Type of NTM Measure					
(2.a) Sanitary and Phytosanitary	9.9	4.2	7.2	7.5	8.7
(2.b) Technical Barriers to Trade	5.0	4.5	3.1	4.1	3.3
(2.c) Pre-Shipment Inspection	2.5	1.1	1.1	1.0	1.4
(2.d) Quantity Control Measures	2.1	1.6	1.4	1.6	1.0
(2.e) Price Controls	1.7	1.1	1.6	0.0	1.2
(2.f) Export-related Measures	3.0	4.2	3.1	2.0	2.1

Source: https://unctad.org/topic/trade-analysis/non-tariff-measures/NTMs-data

Tables 3.6 to 3.8 show the number of NTMs imposed by different countries. However, the true incidence of NTMs emerges based on feedback from the industry/exporters. That shows that the trend that had begun to reduce the incidence of NTMs is now being reversed for a number of reasons. Examples of these are provided below.

For NTMs, Numeric Estimates Do Not Tell The Whole Story: The Tables above are based on conventional analysis of NTMs that focuses on the number and types of NTMs and the coverage of NTMs in relation to imports. Five Important points about NTMs are relevant in this context which suggest that a wider approach is required to properly address NTMs.

(i) Effective implementation of policies must be an important focus to improve operational conditions otherwise impacted by NTMs. Good policies may not be implemented properly or effectively, and even one NTM implemented with a restrictive approach can negate the effects of several which are implemented with a facilitating approach.

(ii) NTMs have a comparatively larger possibility of being arbitrarily implemented or be a cause of longer delays.

(iii) NTMs on imports also impact exports, because restrictions on imports which are domestically processed and further exported adversely affect links with GVCs and the capability to export.

(iv) Import restrictions on products that are significant inputs into other sectors, will lead to inefficiency, magnifying the restrictive effect of non-tariff measures for one sector to adversely impact domestic economic activity on a much wider scale.

(v) Feedback from industry: It is important to keep taking periodic feedback from industry about the implementation and impact of specific NTMs. Recent feedback suggests that when more than one agency is responsible for implementing a policy, it could lead to duplication of responsibilities, and a longer time for approval. For example, exporters of certain agricultural products have to get approvals from two or more agencies, e.g. the EIC, CAPEXIL, and State Animal Husbandry Departments. Similarly, the new

regulation, for ensuring that conditions of "trusted electronics value chain" are met, is subject to two parallel exercises under two different agencies. This introduces considerable time lag and uncertainty in the decision process, including how to address a situation where one agency considers the conditions to be met but the other one decides that the relevant criteria are not met.

Thus, while the incidence of NTMs in India in terms of certain criteria is lower than for comparator countries, feedback from the industry suggests that the situation has begun to change and the implementation of NTMs is resulting in higher restraints on imports.[100] Thus, the direction of change of NTMs in India is restrictive, even though the conventional measure of incidence of NTMs is lower than the comparator countries discussed here.

To some extent, the adverse impact of NTMs can be mitigated by an improvement in trade facilitation, an area which is being emphasised by India.

3.5 Trade Facilitation

This is a major policy initiative which would have a positive impact on most of the major objectives of Atmanirbhar Bharat. Trade facilitation is part of "ease of doing business" which impacts efficiency in both trade and investment activities. India has made considerable improvements in conditions relating to trade facilitation and ease of doing business. It continues to focus in a big way on further improvement as shown by its Trade Facilitation Action Plan 2020-2023.[101] Based on these efforts, India has improved its ranking in several international indices. In terms of the OECD Trade Facilitation Indicators, operational conditions in India have improved even between 2017 and 2019: the indicator of India's average trade facilitation performance increased from 1.25 in 2017 to 1.52 in 2019.

Such improvement and the efforts being made are commendable. The next stage would require a more focused approach for comparison, which shifts attention from global ranking to ranking amongst comparator economies, with a focus on certain key areas for greater attention.

Table 3.9 below compares India with 11 comparator economies in terms of the main criteria that are considered under OECD's Trade Performance Indicators.[102] This shows that India still needs to improve when compared with certain other economies with which it competes in global markets. In this context of competitiveness, it is useful to identify the specific areas of focus and monitor progress both within the country as well as in comparison with comparator economies. **The policy areas that could be selected for priority focus may be those for which India is ranked low, e.g. rank of tenth, eleventh or twelfth out of the 12 economies (i.e. last quartile) shown in Table 3.9 below.**

A Specific Focus on Exports: Since exports are an important objective of Atmanirbhar Bharat, and a high tariff regime would mitigate against that, it is useful to consider an index specific to export processes. The indices relating to the part of Ease of Doing Business Index under its section "Trading Across Borders"[103] are relevant for this.[104] Another index which provides a basis for improving export-related processes is the

[100] More detail of such feedback is provided in the chapters on specific sectors in the Report.

[101] https://www.cbic.gov.in/resources//htdocs-cbec/implmntin-trade-facilitation/NTFAP2020-23jk.pdf

[102] See http://www.compareyourcountry.org/trade-facilitation

[103] https://www.doingbusiness.org/en/data/exploretopics/trading-across-borders

[104] The goal under India's Trade Facilitation Plan 2020-2023 is to bring the rank for this Index to below 50. See page iii of https://www.cbic.gov.in/resources//htdocs-cbec/implmntin-trade-facilitation/NTFAP2020-23jk.pdf

Logistics Performance Index.[105] India's ranking for these two indices, respectively, was 68th and 44th needs to be improved.

Table 3.9: Comparison of India's Trade Facilitation Performance Index Among Selected Economies, 2019

India's Rank out of 12 Countries	Policy Area/ Average Index	Economy ranked below India (or same rank as India)
8th out of 12 economies	Average TFP Performance	Indonesia, Malaysia, Thailand, Vietnam
1st out of 12 economies	- Internal border agency cooperation	Australia, Canada, China, Germany, Indonesia, Malaysia, Mexico, Singapore, Thailand, US, Vietnam
3rd out of 12 economies	- Information availability	Canada, China, Germany, Indonesia, Malaysia, Mexico, Thailand, Vietnam (same rank: Singapore)
6th out of 12 economies	- Automation - External border agency cooperation	Canada, China, Germany, Indonesia, Malaysia, Vietnam; China, Indonesia, Malaysia, Vietnam (same rank: Singapore, Thailand)
8th out of 12 economies	- Governance and impartiality	Indonesia, Malaysia, Thailand, Vietnam
10th out of 12 economies	- Fees and charges - Documents	Indonesia, Thailand Indonesia, Malaysia
11th out of 12 economies	- Involvement of the trade community; - Appeal procedures	(same rank: Vietnam) Mexico
12th out of 12 economies	- Advance rulings; - Procedures	

Source: https://www.compareyourcountry.org/trade-facilitation?cr=oecd&lg=en

Note: The economies selected for comparison are Australia, Canada, China, Germany (as proxy for EU), India, Indonesia, Malaysia, Mexico, Singapore, Thailand, US, Vietnam.

Table 3.10 shows India's rank relating to export procedures covered by these two indices. The National Action Plan on Trade Facilitation provides for addressing/improving the components mentioned in Table 3.10. A specific focus on these indices would help improve export performance.[106]

Table 3.10: India's ranking for selected indices/performance levels

Selected Components of Trading Across Border Index (2020):	Rank among 193 economies
a. Time to Export – Border Compliance (hours)	111
b. Time to Export – Documentary Compliance (hours)	75
c. Cost to Export – Border Compliance (USD)	64
d. Cost to Export – Documentary Compliance (USD)	65

[105] https://lpi.worldbank.org/international/global

[106] A more detailed and longer list of specific areas for focus is provided in a recent work by Dr. Jayanta Roy, which includes inter alia issues relating to trade facilitation.. See Jayanta Roy (2021), "Trade Policy and Post-Covid Growth" in Sanjaya Baru (ed.), Beyond Covid's Shadow, Rupa, New Delhi.

Selected Components of Logistics Performance Index (2018):	Rank as indicated below
a. Lead Time for Export – Port/Airport Supply Chain	52nd out of 95th economies*
b. Lead Time for Export – Land Supply Chain	52nd out of 76th economies*

Source: https://www.doingbusiness.org/en/data/exploretopics/trading-across-bordersand

https://openknowledge.worldbank.org/bitstream/handle/10986/29971/LPI2018.pdf

Note: * = The total number of economies differ because of variation in the number of economies for which data is available on the issues covered by the index.

3.6 An Overview of India's Trade Policy Compared with Selected Economies

In a number of areas, India's policy pre-occupations and approaches are similar to the major economies, including China, EU and the US (Table 3.11). However, there are differences, in particular with respect to tariffs, non-tariff measures, and India's approach to FTAs. Table 3.11 provides a summary description of India's trade policy approach compared to selected other economies. More detail on the large economies is given in Chapter 4 on policies of China, EU and US.

Table 3.11: Comparison of Trade Policies of India with Selected Other Economies

	China	EU	US	Vietnam	India
Tariff Average	Medium, decreased slightly since 2010	Relatively low except medium for agriculture	Low	Medium, except high for agriculture	High, increased significantly since 2018
Non-Tariff Measures	Large incidence, application not predictable	Large incidence, especially strict for agriculture	Large incidence, at times used for protectionist reasons	Large incidence	Relatively lower incidence, recently becoming more restrictive
Facilitation/ Ease of Operations	Greater focus on inside the border facilitation and for exports	High level in general	High, recent focus more on domestic investors	Medium, with high level for preferred investors	Medium, with continued efforts to improve
Subsidy	High	Medium, selectively high	Selectively high	Medium, with high level for preferred investors	Medium to high for selected sectors
Approach to GVCs	Focused approach, emphasis on increasing domestic content	Increasingly focused on domestic content	Strong emphasis on domestic content in selected sectors	High focus, with some subsidy also to domestic suppliers	Strong emphasis on domestic content, especially for specific sectors
Approach to FTAs	Interested, particularly in market access, with medium to high level disciplines in rules	Highly interested	Highly interested	Highly interested, with flexibilities and transition periods	Not interested, domestic concerns will make deeper FTAs difficult
Focus on new technology	Very high	Very high	Very high	Low to medium, mostly FDI linked	Low to medium. High focus on selected sectors

	China	EU	US	Vietnam	India
Particularly concerned about another economy	Large concern about US policy towards China; increasingly concerned about others as well	Large concern about China	Large concern about China	Managing the fallout from others' policies	Large concern about China
Nature of concern	Reliance on US for markets and investment, and emerging geopolitical coalition developing to manage China's impact	Reliance on China for inputs in GVCs and strategic metals/minerals; China's subsidy, technology and competition policies	Reliance on China for inputs in GVCs and strategic metals/minerals; China's subsidy, technology and competition policies	Concerned about turmoil in global economic conditions due to the increasing tensions	Reliance on China for inputs in GVCs and strategic metals/minerals; China's subsidy, technology and competition policies
Action to address the concern	Focus on increasing domestic abilities, link with other economies including through FTAs and its BRI initiative, WTO and, improving support to inward FDI	Focus on increasing domestic abilities, link with other economies including FTAs and WTO, agreement of investment rules with China and other countries	Investment restrictions, focus on domestic GVCs and technological abilities, link with other economies including FTAs, limiting access of China to its technology	Improving FDI conditions, linking up with other economies through FTAs	Tariffs and investment restrictions, focus on increasing domestic content, link with other economies for resilient value chains, sharing of vaccines and other health-related products

Note: For tariff averages, the indicators are as follows: Low = Less than 5%; Relatively low = Close to 5%; Medium = Above 5% but below 10%; High = Above 10%.

3.7 A Comparison of India, China and Vietnam: Exports, Imports and Trade Deficit Developments Since 2010

This section compares India with China and Vietnam — China is a large economy and Vietnam a small one. However, both have done very well in terms of merchandise exports. Table 3.12 shows some key economic features of these economies.

Table 3.12 shows that India's tariffs are significantly higher than for China and Vietnam. China has seen a small reduction in its average MFN tariffs while Vietnam's tariffs have remained largely unchanged since 2010. China has now become the largest merchandise exporter in the world. India's share in global merchandise exports has remained between 1.6% and 1.7% since 2011, while Vietnam's share in global exports has increased significantly during this period. In 2020, Vietnam's merchandise exports were higher than those of India: USD 282.6 billion for Vietnam and USD 276.2 billion for India.[107]

[107] In 2019, manufactures accounted for 84.6% of merchandise exports of Vietnam. The corresponding estimate was 70.8% for India. Though full data for 2020 manufactures exports is not available, these too are likely to exceed India's manufactures exports during 2020. For the first three quarters of 2020, manufactures exports of respectively China, India and Vietnam were USD 1,118 billion, USD 200.2 billion, and USD 202.4 billion.

Table 3.12: Comparison of China, Vietnam and India (2010, 2015 and 2019)

	2010	2015	2019
GDP (USD billion)	China: 6,087.2 India: 1,675.6 Vietnam: 115.9	China: 11,061.6 India: 2,103.6 Vietnam: 193.2	China: 14,342.9 India: 2,868.9 Vietnam: 261.9
FDI Inflows (USD billion)	China: 114.73 India: 27.42 Vietnam: 8	China: 135.6 India: 44.1 Vietnam: 11.8	China: 141.2 India: 50.6 Vietnam: 16.1
Merchandise Exports (USD billion)	China: 1,578 India: 226 Vietnam: 72	China: 2,275 India: 267 Vietnam: 162	China: 2,499 India: 324 Vietnam: 264
Manufactures Exports (USD billion)	China: 1,477 India: 138 Vietnam: 46	China: 2,143 India: 182 Vietnam: 131	China: 2,321 India: 229 Vietnam: 224
Ratio of exports of goods and services to GDP	China: 27.2% India: 22.4% Vietnam: 72%	China: 21.4% India: 19.8% Vietnam: 89.8%	China: 18.4% India: 18.4% Vietnam: 106.8%
MFN Average Tariff – Total (Non-Agriculture in brackets)	China: 9.6% (8.7%) India: 12.6% (9.8%) Vietnam: 9.8% (8.7%)	China: 9.9% (9%) India: 13.4% (10.1%) Vietnam: 9.5% (8.4%)	China: 7.6% (6.5%) India: 17.6% (14.1%) Vietnam: 9.6% (8.4%)

Source: UNCTAD (various World Investment Reports), WTO (https://data.wto.org/, and various World Tariff Profiles Reports) and World Bank (https://data.worldbank.org/indicator/NE.EXP.GNFS.ZS).

A noteworthy feature for India is that while the global share of its merchandise remained broadly unchanged since 2011, its global share of manufactures exports increased (Table 3.13). This was based on the performance of a number of manufactured products, whose global export share increased between 2010 and 2019. However, the data also shows that India's export share for a number of manufactured products (not shown in the Table) decreased during the previous decade.

The increase in manufactures exports for Vietnam has been much larger than for India, with a particularly large increase in two of the key areas where Vietnam focused, i.e. clothing and telecom equipment (cellular mobile phones).

Table 3.13: Share in Global Exports from India, China and Vietnam for Selected Product Categories (%)

	India				China				Vietnam			
Category	**2010**	**2015**	**2019**	**2020**	**2010**	**2015**	**2019**	**2020**	**2010**	**2015**	**2019**	**2020**
Merchandise	1.5	1.6	1.7	1.57	10.3	13.7	13.2	14.74	0.5	1.0	1.4	1.61
Manufactures	1.4	1.6	1.8		14.8	19.1	18.2		0.5	1.2	1.75	
Iron & Steel	2.5	2.2	2.9		9.4	16.8	13.2		0.3	0.7	1.2	
Chemicals	1.4	2.0	2.4		5.2	7.0	7.3		0.1	0.2	0.3	
Office & Telecom Equipment	0.2	0.1	0.3		27.8	34.0	31.7		0.4	2.7	4.6	
Transport Equipment	0.9	1.1	1.2		5.7	6.0	5.8		0.1	0.2	0.2	
Textiles	5.1	6.0	5.6		30.4	37.8	39.2		1.2	2.0	3.0	
Clothing	3.2	4.0	3.5		36.6	38.5	30.7		2.9	4.8	**6.3**	

Source: WTO

Note: For 2020, estimates are available only for merchandise exports.

India's trade deficit compared to China and Vietnam: The objective of trade deficit encompasses within it the twin objectives of reducing imports and increasing exports. The use of tariffs by India focuses on reducing imports, and attracting FDI to improve domestic production and export capacity by increasing the links with GVCs. India is a high tariff economy and the focus on raising tariffs has increased since 2018. It is useful to consider the comparative experience of India, China and Vietnam, the latter two economies with relatively lower average tariffs.

Table 3.14 shows the levels of exports and imports in 2010 and 2019 for India, China and Vietnam. Each country registered an increased in its levels of exports and imports during this period. A very large increase took place in exports and imports of China. Both exports and imports of Vietnam increased more than that for India, together with a higher participation of Vietnam in GVCs.[108] Both China and Vietnam, with relatively lower tariffs have achieved the objective of increasing exports better than India.

Table 3.14: Exports and Imports in 2019 compared with 2010 (USD billion)

	India 2010	**India 2019**	**China 2010**	**China 2019**	**Vietnam 2010**	**Vietnam 2019**
Merchandise Exports	226.4	324.3	1,577.8	2,499.5	72.2	264.3
Merchandise Imports	350.2	486.1	1,396.2	2,078.4	84.8	253.4
Manufactures Exports	138.0	229.4	1,476.5	2,320.9	46.2	223.6
Manufactures Imports	157.4	240.2	894.3	1,240.5	61.1	198.3

Source: WTO.

[108] See the information on backward and forward participation in GVCs at https://stats.oecd.org/Index.aspx?DataSetCode=TIVA_2018_C1

An important concern of India is to reduce the trade deficit. Table 3.15 shows the level of trade surplus or deficit in 2019 compared to that in 2010,for merchandise and manufactures trade. China had a large surplus in both merchandise and manufactures trade. Vietnam was able to convert its trade deficit in 2010 into a trade surplus by 2019. India has had a different experience. Its merchandise trade deficit in 2019 was more than in 2010; India's manufactures trade deficit was lower in 2019 compared to 2010.

Table 3.15: Comparison of Merchandise and Manufactures Trade Deficit/Surplus in 2019 with Trade Deficit/Surplus in 2010

	Merchandise Trade Surplus/Deficit	Manufactures Trade Surplus/Deficit
India	In 2019, Trade Deficit was USD 161.7 billion, In 2010, Trade Deficit was USD 123.9 billion	In 2019, Trade Deficit was USD 10.7 billion, In 2010, Trade Deficit was USD 19.4 billion
China	In 2019, Trade Surplus was USD 421.1 billion, In 2010, Trade Surplus was USD 181.5 billion	In 2019, Trade Surplus was USD 1.08 trillion, In 2010, Trade Surplus was USD 582.2 billion
Vietnam	In 2019, Trade Surplus was USD 10.9 billion, In 2010, Trade Deficit was USD 12.6 billion	In 2019, Trade Surplus was USD 25.3 billion, In 2010, Trade Deficit was USD 14.9 billion

Source: Based on data from WTO.

A more disaggregated product level data shows the developments in greater detail. India has registered a merchandise trade deficit every year from 2010 to 2019 (Table 3.16). For three years during that period, however, India had a surplus on its manufactures trade. These years were not the ones when India decided to increase tariffs in a major way. For instance, in 2018, when India decided to increase its tariffs significantly, there was an increase in its deficit. In the subsequent year, 2019, there was a reduction in deficit, but no surplus on trade was achieved. In contrast, Vietnam has registered a surplus each year since 2016, and this surplus has increased annually in that period. Such a consistent direction of change is not evident for India during the previous decade.

Table 3.16: Merchandise and Manufactures Trade Deficit/Surplus of India and Vietnam, 2010 to 2019 (USD billion)

	Merchandise Trade Deficit/Surplus		Manufactures Trade Deficit/Surplus	
	India	Vietnam	India	Vietnam
2010	-123.9	-12.6	-19.4	-14.9
2011	-161.6	-9.8	-7.6	-11.8
2012	-192.9	**0.75**	-8.2	-5.3
2013	-150.5	0.0	**6.9**	-3.5
2014	-140.2	**2.4**	**12.5**	**0.28**
2015	-126.2	-3.5	-5.6	-1.2
2016	-97.1	**1.8**	**0.062**	**5.1**
2017	-150.7	**2.1**	-17.6	**7.9**
2018	-189.7	**6.8**	-23.1	**20.8**
2019	-161.8	**10.9**	-10.7	**25.3**

Source: WTO

Note: Trade Surplus is highlighted.

Table 3.17 takes a more disaggregated look at the deficits in different product categories in 2019. India's position in global markets is stronger than Vietnam's in pharmaceuticals, transport equipment (including automotive products), and textiles. Vietnam has a larger presence in areas of clothing, telecommunications equipment, electronic data processing, and office equipment. Vietnam has come up in these sectors with the help of its coherent policy approach and attracting FDI, especially focused on global or lead firms which manage the GVC and its links with global markets.[109] It has done so with subsidy support to firms and through facilitation of trade and investment. India has more recently begun to attract global firms through its structured subsidy scheme (e.g. PLI), but needs to work much more on the issues highlighted in the sections on NTMs and Trade Facilitation.

Table 3.17: Trade Surplus/Deficit for Selected Product Categories, 2019 (USD billion)

	China	India	Vietnam
Merchandise Trade	421.1	-161.8	10.4
Manufactures Trade	1,080.5	-10.7	25.3
1. Chemicals	-57.5	-6.4	-23.1
1.a. Pharmaceuticals	-18.4	13.4	-3.5
2. Machinery and Transport Equipment	408.8	-47.6	5.7
2.a. Office and Telecom Equipment	178.8	-38.3	28.9
2.a.i. Electronic Data Processing and Office Equipment	143.0	-18.2	8.6
2.a.ii. Telecommunications Equipment	231.8	-6.8	41.2
2.a.iii. Integrated Circuits and Electronic Components	-195.9	-13.3	-20.9
2.b. Transport Equipment	158.6	10.9	-4.0
2.b.i. Automotive Products	-207.2	8.8	-4.7
3. Textiles	103.9	12.6	-8.2
4. Clothing	142.6	15.8	30.0

Source: WTO
Note: Negative number shows trade deficits.

One important indication from the discussion above is that high tariffs per se would not lead to higher exports or an increase in the links with GVCs. In fact, for a large country like India, an increase in tariffs provides an incentive to sell in the domestic market, and the adverse impact of tariffs on efficiency creates an additional disadvantage for increasing exports in a highly competitive global market.

Further, data on India's trade and tariffs show that there is no consistent link between tariffs and exports or imports, both at the aggregate level (Table 3.18) and for specific product categories based on more detailed assessment.[110] Exports in certain years prior to 2018 have been higher than in the recent past. Imports have fallen in years prior to the recent past when tariffs were comparatively lower. Certain years of relatively lower tariffs recorded manufactures trade surpluses and deficits.

[109] See page 6 of https://icea.org.in/wp-content/uploads/2021/02/DisabilityReport.pdf

[110] The analysis of trade and tariffs for more specific product categories shows a similar lack of close links based on trade data at greater detail and the evolution of tariffs shown by various tariff notifications by the Government of India's tariff schedules.

One implication of this information is that factors other than tariffs have a significant impact on exports and imports. They include inter alia FDI, ease of doing business, subsidy policies, and a focus on large firms that are "lead firms" in GVCs. A useful way to consider these factors would be to focus on them within a framework of those initiatives which would increase India's competitiveness.

Table 3.18: India's Exports, Imports and Trade Surplus/Deficit, and Average MFN Tariffs

	Exports		Imports		Surplus/Deficit		
Year	**Merch.**	**Mfrs.**	**Merch.**	**Mfrs.**	**Merch.**	**Mfrs.**	**Simple Average MFN Tariff**
2001	0.043	0.033	0.0504	0.0221	-0.007	0.0106	32.2% (for 2001/02)
2005	0.0996	0.709	0.143	0.0672	-0.043	0.004	19.2%
2009	164.9	113.3	257.2	127.2	-92.3	-13.9	12.9%
2010	226.4	138.0	350.23	157.4	-124.0	-19.4	12.6%
2011	302.9	184.3	464.5	191.5	-162.0	-7.2	Not Available
2012	296.8	180.1	489.7	188.3	-193.0	-8.2	13.7%
2013	314.8	187.9	465.4	181.0	-151.0	6.9	13.5%
2014	322.7	198.7	462.9	186.2	-140.2	12.5	13.5%
2015	268.0	181.6	394.1	187.2	-126.1	-5.6	13.4%
2016	264.5	186.1	361.7	186.0	-97.1	0.06	13.4%
2017	299.2	205.0	449.9	222.7	-150.7	-17.7	13.8%
2018	324.8	223.3	514.4	246.4	-189.6	-23.1	17.1%
2019	324.3	229.4	486.1	240.1	-161.8	-10.7	17.6%

Source: WTO (https://data.wto.org/; and WTO Secretariat's Trade Policy Reports.

Note: (1) Numbers have been rounded up; (2) Tariff estimate for 2001/02 is from WTO's Trade Policy Review of India, Secretariat Report; (3) Negative number shows trade deficit.

3.8 Competitiveness is Important for Sustaining the Achievement of Trade-Related Objectives

Competitiveness is the key to sustaining the achievement of the trade-related objectives of India. In this context, it is worthwhile to consider the global share of India in merchandise exports (Table 3.19). Since 2011, India's global merchandise exports share has fluctuated between 1.6% (2012) and 1.7% (2014).

Table 3.19: India's Share in Global Merchandise Exports, Imports, and Trade Surplus/Deficit

Merchandise	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020***
Exports	1.31%	1.48%	1.65%	1.60%	1.66%	1.70%	1.62%	1.65%	1.69%	1.66%	1.71%	1.57%
Imports	2.02%	2.27%	2.52%	2.62%	2.45%	2.43%	2.36%	2.23%	2.50%	2.59%	2.52%	2.09%
Surplus/Deficit (USD bn)	-92.0	-124.0	-162.0	-193.0	-151.0	-140.0	-126.0	-97.0	-150.0	-190.0	-162.0	-95.7
Manufactures												
Exports	1.35%	1.38%	1.60%	1.57%	1.58%	1.62%	1.62%	1.69%	1.71%	1.72%	1.80%	N.A.
Imports	1.46%	1.52%	1.59%	1.57%	1.46%	1.46%	1.56%	1.57%	1.71%	1.76%	1.75%	N.A.
Surplus/Deficit (USD bn)	-13.9	-19.4	-7.2	-8.2	6.9	12.5	-5.6	0.06	-17.7	-23.1	-10.7	-13.9

Source: WTO
Note: * = 2020 was an exceptional year due to the impact of Covid-19.
Figures have been rounded up.

Earlier, between 2001 and 2010, India's global export share increased significantly, for a period when there was a sharp fall in India's average MFN tariffs (Table 3.20); in 1990, India's global export share was 0.52% which increased to 0.7% by 2001 and then achieved a rapid increase to 1.65% by 2011. Significantly, this was also a period of major increase in oil prices, with the crude oil price increasing by about 4.2 times between 2001 and 2008. Moreover, this period includes the global economic-financial collapse that took place in 2008-09, slowing down the world economy and demand for global exports and imports.[111] These developments had a major impact on India's trade deficit.

Table 3.20: India's Share in Global Exports, Imports, Surplus/Deficit, and Average MFN Applied Tariffs for Selected Years

Merchdse	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Exports	0.70%	0.79%	0.78%	0.83%	0.95%	1.00%	1.07%	1.21%	1.31%	1.48%
Imports	0.79%	0.85%	0.93%	1.05%	1.33%	1.44%	1.61%	1.95%	2.02%	2.27%
Surp/Def (USD bn)	-7.03	-7.27	-13.50	-23.13	-43.25	-56.60	-79.21	-126.20	-92.29	-123.88
Manufrs.										
Exports	0.73%	0.79%	0.82%	0.84%	0.97%	0.97%	0.98%	1.08%	1.35%	1.38%
Imports	0.47%	0.56%	0.62%	0.68%	0.88%	0.96%	1.02%	1.28%	1.46%	1.52%
Surp/Def (USD bn)	10.69	9.95	9.93	8.56	3.66	-2.91	-8.45	-26.03	-13.86	-19.43

	1990/91	2001/02	2005	2007	2008	2009	2010
Avg. MFN Applied Tariff	125%*	32.2%*	19.2%	14.5%	13%	12.9%	12.6%

Source: WTO.

Note: (1) * = This estimate is from WTO Secretariat's Trade Policy Reviews of India published in 1998 and 2002; (2) Among other changes, a major oil price rise took place between 2001 to 2010 -- average annual price for crude oil increased from about USD 22 per barrel in 2001 to about USD 24, 28, 36, 49, 59, 67, 92, 59 and76, respectively, per barrel in the years from 2002 to 2010.

This again shows that tariffs per se do not have a close link with export performance. One reason for this is that high tariffs lead to inefficiencies and drag the competitiveness down.

It is noteworthy that in the past decade, the global import share of India has also increased significantly. This could be both due to the requirements of India's growth and exports, as well as relatively greater competitiveness of others (particularly China) from where India imports many of its requirements.

Need to Recognise that Different Policies have Different Impacts on Competitiveness: An important point to bear in mind is that any policy which reduces competitiveness will not lead to sustaining an increase in exports, a decrease in imports, or in improving links to GVCs over time.

An important point that is often overlooked in this context is the importance of scale of operations for creating stronger competitiveness. A policy which creates inefficiencies and consequently lowers exports will in many cases lead to a comparatively lower scale of operations. This in turn leads to lower competitiveness, resulting in further knock-on negative effects on exports, scale and competitiveness. Table 3.21 shows that different policies do not have similar effects on these objectives, including competitiveness.

[111] In 2009, global merchandise exports and imports fell, respectively, by -12% and -12.9%. See https://www.wto.org/english/news_e/pres12_e/pr658_e.htm

Table 3.21: Impact of Tariffs and Subsidies on Selected Objectives of Atmanirbhar Bharat

Policy Measure	Reduces	Increases	Impact on Competitiveness
Tariff →	Imports	Domestic price, Domestic output	Reduces competitiveness → Reduces ability to export, Reduces possibility of large-scale investment
Subsidy →	Imports, Domestic price	Domestic output	Increases competitiveness → (a) Increases ability to export, (b) Increases possibility of large-scale investment

Conclusions

This chapter discussed the main trade policies used by India, broadly classified as tariffs, non-tariff measures (mainly standards), trade facilitation and subsidies. It shows that India is a relatively high tariff and low non-tariff measures country. Both tariffs and non-tariff measures have become more restrictive in recent years. It makes the point that restrictive trade policies introduce inefficiency in domestic production, thus adversely affecting competitiveness. This adversely affects exports, links to GVCs, and import competitiveness. This can be indicated for instance by the evolution of India's export and import shares in global trade. India's global export shares have ranged between 1.6% and 1.7% since 2011, and import shares between 2.2% and 2.5%. The sharp increase in export share in the previous decade of 2001-10 has not repeated itself in the decade of 2011-20. In this context, the chapter also notes that any policy which reduces exports would in many cases limit the scale of operations, thus adversely affecting competitiveness in many sectors. Further, with a relatively high tariff regime, India would be at a disadvantage when entering into FTAs. Meanwhile, India's competitor countries are going ahead with their FTAs, creating an advantage for their exporters and driving export market share away from India.

To the extent that tariffs are being used to encourage FDI and domestic investment, trade restrictive schemes must be recognised as, inter alia, adversely affecting competitiveness. Competitiveness is at the heart of the ability to achieve and sustain several objectives of Atmanirbhar Bharat. This is evident from the experience of China and Vietnam compared to India. Both these countries register trade surpluses, with Vietnam converting its trade deficit into a surplus over the last decade. India remains with a trade deficit which is a major area of concern for its policy-makers. Moreover, India's middle class will continue to grow in the future with its rising demand adding to import requirements unless met domestically by competitive production. Since tariffs are being justified on the grounds of creating domestic investment and production opportunities, it is essential to realise the attendant lack of competitiveness would tend to negate the short-term perceived benefit of higher domestic production. Therefore, if used, restrictive trade policies should be time-bound and temporary, so as to bring in competitive pressures to incentivise greater competitiveness.

This chapter has also illustrated the differential impact of policies, e.g. a comparison of tariffs and subsidies. India has initiated a structured subsidy programme under its Production Linked Incentive (PLI) schemes. This initiative focuses on a better policy than raising tariffs, but this too can disincentivise an increase in productivity and competitiveness. To that extent, subsidies too should be time-bound and temporary. India's PLI scheme does incorporate such time limits for the subsidy support.

Trade facilitation is a policy with beneficial effect for all objectives of Atmanirbhar Bharat, through its impact on competitiveness, enhancing the ability to create better capabilities for accessing both domestic and export markets, and to improve links with GVCs. Trade facilitation is an areas of special focus of India, and the

country is making steady progress in improving its operational conditions. However, to give more focus to these efforts, it is important to not only compare the country's performance on a global scale but also in terms of key comparator economies. This chapter shows that India needs to improve in certain specific areas where it is in the last quartile of the smaller group of comparator economies. The chapter has identified those areas for such a focus, together with identifying certain components of export facilitation to enable a more competitive performance in exports as well.

This chapter also provides an overview of the main trade policy objectives of China, EU, India, US and Vietnam to illustrate both similarities and differences in the approaches of these economies. The experience with Covid-19 has changed the policy orientation and risk-awareness in several economies. Efforts are being made to reduce reliance on single sources as the major provider of inputs, especially for strategic products. Moreover, greater scrutiny of investment has begun across nations in general and within major economies in particular. Partnerships for diversification of sources for inputs and enhanced supply chain opportunities are seen as a new emphasis for increasing the resilience of supply chains. Thus, diplomacy and coalition-building are now an important part of the trade policy tool box.

Another important point which cannot be over-emphasised is that the impact of good policies can be completely lost if they are not efficiently and effectively implemented. Industry feedback suggests that there is a particular need to address the area of policy implementation, including making sure that if more than one agency is involved in implementation of a specific policy they do not create confusion or difficulties by adding cumbersome procedures and duplication of approval criteria.

► Chapter 4

Trade Policy Approaches of Major Economies: China, EU and the US

Introduction

Trade policy engagements and trading conditions have changed in a major way since 23 March 2018,[112] when the US imposed its tariffs on aluminium and steel from China and a number of other countries including India. The subsequent bilateral engagement of US and China have impacted global trade and investment conditions. Tariffs imposed by both economies, some retaliatory tariffs by others, and the experience with Covid-19,[113] shrank market access opportunities. This in turn affected investment levels and international firms sought new destinations for their FDI, and alternative ways to increase resilience of their supply chains. Global economic and political interactions are increasingly becoming divided between large industrial economies, on the one side, and China, on the other. The latest examples of this are the recent Declaration by the G7 Ministers which has a section focused on China,[114] and the tensions between EU and China. China, on its part, is developing its own strategies to address this emerging scenario.[115]

This chapter looks in greater detail at the trade and investment policies in the largest economies in the world, i.e. China, EU and the US. The discussion shows some major changes in the global economic system

[112] https://www.china-briefing.com/news/the-us-china-trade-war-a-timeline/

[113] See, for example, https://www.un-page.org/Policy%20Responses; https://www.apec.org/Measures-Related-to-Coronavirus;https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-Covid-19;https://www.wto.org/english/tratop_e/covid19_e/trade_related_support_measures_e.htm; https://www.unescap.org/sites/default/d8files/knowledge-products/Afghanistan_COVID%20Country%20profile%20041120.pdf; https://home.kpmg/xx/en/home/insights/2020/04/european-union-government-and-institution-measures-in-response-to-covid.html; https://home.kpmg/xx/en/home/insights/2020/04/government-response-global-landscape.html; https://investmentpolicy.unctad.org/investment-policy-monitor; https://www.un.org/ldcportal/ilo-country-policy-responses-to-Covid-19/

[114] https://eeas.europa.eu/headquarters/headquarters-homepage_en/97842/G7%20Foreign%20and%20Development%20Ministers%E2%80%99%20Meeting:%20Communiqu%C3%A9

[115] See https://cdn.odi.org/media/documents/odi_economic_pulse_1_v6.pdf

and trade and investment policy tool-box used by major economies (section 4.1). Policies of China, EU, and the US will have a major impact on global market conditions, thus affecting the conditions which India will have to face in the next few years.[116] The trade and investment policy approaches in these economies are discussed in sections 4.2 to 4.4. Section 4.5 concludes the discussion.

4.1 A Changing World Economy

4.1.1 US tariff actions increased risks and created negative impact on trade and output:

Strong US action against China increased uncertainty in the global trading system, affecting both exporters and importers across countries. The largest impact of these bilateral tariff increases is on the exporters and importers of the US, followed by China, Japan and the EU (Tables 4.1 and 4.2). It is noteworthy (and expected) that the importers from the US have a larger burden due to this uncertainty compared to US exporters. The Chinese exporters face an opposite situation because of the US trade restrictions, as do Indian exporters. The policies of the new administration suggest that the tension and uncertainty is likely to continue, resulting in a sustained impact on the additional costs imposed by this situation.

Table 4.1: Exporters from Selected Areas/Countries: Increase in trade weighted averages of ad valorem equivalent (AVE) and fixed cost equivalent (FCE) trade cost because of trade policy uncertainty (TPU)

	Low TPU Situation Average AVE / FCE Per EXPORTER		High TPU Situation Average AVE / FCE Per EXPORTER	
	AVE (%)	FCE (%)	AVE (%)	FCE (%)
Global average	1.5	11.1	3.1	32.1
USA	6.1	42.6	13.8	138.0
China	2.1	19.4	3.9	48.7
Japan	3.0	26.4	3.9	43.7
EU28	1.2	9.3	3.0	33.7
Other Developed Countries	1.2	7.5	2.2	14.5
India	0.7	3.6	1.7	10.2
Latin America	0.9	4.5	1.6	8.3
Middle East	0.2	1.4	0.5	4.0
Rest of World	0.3	1.0	0.7	3.9
Sub-Saharan Africa	0.2	1.3	0.7	3.5
ASEAN	0.1	0.7	0.3	2.1
Other Asia	0.2	0.9	0.3	2.0

Source: Table 4 of https://www.wto.org/english/res_e/reser_e/ersd202004_e.pdf

Notes: (1) Economies are ranked in the Table based on the FCE estimates for High TPU situation; (2) High TPU = A situation when market participants expect both an increase in trade costs between all trading partners and an additional increase in trade costs for trade with the US; (3) Low TPU = Increase in trade costs only vis-à-vis the United States.

[116] See, for example, https://voxeu.org/article/emerging-markets-amid-us-and-china-cross-currents

Tables 4.1 and 4.2 show estimates of costs due to the trade policy uncertainty created under this situation. Two versions of the costs are shown, one in terms of ad valorem equivalent (AVE) and another in terms of fixed cost equivalent (FCE). These estimates show the likely increase in costs under trade policy uncertainty (TPU) situations, both low and high TPU situations. The actual costs are likely to be within this range. In 2020, these estimates were further compounded due to the uncertainty and perceived risks on account of the GVC disruptions caused by Covid-19.

Table 4.2: Importers in Selected Areas/Countries: Increase in trade weighted averages of ad valorem equivalent (AVE) and fixed cost equivalent (FCE) trade cost because of increased trade policy uncertainty (TPU)

	Low TPU Situation Average AVE / FCE Per IMPORTER		High TPU Situation Average AVE / FCE Per IMPORTER	
	AVE (%)	FCE (%)	AVE (%)	FCE (%)
Global average	1.5	11.1	3.1	32.1
USA	7.7	61.3	14.5	159.9
China	1.3	10.1	2.7	23.9
EU28	0.5	4.0	1.8	21.3
Japan	0.8	5.3	2.6	19.3
Other Developed Countries	1.2	6.8	2.1	12.9
Latin America	0.6	2.9	1.2	6.4
Middle East	0.2	1.1	0.5	3.0
Rest of World	0.1	0.5	0.4	2.6
India	0.1	0.3	0.4	2.3
Sub-Saharan Africa	0.1	0.5	0.3	1.5
ASEAN	0.1	0.4	0.2	1.3
Other Asia	0.1	0.5	0.3	1.8

Source: Table 4 of https://www.wto.org/english/res_e/reser_e/ersd202004_e.pdf

Notes: (1) Economies are ranked in the Table based on the FCE estimates for High TPU situation; (2) High TPU = A situation when market participants expect both an increase in trade costs between all trading partners and an additional increase in trade costs for trade with the US; (3) Low TPU = Increase in trade costs only vis-à-vis the United States.

4.1.2 Other salient trade and investment policy actions

China, EU and the US focus on facilitation of trade and investment, particularly as a response to the difficulties arising due to Covid-19. China and the EU do not rely on tariffs increases to raise FDI, but the US has done so in certain cases. China and the EU have historically relied quite extensively on non-tariff measures (NTMs), and the use of these NTMs as trade barriers seem to have increased more in the case of China but also to some extent by the EU. As a result of NTMs acting as a barrier, one estimate of openness of goods trade (shown below) has found that China's goods imports have faced increasing restrictions even though China's tariffs have declined in the past several years.

The investment regulatory regime for China is more restrictive than the EU and the US, and thus more facilitating policies have to be implemented by China whenever it liberalises the policy regime. China has encouraged foreign investment in an increasing number of targeted sectors through its lists of sectors opened up for FDI at the national and regional level. These policies include both facilitation as well as financial support policies.

Nonetheless, all the three major economies have instituted screening of foreign investment, and they are all concerned about the security and resilience of their value chains. The concerns in the case of EU and US are primarily due to China's dominance as a supplier of critical materials and minerals, while China's concern is more due to the current and likely future adverse trade and investment policy initiatives taken by its major trading partners, particularly the US. All three give major emphasis to increasing domestic production/ investment in general and in particular for strategic sectors, including for Covid-19-related products. This emphasis includes improving resilience of domestic value chains and a focus on building domestic capabilities to be more self-sufficient in some key strategic areas (such as pharmaceuticals, defence production, and new technologies).

China has traditionally looked toward global markets to gain markets but has also begun to emphasise its domestic market in view of the increasing global tensions. The EU emphasizes both additional markets and developing new regulatory regimes that will create a stable and predictable level playing field in global markets. The objective in particular is to address concerns regarding China's subsidies and other trade and investment-related policies (IPR, competition policy, state enterprise sector). The US combines these two objectives, by making efforts to open other markets for its exporters, building a new trade regulatory system mainly through FTAs and to some extent within the WTO. In the US, the FTAs are now increasingly being considered as instruments for building coalition partners and groups with connected economic interests as part of a larger initiative to build allies that will help it challenge China on the global stage. In the EU and US, such partnerships are considered as instruments for developing predictability and stability of the rules that determine trade and investment conditions.

All three major economies focus on improving technological capabilities of their producers, especially for new technologies. These technologies will fundamentally change the operational conditions and competitiveness in the future. They recognise the role of technology for maintaining and improving competitiveness. In this context, the US is taking a particularly strong position by limiting the access of Chinese companies to its technologies, and building coalitions to develop alternative sources of key inputs in the areas of electronics, medical products, and defence-related products.

Thus, a number of the significant policy objectives/concerns of these major economies are similar to those emphasised by India. There are, however, some differences. India relies relatively more on tariffs and less on NTMs. All three develop their policy responses after conducting detailed strategic evaluation of the issues, backed by information, detailed analysis, and interaction with stakeholders. This strategic evaluation takes account of the supply chains involved, the reliability and predictability of access to inputs and technological capabilities, and the time profile of the policy steps required to bring about effective change. China tends to have a longer-term perspective and also uses in a more systematic manner its outward FDI for strategic gains. However, the policy evaluations by EU and the US also have a considerably long-term perspective. Both take a major interest in developing economic linkages through FTAs, and China has now begun to take a greater interest in being part of FTAs. The prevailing technological capabilities in these economies are much deeper and more extensive than India, and thus they can initiate their engagement from a higher point in the value chain and capability levels. Though at a stronger position in the value chains, each of them give major emphasis to maintaining and increasing competitiveness, both at present and in the future.

4.2 China

China is a major economy at the centre of several GVCs. China's trade and investment policies provide some interesting insights. One, the openness of trade and investment policies have followed different trajectories,

with investment conditions becoming more open over time. Within trade, the situation is mixed for different categories of trade policy, as discussed below.

At present, with trade tensions and the impact of Covid-19, China has developed a dual strategy under its 14th Five Year Plan (FYP) for 2021-25, emphasising both "external circulation" (accessing global demand and foreign capital and technology) and "internal circulation" (stocking domestic demand and domestically developed technology).[117] China aims to create more open markets through trade agreements, particularly with regional partners; after RCEP, it has begun to show an interest in the Comprehensive and Progressive Trans Pacific Partnership (CPTPP). It wants to reduce its reliance on foreign technology (thus focusing on growth of domestic technologies and innovation), and increase the role of domestic consumption in its growth process. In this process, China aims to give greater stability to its supply chains (including for domestic production and trade), and increase its domestic capabilities to reduce risks, uncertainty, and trade tensions abroad. At the same time, China is creating much more open conditions for FDI, to sustain its momentum and maintain its links with global markets.

4.2.1 China's Trade Policy

While China's tariffs have decreased somewhat over time, its non-tariff measures (NTMs) have been quite pervasive. The impact of NTMs cannot be ascertained only by the number of measures but also requires a consideration of the actual practice in implementing the NTMs. An index of the openness of China's trade for goods and services that tracks the qualitative direction and extent of liberalisation (openness to imports) shows a mixed picture.[118] The index is developed for this exercise taking as a starting point the period just before China's Third Plenum of the Party Central Committee in November 2013, i.e. for the fourth quarter of 2013 the index is taken as 100. Table 4.3 below provides an overview since the second quarter of 2015, with a more complete coverage from 2018 onwards. The indices show that China has followed different trajectories for trade in goods and trade in services. Goods imports in China have become less liberal over time, while services imports were less open for several years but have now become as open as in end 2013.

Table 4.3: Estimated Index of Trade Liberalisation, Second Quarter 2015 to Second Quarter 2020 (Fourth Quarter 2013 = 100)

	2Q 2015	4Q 2015	2Q 2016	4Q 2016	2Q 2017	4Q 2017
Goods	91.1	83.9	80.2	80.7	85.5	87.0
Services	94.1	87.6	91.9	94.3	94.8	93.5
	1Q 2018	**2Q 2018**	**3Q 2018**	**4Q 2018**	**1Q 2019**	**2Q 2019**
Goods	86.4	86.9	88.5	85.5	83.9	81.1
Services	93.4	94.1	95.1	95.8	95.9	95.7
	3Q 2019	**4Q 2019**	**1Q 2020**	**2Q 2020**		
Goods	77.4	77.9	77.1	75.4		
Services	97.0	97.1	98.8	100.8		

Source: https://chinadashboard.gist.asiasociety.org/winter-2021/page/trade

[117] For more detail, see https://chinadashboard.gist.asiasociety.org/winter-2021/page/trade

[118] See https://asiasociety.org/policy-institute/executive-summary-third-plenum-roadmap

***Tariffs**:* China reduced its tariffs after 2013 and the average MFN tariffs went down in 2019, by almost one-quarter of its level in the previous year, to reach 7.6% (Table 4.4 below).[119] During 2020, China has focused in particular on trade facilitation, including through tariff reduction for products important for meeting the demand of consumers and the import of goods associated with Covid-19 products. In 2020, China's most-favored-nation (MFN) tariffs are lower than the previous year "for over 850 commodities".[120] The aim is to "introduce or reduce the provisional import tax rates on products … that are relatively scarce in the country or have foreign characteristics to better meet people's needs".[121]

Table 4.4: China - Simple Average MFN Applied Tariffs (%)

	Agriculture	Non-Agriculture	Total
2010	15.6	8.8	9.7
2011	15.6	8.7	9.6
2012	Not available	Not available	Not available
2013	15.6	9.0	9.9
2014	15.2	8.6	9.6
2015	15.6	9.0	9.9
2016	15.5	9.0	9.9
2017	15.6	8.8	9.8
2018	15.6	8.8	9.8
2019	13.9	6.5	7.6

Source: WTO, World Trade Profile reports for the years 2014 to 2020.

Nonetheless, as shown in Table 4.3 above, the index for trade openness shows that overall the trading system became more restrictive. This could be attributed to China's non-tariff barriers to trade that seem to have become more severely binding according to the index, and to the tariffs being increased in a selective, non-MFN manner for most imports from the US in retaliation to the US's actions.[122]

Non-Tariff Measures (NTMs):

Three different estimates of the incidence of NTMs applied by selected countries are shown in Table 4.5 below. China applies a relatively large number of non-tariff measures.[123] One assessment of China's policies states that it has used "an unlimited array of administrative interventions as coercive, informal tools of statecraft. Despite China's claims to the mantle of trade liberalisation leadership, our indicators show openness in non-

[119] For example, see page 157 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV23.pdf&Open=True

[120] http://www.chinatax.gov.cn/eng/c101269/c5142185/content.html

[121] Ibid.

[122] For examples of some tariff increases and import licensing, see pages 181 and 182 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV23.pdf&Open=True

[123] However, non-tariff measures such as health and safety standards are required to meet specific national objectives. These non-tariff measures become non-tariff trade barriers depending on the nature of their application by the implementing authorities.

strategic, highly protected goods categories has only decreased since 2013."[124] The higher NTMs in each category are highlighted below.

Table 4.5: Incidence of Non-Tariff Measures of Selected Countries

	Prevalence Score (see Note 1)		Prevalence Score
China	**6.8**	**Singapore**	2.6
European Union	**6.3**	**Thailand**	2.1
India	4.9	**USA**	4.1
Indonesia	3.0	**Vietnam**	**5.0**
	Frequency Index (see Note 2)		**Frequency Index**
China	**90%**	**Singapore**	47%
European Union	**92%**	**Thailand**	28%
India	47%	**USA**	**77%**
Indonesia	**61%**	**Vietnam**	**89%**
	Coverage Ratio (see Note 3)		**Coverage Ratio**
China	**92%**	**Singapore**	60%
European Union	**89%**	**Thailand**	38%
India	69%	**USA**	**83%**
Indonesia	**70%**	**Vietnam**	**92%**

Source: https://unctad.org/topic/trade-analysis/non-tariff-measures/NTMs-data

Notes: (1) Prevalence score is the average number of NTMs applied to imported products; (2) Frequency index indicates the percentage of imported products to which NTMs apply; (3)Coverage ratio measures the percentage of trade subject to NTMs.

The actual incidence of these measures depends on their application, which in China's case further increases the adverse impact of NTMs.[125]

Trade Facilitation:

A major focus of China has been on facilitation, particularly as part of investment promotion to improve its domestic technological base and competitive ability in global trade. China organises its trade facilitation programmes at three levels. First, at the general level with its regulations and practices that apply to all sectors, captured by general indicators such as in Table 4.6 below. Second, special treatment for specific targeted sectors, for which improved trade facilitation is provided. Third, even better and more focused trade facilitation and incentives are provided to specific targeted global and domestic firms. Its performance is amongst the highest for advance rulings and fees and charges (i.e. most facilitative) and amongst the lowest for procedures, information availability, and external border agency co-operation. It is noteworthy that among the comparator countries, only India ranks below China for procedures. It is in these areas that it compensates and provides facilitation by focusing on specific sectors and large global firms, which are given quicker and more substantive support.

[124] https://chinadashboard.gist.asiasociety.org/winter-2021/page/trade

[125] See, for example, https://www.macmap.org/en/covid19

Table 4.6: Comparison of China's Trade Facilitation Performance Index with Selected Economies

Policy Area	China's Rank Among Selected Economies (including China)	Economy ranked below China (or same rank as China)
Average TFP Index	6th out of 12 economies	India, Indonesia, Malaysia, Mexico, Thailand, Vietnam
A-Information availability	9th out of 12 economies	Malaysia, Mexico, Thailand
B-Involvement of the trade community	5th out of 12 economies	Indonesia (same rank: Germany (EU))
C-Advance rulings	1st out of 12 economies	Australia, Germany (EU), India, Indonesia, Mexico, Thailand, US (same rank: Malaysia, Singapore, Vietnam)
D-Appeal procedures	6th out of 12 economies	Canada, India, Indonesia, Mexico (same rank: Malaysia, Vietnam)
E-Fees and charges	2nd out of 12 economies	Australia, Canada, Germany (EU), India, Indonesia, Malaysia, Mexico, Thailand, US, Vietnam (same rank: Singapore)
F-Documents	8th out of 12 economies	India, Indonesia, Malaysia (same rank: Mexico)
G-Automation	8th out of 12 economies	Indonesia, Malaysia, Vietnam
H-Procedures	11th out of 12 economies	India
I-Internal border agency cooperation	8th out of 12 economies	Indonesia, Malaysia, Thailand (same rank: Vietnam)
J-External border agency co-operation	10th out of 12 economies	(same rank: Malaysia, Vietnam)
K-Governance and impartiality	7th out of 12 economies	India, Indonesia, Malaysia, Thailand, Vietnam

Source: https://www.compareyourcountry.org/trade-facilitation?cr=oecd&lg=en

Note: The economies selected for comparison are Australia, Canada, China, Germany (EU), India, Indonesia, Malaysia, Mexico, Singapore, Thailand, US and Vietnam.

Outlook:

The approach of China is to continue to open trade in less technology-intensive sectors (particularly services),[126] rely on free-trade ports and industrial or economic zones, and continue with free-trade agreement negotiations to develop new areas of foreign trade growth. For instance, President Xi Jiping in his speech at the November 2020 China International Import Expo (CIIE) at Shanghai said that:

"China will continue to leverage the pioneering role of **pilot free trade zones and free trade ports** in steering opening up. We will introduce a **negative list for cross-border services trade and open still wider in areas like the digital economy and the Internet**. We will deepen **reform and innovation in trade and investment liberalization and facilitation,** and make **institutional innovations to support an open economy of higher standards.** …China will encourage **cross-border e-commerce** and other new business forms and models to grow even quicker to foster new drivers of foreign trade. China will **shorten its catalog of technologies prohibited or restricted from import** to create a favorable environment for the free flow of technologies

[126] For example, at the November 2020 Shanghai Import Expo, President Xi announced a new "Negative List" on cross-border services trade to improve market access. For examples of some facilitation measures and steps to liberalise services, see pages 208, 209, 218, 227, 238, 271 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV23.pdf&Open=True

across borders. …China stands ready to conclude **high-standard free trade agreements** with more countries in the world. We will work for the early signing of the Regional Comprehensive Economic Partnership (RCEP) and speed up negotiations on a China-EU investment treaty and a China-Japan-ROK free trade agreement. We look forward to more exchanges and mutual learning with **high-standard free trade zones** in other parts of the world."[127] (emphasis added)

4.2.2 FDI Policy

China has opened up FDI in several sectors since 2013,[128] moving from an approval-based system to a more liberal negative list-based approach, gradually reducing the number of restricted sectors.[129] Thus, China has been introducing step-wise reform in the area of foreign investment, especially inward FDI, reducing market access restrictions for FDI, creating a more level playing field, and promoting FDI with incentives and easier operational/establishment conditions.[130] However, compared to other major economies like the US and EU, China's FDI regime is quite restrictive.[131]

China adopted its Foreign Investment Law on 1 March 2019, which took effect on 1 January 2020.[132] Among the main issues covered by it are investment facilitation, investment incentives, and Special Economic Zones. This is an effort to give structure and focus to several initiatives taken by China to facilitate and promote FDI in the past three years.[133] China's investment-related policy steps have covered issues such as updating/simplifying negative lists for investment, further stabilisation of foreign trade and FDI regimes, regulations for pilot free-trade zones, measures for overseas transfer of intellectual property rights, rules for foreign investment in securities firms, opening up the financial sector, implementation of foreign investment law, and liberalisation of cross-border investment and trade.

Some significant initiatives: Among the more wide-ranging recent announcements was the Circular released on 12 August 2020 by the General Office of the State Council of the People's Republic of China, with 15 policies aiming to protect foreign trade entities and to keep supply chains stable against the economic fallout of Covid-19.[134] The focus is on easier provision of export credit insurance for risks that could be controlled, credit support to foreign trade firms (especially micro, small and medium enterprises), low-cost funding to foreign-funded firms, and facilitating foreign trade flows and business travel to China. Some notable parts of the policy include:

- Export credit insurance to safeguard orders, with extension of financing models and methods that provide easier financing and increase credit levels.

---

[127] https://news.cgtn.com/news/2020-11-04/Full-text-Xi-Jinping-s-speech-at-the-opening-ceremony-of-3rd-CIIE-V9kN7emGcw/index.html

[128] https://chinadashboard.gist.asiasociety.org/winter-2021/page/cross-border-investment

[129] For examples of some recent investment promotion policies, see page 194 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV23.pdf&Open=True

[130] For 2017, see https://www.lexology.com/library/detail.aspx?g=b087304f-ac10-4d00-b2bb-bcea8492ec00. For policy steps taken since January 2018, seehttps://investmentpolicy.unctad.org/investment-policy-monitor/45/china.

[131] See, for example, a comparison of China and EU Member States on pages 18 and 19 of https://www.eca.europa.eu/Lists/ECADocuments/RW20_03/RW_EU_response_to_China_EN.pdf

[132] See https://investmentpolicy.unctad.org/investment-policy-monitor/measures/3375/china-china-adopted-the-foreign-investment-law

[133] See https://investmentpolicy.unctad.org/investment-policy-monitor/45/china for the

[134] Circular on Further Stabilizing Foreign Trade and Foreign Investment. See, for example, http://english.www.gov.cn/policies/latestreleases/202008/12/content_WS5f33e19bc6d029c1c2637a2d.html and https://www.lexology.com/library/detail.aspx?g=285d74b1-56d8-4f6c-8e6f-126b63d16fe1#:~:text=On%20August%2012%2C%202020%2C%20the,to%20keep%20supply%20chains%20stable

- Establishing about 30 new pilot projects in market procurement.
- Promoting processing trade industrial parks jointly built by companies in specified regions of China.
- Additional support for labour-intensive export enterprises, including through policies such as tax and fee cuts, export credit loans and insurance, stabilisation of employment and discounts in electricity and water charges.
- Specific attention to identify and support large-scale foreign trade enterprises to address their production and operational problems, including accelerated tax returns.
- Emphasis on use of digital methods to improve performance, and using them for online exhibitions to be held by local governments and key industry associations.
- Further facilitation of customs clearance, and improving the business environment at ports.
- Key foreign investment projects over USD 100 million to be treated in the same way as a domestic investment project.
- Increasing services for specific foreign investment projects, e.g. increasing support for foreign investment projects in terms of the sea use, land use, utility usage and environment protection issues.
- Helping foreign trade firms expand clientele, improving trade facilities and services, including cross-border e-commerce platforms, cross-border logistics, and overseas warehouses.
- Encouraging foreign investors to invest in high-tech industries as well as healthcare enterprises. Facilitating the application process for high-tech enterprise certification.
- Lowering the threshold for foreign R&D centres to be eligible for preferential policies, such as preferential import tax treatment.
- Facilitating trips of foreign business persons to China, together with strict epidemic prevention and control measures in place.
- Particular focus on facilitating personnel exchanges in important business, logistics, production and technical services of foreign trade and foreign enterprises.

Examples of some recent schemes for specific locations: On 18 October 2020, the General Offices of the Chinese Communist Party Central Committee and of the State Council issued a **series of new policies under a comprehensive 2020-25 pilot plan for reforms in Shenzhen**.[135] Greater autonomy has been provided to Shenzhen under "Authorization Lists" of approved matters to be released from time to time. The first Authorization List was released on 18 October 2020,[136] and provides pilot measures for "market-oriented allocation of production factors, business environment, science and technology innovation, opening-up the market, public services, as well as environmental and urban space governance."[137] Among others, the initiatives in Shenzhen will further relax restrictions in energy, telecoms, public service, transport, education, financial services, and shipping industries. These policies for Shenzhen follow the release of a shorter FDI Negative List and draft measures, that improved foreign investor access in June 2020 to several sectors.[138] Other regional initiatives to open up investment conditions, include those announced by Shanghai.[139]

---

[135] For more detail, see https://www.lawinfochina.com/display.aspx?id=34166&lib=law and https://www.simmons-simmons.com/en/publications/ckh3kyol91xlt09693fbbkzcu/china-unveils-list-of-measures-to-facilitate-pilot-reforms-in-shenzhen

[136] https://investmentpolicy.unctad.org/investment-policy-monitor/measures/3571/china-giving-shenzhen-greater-autonomy-to-attract-investment

[137] For more detail, see https://www.simmons-simmons.com/en/publications/ckh3kyol91xlt09693fbbkzcu/china-unveils-list-of-measures-to-facilitate-pilot-reforms-in-shenzhen

[138] For more detail, see https://www.china-briefing.com/news/chinas-2020-new-negative-lists-signals-further-opening-up/ and https://www.simmons-simmons.com/en/publications/ckh3kyol91xlt09693fbbkzcu/china-unveils-list-of-measures-to-facilitate-pilot-reforms-in-shenzhen

[139] https://investmentpolicy.unctad.org/investment-policy-monitor/measures/3563/china-shanghai-adopts-new-foreign-investment-regulations

Two other important recent policies on FDI: Complementing the shortening of the negative list for FDI have been two policies announced in December 2020. One is the "New Version of Catalogue of Industries for Encouraging Foreign Investment",[140] and the other is "Measures on National Security Review of Foreign Investment".[141]

The encouraged industries have customs duty exemption for import of self-use equipment within a total amount of investment, land provided at preferential prices and at looser regulations on land use, and a reduced corporate income tax rate of 15% if specified conditions are met. The new list of encouraged industries has 1,235 items, an increase from the previous list of 1,108 items. Of these 65 new items have been added to the national list, 62 new items in the regional list, and 88 items have been modified.[142] The focus is to attract FDI in three main areas:

(a) **Specific advanced manufacturing industries**: Examples included integrated circuit (IC) packaging and test equipment, laser projection equipment, ultra-high-definition television (UHD TV), ventilators, ECMO, artificial intelligence (AI) auxiliary medical equipment, key new materials — such as special glass fibre and high-performance fibre, and key components – such as high-pressure vacuum element, special value, special bearing, special glass, and wheel speed sensor.

(b) **Production-oriented service industries**: Examples include 5G telecommunication technology, blockchain technology and design of sewage treatment facilities, with a focus on boosting the quality of modern services as well as the integrated development of manufacturing and service sectors.

(c) **Industries to advance the regions in central, western and northeastern regions of China** (Table 4.7 below).

Table 4.7: Key Areas Added/Revised in China's 2020 Catalogue of Foreign Investment Encouraged in Regions (Regional Catalogue)

Provinces	Examples of New Encouraged Areas of Investment
Heilongjiang and Yunnan	Agricultural product processing; Tourism development
Henan, Shaanxi, and Guangxi	Medical equipment; Epidemic prevention and protection articles; Active Pharmaceutical Ingredient (API) production
Hubei, Sichuan, and Chongqing	Semiconductor materials; Industrial ceramics
Anhui and Shanxi	Vocational schools
Hainan	Trade; Shipping; Finance; Tourism, Yacht design and manufacturing; Financial leasing services; R&D; Design; Parts manufacturing of new energy vehicles (NEVs)

Source:https://www.china-briefing.com/news/china-2020-fi-encouraged-catalogue-effect-january-27-2021/

Note: The whole island of Hainan is being developed into a free-trade port. The foreign investment catalogue for Hainan includes as many as 50 items. Of these, 10 added items are related to the sectors mentioned in the Table.

[140] https://investmentpolicy.unctad.org/investment-policy-monitor/measures/3635/china-new-version-of-catalogue-of-industries-for-encouraging-foreign-investment

[141] https://www.china-briefing.com/news/china-2020-fi-encouraged-catalogue-effect-january-27-2021/

[142] Ibid.

The measures on national security review of foreign investment[143] authorise the "Foreign Investment Security Review Working Mechanism" to review foreign investments in certain covered sectors. The sectors covered under this include foreign investment in:[144]

- military industry, military-related industry, and other areas relating to China's national defence security, as well as investment in the surrounding areas of military installations and military facilities;
- important areas relating to national security, including those considered to be important in selected sectors, i.e. agricultural products, energy and resources, equipment manufacturing, infrastructure, transportation services, cultural products and services, information technology and Internet products and services, financial services, key technologies, etc. This would include obtaining de facto control of the invested enterprise.

Interlinked and supportive policy framework: China's policy framework is developed based on a strategic evaluation of different situations, factors affecting domestic and global operating conditions, and interlinked sectors or policy chain related issues. Thus, the approach is not to consider individual policies in isolation but a range of policies with overlapping or complementary effects. The aim is to create an interconnected network of supportive policies for investment reform in China, including to address the adverse effects of Covid-19. Examples of these policies are provided in Table 4.8 below. It is part of a larger integrated strategy for developing China into a powerful presence on the global stage.[145]

Table 4.8: Examples of Different Types of Policy Reform Introduced by China

Business environment
- Promotion of customs clearance efficiency for import and exports. - Widening the "single window" application in international trade. - Removing more operational and investment barriers to foreign-invested and foreign trade firms, such as offering all prefecture level and above cities mandates to register foreign-invested firmss. - Accreditation of high-tech foreign-invested companies will be made easier.
Reduction in coverage of negative list for FDI
- The 2020 negative lists for foreign investment went into effect on July 23. - The national negative list was cut from 40 to 33, and the negative list for pilot free trade zones (FTZs) was shrunk from 37 to 30.[146]
Cross-border E-commerce
- After setting up 59 cross-border e-commerce pilot zones, China approved 46 new ones. - Considering incorporation of cities of eligible zones into a pilot program on retail imports on cross-border e-commerce, and assisting enterprises to jointly build and share overseas warehouses.

[143] https://investmentpolicy.unctad.org/investment-policy-monitor/measures/3632/china-measures-of-national-security-review-of-foreign-investment

[144] For more detail, see https://www.jdsupra.com/legalnews/china-publishes-new-rules-on-national-23076/

[145] See for example, the discussion on pages 8 to 16 of https://www.eca.europa.eu/Lists/ECADocuments/RW20_03/RW_EU_response_to_China_EN.pdf

[146] For more detail, see https://www.china-briefing.com/news/chinas-2020-new-negative-lists-signals-further-opening-up/

Further equalising benefits for domestic and foreign companies
- Tax and fee relief policies designed to help companies in difficulty should equally apply to both domestic and foreign-invested enterprises. - Key foreign investment projects to receive greater support in terms of land use. - Foreign-invested companies to be entitled to apply for special re-lending and re-discount quota and new loans from the Export-Import Bank of China the same way as their Chinese peers.
Further boost customs clearance efficiency for imports and exports
- Promoting "pre-arrival declaration" for imports and exports, allowing enterprises to make a declaration in advance. Thus inspection and release can be completed as soon as goods arrive in a customs surveillance zone. - Improving "two-step declaration" mode for imports. Enterprises can pick up imported goods after simplified declaration and risk investigation and treatment. The full declaration can be completed afterwards. - Testing the practice of "ship-side pick-up" of imported goods and "loading-up-arrival" of exported goods in eligible customs surveillance zones. - Promoting traceable inspections with whole-process monitoring and if possible, unburden enterprises of compulsory presence at inspections. - Prohibiting unreasonable measures such as daily throughput control, for faster customs clearance.
Widen 'single window' application in international trade
- Expanding the scope of 'single window': apply the present solution used in law enforcement for customs clearance at ports, to other international trade links, such as port logistics and related services. - Releasing charges concerning ports, shipping agency, and tallying services online and permit online searches for such information. - Handling all import and export certificates via 'single window' unless bound by confidentiality or similar requirements, and related departments perform their duties and make inspections using the service system. - Promoting online payments of charges and certificate printing by enterprises.
Removing operational and investment barriers to foreign-invested and foreign trade firms
- For example, offering all prefecture level and above cities in the country mandates to register foreign-invested firms. - New mechanism to handle complaints by foreign-invested entities, which broadens the scope of possible complaints.

Sources: http://english.www.gov.cn/policies/infographics/202008/12/content_WS5f335b1ec6d029c1c26379d1.html, http://english.www.gov.cn/policies/infographics/202007/23/content_WS5f18be19c6d029c1c26367f2.htmland https://investmentpolicy.unctad.org/investment-policy-monitor/measures/3575/china-new-mechanism-to-handle-complaints-by-foreign-invested-entities.

4.3 European Union (EU)

This section begins with a discussion of the background to the EU's trade and investment policy, providing the main areas of focus and the way ahead planned for the future. This is followed by a discussion on trade policy developments, and the main policies that are emphasised by the EU. The last part of the discussion on EU provides an overview of its FDI policy, with a particular focus on recent developments in the area.

4.3.1 Recognition of the Overlap between Trade and Investment Policy

Articles 207.1 and 207.4 of the "Consolidated Version of the Treaty on the Functioning of The European Union" specify a common commercial policy which includes both trade and FDI related issues.[147] In recent years, and particularly after the experience with Covid-19, some concerns have become particularly important for the EU in the context of inward FDI. Based on its assessment of the emerging trends in foreign investment in EU, including new investments, in particular by State Owned Enterprises (SOEs), and the likely transformation

[147] See page 2008/C 115/140 of https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:C:2008:115:FULL&from=EN

taking place due to "digitalisation, robots, artificial intelligence, the internet of things and 3D printing",[148] the EU saw a need to assess several foreign investments that impact its strategic and security interest. For the EU, unlike India, the conditions of investment abroad by its companies are also as important as foreign investment into the EU. Thus, similar to trade regulation, the global rulebook on investment is also a part of the EU's focus, which it attempts to develop through its Bilateral Investment Treaties, the content of the Investment Chapter in its FTAs, and the negotiations on investment facilitation at the WTO.

Background and the post Covid-19 trade and investment policy regime: The main coverage of issues emphasised by EU can be seen from its framework for a future EU-US collaborative effort covering a wide-ranging agenda.[149] In December 2020, the EU had proposed to establish a new EU-US Trade and Technology Council with an aim "to jointly maximise opportunities for market-driven transatlantic collaboration, strengthen our technological and industrial leadership, and expand bilateral trade and investment … focus on reducing trade barriers, developing compatible standards and regulatory approaches for new technologies, ensuring critical supply chain security, deepening research collaboration, and promoting innovation and fair competition".[150] In the context of regulatory provisions, it emphasised the EU-US partnership to craft global standards, because as it states: "**Where both sides agree, the world usually follows.**" (page 7, emphasis added)

This Council was established on June 15, 2021 with its main goals as:[151]

- Expand and deepen bilateral trade and investment;
- Avoid new technical barriers to trade;
- Co-operate on key technology policies on technology, digital issues and supply chains;
- Support collaborative research;
- Co-operate on the development of compatible and international standards;
- Facilitate co-operation on regulatory policy and enforcement;
- Promote innovation and leadership by EU and US firms.

A number of working groups have been established under this Council,[152] to operationalize the political decisions into deliverables, coordinate the technical work and report to the political level in areas that cover:

- Technology standards co-operation (including AI and Internet of Things, among other emerging technologies);
- Climate and green tech;
- Secure supply chains, including semiconductors;
- ICT security and competitiveness;
- Data governance and technology platforms;
- The misuse of technology threatening security and human rights;
- Export controls;
- Investment screening;
- Promoting SME access to and use of digital technologies;
- Global trade challenges.

---

[148] Page 10 of https://ec.europa.eu/commission/sites/beta-political/files/reflection-paper-globalisation_en.pdf

[149] For more detail, see the document on "A new EU-US agenda for global change" at https://ec.europa.eu/info/sites/info/files/joint-communication-eu-us-agenda_en.pdf

[150] Ibid. See page 7.

[151] https://ec.europa.eu/commission/presscorner/detail/en/IP_21_2990

[152] Ibid.

These initiatives will have very significant implications for global trade and investment, including the regulatory regimes that may emerge in regional and multilateral fora. An indication of the thrust of these changes is provided by the vision of the EU's document,[153] which included, inter alia:

- Joining forces as tech-allies to shape technologies, their use and their regulatory environment;
- Co-operation on digital supply chain security done through objective risk-based assessments;
- Acting together on AI, based on their shared belief in a human-centric approach and dealing with issues such as facial recognition;
- To start work on a Transatlantic AI Agreement to set a blueprint for regional and global standards aligned with EU and US values;
- Intensifying co-operation at bilateral and multilateral levels to promote regulatory convergence, and facilitate free data flow with trust on the basis of high standards and safeguards;
- Renewing EU's and the US's commitment to strengthening open and fair trade to improve the level playing field by setting high standards, make critical supply chains more resilient and address the challenges of protectionism and unilateralism;
- Closer co-operation on issues such as investment screening, Intellectual Property Rights, forced transfers of technology, and export controls; working together on the joint promotion and protection of workers' rights; increasing transatlantic co-operation to push for worldwide adherence to the relevant conventions under the International Labour Organization; and,
- New EU-US Dialogue on China to provide a key mechanism for advancing their interests and managing bilateral differences.

The new industrial strategy: The issues emphasised under this "new EU-US agenda for global change" are also reflected both in EU's new industrial strategy,[154] and in the consultation process that has been launched to review EU's trade and investment policy.[155] This section focuses on the trade and investment policy-related parts of these documents. The aim is also to provide an indication of policies that are similar to the concerns being highlighted by India and other nations. The emphasis under the EU's new industrial strategy[156] is on:

- Bringing more manufacturing back to EU
- Thorough screening and analysis of industrial needs and identification of ecosystems needing a tailor-made approach

---

[153] https://ec.europa.eu/info/sites/info/files/joint-communication-eu-us-agenda_en.pdf

[154] See https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0102&from=EN and https://ec.europa.eu/commission/presscorner/detail/en/ip_20_416.

[155] https://trade.ec.europa.eu/doclib/docs/2020/june/tradoc_158779.pdf. The European Commission's Directorate-General for Trade has a Strategic Plan 2020-2024 which focuses on four key objectives: Multilateral co-operation including updating and upgrading WTO; Bilateral and Regional Partnerships; Sustainable Trade; and Protecting EU companies and citizens from unfair trade and investment. These issues are discussed within a strategic framework without going into details of trade policy within the EU. See, https://trade.ec.europa.eu/doclib/docs/2020/november/tradoc_159104.pdf

[156] The EU has also prepared a framework for Europe to repair and prepare for the next generation. This framework emphasises several of the initiatives mentioned in the new industrial strategy, and focuses on augmenting or providing new funds for investment addressing, for example, recovery and resilience, sustainability, solvency support, sustaining employment, skills, investment incentives, health programmes, supporting global partners, investment in clean technologies and value chains, rural development, and deeper digital markets. See https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0456&from=EN

- Standardisation and certification (social, labour and environmental standards), digital economy, IPR, Competition Policy, New Circular Economy Plan, Comprehensive Strategy for Sustainable and Smart Mobility, Carbon Border Adjustment Mechanism, Just Transition Platform to offer technical and advisory support for carbon-intensive regions and industries, review of the Trans-European Network Energy regulation, Industrial innovation strategy, skilling and re-skilling
- Framework for screening of foreign direct investment[157]
- State aid rules for Important Projects of Common European Interest (IPCEI), renewed sustainable finance strategy, a new Digital Finance Strategy, synergy between civil, space and defence industries, a new EU pharmaceutical strategy, an Action Plan on Critical Raw Materials
- Follow-up to the 5G Communication[158] and the Recommendation on cybersecurity[159]
- Addressing foreign subsidies, increasing access to Government procurement opportunities abroad, a new Chief Trade Enforcement Officer, and reinforced customs controls for compliance with EU trade rules and Agreements
- Upholding, updating and upgrading the WTO system

The most recent expression of EU's industrial policy goals are in the legislative proposal to address the foreign subsidies distorting the EU internal market.[160] The focus is on China's practices. Areas of specific action relate to changing the rules of the WTO Subsidies Agreement to make them more in line with the concerns expressed inter alia by Japan, EU and the US as a group at the WTO, address the situation of dependency on China for key inputs in supply chains (particularly in critical areas), and increased efforts to reach out to allies to develop a common strategy to address the situation.

An added background to the dependency assessment is a recent Staff Working Document of the European Commission which notes that, "China represents around 52% of the total value of imports of the most foreign dependent products and it is among the top three suppliers for around 54% of these goods. In terms of stages of processing, around 16% of the most foreign dependent products are raw materials, around 57% are intermediate goods and around 27% final goods."[161]

Bringing More Manufacturing Back to EU and addressing dependency on limited number of suppliers for critical areas: This EU initiative focuses on improving competitiveness, resilience of value chains, and reducing the EU's dependence on external sources to the extent possible. While a need for improving the extent of manufacturing with the EU was being emphasised earlier, the experience with Covid-19 has reaffirmed the importance of this objective.[162] In this context, the EU has examined both overall manufacturing as well as the key strategic areas for which it would work to increase its domestic production facilities.[163] The main strategic areas considered include: specific target sectors; technologies which would be of major importance in the future, as the operational technological conditions and methods are changing rapidly; inputs, i.e. minerals

---

[157] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0452&from=EN. In this Regulation, see in particular Article 4 which addresses "Factors that may be taken into consideration by Member States or the Commission".

[158] https://ec.europa.eu/transparency/regdoc/rep/1/2020/EN/COM-2020-50-F1-EN-MAIN-PART-1.PDF

[159] https://ec.europa.eu/digital-single-market/en/news/cybersecurity-5g-networks

[160] For a summary of the risks for EU arising due to China's state investment driven strategies, see page 25 of https://www.eca.europa.eu/Lists/ECADocuments/RW20_03/RW_EU_response_to_China_EN.pdf

[161] Page 23 of https://ec.europa.eu/info/sites/default/files/swd-strategic-dependencies-capacities_en.pdf

[162] See for example, page 6 of https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0474&from=EN

[163] https://www.epma.com/dm-industry-news/833-eurofound-report-future-of-manufacturing-in-europe-april-2019/file

and metals, which are critical for the value chains for these sectors/technologies; extent of reliance on any specific country/region for critical inputs.

The EU has evaluated the critical raw materials needed for improving the future of EU's manufacturing[164] including for the pharmaceuticals sector,[165] and certain other critical sectors for renewables, e-mobility, defence and space.[166] In this context, the EU's industrial policy for manufacturing includes a focus on specific action plans for targeted sectors/areas of pharmaceuticals[167] and critical raw materials[168] for the defence sector, digital supply chains, photo voltaic (PV) modules, as well as those needed for five game-changing technologies, namely advanced industrial robotics; additive manufacturing; industrial Internet of Things; electric vehicles; and industrial biotechnology. Yet another study on critical raw materials for strategic technologies/sectors in the EU has focused on a longer though overlapping list, namely Batteries, Fuel cells, Motors, Wind, PV, Robotics, Drones, 3D printing, and ICT.[169]

Assessing the critical raw materials for its industrial system as well as for targeted sectors, the EU noted that it "is between 75% and 100% reliant on imports for most metals".[170] The detailed study has identified EU's dependence on certain key suppliers for a large number of strategic materials; China is a major supplier for these inputs in general.[171] Another examination of this issue, within the framework of supply chains, also shows the dominant presence of China as a source of supply for each stage of the supply chain (Table 4.9 below).

Table 4.9: Top Three Suppliers to EU for Raw Materials, Processed Materials, Components and Assemblies for Nine Technologies Important for the Future

(Aggregated approximate shares for the technologies relating to: Batteries, Fuel cells, Motors, Wind, PV, Robotics, Drones, 3D printing and ICT)

Segments of the Supply Chain	Top Three Suppliers for Nine Specified Technologies (Aggregated)
Raw Materials	(1) China (40%); (2) Africa (20%); (3) Latin America (10%)
Processed Materials	(1) China (31%); (2) EU27 (23%); (3) USA (18%)
Components	(1) China (35%); (2) USA (21%); (3) Japan (19%)
Assemblies	(1) China (38%); (2) EU27 (20%); (3) Rest of Asia (10%)
Share of EU27 if not given above	4% (Raw materials); 11% (Components)

Source: Figure 65 on page 82 of the link for the study at https://ec.europa.eu/docsroom/documents/42881

Note: This Report was produced in 2020, when UK was still a part of EU.

[164] See Table 4 on page 32 of https://www.epma.com/dm-industry-news/833-eurofound-report-future-of-manufacturing-in-europe-april-2019/file

[165] https://cddf.org/wp-content/uploads/2020/09/090166e5cfeeeabe-2.pdf

[166] For more detail, see in particular the cover page, Figures 1, 3, 6, 28, 33, 37, 40, 45, 48, 49, 54, 58, 61, 62, 64, 65, and 62, and pages 88 to 91 in https://ec.europa.eu/docsroom/documents/42881

[167] https://ec.europa.eu/health/human-use/strategy_en

[168] https://ec.europa.eu/growth/sectors/raw-materials/specific-interest/critical_en

[169] See https://ec.europa.eu/docsroom/documents/42881 for a link to the study.

[170] Page 5 of https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0474&from=EN

[171] See for instance Annex 1 on pages 19 to 21 of https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0474&from=EN. For the significance of these critical raw materials for a range of different industries see the Table in Annex 2 on page 22 of the cited document.

Steps to be taken: The strategy to mitigate risks in specific high-priority sectors focuses in particular on critical raw materials for strategic technologies and sectors in the EU.[172] The EU has developed its Action Plan on Critical Raw Materials, aimed to:[173]

- **Develop resilient value chains** for EU industrial ecosystems;
- **Reduce dependency on primary critical raw materials through circular use of resources**, sustainable products and innovation;
- **Strengthen domestic sourcing** of raw materials in the EU;
- **Diversify sourcing from third countries and remove distortions to international trade**, fully respecting the EU's international obligations.[174]

In this context, the EU has noted that:

"China, the United States, Japan and others are already working fast to secure future supplies, diversify sources of supply through partnerships with resource-rich countries and develop their internal raw material-based value chains."[175]

It is notable that the sectors covered by this initiative include priority areas for India, namely the defence sector, digital supply chain, photo voltaic (PV) modules, and pharmaceuticals.

4.3.2 Trade Policy

EU has a comprehensive and strategic approach to trade policy which recognises the overlap with investment policy initiatives. Its tariff regime is oriented more towards protecting agriculture. It emphasises a number of trade-related objectives including the environment, social standards, and health and safety standards. Its non-tariff measures and subsidy regimes take these aspects into account. Further, the EU emphasises building a combination of market access initiatives which include preferential trade regimes and partnerships to improve capacities in less developed economies. In this context, it also emphasises working through regional and multilateral (WTO) initiatives to impact the rules-based systems taking account of its broader policy initiatives.

The **EU focuses on five key aspects of trade policy** which are common across both emergency and normal trading conditions, namely:

(1) **Measures to facilitate trade**: The notifications to WTO include border management and maintenance of supply chains aimed at facilitating trade.[176]

(2) **Emphasis on principles of trade regulation** which result in transparent, stable and predictable trade opportunities;

---

[172] https://ec.europa.eu/docsroom/documents/42881

[173] See https://ec.europa.eu/commission/presscorner/detail/en/ip_20_1542.

[174] One of the Action Points specified for the EU is to: "Develop strategic international partnerships and associated funding to secure a diversified and sustainable supply of critical raw materials, including through undistorted trade and investment conditions, starting with pilot partnerships with Canada, interested countries in Africa and the EU's neighbourhood in 2021". See page 17 of https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0474&from=EN

[175] Page 6 of https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0474&from=EN

[176] For the EU, the list can also be seen at https://tfadatabase.org/information-for-traders/import-export-and-transit-procedures/measures-related-to-Covid-19

(3) **Based on certain trade-related criteria which are forward-looking and/or promote common objectives** addressed by social and sustainable standards;

(4) **Emphasis on creating conditions to be better prepared for emerging changes in international trade activity**, e.g. digital, addressing factors which affect risks and resilience of supply chains, and preparing for the next major emergency due to the pandemic.

(5) **High prevalence score of non-tariff measures**, as shown by Table 3.8 above. The EU imposes several distinct NTMs on regulated products, indicating that it has a relatively high intensity of regulating trade.

Trade policies emphasised by the EU are also indicated by a recent joint statement focusing action on Covid-19 by the Ottawa Group at WTO, of which the EU is a member.[177] It specifies six action areas, namely:

- Transparency and Withdrawal of Trade-Restrictive Measures;
- Keeping Open and Predictable Trade in Agricultural and Agri-Food Products;
- E-commerce (focused on plurilateral e-commerce negotiations at the WTO);
- Trade Facilitation – Use of Information Technology and Streamlined Procedures (focused on Trade Facilitation Agreement and exchange of information on best practices for trade facilitation);
- Initiative on Medical Supplies ("…to identify what steps WTO Members could take to facilitate trade in medical supplies to help ensure that the world is better positioned to deal with future health emergencies and to help ensure that versatile, diversified and resilient supply chains exist that allow all members access to vital medical supplies.")[178]
- Deepen Engagement with Stakeholders ("…how best to pursue intensified engagement with stakeholders in order to better inform policymaking.")

Consultation note to review trade policy: This note aims at building EU's trade policy regime for the post Covid-19 economy. It does not focus on internal trade measures but on principles to be followed for trade policy and how to improve trade opportunities abroad. The main points emphasised are:

(a) Build more resilience – internal and external dimensions

- Improve resilience of supply chains
- Stabilise strategic engagement with key trading partners
- On the external side, it will be important to develop international governance measures that support stability and predictability

(b) Develop a network of trade agreements for:

- Market access and trade facilitation
- Improve conditions of investment by protecting IPRs (including IPR related to geographical indications)
- Focus on implementation and enforcement of the terms of the trade agreements
- Promote regulatory co-operation
- Focus on EU's closest trade partners in neighbouring regions and Africa

[177] The members are Australia, Brazil, Canada, Chile, EU, Kenya, Republic of Korea, Mexico, New Zealand, Norway, Singapore and Switzerland.

[178] Page 5 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/GC/217.pdf&Open=True

(c) Support SMEs

- Provide stable and predictable business environment
- Help SMEs to do business abroad (e.g. through EU initiatives to include supporting provisions for SMEs in FTAs, creation of SME contact points, the Enterprise Europe network,[179] and IPR Helpdesk for SMEs, and a Trade Defence Helpdesk for SMEs)
- Increase information on opportunities available to SMEs

(d) Support the green transition and making of trade more sustainable and responsible

- Foster a sustainable approach to trade and investment
- Strengthen resilience through due diligence schemes to promote sustainability, responsible business conduct, and transparency in supply chains

(e) Support the digital transition and technological development

(f) Ensure fairness and a level playing field

- Ensure that EU's openness is not abused by unfair, hostile or uncompetitive trade practices.
- Important to agree on clear rules with trade partners and to stand up for the rights under the Agreement.

Tariffs: The simple average MFN tariff of EU has remained broadly unchanged for several years. While non-agriculture tariffs have remained broadly unchanged, there has been a slight decrease in agriculture MFN tariffs (Table 4.10).[180] EU reduced tariffs on 17 tariff lines at 8-digit level on 1 July 2020 due to the expansion of the Information Technology Agreement, and tariff and VAT relief was provided during 2020 for goods needed to combat the effects of Covid-19.[181]

Table 4.10: EU - Simple Average MFN Applied Tariffs (%)

	Agriculture	Non-Agriculture	Total
2010	12.8	4.0	5.1
2011	13.9	4.0	5.3
2012	13.2	4.2	5.5
2013	13.2	4.2	5.5
2014	12.2	4.2	5.3
2015	10.7	4.2	5.1
2016	11.1	4.2	5.2
2017	10.8	4.2	5.1
2018	12.0	4.2	5.2
2019	11.4	4.2	5.1

Source: WTO, World Trade Profile reports for the years 2014 to 2020.

[179] Enterprise Europe Network (europa.eu)

[180] Another WTO source gives slightly higher average tariffs of 6.3%, but the overall message on tariffs not changing remains valid. See Table 3.3. of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/S395R1.pdf&Open=True

[181] See page 157 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV23.pdf&Open=True

Non-Tariff Measures: Table 4.5 shows that EU has a relatively high incidence of non-tariff measures (NTMs). The application of its NTMs has been a major concern in several countries. For example, EU has had the largest number of specific trade concerns raised within the WTO with respect to both technical barriers to trade[182] and sanitary and phytosanitary measures.[183] Similarly, the USTR report mentions concerns relating to many NTMs of the EU and its Member States applied in several sectors.[184]

Trade Facilitation: Taking Germany's index as representing the EU, it has a high rank for trade facilitation (Table 4.11). In certain areas, however, there is a considerable scope to improve, e.g. information availability, advance rulings, and automation.

Table 4.11: Comparison of EU's Trade Facilitation Performance Index with Selected Economies

Policy Area	EU's Rank Among Selected Economies (including EU)	Economy Ranked Above EU (or same rank as EU)
Average TFP Index	2nd out of 12 economies	US
A-Information availability	6th out of 12 economies	Australia, Canada, India, Singapore, US
B-Involvement of the trade community	5th out of 12 economies	Australia, Canada, Singapore, US (**same rank**: China)
C-Advance rulings	7th out of 12 economies	Australia, China, Malaysia, Singapore, US, Vietnam
D-Appeal procedures	1st out of 12 economies	
E-Fees and charges	4th out of 12 economies	China, Singapore, US
F-Documents	2nd out of 12 economies	Canada (**same rank**: Singapore, Thailand)
G-Automation	7th out of 12 economies	Australia, India, Mexico, Singapore, Thailand, US
H-Procedures	5th out of 12 economies	Australia, Canada, Singapore, Thailand
I-Internal border agency cooperation	3rd out of 12 economies	India, US (**same rank**: Australia, Canada)
J-External border agency cooperation	1st out of 12 economies	(**same rank**: Canada)
K-Governance and impartiality	1st out of 12 economies	(**same rank**: Australia, Canada, Singapore, US)

Source: https://www.compareyourcountry.org/trade-facilitation?cr=oecd&lg=en

Note: The economies selected for comparison are Australia, Canada, China, Germany, India, Indonesia, Malaysia, Mexico, Singapore, Thailand, US and Vietnam.

4.3.3 Other Trade Policy Measures Relating Particularly to Covid-19

A number of other trade-related policies were implemented by the EU during 2020 for addressing Covid-19 concerns. These measures included export authorisation for personal protective equipment and certain other Covid-19 related products,[185] border management practices such as green lanes for availability of goods and essential services to preserve health, for operations of supply chains and to maintain the integrity of the

[182] See Charts 23 and 24 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/G/TBT/45.pdf&Open=True

[183] See Chart B.11 ofhttps://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/G/SPS/GEN804R13.pdf&Open=True

[184] See pages 178 to 199 of https://ustr.gov/sites/default/files/files/reports/2021/2021NTE.pdf

[185] For examples of such measures in different EU economies, see https://www.jonesday.com/en/insights/2020/05/trade-controls-in-the-eu-Covid-19-measures-at-a-glance

EU single market. Further, air cargo operations were facilitated, guidelines provided on optimal and rational supply of medicines to avoid shortage during Covid-19, guidance on customs-related issues associated with Covid-19, and for the public procurement framework in the emergency situation related to Covid-19.[186]

A Temporary Framework for State aid to support the economy in the Covid-19 outbreak was established, additional funds were provided for rural development, and some product-level policy support measures were implemented such as providing flexibility/financial support for several agricultural products,[187] allowing for private storage of a number of agricultural products,[188] and authorising agreements and market stabilisation for the cut flowers and ornamental foliage sector.[189]

A large number of trade-related support measures for Covid-19 were also notified to the WTO by individual Member States of the EU. The list of support policies is long, with 345 notifications if UK is included and 305 notifications if UK is excluded from the list.[190] The types of measures above show that most interventions were targeted towards specific sectors or activities. The support measures could be considered under three broad categories.

(a) **Support measures (mainly financial support) with a relatively wide coverage**, for example, wage subsidies, employment support, waiver of interest and penalties for late payment of VAT, support to companies adversely affected by Covid-19, and reduction in loan principal amount.

(b) **Support measures (mainly financial support) aimed at international trade activities**, for example, export financing schemes, support to SMEs with certain specified amount of export activity, and trade credit insurance.

(c) **Support measures (mainly financial support) with a specific or targeted focus**, for instance, schemes[191] focused on support to MSMEs, to medium enterprises, and to large companies, airlines, strategic transformation aid for investment in specific regions, primary agricultural products/producers, support to entrepreneurs. On the services side support was extended to the events sector, tour operators, restaurants, deferral of concession fee to specific airports, support to the banking sector, fishery and aquaculture sector, media sector, Ministry of Culture, maritime transport, transport infrastructure, tourism and related sectors. It also included support for specific regions, public health insurance and social security contribution relief for self-employed, non-profit sports organisations, health spa, culture sector, accommodation, family support, compensating self-employed for loss of income, and rent payments for trade and services operators.

Outlook for Trade Policy: While the EU does not focus much on tariff changes, it uses a number of other policies especially during periods of crisis, such as subsidies (general or targeted),[192] or export/import permits

[186] Ibid. See pages 241 and 242 for more detail on these initiatives.

[187] These included fruits and vegetables, wine, milk, potatoes, olive oil and table olives.

[188] Cheese, butter, skimmed milk powder, sheep meat and beef meat.

[189] See items 111 to 126 in the list of trade-related support measures at https://www.wto.org/english/tratop_e/covid19_e/trade_related_support_measures_e.htm

[190] In the list at https://www.wto.org/english/tratop_e/covid19_e/trade_related_support_measures_e.htm. The notifications are from items number 128 to 472 if UK is also considered in the list. Without UK, the list is from items 128 to 432.

[191] For example, general aid scheme, guarantee scheme, compensation scheme, deferring payments, recapitalisation, and the social tourism sector.

[192] Among the important initiatives for providing funds is the Coronavirus Response Investment initiative. See https://ec.europa.eu/regional_policy/en/newsroom/coronavirus-response/

and standards. Its primary trade policy approach encompasses the above-mentioned points that are common across emergency or normal trading conditions. In this context, it looks at the future, recognising in particular the significance of new technologies, innovation, new skills and the changes in operational conditions due to a wider use of digital technologies. At the same time, the EU has conventionally used subsidies or State aid as an instrument of policy intervention. Therefore, its trade policy response during the Covid-19 period is an intensification and more focused intervention of its conventional response, whose broad tenets will remain unchanged at least for the coming decade.

4.3.4 Foreign Direct Investment (FDI)

The EU has handled FDI policies for Member States since 2009.[193] EU's FDI policy focuses on stable, predictable and facilitated conditions for both its outward investment and FDI into the EU. It aims to achieve these objectives through its own policies (for inward FDI), through BITs for its outward FDI, and at a larger level through its negotiations at WTO and discussions at the international fora such as OECD and UNCTAD.[194] In 2012, the EU adopted a regulation "creating a set of rules for bilateral investment agreements between individual EU-members and non-EU countries, to make sure that they are consistent with EU law and with EU investment policy".[195]

A tailor-made approach for screening and analysis of industrial needs and identifying appropriate ecosystem: Among its recent considerations regarding foreign direct investment in the EU, the European Commission has noted a specific concern arising due to State-Owned Enterprises (SOEs). In its document "We coming Foreign Direct Investment while Protecting Essential Interests",[196] it states for example that:

"Foreign investors are increasingly focused on seeking new markets and strategic assets and State-Owned Enterprises play a growing role in the global economy. In some economies State-Owned Enterprises undertake a significant share of outward foreign direct investment, in some cases as part of a declared government strategy. Beyond direct state ownership in enterprises, we also witness situations whereby certain companies are directly or indirectly influenced by the state through various means, or where the state facilitates foreign take-overs by national companies, notably through facilitating access to financing below market rates."

"In this context, **there is a risk that in individual cases foreign investors may seek to acquire control of or influence in European undertakings whose activities have repercussions on especially but not only when foreign investors are state owned or controlled**, including through financing or other means of direction. Such acquisitions may allow the States in question to use these assets to the detriment not only of the EU's technological edge but also its security and public order."[197] (emphasis added)

Taking account of this concern, and noting that several countries screen foreign investments, including Australia, Canada, China, India, Japan and the United States, the EU decided to introduce screening of foreign investment.[198] The European Commission committed to: "carry out by the end of 2018 further in-depth analysis of foreign direct investment flows into the EU, especially in strategic sectors (e.g. energy, space,

[193] https://ec.europa.eu/trade/policy/accessing-markets/investment/

[194] See https://ec.europa.eu/trade/policy/accessing-markets/investment/

[195] See the section on "Investment agreements between EU members and non-EU countries" in https://ec.europa.eu/trade/policy/accessing-markets/investment/

[196] https://ec.europa.eu/transparency/regdoc/rep/1/2017/EN/COM-2017-494-F1-EN-MAIN-PART-1.PDF

[197] Page 5 of https://ec.europa.eu/transparency/regdoc/rep/1/2017/EN/COM-2017-494-F1-EN-MAIN-PART-1.PDF

[198] On page 7, this document (ibid.) also notes that nearly half the EU Member States already have screening mechanisms for FDI.

transport) or assets (technologies and inputs linked to strategic sectors, critical infrastructures across sectors, sensitive data) that may raise concerns in the areas of security, public order and/or control of critical assets, in particular when the investor is owned or controlled by a third country, or benefits from significant state subsidies".[199]

The assessment[200] while addressing several other issues has also focused on FDI from China.[201] In its overall conclusions, the Report notes that: "Finally, the analysis of the types of investors shows that state-owned companies, investment funds, and private equity firms, as well as individuals, are more and more active in merger activities, as compared to industrial companies, the traditional type of investor."

"Those findings support the ongoing policy reflection around investment screening, within the EU as well as at international level (e.g. G7 or OECD)."

"The Commission (DG TRADE and the Joint Research Centre) will maintain the Foreign Ownership Database. This will allow the Commission to continue monitoring trends in foreign direct investments in the EU, and to further investigate specific issues, such as investment patterns by countries of origin, the sectoral and geographical distribution of foreign investment and the characteristics of foreign-owned companies."[202]

Two important developments have taken place subsequent to the examination of factors to be considered for screening of FDI.

(a) **The EU has a regulation that provides for screening of FDI and specifies the criteria for doing so**.[203] Article 4 of this Regulation addresses "Factors that may be taken into consideration by Member States or the Commission". **The criteria to be taken into account for screening are**: critical infrastructure, critical technologies, the supply of critical inputs (such as energy or raw materials), access to sensitive information or the ability to control information, and the freedom and pluralism of the media.[204] These include areas such as health, medical research, biotechnology, and infrastructure deemed essential for security and public order.[205]

It is noteworthy that while screening of foreign investment will take place across EU, the focus on investment facilitation still remains a prominent one. Further, in its new investment regulatory system, the EU emphasises a number of aspects, including reaffirming the right to regulate, investors' obligations and no protection of illegal investment, and replacement of Member-State level agreements by EU-wide agreements.[206]

(b) **A bilateral investment agreement was concluded with China on 30 December 2020, but the process of its ratification has been stopped at present**. This agreement includes provisions relating to state-owned enterprises and opening up of high-end services industry.[207] The agreement has a definition of state-owned enterprises which is more expansive, and that of "public body" which is wider, than that

[199] Page 11 of https://ec.europa.eu/transparency/regdoc/rep/1/2017/EN/COM-2017-494-F1-EN-MAIN-PART-1.PDF

[200] https://trade.ec.europa.eu/doclib/docs/2019/march/tradoc_157724.pdf

[201] See, for example, Box 3 on page 60 of https://trade.ec.europa.eu/doclib/docs/2019/march/tradoc_157724.pdf

[202] Ibid. See page 67.

[203] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0452&from=EN

[204] For a summary of the EU framework for FDI screening, see https://trade.ec.europa.eu/doclib/docs/2019/february/tradoc_157683.pdf

[205] Page 273 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV23.pdf&Open=True

[206] For detail, see https://trade.ec.europa.eu/doclib/docs/2020/july/tradoc_158908.pdf

[207] See https://www.globaltimes.cn/page/202012/1211465.shtml

in WTO.[208] It does not change the possibility of developing new disciplines under WTO, which remains a focus of the EU, together with Japan and the US. In recent months, a complication has developed in the ratification of the investment agreement due to the sanctions imposed by the EU against certain Chinese individuals on grounds of human rights, and retaliatory sanctions imposed by China on certain EU individuals.[209] This has led to the ratification process being suspended by the EU.[210]

Similarities and differences of EU compared to Indian objectives and policy focus: Several objectives of the EU are common with those emphasised by India. The most evident example is the EU's Pharmaceutical Strategy. The specific objectives of the Pharmaceutical Strategy are: "Ensure greater access and availability of pharmaceuticals to patients; Ensure affordability of medicines for patients' and health systems' financial and fiscal sustainability; Enable innovation including for unmet medical needs in a way that harnesses the benefits of digital and emerging science and technology and reduces the environmental footprint; Support EU influence and competitiveness on the global level, reduce direct dependence on manufacturing in non-EU countries, seek a level playing field for EU operators**."**[211]

The last objective is noteworthy especially in the context of the Production Linked Incentive (PLI) scheme implemented by India.[212] The scope and nature of the actions emphasised by EU and India are common, e.g. the EU's statement on its focus being to, "Encourage and support EU manufacturing capacity for active pharmaceutical ingredients and pharmaceutical starting materials – crucial elements of a single chemical-pharmaceutical strategic value chain. Build on the lessons learnt from the coronavirus pandemic."[213]

However, some parts of the initiative are different, namely: "This objective calls for supporting EU regulatory presence and global influence aiming to achieve a level playing field for EU companies through harmonized international standards of quality and safety of medicines and by addressing environmental risks."[214] The scope and reach of the policy framework is thus wider than that of India. Likewise, the emphasis on and level of R&D is different, as are the activities to upgrade domestic capabilities.

Similarly, while an emphasis on facilitation of trade and investment is common between the two economies, the extent of reliance on tariffs as trade restrictions is very different. India is focusing on using tariff restrictions as complementary to investment policy. EU has kept its tariffs low (particularly for industrial products), and its assessment of the impact of tariff protectionism is different from that of India. For example, an EU study on the impact of trade protectionism concludes that: "**while China, the EU and the US lose GDP from increased tariffs, the US loses much less than the others. The obvious explanation for this is the trade surplus — primarily attributable to manufacturing — in China and the EU and the large trade deficit in the US**. … The negative effects occur very quickly after tariff hikes, particularly for China and the EU. However, **recovery in China is quicker than in Europe, as the model predicts that China is able to increase exports to other markets, including the EU, and redirect its sourcing of imports to Asian countries at modest additional cost. The EU is less able to redirect its sourcing of imports to relatively low-cost alternatives.**

[208] https://insidetrade.com/daily-news/eu-china-deal-includes-limited-subsidy-rules-broader-soe-definition

[209] https://www.china-briefing.com/news/eu-china-investment-deal-in-doubt-businesses-caught-in-geopolitical-crossfire/

[210] See https://www.china-briefing.com/news/the-eu-suspends-ratification-of-cai-investment-agreement-with-china-business-and-trade-implications/

[211] See page 3 of the Roadmap document https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12421-Pharmaceuticals-safe-and-affordable-medicines-new-EU-strategy-_en. See, also, https://www.euractiv.com/section/health-consumers/news/commission-aims-to-bring-back-medicine-production-to-europe/

[212] https://pharmaceuticals.gov.in/sites/default/files/Gazettee%20notification%20of%20bulk%20drug%20schemes.pdf

[213] Page 3 of the Roadmap document mentioned in footnote 211

[214] Ibid.

The EU GDP effects are primarily driven by lower export volumes, mainly to the US, and higher consumer prices."[215] (emphasis added)

The view of the EU is that the effect of trade protection is negative, and that a positive impact requires improving the ability to increase exports together with a possibility of sourcing imports from relatively low-cost alternatives. This combination is aimed at improving competitiveness.

4.4 United States of America (US)

4.4.1 Background

The United States and the European Union and its Member States implemented large stimulus packages.[216] Especially during 2017 to 2020, US trade policy focused on an aggressive bilateral and transactional approach with individual trade partners, in particular China. Two important criteria for its engagement with other countries were the US bilateral trade deficit with a specific country, and the tariff levels imposed by its partner countries on US exports compared to the corresponding US tariffs for its imports. US trade policy focus has been on imposition of tariffs, limiting access to US technology and its domestic market, while making efforts to increase access to the markets of other nations.

In the past four years, the US used its trade policy as a prominent part of foreign policy, in particular with China, but also with its allies such as the EU. In this context, the basic focus was to use tariff increases as a negotiating tool with China and others. Since 2017, the US has increased its tariffs against all imports of certain products, exempting a few countries from the tariff increases, and in several cases the tariffs were increased on imports from China; for India, US tariffs increased also due to removal of GSP benefits in 2019.[217] The aim of this approach was to achieve at least five objectives, namely:

- Greater market access for US exports in the context of bilateral discussions for increasing market access in another economy;[218]
- Putting pressure on countries to move towards the US positions within ongoing trade agreement negotiations;[219]
- Creating barriers to exports from others to the US market, and thus increasing the incentive to shift investment to the US or drop plans of shifting investment out of the US;[220]
- Achieving foreign policy objectives, or opening up negotiations to get acceptance from another country for the regulatory regimes in selected areas that were emphasised by the US;[221]

---

[215] Page 55 of https://www.epma.com/dm-industry-news/833-eurofound-report-future-of-manufacturing-in-europe-april-2019/file

[216] For examples of stimulus policy measures of the US, see https://home.kpmg/xx/en/home/insights/2020/04/united-states-of-america-government-and-institution-measures-in-response-to-covid.html

[217] For more detail, see, for example, page 137 of https://www.wto.org/english/news_e/news17_e/trdev_04dec17_e.pdf; pages 203-205 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV21.pdf&Open=True; page 109 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OVW11.pdf&Open=True; page 125 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OVW12.pdf&Open=True; pages 143, 144 and 179 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV22.pdf&Open=True;and pages 189-190, and 262-263 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV23.pdf&Open=True

[218] For example, Brazil, China or the EU.

[219] For example, KORUS or USMCA.

[220] At times, the tariff was not actually raised and the threat of an increase in tariffs was sufficient to achieve the objective.

[221] For example, its negotiations with Japan.

- Protect selected domestic industry from import competition;[222]
- Limit access to US technology and develop strategic sectors.

The current policy emphasis under President Biden is on: "tackling the Covid-19 pandemic and restoring the economy; putting workers at the center of trade policy; putting the world on a sustainable environment and climate path; advancing racial equity and supporting underserved communities; addressing China's coercive and unfair economic trade practices through a comprehensive strategy; partnering with friends and allies; standing up for American farmers, ranchers, food manufacturers, and fisheries; promoting equitable economic growth around the world; and, making the rules count".[223]

A comparison with the previous trade policy priorities shows a major re-orientation of approach, particularly for partnering with friends and allies, and workers and environment becoming a prominent part of trade policy agenda. This will change the focus of FTAs, i.e. the approach would be less confrontational, with the template of FTA giving greater emphasis to environment and social standards. However, the emphasis on market access and digital issues will remain similar, and the approach with respect to China will continue to be broadly along the same lines, though with a difference. Both sides will focus on consolidating their links with other economies and the confrontational approach will become more apparent. In that situation, the bilateral trade tensions relating to China could become sharper.

4.4.2 Trade Policy

Tariffs

The simple average of US MFN tariffs has remained low and broadly unchanged for some years now, with a slight reduction in the average MFN tariff in 2019 (Table 4.12). This is possible because the rise in US tariffs on China and others was not MFN, i.e. the increased tariffs were either focused on specific countries, or a broadly general tariff increase was for a limited number of products (Table 4.12).

Table 4.12: US - Simple Average MFN Applied Tariffs (%)

	Agriculture	Non-Agriculture	Total
2010	4.9	3.3	3.5
2011	5.0	3.3	3.5
2012	4.7	3.2	3.4
2013	5.3	3.1	3.4
2014	5.1	3.2	3.5
2015	5.2	3.2	3.5
2016	5.2	3.2	3.5
2017	5.3	3.1	3.4
2018	5.3	3.1	3.4
2019	4.7	3.1	3.3

Source: WTO, World Trade Profile reports for the years 2014 to 2020.

[222] For example, steel and aluminium.

[223] https://ustr.gov/about-us/policy-offices/press-office/fact-sheets/2021/march/fact-sheet-2021-trade-agenda-and-2020-annual-report

Though the average MFN tariffs of the US have remained broadly unchanged, the US increased many tariffs, particularly for imports from China. Since the start of the trade conflict between the US and China, one estimate of tariffs by the US on imports from China shows an increase from "2.6% to 17.5%".[224] As a result of its various tariff increases, mainly on imports from China, the overall applied tariff of the US increased on average by 2 percentage points.[225] Another estimate shows that US average tariffs against China increased from 3.1% in January 2018 to 19.3% in January 2021, and China's tariffs against US products increased from 8% to 20.7% during the same period.[226]

A noteworthy feature is that tariffs of both US and China on imports from the other increased significantly in the past four years. China's tariffs on imports from other nations decreased in this period while a small increase was registered by US tariffs on imports from other nations (Table 4.13).The US raised its tariffs on Chinese imports for several reasons,[227] i.e. to address the bilateral trade imbalance with China; making tariffs more reciprocal; bringing back manufacturing jobs; and to pressurise China to change its policies, such as inadequate IP protection, subsidies of state-owned enterprises, and forced technology transfer.

Table 4.13: Average Tariffs of China and the US from January 2018 to January 2021

	January 2018	January 2019	January 2020	January 2021
US Tariffs on Imports from China	3.1%	12.0%	21.0%	19.3%
US Tariffs on **Imports from other nations**	2.2%	2.9%	3.0%	3.0%
China's Tariffs on Imports from the US	8.0%	16.5%	21.8%	20.7%
China's Tariffs on **Imports from other nations**	8.0%	6.7%	6.6%	6.1%

Source: https://www.piie.com/research/piie-charts/us-china-trade-war-tariffs-date-chart

Non-Tariff Measures (NTMs): Though less than China and the EU, the US has a relatively high percentage of trade subject to NTMs (Table 4.5 above). The US relies to some extent on conventional NTMs, e.g. export restrictions on PPEs allocating scarce or threatened materials to domestic use, a few tariff rate quotas, or import prohibitions/restrictions.[228] In addition, a major focus is given to protection of technology, security of its digital system, and to address policies of other nations that are determined to give them an unfair trade advantage, including through means which are not covered under the WTO provisions (exchange rate manipulation and labour standards).

In recent times, the US has given special emphasis to strategic and security-related issues. It has banned the use of certain Chinese apps, prohibited business transactions with certain Chinese companies, and identified Vietnam as a manipulator of its exchange rates to give itself an unfair advantage, and France and India among others implementing digital tax which is considered as an "undue" burden on US companies.[229]

---

[224] See the section on Introduction of https://www.wto.org/english/res_e/reser_e/ersd202004_e.pdf

[225] Figure 1 of page 7 of https://unctad.org/system/files/official-document/ditctab2020d3_en.pdf. See also page 10 of the document.

[226] https://www.piie.com/research/piie-charts/us-china-trade-war-tariffs-date-chart

[227] See section 7 of https://www.wto.org/english/res_e/reser_e/ersd202004_e.pdf

[228] See, for example, pages 262-263 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV23.pdf&Open=True, pages 103 and 206 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV21.pdf&Open=True; and pages 53, 76, 79, 233 of https://www.wto.org/english/tratop_e/tpr_e/s382_e.pdf

[229] https://ustr.gov/about-us/policy-offices/press-office/press-releases/2021/january/ustr-releases-findings-section-301-investigation-vietnams-acts-policies-and-practices-related

Further, with EU and Japan, the US aims to develop regulatory regimes to address China's non-transparent subsidies, operations of its state enterprises, or policies that result in forced transfer of technology from foreign firms to Chinese firms.[230] A number of these concerns are reflected in the strategy being adopted to address its concerns relating to China.[231] These include:

- An Executive Order of 4 April 2020 formalized an ad hoc working group known as "Team Telecom" to assist the Federal Communications Commission in the review of foreign participation in US telecommunications services, with the objective of enhancing national security.[232]
- An Executive Order signed on 15 May 2019 declared a national emergency with respect to threats against information and communications technology and services in the United States, and prohibited the purchase or use of information and communications technologies or services that pose a national security risk.[233]
- On 19 September 2020, the Department of Commerce announced prohibitions on transactions relating to the mobile applications WeChat and TikTok due to national security concerns.[234]

Trade Facilitation: Among the group of 11 countries we have been using as comparator countries, the US is number one for overall trade facilitation (Table 4.14). It needs to improve most in the area of "Advance rulings".

Table 4.14: Comparison of US's Trade Facilitation Performance Index With Selected Economies

Policy Area	US's Rank Among Selected Economies (including US)	Economy ranked above US (or same rank as US)
Average TFP Index	1st out of 12 economies	
A-Information availability	2nd out of 12 economies	Australia
B-Involvement of the trade community	2nd out of 12 economies	Singapore (**same rank**: Australia, Canada)
C-Advance rulings	6th out of 12 economies	Australia, China, Malaysia, Singapore, Vietnam
D-Appeal procedures	3rd out of 12 economies	EU, Singapore
E-Fees and charges	1st out of 12 economies	
F-Documents	5th out of 12 economies	Canada, EU, Singapore, Thailand
G-Automation	3rd out of 12 economies	Mexico, Singapore
H-Procedures	5th out of 12 economies	Australia, Canada, EU, Singapore
I-Internal border agency cooperation	2nd out of 12 economies	India
J-External border agency cooperation	5th out of 12 economies	Australia, Canada, EU, Mexico
K-Governance and impartiality	1st out of 12 economies	(**same rank**: Australia, Canada, EU, Singapore)

Source: https://www.compareyourcountry.org/trade-facilitation?cr=oecd&lg=en

Note: The economies selected for comparison are Australia, Canada, China, Germany, India, Indonesia, Malaysia, Mexico, Singapore, Thailand, the US and Vietnam.

[230] See, for instance,https://trade.ec.europa.eu/doclib/docs/2020/january/tradoc_158567.pdf

[231] See, for example, pages 13 to 20 of https://ustr.gov/sites/default/files/files/reports/2020/2020USTRReportCongressChinaWTOCompliance.pdf

[232] Pages 105 and 216 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV23.pdf&Open=True

[233] Page 101 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV22.pdf&Open=True

[234] Pages 105 and 216 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV23.pdf&Open=True

4.4.3 Foreign Direct Investment (FDI)

As mentioned above, some of the policies used by the US to retain/increase FDI as well as domestic investment was to increase tariffs, raise the incentives for investment to benefit from the protected US domestic market, and remove tax-related incentives for investment abroad.[235]

Effective 13 February 2020, new regulations broadened the jurisdiction of the Committee on Foreign Investment in the US (CFIUS) by expanding its review powers over foreign investments in US businesses. The new regulations implement the Foreign investment Risk Review Modernization Act of 2018 (FIRRMA), which aims to allow the CFIUS to better address national security concerns. Under the new regime, the CFIUS has express jurisdiction to review non-controlling investments in critical technology, critical infrastructure, and sensitive personal data businesses.[236]

Thus, the US too, like other major economies, introduced a process of **FDI screening** through FIRRMA.[237] Further, on 15 October 2020, the US Department of Treasury's "Final Rule" came into effect, "modifying the criteria for mandatory declarations for certain foreign investment transactions involving a US business that produces, designs, tests, manufactures, fabricates, or develops one or more "critical technologies".[238] In December 2020, the "Holding Foreign Companies Accountable Act"[239] was passed, which allows the possibility of delisting of Chinese companies from US exchanges. In November 2020, the US President signed an Executive Order banning Americans from investing in Chinese firms that the Administration says are owned or controlled by the Chinese military; this Order applied to 31 Chinese firms.[240]

4.4.4 Covid-19 Response

The US took a wide range of measures to address Covid-19 related concerns.[241] These include stimulus measures, tax relief, easier and supportive conditions for the financial and investment sectors, paycheck protection/unemployment compensation, changes in enabling regulations, expansion of credit available, and several customs and trade regulation measures[242] to both retain Covid-19 products for domestic use and allow easier imports of such products.[243]

Reducing risks and increasing reliability of international supply chains by increasing domestic production of Covid-19 related medical products: Covid-19 raised the awareness about US companies' reliance on China in the case of several supply chains of medical products. In addition to the increased uncertainty due to the tense US-China trade relations, the strategic objective of having ready access to requisite medical products led the

[235] See, for example, "Ending Tax Breaks to Move Abroad", Washington Trade Daily, 8 April 2021.

[236] Pages 103 and 207 of https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV23.pdf&Open=True

[237] For more detail, see https://investmentpolicy.unctad.org/investment-policy-monitor/measures/3469/united-states-of-america-new-implementing-regulations-on-fdi-screening-promulgated

[238] https://www.govinfo.gov/content/pkg/FR-2020-09-15/pdf/2020-18454.pdf

[239] https://www.congress.gov/bill/116th-congress/senate-bill/945

[240] https://investmentpolicy.unctad.org/investment-policy-monitor/measures/3636/united-states-of-america-executive-order-on-addressing-the-threat-from-securities-investments-that-finance-chinese-military-companies-nov-12-2020-

[241] https://www.usa.gov/coronavirus. For a list of the type of trade-related measures used, see https://crsreports.congress.gov/product/pdf/LSB/LSB10424

[242] See https://www.cbp.gov/newsroom/coronavirus and https://www.macmap.org/covid19

[243] For details, see https://home.kpmg/xx/en/home/insights/2020/04/united-states-tax-developments-in-response-to-Covid-19.html and https://home.kpmg/xx/en/home/insights/2020/04/united-states-of-america-government-and-institution-measures-in-response-to-covid.html. Some examples of Customs-related measures are in the second of these weblinks, under the section on "Customs Measures".

US to examine in significant detail the supply chains for various Covid-19 related products.[244] It also assessed ways to increase certainty and reliability of supply for these products as well as ways to improve domestic capacity to provide key parts of these chains within the US. The detailed study by the US International Trade Center is now complete and the next steps would be planned for addressing this concern.[245]

Coalition-building: In a reversal to its earlier approach, the US is giving major emphasis to coalition-building and developing a common platform for achieving its various trade and investment-related objectives, with a primary focus to address its geopolitical concerns about China. An important example is the recent meeting of the Quad where forward-looking initiatives were consolidated/ launched for medical products and new technologies.

4.4.5 The Way Ahead

The US relies on a wide variety of trade policy initiatives to achieve its broader objectives. Its focus within the trade policy context has led to an expansion of the scope and range of policies that are considered under the rubric of its trade policy, inside and at the border, as well as regional and international initiatives. It thus affects the operating conditions for its domestic producers and those in other countries due to the policies that impact both access and operations within its own economy (the largest in the world) and the global trade and investment system as well. Though President Biden has begun to change a number of initiatives of President Trump, tariff policy towards China, an emphasis on "America-First", and concerns regarding FDI and technology seem to remain broadly unchanged.

Further, the main focus of its attention, i.e. China, is trying to successfully attract FDI and focus on extending the reach of its trade and investment through the Belt and Road Initiative as well as a plan to more actively pursue its membership of FTAs and Investment Agreements. This includes a stated interest in joining CPTPP. Meanwhile, concerns regarding the subsidy and technology-related practices of China will continue to be emphasised in various fora (including the WTO) by Japan, the EU, and the US. In this background, the US will work on all major components of its trade policy, such as:[246]

Trade rules-setting, liberalisation, and enforcement

- Negotiation of trade agreements to open markets and set rules on trade and investment;
- Enforcement of commitments via dispute settlement and US trade laws.

Export promotion and controls

- US support for export financing, market research, advocacy, and trade missions;
- Licensing and control of strategic exports.

Customs, trade remedies, trade adjustment

- Regulation of borders;
- Laws to address adverse effects of imports on US industries, national security threats, balance of payments, and "unfair" barriers to US exports;
- Assistance for dislocated workers and firms.

---

[244] https://www.usitc.gov/publications/332/pub5145.pdf

[245] https://www.usitc.gov/publications/332/pub5145.pdf

[246] See https://ustr.gov/about-us/policy-offices/press-office/fact-sheets/2021/march/fact-sheet-2021-trade-agenda-and-2020-annual-report. See also page 1 of https://fas.org/sgp/crs/row/IF10156.pdf. For a more detailed discussion of these trade policy components, see https://crsreports.congress.gov/product/pdf/R/R45148

Trade preferences

- Duty-free access to US markets for eligible developing countries and products.

Investment

- Protection and promotion (through investment treaties and trade agreements);
- Examination of inbound FDI for national security implications.

China-centric policy approach that includes a wide range of areas such as technology, market-linkages, coalition-building, and developing regulatory systems through FTAs and WTO.

- The Strategic Competition Act 2021, a comprehensive China-related Bill, has been unveiled in US Congress to focus upon and strengthen US efforts to counter the geopolitical competition from China. A similar objective is encompassed in the United States Innovation and Competition Act 2021.[247]
- Both the US and China have huge expenditure plans for the period ahead to strengthen their economies and strategic areas. While President Biden is introducing a large expenditure plan for the US, China's expenditure plan is larger than this initiative.[248]
- Both China and the US have begun contacts to develop/ retain partners in their efforts to garner support.
- Both have begun to focus on addressing shortages in major inputs, and developing strategies to reduce dependence on the other to strengthen their supply chains and technological capacities.

The likely way ahead on key issues has been summarised by the Congressional Research Service for the US Congress.[249] The key conclusions are that:

- The tariff increase is likely to continue, though the intensity of the pressure will become less over time.
- Instead of mainly direct confrontation with China, a coalition-based approach would be adopted.
- Unlikely that US would focus initially in any major way on FTAs.
- Further, to the extent that FTAs are negotiated, the approach would be a comprehensive FTA and not piecemeal, unless it involves some preferred sectors such as the US-Japan Digital Trade Agreement.[250]
- Both the volume and content of US Trade Adjustment Programs are likely to increase. The US will engage more actively with the WTO, but will continue pushing for the reforms that the previous administration had emphasised.[251]
- In the context of WTO reform, the US is likely to give more emphasis than earlier to proposals already tabled by Ambassador David Walker after his consultations on addressing the impasse.[252]
- Further regulations would be introduced to address concerns about foreign countries (particularly China) to obtain US technology.

---

[247] See, https://www.americanactionforum.org/insight/the-united-states-innovation-and-competition-act-usica-a-primer/ and https://www.cnbc.com/2021/06/08/senate-passes-bipartisan-tech-and-manufacturing-bill-aimed-at-china.html

[248] https://www.bloomberg.com/news/articles/2021-04-02/biden-s-biggest-ever-r-d-plan-still-leaves-u-s-trailing-china

[249] See page 2 of https://fas.org/sgp/crs/row/IF10156.pdf

[250] See https://crsreports.congress.gov/product/pdf/IF/IF10770 and the section on ""Scope of US-Japan Negotiations" in https://crsreports.congress.gov/product/pdf/IF/IF11120

[251] See https://insidetrade.com/trade/our-most-read-%E2%80%98buy-american%E2%80%99-wto-reform-and-beyond

[252] See https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/Jobs/GC/222.pdf

Thus, the US will continue to emphasise the area of technology and IPR, including the issues covered by its Foreign Investment Risk Review Modernization Act (FIRRMA) and the Export Controls Act (ECA). There is considerable uncertainty in this area about the policy ahead. China has reportedly put IPR at the centre of its current market reform "action plan".[253] These "IP reforms are a key part of Beijing's plan to improve its indigenous innovation and its technological capabilities and not have to rely on the US for high-tech products."[254] The US is very concerned about maintaining or increasing its technological lead, and will likely carefully monitor the actions of the Chinese Government/companies.[255]

Conclusions

All the three economies (China, EU, and US) focus on facilitation of trade and investment, particularly as a response to the difficulties arising due to Covid-19. All these major economies have instituted screening of foreign investment, and are concerned about the security and resilience of their value chains. The concerns in the case of the EU and the US are primarily due to China's dominance as supplier of critical materials and minerals, while China's concern is more due to the current and likely future adverse trade and investment policy initiatives taken by its major trading partners, mainly the US and now increasingly also the EU. All three economies give major emphasis to increasing domestic production/investment in strategic sectors, including for Covid-19 related products.

China and the EU do not rely on tariff increases to raise FDI, but the US has done so in certain cases. China and the EU have historically relied quite extensively on non-tariff measures (NTMs), and the use of these NTMs as trade barriers seem to have increased more in the case of China and to some extent in the EU. In contrast, India relies on a high tariff regime and has a relatively lower incidence of NTMs. However, in recent times, India's NTM regime is reportedly being applied in an increasingly restrictive manner.

The investment regulatory regime for China is more restrictive than the EU and the US. Thus more facilitating policies have to be implemented by China whenever it liberalizes its policy regime. China encourages foreign investment in specific targeted sectors through facilitation and financial support policies. A noteworthy feature is that China evaluates and determines which particular industries should be encouraged in specific parts of the country.

China has begun to emphasise both the domestic market and global markets, while the EU emphasises both markets and focuses on developing new regulatory regimes that will create a stable and predictable level playing field in global markets. The objective in particular is to address concerns regarding China's subsidies and other trade and investment-related policies such as IPR, competition policy, and state-owned enterprises. The US focuses on domestic and global markets but with a difference. Its goal is to increase the incentives for its domestic producers through a combination of subsidies and tariffs in specific areas. It also aims to increase foreign market access for its exporters, building a new trade regulatory system mainly through FTAs and to some extent within the WTO. In the US, the FTAs are among the instruments for building coalition partners with connected economic interests as part of a larger initiative to build coalition partners that will help it challenge China on the global stage. In the EU and the US, such partnerships are considered important

[253] https://insidetrade.com/daily-news/china-puts-ip-reforms-center-market-reform-%E2%80%98action-plan%E2%80%99?destination=node/170581

[254] Op.cit.

[255] For a major emphasis given by the US on trade and security, see https://insidetrade.com/trade/our-most-read-%E2%80%98buy-american%E2%80%99-wto-reform-and-beyond

for developing predictability and stability of the rules that determine trade and investment conditions, and create additional global opportunities for their firms.

The prevailing technological capabilities in these economies are much stronger and more extensive than India. They recognise the role of technology for maintaining and improving competitiveness. Each of these major economies emphasises more than India the steps to improve the policies to help improve competitiveness. They focus in particular on improving technological capabilities of their producers, especially for new technologies that will fundamentally change the operational conditions and competitiveness in the future. In this context, the US is taking a strong position by limiting the access of Chinese companies to its technologies and building coalitions with other nations to develop alternative sources of key inputs in the areas of electronics, medical products, and defence-related products.

► Chapter 5

Main Features of India's Investment Policy

Introduction

Investment policy is at the heart of India's industrial policy, and many of its objectives are strongly linked to the aspirations embodied in the Atmanirbhar Bharat initiative. Attracting FDI has been a major focus of the Government to raise investment, build domestic technological capabilities, increase employment, exports, and India's participation in global value chains (GVCs). The larger aim is to improve/ sustain India's competitiveness and ability to address strategic and security-related concerns. With the experience of Covid-19, investment policy now includes a focus on coalition-building and creating increasing levels of mutual trust among like-minded nations to enable easier transfers of medical products, through synergistic international partnerships for resilient supply chains, investment and technology transfers.

In certain cases, achievement of these objectives (such as exports and links with GVCs) requires **trade policy as the moving vehicle of change**. In others, such as upgrading technology and improving and sustaining competitiveness (e.g. through ease of doing business/trade facilitation) what is required is a **synergistic application of both trade and investment policy**. Thus, consistency of these policies and linkages becomes a major aspect to bear in mind.

Section 5.1 introduces the topic and provides information on India's FDI. Indian policy-makers have more closely examined the policy approaches in selected comparator countries as well as identifying the relative disabilities or difficulties in operational conditions faced by investors. In this context, the policy makers have focused on measures which provide a basis to evolve India's own policy regime to build competitiveness and achieve the objectives of Atmanirbhar Bharat. Section 5.2 summarises parts of the investment policy approaches which are similar across countries and those which differ across them. It shows inter alia that security related concerns have become more prominent in recent years, especially due to the experience with global value chain disruptions due to US-China trade tensions and Covid-19 in 2020. This situation has also heightened a need for strategic approach to investment policy. In this background, Section 5.2

also summarises some important similarities and differences among the approaches of India and selected comparator economies.

Section 5.3 focuses on the approaches of two specific economies (China and Vietnam) which have combined an emphasis on FDI with domestic policy reform. Vietnam is a small economy but with an exceptional export success. Its merchandise exports were about one-third of India's in 2000, but in 2020 they exceeded the exports of India. The other, i.e. China, is a large economy and can potentially be a source of learning for several countries, especially developing economies. Section 5.3 shows that these two economies interestingly use quite similar approaches though with some differences. The summary in Section 5.3 helps to provide a basis for considering their approach in the context of India's policy-making.

Section 5.4 discusses several key aspects of India's investment policies, mainly those aimed at investment incentives and investment facilitation. The policies include those adopted to address security-related concerns, which shows that India has a strategic approach when developing its investment policies, though this approach is less comprehensive than some other major economies. The discussion also highlights an increased emphasis on investment facilitation policies which are now a major focus of the Government of India. The main policy scheme embodying incentives, i.e. Production Linked Incentive (PLI), covers a number of sectors. They are in their initial phase of implementation and need oversight to ensure timely and effective implementation. Section 5.5 identifies some specific points to keep in mind in this context. Section 5.6 provides the conclusions of this chapter.

5.1 Investment Flows

FDI inflows to India have increased in the past decade, with India's global rank improving from 14th in 2010 to 10th in 2015, and then 5th in 2020. India was one of the two major economies that registered a rise in FDI inflows in 2020. One was China, with about 5.7% increase in its FDI inflows and the other was India with over 25% rise in its FDI inflows.[256] The increase in FDI inflows over time for some of the comparator economies is shown in Table 5.1. Annual FDI inflows to China have been far larger than to India. However, it is interesting to note that compared to 2010, the rise in annual FDI inflows to India and China have been similar, i.e. the 2020 levels are higher than 2010 levels by USD 36.7 billion for India and USD 34.6 billion for China. However, the larger absolute annual FDI inflows into China have meant a much more significant rise in FDI stock in China compared to India since 2010 (Table 5.2). Interestingly, the stock of FDI in India is much larger than that in Vietnam, but Vietnam's exports now exceed those of India. This is both due to a relatively larger internal market in India and the higher tariffs of India which orient the FDI more towards the internal market.

Table 5.1: Inward FDI Flows in Selected Economies, 2010, 2015 and 2019 (USD billion)

	2000	2010	2015	2019	2020
India	2.3	27.4	44.1	50.6	64.1
China	40.7	114.7	135.6	141.2	149.3
EU	671.4	384.9	591.2	380.3	103.2
US	314.0	198.0	467.6	261.4	156.3
Vietnam	1.3	8.0	11.8	16.1	15.8

Source: UNCTAD

[256] https://unctad.org/system/files/official-document/diaeiainf2021d1_highlight_en.pdf

Table 5.2: Inward FDI Stock in Selected Economies, 2000, 2010 and 2020 (USD billion)

	2000	2010	2020
India	16.3	205.6	480.3
China	193.3	586.9	1,918.8
EU	1,882.8	5,960.4	11,563.4
US	2,783.2	3,422.3	10.802.6
Vietnam	14.7	57.0	176.9

Source: UNCTAD

In the past two decades, a large part of the FDI in India has come to the services sector (Table 5.3). In recent years, however, investment in computer software and hardware (or electronics) sector has become very important. In 2020, over two-fifths of the total FDI inflows were in this sector. In addition to this sector and the services sectors, other prominent sectors include telecommunications, automotive sector, construction, and chemicals. The PLI schemes would generate an increase in FDI in the coming years. The investment in the large electronics sector has already begun in 2020 under the PLI scheme.

Table 5.3: Sector-Wise FDI Equity Inflows, April 2000 to December 2020 (sectors with share above 1%)

Sector	Share	Sector	Share
Services	17.82%	Power	2.95%
Computer Software and Hardware	13.29%	Metallurgical Industries	2.74%
Telecommunications	7.22%	Food Processing Industries	1.96%
Trading	5.7%	Electrical Equipment	1.90%
Construction Development	4.97%	Non-Conventional Energy	1.89%
Automobile Industry	4.87%	Information, Broadcasting, Print Media	1.80%
Construction (Infrastructure) Activities	4.60%	Petroleum and Natural Gas	1.52%
Chemicals (Other than Fertilisers)	3.52%	Consultancy Services	1.18%
Drugs and Pharmaceuticals	3.40%	Industry Machinery	1.11%
Hotel and Tourism	2.99%	Cement and Gypsum Products	1.01%

Source:https://dipp.gov.in/sites/default/files/FDI%20Factsheet%20December%2020.pdf

Note: Services include Banking, Insurance, Financial/Non-Financial, Business, Outsourcing, R&D, Courier, Technical Testing and Analysis, Hospital and Diagnostic Centres, and some others.

5.2 Investment Policy in Selected Major Comparator Economies

Most countries emphasise FDI, and rely on both investment incentives and facilitation.[257] The most common incentives are tax exemption/reduction and financial support linked to specified cost items (e.g. interest costs)

[257] See https://www.invest.gov.tr/en/library/publications/lists/investpublications/guide-to-state-incentives-for-investments-in-turkey.pdf, http://blog.investchile.gob.cl/incentives-for-foreign-investment-in-chile, https://www.pwc.com/my/en/publications/mtb/tax-incentives.html, https://www.kra.go.ke/en/ngos/incentives-investors-certificate/investing-in-kenya/incentives-investorshttps://www.austrade.gov.au/International/Invest/Guide-to-investing/Australian-Government-support-programs,

or criteria (investment, employment, location). Governments actively use internationally accepted indices to gauge progress and also attract investors. The large economies rely on their domestic markets to be an attractive option for FDI, but they recognise a need to supplement this factor with facilitation and incentives with varying scope and coverage across different countries.[258] India has focused on improving facilitation (operational conditions) for a number of years and more recently through a range of incentive schemes.

Security-related concerns: The experience during 2020, due to US-China trade tensions and Covid-19,has resulted in some additional elements becoming prominent parts of investment policy, especially for major economies. Countries have begun to more actively screen FDI for security purposes. In addition, they emphasise limiting or diversifying the sources of FDI to reduce GVC risks, forming coalitions with a view to enhance investment and trade links, and promoting capabilities and investment in new and emerging technologies. As stated by an UNCTAD review of policies for the period May 2020 to December 2020:

"Fifty-two countries and the European Union (EU) took 96 investment policy measures in the review period (May 2020 to December 2020). Nearly half of these measures introduced new regulations or restrictions for investment — the highest ratio in almost two decades. … Almost all new investment regulations or restrictions address national security concerns as more and more countries become worried that domestic core assets and technologies may fall prey to hostile foreign takeovers in the wake of the pandemic. Eighteen countries and economies – Austria, Canada, China, Finland, France, Germany, Hungary, Italy, Japan, Republic of Korea, Malta, New Zealand, Poland, Russian Federation, Slovenia, Spain, United Kingdom and the EU – reinforced the existing FDI screening regime or newly adopted such mechanisms. Kenya, Oman, and the United States of America introduced other types of restrictive measures."[259]

Strategic Framework and Assessment: An important difference across economies is the strategic planning and approach that goes into developing investment policy initiatives. The strategic objectives include an assessment of emerging technologies, sustaining competitiveness, access to markets abroad, reliability and security of supply chain related inputs, and security-related concerns. China, and to a significant extent the EU and the US, adopt a strategic approach based on a consideration of several of these interconnected issues and consider a time profile of the policies that would serve their overall strategic objectives.[260] With the Covid-19 experience, a much larger focus is given now to locating a larger part of the value chain within the domestic territory.[261]

An important example of the strategic framework is China's assessment of its "national strategic needs", and a consequent emphasis under its 14th five-year plan on seven high-tech sectors.[262] China has developed an eight-step plan to achieve self-reliance, focused on strengthening basic research (including higher R&D funding), supporting national laboratories, and promoting preferential tax policies.China will be passing new laws and reviewing existing laws to achieve the new objectives.

---

[258] See, for example, https://www2.deloitte.com/global/en/pages/tax/articles/global-investment-and-innovation-incentives-survey.html

[259] Page 1 of https://unctad.org/system/files/official-document/diaepcbinf2021d2_en.pdf

[260] See, for example, the approach taken in https://www.china-briefing.com/news/investing-in-suzhou-industrial-park-a-brief-profile/

[261] See, for example, https://www.usitc.gov/publications/332/pub5145.pdf and https://pib.gov.in/PressReleasePage.aspx?PRID=1607483

[262] These include: integrated circuits, artificial intelligence and quantum information, life and health science, neural science, biological breeding, and aerospace technology. See https://www.china-briefing.com/news/what-to-expect-in-chinas-14th-five-year-plan-decoding-the-fifth-plenum-communique/

Some Similarities and Differences in Approaches Across Countries: Given the diverse objectives encompassed in investment policies, there are some differences in the approaches of different countries, including the approaches with respect to: the trade policies that are combined with investment policies; the extent of focus given to specific global large firms; the sectors selected for emphasis;[263] creating opportunities through FTAs (which include legal obligations relating to investment); approaches towards bilateral investment agreements; producing key inputs or strategic products domestically; building coalitions to diversify sources of inputs for supply chains; and improving opportunities through outward foreign direct investment.

Interestingly, the approaches used by different economies to diversify their sources of supply of key inputs differ. For example, China's approach to reduce risks of supply chain disruptions includes increasing domestic production of certain items (similar to a number of other nations) and acquisition of foreign companies and resources for assuring reliance in supply of inputs (very different approach to others). This is illustrated in a recent report stating that:

"China is diversifying its supply of critical natural resources – a move that will shore up Beijing's ability to weaponise trade against its geopolitical rivals, according to a newly published report by risk consultancy Verisk Maplecroft. … One way the country is diversifying its import sources is by buying stakes in overseas companies … China is seeking to strengthen its control over global supply chains via overseas investments and partnerships with international majors. Beijing has been supporting Chinese SOEs [State-Owned Enterprises] to 'go global' and establish control of resource bases overseas since the late 1990s," said the report. China imports critical commodities such as crude oil, natural gas, metallurgical coal and iron ore from a highly concentrated group of trading partners.[264]

Table 5.4 provides a summary picture of the investment policy focus and approaches of selected economies, including India.

Table 5.4: A Summary Look at Investment Policy and Approach of Selected Economies

Investment-Related Issue	India	China	EU	US	Vietnam
Large Domestic Market	Yes	Yes	Yes	Yes	No
Incentives	Low to high, depending on sector	High	Low to medium	Low to medium	Medium to High
Facilitation	Medium	High	Medium, with established and functioning systems	Medium, with established and functioning systems	Medium to High, depending on sector
Trade Policy	Protectionist	Facilitative, with control in several areas	Trade Policy: focused on competitiveness	Protectionist in selective cases	Facilitative
Focus on Large Global Firms	In few sectors	Across the board	Mixed Approach	Mixed Approach	High emphasis in priority sectors
Screening for Security	Yes	Yes	Yes	Yes	Not a priority

[263] See, for example, https://www.whitehouse.gov/briefing-room/statements-releases/2021/02/24/fact-sheet-securing-americas-critical-supply-chains/

[264] Page 5, Washington Trade Daily, March 18, 2021

Investment-Related Issue	India	China	EU	US	Vietnam
Focus on Producing Products in Short Supply	Yes – e.g., Pharmaceuticals	Yes – e.g., Semi-conductor chips	Yes – e.g., Semi-conductor chips; rare earth minerals	Yes – e.g., Semi-conductor chips; medical goods	No
Seeking Coalitions for Diversifying Inputs for Supply Chains	Through strategic partnerships	Through BRI and commercial and strategic partnerships	Through commercial and strategic partnerships	Through commercial and strategic partnerships	Through FDI and FTAs
Acquisition Abroad for Diversification	No	Yes	Through commercial and strategic partnerships	Through commercial and strategic partnerships	No
Focus on New and Emerging Technologies	Medium	High	High	High	Not relevant
Emphasis on FTA/ BRI	No	Now increasing interest	High	High	High
Approach to Outward FDI	Not encouraged	High emphasis	Medium emphasis	Increasingly not encouraged	Not relevant
Detailed Strategic Assessment underlies Investment Policy?	Some initiatives, though efforts on this have begun	Yes	Some, increasingly being emphasised	Yes	Some, good internal coordination

In this background, it is useful to take a closer look at the investment policy approach of China and Vietnam, two economies which have performed exceptionally in terms of increasing their presence in global markets. One is a large economy and the other a small one, but both have taken global market shares away from India in the specific products on which they focus.

5.3 Investment Policy Approaches of China and Vietnam

Their approach suggests that they both conceptualise a wide-ranging interconnected framework of issues and focus on effective implementation through reviews and course-correction.[265] They also conduct a detailed assessment of new regulatory issues that may have a wide-ranging impact, such as environmental issues.[266]

Summary of the approaches of China and Vietnam

1. **An overarching comprehensive assessment of national priorities and approaches forms an underlying basis**: The schemes that are formulated are based on a comprehensive assessment of the national objectives to be emphasised and the interconnected steps needed for achieving those objectives.

2. **Emphasis on easier availability of good-quality infrastructure and skills:** Land, building – plug and play, good quality of power supply, roads, water, skilled labour, and easy connectivity with ports, airports, and technical universities. However, while it is easier to develop facilities like plug and play and regular power supply for the facility through sub-stations, it is more difficult to address the issue of relevant skills.

[265] See, for example, https://pcivietnam.vn/en/publications/2019-pci-full-report-ct174

[266] See, for example, https://pcivietnam.vn/en/publications/assessing-the-impact-of-climate-change-on-vietnamese-businesses-ct181

That is still work in progress in Vietnam.[267] Nonetheless, the importance of these factors is recognised and emphasis is given to address them in the context of investment and industrial zones. Of course, availability of skills and talent varies considerably across different regions of the country.[268]

3. **Cheap price for the infrastructure used**: For land, either exemption of a charge or a low price is charged. Plug and play are available at reduced prices. If an exceptionally large piece of land is required and not yet available, the Government prepares the land with roads, water and power connections, and provides it in a relatively short period of time. Government creates additional facilities near the factory, as required, especially for large global firms, e.g. air strips for aircrafts landing and taking off for delivery of inputs and final products.
4. **Subsidies are provided to reduce the cost burden and improve competitiveness**: Examples include exemption from import tariffs of machinery and equipment when installing the factory, exemption or reduction of income taxes, and exemption/reduction or sharing the cost of labour, housing, training and of R&D.
5. **Special coordinated focus given to attracting mega-firms or "lead firms" in Global Value Chains**: These countries aim to achieve their objectives by linking up with firms which manage GVCs, i.e. the "lead firms". These firms are major global brand firms, which have the ability to place the products in most major markets of the world. Relatively more attractive preferential and support policies are offered to such firms.
6. **Priority sectors are decided based on a coherent and coordinated approach emphasising national objectives**, including objectives focused on new and emerging technologies, skill, employment, regional development, specific leading sectors for particular parts of the country.
7. **Improving the domestic ecosystem or development of the supply chain in the domestic market**: Providing subsidies and facilitation to "supporting industries" which supply inputs to the main promoted industry. The strategy to build local firms is often based on their business links with the large firms in the industry and the ecosystem generated from investment by large-scale firms.
8. **Ease of doing business**: Quick approvals, permits, customs clearance, and identifying policy constraints on exports to address them as required. Priority sectors/firms are given special treatment.
9. **Stability of policy for a specified period, and** emphasis on the Government officials adopting a **helpful and facilitating approach.** Oversight is maintained to monitor that officials **effectively implement** the incentive and support policies. This commitment **creates credibility of the policy regime**.[269]
10. **Periodic reviews**: Periodic reviews to revise the incentive and facilitation schemes, as necessary. This may take place annually in certain instances for improving performance[270] and also every five years or so to examine a need to change the policy to a more significant extent. The aim is to combine stability of policy and any change in policy, if required.

---

[267] "According to the PCI data, only 29% of foreign employers and 27% of domestic employers assess the workforce near where they do business in Vietnam as fully sufficient to meet their needs", page 147 of https://pcivietnam.vn/en/publications/2019-pci-full-report-ct174

[268] https://www.vietnam-briefing.com/news/vietnam-industrial-zones-how-to-pick-location-for-your-business.html/ and page 9 of http://asiaperspective.net/ap17/wp-content/uploads/2019/11/ap-vietnam-kez-report-part-one-251119a.pdf

[269] For an example of a summary assessment of the continued problems and improvements made in the operating situation in Vietnam, see pages 68, 115 and 116 https://pcivietnam.vn/en/publications/2019-pci-full-report-ct174

[270] See, for example, https://pcivietnam.vn/en/publications/2019-pci-full-report-ct174

Some examples of the investment incentives in China and Vietnam are as follows.

China: China provides a range of investment incentives, both financial assistance and tax exemptions or reductions. The incentives provided by the Central schemes are sometimes supplemented by schemes at the provincial level or investment zones/city levels. In general, the tax rates differ across regions and also for specified sectors. For example[271]:

(a) 5 years zero tax and next 5 years 12.5% tax (e.g. for integrated circuits);

(b) 3 years zero tax and next 3 years 12.5% tax (e.g. for basic infrastructure, environment protection and energy);

(c) 2 years zero tax and next 3 years 12.5% tax.

(d) Income tax of 15% in general after the special incentive periods, or for the period specified for particular areas or activities.

Shorter periods for depreciation (effectively subsidy on investment) are also provided.[272]

A number of incentives are provided by provinces or special zones,[273] such as cheap land, reduced costs/ tax for operational facilities, tax exemption for imported equipment,[274] special funding schemes and cheap loans which reduce capital and operating costs,[275] subsidy on investment in specific sectors, reduction in raw material cost, financial support for training of personnel or for acquiring expertise for the project, and subsidy for R&D.[276]

For R&D, in addition to allowing deductions ranging from 50% to 75% for R&D costs, funding support is provided to R&D centres as well as support for talent acquisition, facilitation for a range of activities such as land use for R&D purposes, customs clearance for cross-border R&D, cross-border financial services, environmental assessment and hazardous waste management, and protection of intellectual property rights (IPRs).[277]

Further, China has an exceptionally preferential approach for large global companies going much beyond the conventional support policies, e.g., constructing runways close to the factory to enable planes to land and take-off to transport inputs/finished products, or giving exceptionally large subsidies on machinery/equipment/ land, together with a dedicated facilitation service targeted solely towards the company concerned.

Vietnam: Like China, Vietnam also offers generous tax incentives to investment in specific sectors or regions. They involve lower corporate tax rates, supplemented by still more generous tax reductions in priority areas. The subsidy is at two levels. One is general reduction in tax rates such as 10%, 15% or 17% instead of 20%. Second is more generous incentives for preferred activities or regions. These include zero tax for 4 years,

---

[271] See https://taxsummaries.pwc.com/peoples-republic-of-china/corporate/tax-credits-and-incentives.

[272] https://taxsummaries.pwc.com/peoples-republic-of-china/corporate/deductions

[273] https://www.china-briefing.com/news/chinas-economic-development-zones-types-incentives/

[274] https://www.china-briefing.com/news/china-2020-fi-encouraged-catalogue-effect-january-27-2021/

[275] http://english.www.gov.cn/policies/latestreleases/202008/12/content_WS5f33e19bc6d029c1c2637a2d.html

[276] See, for example, https://taxsummaries.pwc.com/peoples-republic-of-china/corporate/tax-credits-and-incentives

[277] https://investmentpolicy.unctad.org/investment-policy-monitor/measures/3620/china-shanghai-introduces-support-policies-to-encourage-foreign-r-d-centers

and half of the lower tax rate (say, half of 10%) for 9 years.[278] In certain cases, the period of zero tax and half of the lower applicable tax differs from the conventional schemes, e.g., the periods for zero tax could be 4 (or 2) years, combined with 5 (or 4) years of 50% reduction in the applicable tax instead of 9 years.[279]

In addition, rental for factory land is exempted or reduced for a specified period, financial support is provided for training/lodging of workers, and duty-free imports are allowed for: machinery and equipment; material and spare parts for the machinery; specialised means of transportation; and goods that are imported for serving environmental protection.

Financial incentives or tax reduction are provided also for the supporting industries in priority sectors, i.e. those which provide inputs processed by the main beneficiary firm, thus creating incentives for domestic producers which are part of the value chain.[280] In addition, Vietnam (or certain regions in the country) provide interest rate subsidies to specified activities or enterprises, e.g. the supporting industries,[281] small and medium enterprises, and for investments in certain specified sectors.

Vietnam plans its industrial zones in a manner that all basic requirements, including power, input suppliers, skilled/unskilled labour, and airports/ports are within easy reach. Similar to China, Vietnam too gives more significant incentives for large global firms. For example, in one case, the lower preferential tax of 5% was offered for 26 years instead of the 9-year period under the general policy.

5.4 India's Recent Investment Policy Initiatives

India's economic policy approach for Atmanirbhar Bharat emphasises investment policy as one of the main planks to achieve its objectives. In that context, the main focus is on a combination of inviting FDI, developing domestic capabilities, and improving the operational conditions for investors/producers in India, i.e. ease of doing business, with a particular emphasis on priority sectors.

The policy objectives include reduction in imports due to larger domestic production of the products concerned, greater links with global value chains (GVCs), and higher exports. Together these would result in a lower trade deficit, and a reduction in the present vulnerability or dependence on limited sources of foreign supply in strategic sectors.

While Atmanirbhar Bharat was announced in mid-2020, the emphasis on investment policy is much older. Under this government, the Make in India initiative had similar objectives though some parts of the current focus were not as prominent or considered with a similar level of urgency. These include a reduction in the risks due to single or few sources of input supply for GVCs, identification of some specific major strategic sectors and giving high priority to their development within India, an explicit recognition of the "disabilities" faced by Indian producers when competing with other economies in the global markets, and an approach to specify certain industries as priority areas of policy focus for financial incentives and support. This has resulted in inter alia the development of Production Linked Incentive (PLI) schemes. Further, the US-China trade tensions have led to foreign investors looking for alternative destinations for investment. The Indian

[278] See for example, EY, Investment in Vietnam 2020, A Reference Guide, and also https://taxsummaries.pwc.com/vietnam/corporate/tax-credits-and-incentives

[279] https://taxsummaries.pwc.com/vietnam/corporate/tax-credits-and-incentives

[280] The domestic firms, in particular SMEs are also provided a range of incentives through specific schemes for SMEs. See https://www.vietnam-briefing.com/news/vietnam-issues-investment-incentives-smes.html/

[281] https://vietnamnews.vn/economy/822039/companies-in-supporting-industry-to-be-provided-with-interest-rate-subsidy-next-year.html

Government began focusing on attracting such FDI, with a particular emphasis on major global firms (similar to the strategy adopted, for example, by China and Vietnam). Therefore, the PLI scheme for large electronics (one of the first to be announced) has a major segment for global firms.

India's policy initiatives to improve the investment opportunities cover several interlinked areas, with specific incentives and facilitation that impact the attractiveness and ease of investing and operating in India.

5.4.1 Overall Investment Policy Approach

FDI liberalisation has taken place in 87 policy areas across 21 focus sectors. For example, FDI limit in sectors such as Defence Manufacturing under the automatic route has been raised from 49% to 74%, and commercial mining in the coal sector has been introduced.[282] The Government has introduced multiple policy interventions to fast-track FDI, and in view of the current global conditions and widespread interest received by India from companies looking to diversify their supply chain, the Government has introduced several measures to support these investments. The attempt is to implement this reform in a coordinated and comprehensive manner. The Government has reduced corporate tax in India in 2019 to 15% (for new investments in manufacturing) from 25%, and introduced Goods and Services Tax (GST) which subsumes almost all the indirect taxes except a few state taxes. The range of activities of the organisation "Invest India" illustrates the thrust of India's investment policy approach covering several interconnected areas, and provides examples of the diverse activities under the rubric of investment policy (see Table 5.5 below).

Table 5.5: Projects with which Invest India is involved

Scheme	Description/ Coverage
Investor Targeting	Promotion of India investment opportunity to FDI investors; Identification of potential FDI investors and creation of specific strategies for their India investments
Investor Facilitation	Hand-holding of investors through their investment journey in India; Facilitation of issue redressal for investors in India
Brand Communication	Strategic marketing of Brand Invest India and the India investment opportunity
States' Engagement & Capacity Building	Build world-class investment promotion and facilitation capacity in all States through intensive workshops, consulting engagements and rating exercises
Financial Investors Initiative	The initiative focuses on promoting institutional investment and facilitating the allocation of capital to India by limited partners and increased deployment by general partners. The team works with investors to identify investment opportunities, undertake policy advocacy, and facilitate the resolution of issues at different stages of investment.
Project Monitoring Group	PMG is an institutional mechanism for resolving a variety of issues including fast tracking the approvals for setting up and expeditious commissioning of large Public, Private, and Public-Private Partnership (PPP) Projects.
Startup India	Startup India is a flagship initiative of the Government of India, intended to build a strong ecosystem that is conducive for the growth of start-up businesses, to drive sustainable economic growth and generate large-scale employment opportunities.
Strategic Investment Research Unit	To develop actionable insights showcasing the India story to the world.

[282] For more detail, see https://dipp.gov.in/sites/default/files/FDI-PolicyCircular-2020-29October2020_0.pdf

Scheme	Description/ Coverage
AGNIi (Innovations)	Accelerating Growth of New India's Innovations (AGNIi)[283] is a policy for accelerating commercialisation of innovation and technology to boost growth.
India Investment Grid	The National Infrastructure Pipeline (NIP) is a first-of-its kind, whole-of-government exercise to provide world-class infrastructure across India, and improve the quality of life for all citizens. It aims to improve project preparation and attract investments into infrastructure.
Industrial Information System (IIS)	IIS is a Geographic Information System which provides investors with a seamless experience to identify investable industrial land. The portal has 3,400+ industrial parks geotagged across 4.8 lakh hectares and has been integrated with industrial GIS systems of State Governments.
Industrial Park Rating System (IPRS)	IPRS was developed to evaluate the competitiveness of industrial parks against global benchmarks across four dimensions, namely, internal infrastructure, business services and facilities, and environment and safety management. 430 Industrial parks of 30 States and Union Territories are being evaluated under the exercise.
Regional Development: North East (NE) Desk of Invest India	The North-East Desk is to extend support to NE States for investment promotion and facilitation. This is to give a further impetus for creation of best-in-class investment promotion agencies in the NE Region. The activities undertaken by the NE Desk will include focus on Investment Targeting and Promotion, Investor Facilitation, Strategic Tie-ups, capacity building of investment teams and creating of a conducive Investment Policy Framework.

Source: Invest India

This various parts of the investment policy approach comprise initiatives with both wide-ranging impact as well as sectoral focus for improving conditions of investment. They include:

Coordination and Oversight: The Government has established a coordination and oversight mechanism through an empowered group of Secretaries, overseeing Project Development Cells set up across Central Government Ministries. A targeted Project Monitoring Group is part of the Department of Promotion of Investment and Internal Trade (DPIIT).[284]

Security-related concerns: India has been concerned about the security breaches that could occur, in particular with digital transmissions. It has begun examining specific products and technologies, particularly digital technologies, and has established a system for increasing the trustworthiness of electronic value chains. Further, it has amended its policy on FDI, by changing the conditions applicable to investment from neighbouring countries.[285]

[283] https://www.agnii.gov.in/

[284] Since the merger with DPIIT, the Project Monitoring Group (PMG) has resolved all issues pertaining to 102 projects worth INR 2.6 lakh crores. The PMG team has coordinated with multiple States and Central Ministries to resolve 394 issues. The team reaches out to the private sector to assist in expeditious commissioning of projects, and around 23% of all newly added projects on the PMG portal are from the private sector.

[285] "An entity of a country, which shares a land border with India or where the beneficial owner of an investment into India is situated in or is a citizen of any such country, can invest only under the Government route. Further, a citizen of Pakistan or an entity incorporated in Pakistan can invest, only under the Government route, in sectors/activities other than defence, space, atomic energy and sectors/activities prohibited for foreign investment." See https://pib.gov.in/PressReleasePage.aspx?PRID=1615711#:~:text=However%2C%20an%20entity%20of%20a,only%20under%20the%20Government%20route.&text=1(a)%2C%20such%20subsequent,will%20also%20require%20Government%20approval.

Incentive Schemes: The Government has introduced new incentive schemes and revised some previous ones. In early 2020, the Government announced a PLI scheme for sectors such as Electronics, Pharmaceuticals, and Medical Devices. The response from the industry was encouraging, and for sectors such as Electronics, cumulative investment of INR 11,000 crores (USD 1.4 billion) was announced by investors. Subsequently, the Government has expanded the coverage of this PLI scheme to include additional sectors. The aim is to develop India as a key industrial hub and transform the manufacturing ecosystem in industries such as Pharmaceuticals, Electronics, Automotives, Telecom and Networking Products, Textile Products, Textiles, and Food Products, among others.

A good example of the comprehensive approach to incentive schemes is the electronics sector. It includes a focus on global and domestic firms producing mobile phones, the parts and components sector for mobiles as well as other electronics products such as laptops, assistance to capital investment such as through the Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS)[286], and the Modified Electronics Manufacturing Clusters (EMC) 2.0 Scheme.[287] The Government phased out its MEIS scheme for subsidy on manufactured exports, to be replaced by a Remission of Duties and Taxes on Exported Products (RoDTEP) scheme which supports exports consistent with WTO requirements.[288]

5.4.2 Facilitation Policies

Facilitation policies address laws/ regulations, as well as the processes and timelines for implementing these policies. India has implemented a wide range of facilitation policies for example:

Facilitation policies - Laws/ regulations: On 27 July 2017, the Lok Sabha passed the Companies (Amendment) Bill, 2016 with respect to structuring, disclosure and compliance requirements for the companies. The Act removes the restriction under section 186 of making investment through not more than two layers of investment companies. It also addresses inconsistencies and procedural restrictions in the Companies Act, 2013.[289] Other examples include the **Insolvency and Bankruptcy Code (IBC)** which is a bankruptcy law to establish a resolution mechanism for a time-bound re-organisation procedure for corporate debtors with participation of professional institutions for the effective handling of the proceedings – thereby improving recovery rate and reducing time to resolve insolvencies in India;[290] codes such as the **Code on Wages 2019**, that amended and consolidated laws relating to wages, bonus and matters connected therewith;[291] the

[286] See https://www.meity.gov.in/esdm/SPECS; https://www.meity.gov.in/writereaddata/files/scheme_for_promotion_of_manufacturing_of_electronic_components_and_semiconductors.pdf and https://www.meity.gov.in/writereaddata/files/SPECS-Guidelines-01062020.pdf. SPECS provides a financial incentive of 25% on capital expenditure for the identified list of electronic goods that comprise downstream value chain of electronic products, i.e. electronic components, semiconductor/ display fabrication units, ATMP units, specialised sub-assemblies and capital goods for manufacture of these above-mentioned products.

[287] https://www.meity.gov.in/esdm/emc2.0. The EMC 2.0 Scheme provides financial assistance for setting up of both EMC projects and Common Facility Centres (CFCs) across the country. The Scheme is open for receipt of applications for a period of 3 years from the date of notification. A period of 5 years is available for disbursement of funds to the approved projects.

[288] MEIS was found to be inconsistent with WTO in a dispute raised by the US. The RoDTEP scheme is established based on the provisions specified by the WTO Agreement on Subsidies and Countervailing Measures.

[289] https://prsindia.org/billtrack/the-companies-amendment-bill-2016

[290] For details, see the website https://www.ibbi.gov.in/

[291] The Code subsumed four labour laws -- Minimum Wages Act, Payment of Wages Act, Payment of Bonus Act and Equal Remuneration Act. The Code universalised the provision of minimum wages and timely payment of wages to all employees irrespective of the sector and wage ceiling. Under this, the number of Registers/Forms prescribed under 9 central laws and rules was reduced from 56 to 5.

Industrial Relations Code 2020 which addresses matters related to workers' classification, holidays, paydays, and wage rates, and termination of employment and grievance redressal mechanisms for establishments with at least 300 workers; and a **Code on Occupational Safety, Health and Working Conditions 2020**.[292]

Facilitation policies - Single Window System for Clearances: The government is focusing on a single window portal that reduces the number of times businesses would need to interact with the government for getting clearances. India's Customs Single Window, supported by the e-SANCHIT portal, provides traders the facility to lodge their clearance/supporting documents online at a single point. The new system provides for unified and integrated business procedures. It also encourages risk-based self-regulation and third-party certifications, and introduction of the post-clearance audit of consignments identified by the Risk Management System (RMS). Express Cargo Clearance System (ECCS) has been introduced at Delhi, Mumbai, and Bengaluru. These initiatives help reduce the number of consignments that need to be inspected on arrival.

Facilitation policies - Oversight: These initiatives are supplemented by mechanisms for oversight of effective performance. The National Time Release Study is a good example of such a mechanism for accountable governance to "measure rule based and procedural bottlenecks (including physical touchpoints) in the clearance of goods, from the time of arrival until the physical release of cargo. The aim is to identify and address bottlenecks in the trade flow process and take the corresponding policy and operational measures required to improve the effectiveness and efficiency of border procedures, without compromising efficient trade control."[293] The study shows considerable detailed evaluation,[294] and the important part of the process now depends on effectiveness of the measures to address the shortcomings.

Facilitation policies - National Trade Facilitation Action Plan: India is now in its second phase of India's National Trade Facilitation Action Plan[295] which includes measures to improve infrastructure. The policy measures to address constraints on investment go beyond the requirements under the WTO Trade Facilitation Agreement. A National Committee on Trade Facilitation coordinates and oversees the implementation of the action plan.

Facilitation policies - Easing the tax system: In addition to reducing the corporate tax rate, the Government has introduced a **'Transparent Taxation' Platform** aimed at removing a physical interface between the taxpayer and the income tax department. It provides for faceless assessment, appeals and a taxpayers' charter. Likewise, initiatives like TURANT Customs[296] (faceless, contactless and paperless Customs clearance process) have been introduced to make customs clearance faster, faceless, and direct contact-free. Another example of tax simplification is the reform of the Angel Tax in 2019.[297]

---

[292] In this Code, the factory definition has been expanded to 20 workers for premises where the process uses power and 40 workers where the process uses no power. Secondly, the manpower limit on hazardous conditions has been removed, and mandates from the Code on contractors apply to those employing 50 or more workers instead of 20.

[293] https://pib.gov.in/PressReleasePage.aspx?PRID=1581003

[294] http://jawaharcustoms.gov.in/pdf//TRS_2020.pdf

[295] https://www.cbic.gov.in/resources//htdocs-cbec/implmntin-trade-facilitation/national-trade-facilitation.pdf

[296] https://www.cbic.gov.in/resources//htdocs-cbec/customs/cs-circulars/cs-circulars-2020/Circular-No-40-2020.pdf

[297] The Angel Tax, formally known as Section 56 (2) (viib) of the Income Tax Act, taxes funds raised by start-ups if they exceed the fair market value of the company. Concerns were raised that it is not possible to calculate the fair market value of a start-up. The FM announced that start-ups will not be required to present the fair market value of their shares issued to certain investors including Category-I Alternative Investment Funds (AIF).

Facilitation policies – Better Infrastructure and Information to Help Investors: The Government has implemented several policies to improve the infrastructure and provide information that will ease decision-making and operations of investors. Examples include the **National Infrastructure Pipeline (NIP)** focusing on infrastructure development across several key sectors e.g. energy, railways, roads, irrigation (34 sub-sectors and 7,621 projects).[298] The Ministry of Commerce and Industry's **Industrial Information System (IIS)** provides information on available industrial land by showcasing 4.8 lakh hectares of geotagged locations across 3,376 industrial parks.[299] It also provides plot-level information, distance from nodal connectivity points, raw materials, and available internal infrastructure.

Facilitation policies - Easing of Norms by the Reserve Bank of India (RBI) for Foreign Investment in Start-ups: Examples include a simplification and liberalisation of the External Commercial Borrowings regime established by RBI in 2019, and Foreign Venture Capital Investors (FVCI) registered under the Securities and Exchange Board of India (Sebi) Regulations requiring no approval for investing in equity or equity-linked instrument or debt instrument issued by an Indian start-up.

Other examples of Facilitation Policies: The Government notified in 2020 a scheme to **digitalise and simplify the process for company registration** (SPICe+);[300] the improvements made in the national IPR policy; and the **National IPR Policy (2016)** which sets in place an institutional mechanism for implementation, monitoring and review, with an aim to incorporate and adapt global best practices to the Indian scenario.[301]

5.5 Some Lessons to Keep in Mind

The discussion on Trade Policy (see chapter 3) shows that while the Government is making efforts on several fronts and improving its performance in terms of facilitation, India is still considerably behind the comparator countries in a number of areas. To improve performance, it is useful to learn from industrial policy experience of nations and focus on some good governance initiatives and priority areas of action identified in that context. A wide-ranging review[302] of industrial policy experiences shows that the positive impact of policy requires **ensuring that implementation is done in an effective manner**. The review concludes that:

"Desirable features of good incentive programmes include **standard setting, automatic sunset clauses, built-in programme reviews, monitoring and establishment of clear benchmarks for success or failure, and periodic evaluation** exercises. These and other instruments can be used to limit the likelihood of abuse and implementing proactive policies based on strong public-private cooperation. Their application, of course, requires **competent public agencies and effective coordination**."[303] (emphasis added)

---

[298] https://indiainvestmentgrid.gov.in/national-infrastructure-pipeline

[299] https://www.indiafilings.com/learn/industrial-information-system-iis/

[300] http://mca21.gov.in/Ministry/pdf/SPICeForm_28082020.pdf

[301] The 'Pendency in Trademark' examination time has been reduced to 1 month The disposal of Patent applications has increased more than two-folds and the disposal of Copyright applications has increased by almost 5 times. The shortest time taken to grant a patent recently has been 67 days from the filing of the request for examination. As on 31 December 2019, 1,454 of the 1,700 expedited applications received had been examined and 671 patents granted.

[302] https://www.researchgate.net/publication/262857559_Industrial_policy_productive_transformation_and_jobs_Theory_history_and_practice

[303] Page 31 of https://www.researchgate.net/publication/262857559_Industrial_policy_productive_transformation_and_jobs_Theory_history_and_practice

Effective implementation of policies requires adherence to good governance or good regulatory practices which include, for example, transparency, stability of policy, timely decisions and approvals (i.e. avoiding delays), consultations with stakeholders, non-arbitrary decision-making, and not creating arbitrary or unnecessary barriers to trade. This would be facilitated by adopting international practice/standards to the extent possible, and a process to review and address any complaints or concerns of the industry/ exporters.[304]

In this regard, the experience of other nations and feedback from Indian industry suggests some key areas of focus, including:

(a) **Impact of policy on competitiveness is the most important criterion to evaluate all policies.** Keeping in mind the impact of a policy on competitiveness is the best way to assess policy measures and whether and for how long they should be implemented. Policies that improve competitiveness should be preferred to those which may have some direct or indirect adverse impact on competitiveness.

(b) **Technological change is a common factor impacting competitiveness in several sectors.** A number of sector-specific chapters in this Report show that **technology is becoming a very significant factor for creating and maintaining competitiveness in several industries**, including the ones being emphasised by the Government. Therefore, support policies should keep this feature in mind and develop strategies for sustaining technology upgradation.

(c) **Important to prioritise some sectors, and more closely monitor the impact of policy on them.** These sectors include those which are important inputs into others (e.g. electronics), or have a strategic significance for some other reason.

(d) **Reduce delays in approvals and disbursement of subsidies**. Delays reduce the impact of investment incentives and the credibility of the Government. An important example of delays in implementation is the disbursal of monies under the M-SIPS scheme for electronics. Feedback from the industry also shows that the implementation of this scheme needed significant improvement to achieve the desired level of effective application.[305] It is noteworthy that the Guidelines of the PLI schemes include timelines in general. However, some of them do not yet have any indicated timeline for disbursal of the subsidy.

One principle that could address many matters of delay, e.g. cargo clearance or approval of standards, is to establish a system with a specified timeline for approval together with deemed approval on a wider scale. After the specified timeline is crossed, **deemed approval** could be given unless there is some exceptional situation. This should be supplemented by a review process to ensure that the exceptional situation does not become the norm.

(e) **Ensure stability of policy**. It is important to avoid arbitrary changes in existing policy without consultation and feedback, notifying changes in operating conditions with retrospective effect, or implementing a major change in the operating conditions due to the decision of the overseeing official (such as stopping all transactions because a single batch of imports does not meet the specified criteria).

---

[304] The basic principles are reflected, for example, in the "Code Of Good Practice For The Preparation, Adoption And Application Of Standards" of the WTO Agreement on Technical Barriers to Trade.

[305] The period of the scheme was from 3 August 2005 to 31 December 2018, and disbursement continued in 2019. According to the Annual Report of MeitY 2019-20, till 30 November2019, a total of 407 applications were received, and 235 were approved. Of the approvals, 69 were approved by March 2016 and total of 95 by March 2017, and "incentives to the tune of Rs. 836.19 crores have been disbursed to the 64 applicants." See, Page 106 of https://www.meity.gov.in/writereaddata/files/Annual_Report_2019%E2%80%9320.pdf

(f) **Sunset-clause.** A clear timeline for terminating a policy is required for efficient policy formulation as well as incentivising adjustments by firms to improve their efficiency and competitiveness. This is especially important for policies that have any adverse impact on competitiveness but are needed for a period of time to achieve any immediately pressing objective.

(g) **The evaluation of whether a policy measure is being effectively implemented should be based on a large enough coverage in the country, and not on a small sample based on the experience in a few places**. This should include the identification of the situation in States and the Centre, all the major ports/airports, and those activities which need to be addressed on a priority basis.

(h) **When new schemes are implemented, the initial experience should be examined and teething problems addressed**. Experience suggests that new policy measures, be they to facilitate the process (e.g. faceless assessment)[306] or to create additional requirements (e.g. environmental requirements),[307] have teething problems and increase the burden on the firm subject to these conditions. This would require introducing as an integral part of the process a mechanism to identify the nature of problems that arise and the methods used in certain cases to address the problems.

(i) **Facilitation schemes and incentive schemes have dissimilar effects.** Both facilitation and incentive policies have a positive impact on competitiveness, and thus would likely result in higher domestic output and exports. Nonetheless, there is a difference. Facilitation introduces features that will improve competitiveness by increasing efficiency and reducing costs on a more permanent basis. A subsidy, however, provides a temporary relief unless specific efforts are made by producers to reduce costs and efficiency. Incentives for such efforts are created by ensuring that a subsidy does not become a permanent support system for any sector.

(j) **Certain other, accompanying policies have adverse effects and thus need careful consideration.** In India, investment promotion has in several cases been accompanied by an increase in tariffs, including tariffs on imports of inputs for a promoted product. In some cases, the increase in tariffs had begun under a Phased Manufacturing Programme (PMP)aimed at promoting domestic production.

An increase in tariff results in a loss of competitiveness, especially in the export market. By making inputs more costly, a tariff on inputs in effect reduces the net PLI subsidy granted to a sector. Further, a general equilibrium analysis using GTAP[308] shows that the loss of competitiveness takes place both for the products for which tariffs are increased, as well as the general level of exports from the economy. Thus, while a tariff increase would likely result in an increase in domestic production, it tends to reduce exports of the product for which tariffs are increased. It also leads to a wider loss of competitiveness leading to a fall of aggregate exports and domestic economic activity if the protected product is an important input in other sectors. Table 5.6 shows such a result of the GTAP analysis of a rise in tariffs on inputs for mobile phones.

[306] https://www.thehindubusinessline.com/news/national/faceless-schemes-of-direct-taxes-creating-more-problems-than-resolutions/article33445675.ece

[307] See, for example, page 112 and chapter 6, including annexes 6.1 and 6.2 of https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/SpecialPublications/Report-on-Domestic-Constraints-on-Exports-of-Selected-Sectors-new.pdf

[308] Global Trade Analysis Project.

Table 5.6: GTAP Results of the Impact of PMP in the Electronics (Mobile Phone) Sector
(figures are in percentages)

Economic Activity Impacted	Percentage Change due to Tariff Increase under PMP
Sectoral Employment (due to higher domestic production)	0.201
Sectoral Exports	-0.71
Overall (economy-wide) GDP	-0.0647
Overall (economy-wide) Exports	-3.1001
Overall (economy-wide) Imports	-1.9934
Overall (economy-wide) Employment	-0.1297
Overall (economy-wide) Investment	-0.4124

Source: Table 5.7 of https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/SpecialPublications/Report-on-Domestic-Constraints-on-Exports-of-Selected-Sectors-new.pdf

Thus, with tariff increases, only one set of the objectives (domestic employment, domestic production and reduction in imports) will be positively achieved in the sector protected through tariffs. However, tariffs are also likely to result in lower exports of the protected products, and also exports of other sectors that use the protected product as an input. This makes it important to consider the extent to which the product area protected by tariff increases is linked to other parts of the economy. Such a link could lead to a fall in the total employment and exports of the economy even if the domestic production of the protected product increases due to tariffs. This also implies that a supplementary policy measure would have to be implemented in order to focus on increasing exports.

Since tariff increases adversely affect competitiveness, this should not be a primary policy of choice. However, if a tariff increase must be implemented, it should be temporary and phased out after a limited period. For example, a tariff increase in the electronics sector could have a time limit of 5 years, similar to that of the PLI scheme. In addition, a clear timeline for improving competitiveness should be part of the policy framework.

(k) Policies that promote an increase in scale of operations are important for improving competitiveness and domestic value addition. A value chain for any product requires a whole range of inputs. It is recognised that for many products, a larger scale of operation provides a good basis to reduce costs, improve quality, and increase competitiveness. There is one important impact of scale, however which is often overlooked but is very important for sustaining competitiveness. A large scale of production provides the incentives to producers of inputs (parts and components) to locate their production units near the big producer who demands the inputs. With a shift of FDI to India from another place abroad, often this involves the previous providers of parts and components located abroad to invest in the territory where the main hub of production is located. This helps build the domestic ecosystem, and is the most effective way to achieve higher domestic value added within a relatively short period of time, as a larger part of the value chain gets located within the country. Without production on a large scale, this process takes more time, and such a delay also reduces the effectiveness of the support policies implemented for the sector. The resulting situation is a loss of ability to compete, and much more effort needed to develop the domestic ecosystem. In the meantime, those who allow the hub and spoke FDI to take place within their territory are able to capture a larger part of the global market and better establish themselves in the global value chains.

(l) **Both FDI and domestic producers of different tiers in the supply chain are important for developing the domestic ecosystem.** A policy which creates obstacles for the producers of parts and components (FDI or domestic) to shift close to the main product in the value chain, reduces the scale of operation and competitiveness, and lowers domestic value addition.

Conclusions

Chapter 1 had noted that investment policies form the bulk of international industrial policy initiatives. This chapter discusses important aspects of India's investment policy and its overlap with trade policy. It illustrates that some trade policies such as tariffs achieve certain objectives but work against others. Tariffs on the subsidised product act as a disincentive to reduce its production costs, adversely affecting the ability to increase participation in GVCs. Further, a rise in tariffs (or other forms of trade restrictions), particularly tariffs on inputs, erodes the benefits of subsidies. Other policies, like trade facilitation and subsidies contribute more positively to both investment and trade. However, there is a difference in that facilitation policy has a more permanent impact on competitiveness, but subsidy policy on its own does not lead to greater efforts by firms to improve cost-effectiveness of their operations.

Section 5.1 provides an overview of FDI inflows into India and compares India with some other economies. India's annual FDI inflows increased from relatively low levels in 2000 to over USD 60 billion now. A significant part has come to services, telecommunications, and computer services and hardware. Section 5.2 gives an overview of investment policies in a number of economies, including China, the EU and the US. In addition to investment incentives and facilitation, what has gained prominence are security-related concerns, resilience of supply chains,[309] and strategic objectives that are leading to more inward-looking investment. These objectives are similar to those emphasised by India, though with some significant differences. India relies on trade restrictions much more than others. Moreover, it has only recently begun to focus more on global firms and specific priority sectors in a way that China and Vietnam have done for several years. Other nations are keener than India to create opportunities through FTAs and bilateral investment agreements. Vietnam is not as focused on producing key inputs or strategic products domestically as others including India; and China relies also on outward FDI while that is not the case for India.

It is important to learn from investment policy strategy of countries that have done comparatively well in terms of attracting FDI. Section 5.3 summarises the main aspects of the investment policy regime of China and Vietnam, both of which follow a similar approach. They conduct a strategic evaluation and based on the priorities identified, a comprehensive approach is taken to improve operational conditions. Implementation is monitored to examine areas for improvement.

In this context, Section 5.4 discusses India's investment policy initiatives and illustrates the large scope and coverage of these efforts. India has taken account of several factors which underpin a successful investment policy regime. It has made steady progress in establishing an investment-related legal/regulatory framework, investment incentives and facilitation, and working together with States to coordinate and facilitate operations. India relies relatively more on investment facilitation than investment incentives, though its recent PLI policies act as a major new incentive policy for a number of areas identified for support.

A major lesson from the experience of other countries is that support for effective implementation of policies is crucial. India has a number of good policy initiatives on the ground, and a major issue becomes how

[309] See, for example, https://www.whitehouse.gov/briefing-room/statements-releases/2021/02/24/fact-sheet-securing-americas-critical-supply-chains/

effectively they are implemented. Feedback from Indian industry suggests that this is a particularly important area to address and improve in India. Section 5.5 discusses this and a number of other steps for improvement. It also shows that not only is there an apparent conflict at times between trade and investment policies, but that the overall impact requires a consideration of whether or not the product of a protected sector (e.g. electronics) is an important input into other sectors. For sectors whose products are linked to other sectors, the overall aggregate adverse effects can submerge any positive sectoral effects. Other insights from Section 5.5 include the differential impacts of different support policies (subsidies and facilitation); the crucial role played by technology and scale of operations for creating and maintaining cost-competitiveness in several sectors emphasised by India; and the huge significance of:

- reducing delays for achieving better competitiveness;
- larger links with GVCs;
- improving exports;
- reducing imports; and,
- increasing domestic value addition.

In the context of reducing delays, the practice of deemed approval after a specified period of time for approvals, is an approach that could be adopted on a wider scale.

A key point that emerges from this chapter is the need to evaluate all policies in terms of their impact on competitiveness. Policies which reduce incentives to improve competitiveness should normally not be adopted. Alternatively, if there a need to use them, they should be temporary and phased out after a limited period of time. This section makes the point that the only policies with permanent beneficial effects are facilitation policies. Others such as tariffs and subsidies should be limited to a short period of time, similar to what has been done for the period of subsidies made available under the PLI schemes.

► Chapter 6

Investment and Trade Policies in Textiles and Clothing

Introduction

The textiles and clothing industry occupies a very important place in the Indian industrial arena. It accounts for 7% of industry output in value terms, 2% of GDP and 12% of the country's exports.[310] It is the second largest textile and clothing industry in the world, next only to China, with an estimated output of USD 137 billion in FY 2018-19 with domestic consumption and exports accounting for USD 97 billion and USD 40 billion, respectively.[311] The domestic consumption of USD 97 billion was divided into household consumption of USD 83 billion with technical textiles accounting for the balance USD 14 billion.[312] The textile industry is also the second largest employer in the country after agriculture, providing direct employment to 45 million people and indirect employment to another 60 million in allied sectors.[313]

6.1 Exports

India has a 5% share of global trade in textiles and clothing.[314] The breakup of India's exports from 2014-15 to 2018-19 is provided in Table 6.1.

[310] http://texmin.nic.in/sites/default/files/AR_MoT_2019-20_English.pdf

[311] https://www.fdi.finance/sectors/textiles-and-garments

[312] Ibid.

[313] http://texmin.nic.in/sites/default/files/AR_MoT_2019-20_English.pdf

[314] Ibid.

Table 6.1: India's Textile and Clothing Exports (2014-15 to 2018-19)

(in USD billion)

Product	2014-15	2015-16	2016-17	2017-18	2018-19
Clothing (Garments)	16.8	17.0	17.4	16.7	16.2
Cotton Raw, including Waste	1.9	1.9	1.6	1.9	2.1
Cotton Yarn	3.9	3.6	3.2	3.4	3.9
Other Textile Yarn, Fabrics, Made-Ups	0.4	0.3	0.4	0.4	0.5
Cotton Fabrics & Made-Ups	5.5	5.2	5.4	5.4	6.0
Manmade Staple Fibre	0.6	0.5	0.6	0.6	0.6
Manmade Yarn, Fabrics and Made-Ups	5.3	4.7	4.6	4.8	5.0
Wool and Woollen Textiles	0.2	0.2	0.2	0.2	0.2
Silk Products	0.1	0.1	0.08	0.07	0.08
Handloom Products (including Carpets)	0.4	0.4	0.4	0.4	0.3
Jute Products	0.4	0.6	0.3	0.3	0.3
Total Textiles and Clothing (T&C)	36.9	36.0	35.4	36.7	36.6
Handicrafts	3.3	3.3	3.6	3.6	3.8
TOTAL T&C including Handicrafts	40.1	39.3	39.0	39.2	40.4
India's Overall Exports	310.3	262.3	275.9	303.4	329.5
% T&C Exports of Overall Exports	13%	15%	14%	13%	12%

Source: Ministry of Textiles.

From Table 6.1 we find that clothing is the largest segment of India's exports, followed by cotton fabrics & made-ups and cotton yarn. The fibre ratio of our exports between cotton and manmade fibres (MMF) is around 65:35 whereas the fibre composition in global trade is 28:72.[315]

The comparative shares of the top five exporters of textiles and clothing in the world from 2000 to 2019[316] is presented in Table 6.2.

Table 6.2: The Top 5 Exporters of Textiles and Clothing

Exporter	% Share in World Exports					Value (in USD billion), 2019
	2000	2005	2010	2017	2019	
TEXTILES						
China	10.4	20.3	30.5	37.1	39.2	120
EU	36.7	34.9	27	23.4	21.7	66
India	3.6	4.1	5.1	5.8	5.6	17
US	7.1	6.1	4.8	4.6	4.4	13
Turkey	2.4	3.5	3.6	3.9	3.9	12

[315] http://texmin.nic.in/sites/default/files/Indian%20Manmade%20fibre%20textile%20industry_0.pdf

[316] Kim M. (2019), Export Competitiveness of India's Textiles and Clothing Sector in the United States, Institute of Indian Studies, Hankuk University of Foreign Studies, Seoul.

Exporter	% Share in World Exports					Value (in USD billion), 2019
	2000	2005	2010	2017	2019	
CLOTHING						
China	18.2	26.6	36.7	34.9	30.8	152
EU	28.7	31	28.4	28.6	27.6	136
Bangladesh	2.6	2.5	4.2	6.5	6.8	34
Vietnam	0.9	1.7	2.9	5.9	6.2	31
India	3.0	3.1	3.2	4.1	3.5	17

Source: WTO (2020).

6.2 Structure of the Industry and Challenges Faced by India

6.2.1 Raw Materials

The textile and clothing industry in India is fully integrated from fibre to clothing. Though natural fibres like silk, linen, wool, jute and manmade fibres like polyester, acrylic and viscose are all produced in India in varying quantities, the bedrock of the industry continues to be cotton. India is among the top two producers, consumers and exporters of cotton in the world. However, India also imports some amount of extra long staple cotton every year because it does not produce enough quantities of this variety.[317] India's production of cotton is more than 300 lakh bales (170 kg per bale) per year.[318] Cotton cultivation provides a livelihood for 5.8 million cotton farmers and another 40-50 million people are engaged in related activities such as cotton processing and trade. In terms of raw materials used in India, cotton accounts for roughly 60%.[319]

6.2.2 Cotton Yarn

Among the five distinct segments of the industry, namely spinning, weaving, processing, made-ups and garments, India's cotton spinning industry is the most competitive in global terms. This is because of the plentiful availability of cotton fibre and a spinning mills sector, which has modernised from the late eighties onwards and enjoys the benefits of scale. In the period 1989-98, India was the largest importer of spinning machinery accounting for 28% of global shipments.[320] There are standalone spinning mills as well as spinning mills which are a part of the 200 odd composite mills, which also produce cotton yarn. Roughly 25%-30% of India's cotton yarn output is exported.[321]

6.2.3 Manmade Fibre and Manmade Filament Yarn

Manmade fibres (MMF) could either be synthetic fibres (produced from crude oil) or cellulosic fibres (produced from wood pulp). The main varieties of synthetic staple fibres are polyester, acrylic and polypropylene. Cellulosic fibres are viscose fibre, modal etc. Currently MMF dominates global textile fibre consumption with a 72:28 ratio of MMF vis-a-vis natural fibres.[322] The share of MMF has been steadily increasing due to the inherent limitations in the growth of cotton and other natural fibres as well as the technical advancements in MMF products. Thus the production capacity and sophistication of MMF will largely determine which country

[317] Annual Report 2019-2020, Ministry of Textiles.

[318] Ibid.

[319] Ibid.

[320] https://www.usitc.gov/publications/332/PUB3401.pdf

[321] The Cotton Textiles Export Promotion Council (Texprocil).

[322] The Synthetic and Rayon Textiles Export Promotion Council (SRTEPC).

has an advantage in the global market in the years to come. Projections by the Ministry of Textiles for 2025 global end-use demand for textile fibres is shown in Table 6.3 below.[323]

Table 6.3: Global end-use demand for textile fibres, 2020-2025

(in million MT)

	2010	2015	2020	2025	Annual average percent change	
					2015-20	2020-25
Cotton	25.1	24.3	24.4	24.9	0.1	0.4
Non-cotton	48.2	65.8	78.8	94.3	3.7	3.7
Total	73.3	90.1	103.2	119.2	2.8	2.9

Source: Ministry of Textiles.

India is the second largest producer of manmade fibres in the world after China. However, there is a wide gap between the production capacities of China and India as brought out in Table 6.4.

Table 6.4: Comparison of India and China in Manmade Fibre Production

(in million Kgs)

Year	Filament		Staple Fibre		PET	
	India	China	India	China	India	China
2012	2700	18645	1124	9295	720	4670
2013	2890	19873	1230	9748	790	5332
2014	3077	20425	1325	10188	880	5781
2015	3365	21881	1400	10655	982	5705
2016	3667	23755	1590	11206	1250	5885
2017	3970	25339	1720	11877	1362	6223

Source: Indo-Rama Synthetics Presentation at CITI Diamond Jubilee Conclave 28 Nov 2018.[324]

6.2.4 Weaving

Of the total fabric production of the country, around 96% was produced in the unorganised sector and only 4% in the organised mills sector between 2010-11 and 2014-15. Of the 96%, roughly 26% came from the knitting sector, 11% from handlooms and 59% from powerlooms.[325]

A bulk of the weaving in India is done in standalone powerloom units. There are approximately 5.26 lakh powerloom units in which there are 23.33 lakh powerlooms. Thus the average number of looms in a powerloom unit is around 4.5.[326] More than 75% of the shuttle looms are obsolete and outdated with a vintage of more than 15 years and have virtually no process or quality control devices / attachments.[327] Of the 23.33 lakh powerlooms, only 1.15 lakhs are shuttleless looms,[328] many of them old and bought second-hand. The low numbers of modern shuttleless looms in the entire industry affects the quality of the fabric produced and the quantity of production.

[323] https://texmin.nic.in/sites/default/files/Indian%20Manmade%20fibre%20industry_0.pdf

[324] https://citiindia.org/gtc2018/pdf/Pres_2_CITI_CONCLAVE_2018_Shri_Anant_Kishore.pdf

[325] SRTEPC

[326] http://texmin.nic.in/sites/default/files/Final%20report%20of%20sub-committee%2018-9-13.pdf

[327] Ministry of Textiles: Annual Report 2019-20.

[328] http://texmin.nic.in/sites/default/files/Final%20report%20of%20sub-committee%2018-9-13.pdf

6.2.5 Processing

The processing segment comprises, apart from the in-house processing units in composite mills, more than 2000 small, standalone independent process houses most of which suffer from a lack of modern machinery and economies of scale.[329] The non-uniform quality of the processed fabric produced affects the value realisation of fabrics as well as made-ups and garments.

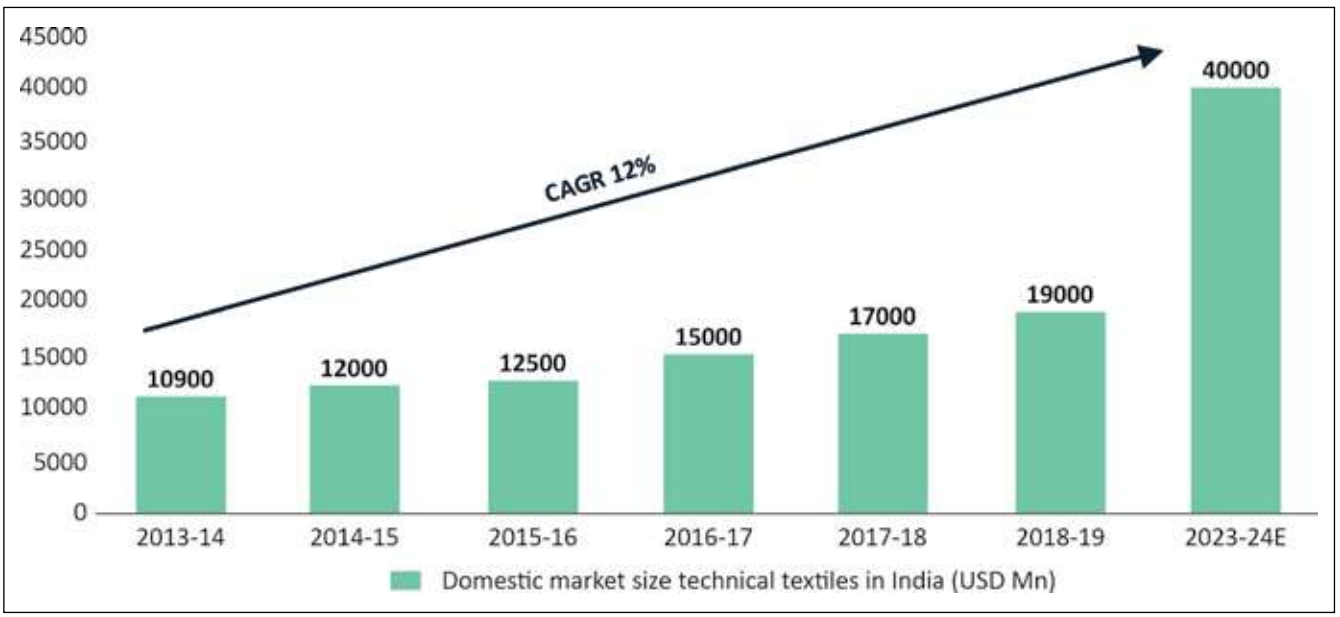
The weaving and processing segments of the industry, which taken together play a key role in determining the value addition for downstream products like made-ups and garments, are the real weak links in the production chain of the textile industry.[330]

6.2.6 Technical Textiles

Technical textiles comprise a group of 12 broad categories (Agrotech, Buildtech, Clothtech, Geotech, Hometech, Indutech, Mobiltech, Meditech, Protech, Sportstech, Oekotech and Packtech) of both woven and non-woven textiles, which are functional fabrics that have applications across various industries including automobiles, construction, agriculture, healthcare, industrial safety etc.[331] Common examples of technical textiles are nets for crop protection, baby and adult diapers, tarpaulin, parachute fabric, nylon tyre cord etc. Indutech, Mobiltech, Packtech, Buildtech and Hometech together represent two-third of the global market in value.[332]

Technical textiles currently account for approximately 13% of India's total textile and clothing market and contribute 0.7% to India's GDP.[333] The current domestic market is estimated at USD 19 billion, growing at a CAGR of 12% since 2013-14 (Figure 6.1) as compared to the global average growth rate of 4%.[334]

Fig 6.1: Domestic Market of Technical Textiles in India (USDMN)



Source: Invest India

[329] https://www.usitc.gov/publications/332/PUB3401.pdf

[330] https://www.indiantextilemagazine.in/indias-weaving-industry-a-need-to-become-globally-competitive/

[331] http://texmin.nic.in/sites/default/files/note_technical_textiles_ammt_0.pdf

[332] https://www.investindia.gov.in/siru/technical-textiles-future-textiles

[333] https://www.investindia.gov.in/team-india-blogs/back-growth-technical-textile-sector-profile-and-interview-dr-sundararaman

[334] https://www.investindia.gov.in/siru/technical-textiles-future-textiles

The demand for technical textiles was pegged at USD 165 billion in the year 2018 and is expected to grow to USD 220 billion by 2025, at a CAGR of 4% from 2018-25. The Asia-Pacific has been leading the technical textiles sector by capturing 40% of the global market, while North America and Western Europe stand at 25% and 22%, respectively.[335]

India's share of non-woven technical textiles is around 12% as compared to 24% for the developed world. India's specialty and industrial fabric industry is highly fragmented and still in its infancy. About 67% of India's technical textiles production is of commodities; only 33% is of high-end products.[336]

Considering the high growth of Indian demand as well as an expanding global market, technical textiles is an area, where focused action, including in R&D, could yield rich dividends.

6.2.7 Made-ups and Clothing

Barring a handful of composite mills, which have ventured successfully into manufacturing made-ups and garments, this segment of the industry is characterised by small units sourcing their fabric largely from the powerloom weavers[337] and then getting them dyed and printed at small standalone process houses. In comparison to the large mills which manufacture made-ups in China and Pakistan, or the large garment factories in China, Vietnam and Bangladesh, the individual production capacities of our made-up and garment manufacturers is very small. Also most of these units are family-run ventures which have not attempted to raise capital either by going public domestically or seeking investments from abroad. Thus the units suffer both from lack of modern technology (especially for the made-ups segment) as well as scale. The figures of exports from China and India in different segments, shown in Table 6.5, reveals that India lags far behind in the production of value- added products like

Table 6.5: Exports from China and India, 2015-19

(in USD million)

Country	January-December					% change
Cotton Yarn	**2015**	**2016**	**2017**	**2018**	**2019**	**2019/2018**
China	1647	1538	1637	1747	1571	-10.06
India	3793	3220	3452	3932	2914	25.88
Cotton Grey Fabrics						
China	2648	3008	2901	2227	956	-57.05
India	343	321	310	376	370	-1.45
Cotton Dyed Fabrics						
China	9298	8570	8996	10022	10461	4.38
India	1242	1175	1236	1360	1412	3.87
Printed Fabrics						
China	2644	2455	2469	2731	2734	0.11
India	462	418	458	494	516	4.37
Made-ups						
China	26958	25971	26526	27856	27918	0.22
India	4639	4584	4989	5227	5165	-1.20

Source: GTA/Ministry of Commerce/China Customs/Texprocil.

[335] https://www.investindia.gov.in/siru/technical-textiles-future-textiles

[336] US ITC report 2016: https://legacy.trade.gov/topmarkets/pdf/Textiles_India.pdf

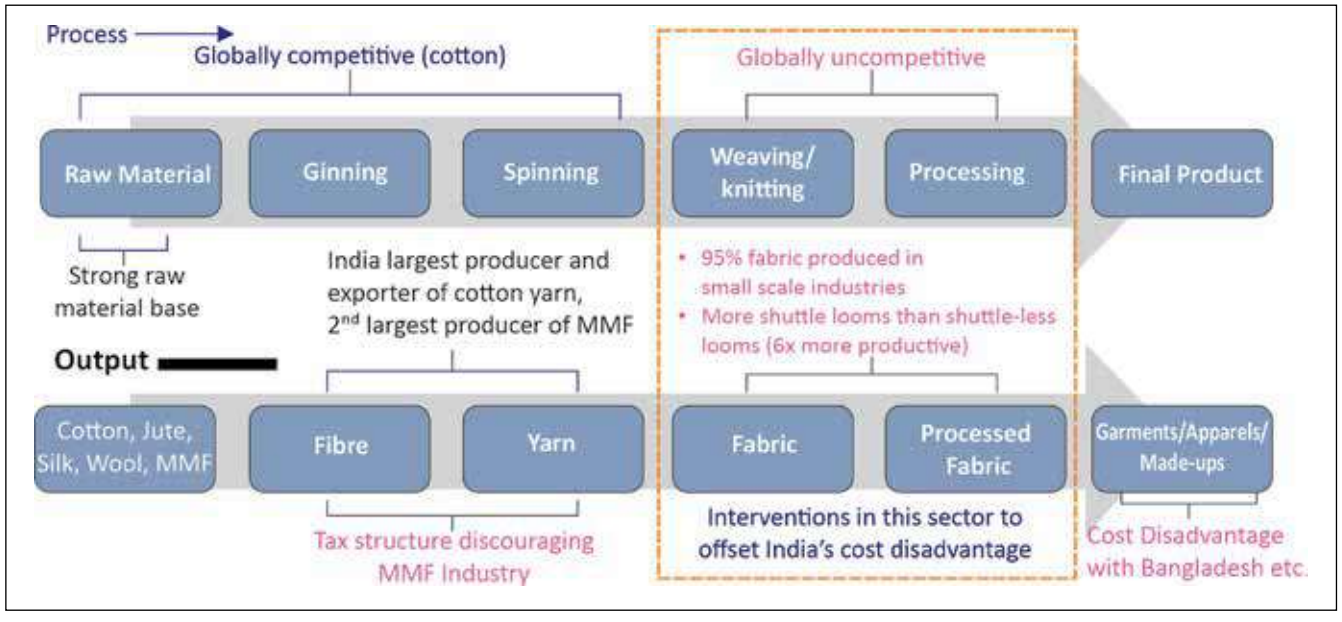
[337] Ministry of Textiles: Annual Report 2019-20.

dyed and printed fabrics and made-ups because of lack of technology and scale, and ends up exporting more of low-value products like cotton yarn.

Niti Ayog analysis of the value chain of the Indian textiles industry

Niti Ayog has carried out an analysis of the value addition by different segments of the Indian textiles and clothing industry to pinpoint the weak links in the value chain. The conclusions arrived at by the Niti Ayog are in consonance with the analysis presented in the foregoing paragraphs about the challenges faced by the Indian industry. The conclusions drawn by the Niti Ayog have been represented diagrammatically in Figure 6.2 below.

Figure 6.2: Uncompetitive Global Value Chain



Source: http://niti.gov.in/weaving-way-indian-textile-industry

6.3 Schemes to Stimulate Investment and Modernise the Industry

6.3.1 Powertex India

The components of the scheme being implemented since 2017 are: (i) In-situ Upgradation of Plain Powerlooms, (ii) Group Workshed Scheme, (iii) Yarn Bank, (iv) Common Facility Centre, (v) Solar Energy Scheme, (vi) Pradhan Mantri Credit Scheme, (vii) Tex Venture Fund, (viii) Grant-in-aid & modernization of Powerloom Service Centres and (xi) Facilitation and Information Technology. The term of the IPDS had been extended till March 2021.[338] Under Powertex India, 3497 looms have been upgraded under the In-situ Upgradation Scheme for Plain Powerlooms, and INR 3.35 crores have been released. In the Group Workshed Scheme, INR 24.18 crores have been released to 51 projects. In the Common Facility Centre Scheme, INR 5.39 crores have been released to 3 projects. Under Pradhan Mantri Credit Scheme for powerloom weavers, INR 5.96 crores have been released to 49 units. Under Grants-in-Aid to TRAs and State Government Powerloom Service Centres (PSCs) INR 4.71 crores have been released to 32 Powerloom Service Centres.[339]

[338] https://pib.gov.in/Pressreleaseshare.aspx?PRID=1697402

[339] https://pib.gov.in/Pressreleaseshare.aspx?PRID=1684735

6.3.2 *Integrated Processing Development Scheme (IPDS)*

An Integrated Processing Development Scheme (IPDS) is under implementation since October 2013 at a total cost of INR 500 crores to enable the textile processing sector to meet environmental standards through appropriate technology including marine, riverine and zero liquid discharge. IPDS proposes to establish 4-6 brownfield and 3-5 greenfield projects addressing the needs of the existing Textile/Clusters. Eligible projects under the scheme would cover the following:

(i) Group A - Water treatment & effluent treatment plant and technology (including marine, riverine and ZLD).

(ii) Group B – Common infrastructure such as captive power generation plants on technology preferably renewable/green technology, and

(iii) Group C – Common facilities such as Testing Laboratories and R&D centres.

So far, 7 projects have been sanctioned: at Balotra, Jasol, Sanganer, Pali (all in Rajasthan), at Virudhnagar, Erode (both in Tamil Nadu), and at Surat (Gujarat), and an amount of INR 56.31 crores released for the implementation of the projects.[340]

6.3.3 *Technology Upgradation Fund Scheme (TUFS) and its successor Schemes*

The Textile Upgradation Fund Scheme (TUFS) was introduced in 1999 to catalyse investments in all the sub-sectors of the textiles and jute industry. It started with a 5% interest reimbursement (IR) provision on capital investment loans, transitioned into an IR + Capital Investment Subsidy (CIS) scheme, and in its current avatar called the Amended TUFS (ATUFS) scheme, under implementation since 13.1.2016, it is a credit-linked CIS.[341]

The objective of ATUFS is to generate employment and promote exports through “Make in India” with “Zero defect and Zero effect manufacturing”. ATUFS is to continue till 31.3.2022.[342]

TUFS and its successor schemes (Modified TUFS, Revised TUFS, Restructured Revised TUFS, ATUFS) have been the primary instruments of the Government for the past 21 years to help the textile and clothing industry to modernise. The figures for subsidy disbursement since 2014-15 in Table 6.6 reveal that the ambitious scheme has slowed down drastically since 2018.[343]

Table 6.6: Budgeted and Actual Expenditure under TUFS and its Successor Schemes, 2014-15 to 2019-20

(in INR crores)

Year	Budget Estimate	Revised Estimate	Actual Expenditure
2014-15	2300	1885.02	1884.31
2015-16	1520	1413.68	1393.19
2016-17	1480	2610.00	2621.98
2017-18	2013	1913.15	1913.15
2018-19	2300	622.63	621.92
2019-20	700	494.37	317.90

Source: Ministry of Textiles.

[340] Ministry of Textiles: Annual Report 2019-20.

[341] Ministry of Textiles website.

[342] Ibid.

[343] Ministry of Textiles: Annual Report 2019-20.

In order to prevent misuse of the subsidies, a complicated and cumbersome system of verification by a Joint Inspection Team (JIT) comprising an officer of the Textile Commissioner's office and having a member each of the lending agency, and the regional Textile Research Association, has evolved over time. The JIT has to physically verify the installation and commissioning of the machinery and recommend the eligible subsidy amount to an entity. Theoretically, the JIT has to complete physical inspection within 88 days of an application for a joint inspection.[344]

The Textile Commissioner has to approve the subsidy claim within 25 working days of the receipt of the JIT report and the subsidy has to be credited to the account of the entity thereafter.[345]

6.3.4 National Technical Textiles Mission (NTTM)

The Mission has been approved for a period of four years (2020-21 to 2023-24) with an outlay of INR 1480 crores divided among the following activities:[346]

(i) For Research, Innovation and Development – INR 1000 crores

(ii) For Promotion and Market Development – INR 50 crores

(iii) For Education, Training and Skilling – INR 400 crores, and

(iv) For Export Promotion – INR 10 crores

(v) Administrative Activities – INR 20 crores

The focus of the Mission is to develop the usage of technical textiles in various flagship missions and programmes of the country, including the strategic sectors. Promotion of innovation among young science and technology graduates is to be taken up by the Mission along with creation of innovation and incubation centres and promotion of startups and ventures. The research output will be with a Trust with the Government for easy and accessible proliferation of the knowledge gained.

6.3.5 Export Oriented Units (EOUs) and Textile Units in SEZs

In the nineties, a number of 100% EOUs came up for cotton yarn production because cotton yarn exports from Domestic Tariff Area (DTA) units were subject to an overall quantitative ceiling in most years (because of limited production of cotton in the country), while 100% EOUs were not subject to the ceiling, and were free to export. With the Technology Mission of Cotton initiated in 2000 and the introduction of high-yielding BT Cotton in the early 2000s, our cotton production went up steeply, and restrictions on the exports of cotton yarn were lifted within a few years. Thus there was no need to have a cotton yarn unit in the 100% EOU sector any longer. Because of the surge in cotton production beginning in the early 2000s, most of the 100% EOU units debonded to become DTA units and there are only a handful of cotton spinning mills functioning as 100% EOUs now.[347]

The Special Economic Zones (SEZs) were never favoured by the textiles and clothing industry for setting up manufacturing units because the **import penetration in our textile exports was quite low and most of the raw materials used were sourced domestically**. The situation continues to be the same and the figures in Table 6.7 show that the share of textile exports manufactured in the SEZs accounts for only around 1% of

[344] Ibid.

[345] Ibid.

[346] https://pib.gov.in/PressReleasePage.aspx?PRID=1656237

[347] Discussion with ED, Texprocil and officials of SITRA.

the total exports of manufactured goods from the SEZs.[348] Moreover, barring a handful of clothing items, most of the other items were low-value fabrics or sacks and bags.

Table 6.7: Exports of Textile Items by SEZ units

(in INR crores)

Jurisdictional DC of SEZs	Commodity Code (ITC-HS)	Commodity Description	Apr-Dec 2020	Apr-Dec 2019
Falta	6116	Gloves, Mittens and Mitts, Knitted or Crocheted	28	25
	6203	Men's or Boys' suits, ensembles, jackets, blazers, trousers etc.	24	31
	6305	Sacks and bags, of a kind used for the packing of goods	15	44
	6211	Track suits, ski suits and swimwear; other garments	12	07
	5907	Textile fabrics otherwise impregnated, coated or covered etc.	04	03
Kandla	6309	Worn clothing and other worn articles	370	487
	5603	Non-wovens, whether or not impregnated, coated, covered or laminated	240	221
NOIDA	6305	Sacks and bags, of a kind used for the packing of goods	383	408
Visakhapatnam	6004	Knitted or crocheted fabrics of a width exceeding 30 cm etc.	233	324
	6108	Women's or girls' slips, petticoats, briefs, panties etc.	226	415
	6107	Men's or boys' underpants, briefs, nightshirts etc.	238	243
Total (for Textiles & Clothing)			1773	2208
Total (for all manufactured products)			160194	231717

Source: Export Promotion Council for EOUs and SEZs.

6.3.6 Scheme for Integrated Textile Parks (SITP)

The scheme was started in 2005[349] to provide the textile industry with world-class infrastructure facilities. The project cost covers common infrastructure and buildings for production/support depending on the needs of the ITP with total financial support of 40% of the project cost, subject to a maximum of INR 40 crores.[350] An additional amount of INR 10 crores can be provided to ITPs for setting up new/additional apparel units in the park. Some of the important components of the ITP scheme are roads, drainage, water supply, effluent treatment plant, electricity supply including captive power plant, and telecommunication lines. Out of the 56 ITPs sanctioned, only 22 had been completed till December 2020.[351]

6.4 Free Trade Agreements

6.4.1 South Asian Free Trade Agreement (SAFTA)

SAFTA came into force in 2006, the signatories being Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. Of these, Afghanistan, Bangladesh, Bhutan and Nepal are LDCs, to whom India has

[348] Export Promotion Council for EOUs and SEZs.

[349] http://texmin.nic.in/sites/default/files/Report_SITP_26Dec2016.pdf

[350] Ministry of Textiles: Annual Report (2019-20).

[351] https://pib.gov.in/Pressreleaseshare.aspx?PRID=1684735

extended its Duty Free Tariff Preference (DFTP) scheme over and above the SAFTA concessions. While Pakistan does not extend even the Most Favoured Nation (MFN) treatment to India, and has not abided by its SAFTA commitments to India, Sri Lanka is itself a capable exporter of clothing. Maldives also has a small clothing exports industry. India has traditionally been exporting cotton, cotton yarn and manmade filament yarn, and MMF to Bangladesh, Sri Lanka, Nepal and Maldives. India also allows duty-free export of garments to Bangladesh, Nepal and Sri Lanka, subject to quantitative restrictions. The exports of important textile products to a few important SAFTA countries is shown in Table 6.8.

Table 6.8: Exports of Textiles and Clothing to Important SAFTA Countries

(in USD million)

ITC (HS) Chapter and Description	2005-06	2012-13	2019-20
BANGLADESH			
52-Cotton (incl. cotton, cotton yarn and cotton fabrics)	289.37	1505.76	1649.99
54-Manmade filaments	23.26	44.25	215.02
55-Manmade staple fibres	40.37	121.31	149.98
60-Knitted or crocheted fabrics	3.26	47.62	68.84
SRI LANKA			
52-Cotton (incl. cotton, cotton yarn and cotton fabrics)	97.61	216.87	236.01
54-Manmade filaments	38.91	56.30	45.87
55-Manmade staple fibres	20.82	42.15	44.30
60-Knitted or crocheted fabrics	10.13	85.89	198.54
NEPAL			
52-Cotton (incl. cotton, cotton yarn and cotton fabrics)	18.99	40.46	66.19
54-Manmade filaments	1.77	5.77	36.54
55-Manmade staple fibres	1.04	27.88	48.05
60-Knitted or crocheted fabrics	0.59	1.32	6.21

Source: Ministry of Commerce & Industry.

We see from Table 6. 8 that cotton yarn and cotton fabrics continue to dominate our exports to other SAFTA countries. However, manmade filament and manmade fibres are also being exported in small quantities to these countries. Since Bangladesh and Sri Lanka do not produce much woven fabric themselves but are strong exporters of clothing, they import a large volume of woven cotton and blended fabrics, mainly from China for converting into garments.[352] Some of the important reasons for favouring imports from China rather than India are: (a) very often the buyers designate Chinese mills for sourcing of fabrics **because of their higher quality, shorter delivery time and ability to stick to delivery schedules**, (b) **Slow clearance of shipments** at our land border at Benapole-Petrapole (Bangladesh) and **higher costs of transporting by container** to Bangladesh and Sri Lanka compared to shipments from China, (c) **Inability of Indian suppliers to supply large volumes** of uniform quality fabrics with a short turnaround time.

[352] Discussion with ED, Texprocil

6.4.2 India-ASEAN FTA

The India ASEAN FTA entered into force on 1 January 2010 between India, on the one hand, and Malaysia, Singapore and Thailand, on the other. The other 7 ASEAN countries joined the agreement once their internal ratification processes were over. According to a study done by the Asia Pacific Research and Training Network on Trade in 2011,[353] a welfare loss for India was projected because of allocative inefficiency and negative terms of trade. The study had further concluded that "*…after full trade liberalization, India's allocative efficiency will increase, but the terms of trade effect will worsen continuously and remain negative. India will be able to arrest the worsening in terms of trade once the gain in allocative efficiency is used to improve productivity in the export-oriented sectors as well as achieve economies of scale*".

A snapshot view of India's exports to ASEAN from 2009-10 to 2019-20 in important textile categories is provided in Table 6.9. From Table 6.9, we can see that the benefits of the FTA have been marginal for India in the textiles sector. Two of the reasons attributed for this are the ASEAN China FTA which came into force in 2005 and the erosion of competitiveness of Indian textile products on account of low technology and lack of scale.[354] In addition, the factors mentioned above, i.e. delays in responding to global value chain requirements, would also be responsible for reduced competitiveness. It may be mentioned that more than 90% of the tariff lines for ASEAN-6 (Brunei Darussalam, Indonesia, Malaysia, the Philippines, Singapore and Thailand) and China are already eliminated as on 1 January 2012.

Table 6.9: India's Exports to ASEAN Countries

(in USD million)

ITC (HS) Chapter with brief description	2009-10	2020-11	2018-19	2019-20
52-Cotton (incl. cotton, cotton yarn and cotton fabrics)	364.95	477.96	875.11	538.68
54-Manmade filaments	75.70	133.50	195.92	164.23
55-Manmade staple fibres	79.35	97.53	130.57	124.52
61-Articles of apparel and clothing accessories, knitted or crocheted	33.26	48.77	69.97	74.74
62-Articles of apparel and clothing accessories, not knitted or crocheted	116.42	98.94	163.59	175.04
63-Other made-up textile articles; sets; worn clothing and worn textile articles; rags	35.18	43.46	63.12	57.97

Source: Ministry of Commerce & Industry.

6.4.3 India-Korea CEPA

The India-Korea Comprehensive Economic Partnership Agreement (CEPA) came into effect from 1 January 2010. Our major exports in textiles to Korea are in Chapter 52 (Cotton) and to a much smaller extent in Chapters 54 (Manmade filament), 55 (Manmade fibres), 61 (Knitted garments) and 62 (Woven garments). The export figures for our major textile export products for a few chosen years are in Table 6.10.

[353] Sikdar, C. and B. Nag (2011), "Impact of India-ASEAN Free Trade Agreement: A cross-country analysis using applied general equilibrium modelling", Asia-Pacific Research and Training Network on Trade Working Paper Series, no. 107 available at https://www.unescap.org/sites/default/files/AWP%20No.%20107.pdf

[354] Discussion with Secretary General, Apparel Export Promotion Council (AEPC).

Table 6.10: India's exports of textile items to Korea

(in USD million)

ITC (HS) Code Chapter	2009-10	2010-11	2012-13	2013-14	2017-18	2018-19	2019-20
52-Cotton (incl. cotton, cotton yarn and cotton fabrics)	233.56	319.46	216.56	211.54	203.26	237.03	189.19
54-Manmade filaments	2.02	12.77	9.11	33.49	38.68	46.89	37.79
55-Manmade staple fibres	2.65	6.32	2.06	2.08	19.56	31.49	26.33
61-Articles of apparel and clothing accessories, knitted or crocheted	4.03	7.35	16.21	15.33	22.46	25.47	19.88
62-Articles of apparel and clothing accessories, not knitted or crocheted	8.62	7.21	13.73	19.25	21.89	31.28	26.78
63-Other made-up textile articles; sets; worn clothing and worn textile articles; rags	1.98	3.52	6.27	8.64	9.96	11.42	9.65

Source: Ministry of Commerce & Industry.

From Table 6.10, it would be clear that India's gains as a result of CEPA concessions have been very modest. In fact in the case of our largest export products of cotton (namely cotton, cotton yarn and fabrics), there has actually been a decline in 2019-20 compared to the situation existing before the CEPA came into force.

Two of the reasons ascribed to the lack of growth of Indian textile exports to Korea were: (a) the sensitive and exclusion lists of tariff lines in the textiles sector[355] and (b) the large number of FTAs that Korea has entered into with other countries or country groups. According to a September 2019 report, Korea had 15 FTAs covering 52 countries.[356] Korea's major imports of textiles and apparel in 2018 were from: China (USD 6,095 mn); Vietnam (USD 4,342 mn); Indonesia (USD 899.2 mn); Italy (USD 723.9 mn); the United States (USD 500 mn); India (USD 498.5 mn).[357]

India-Japan CEPA

The India Japan Economic Partnership Agreement (CEPA) came into effect on 1 August 2011. The CEPA with Japan is only one of the two FTAs that India has signed with OECD economies, the other one being with Korea. Textiles is one of the main sectors availing of CEPA concessions for exports to Japan. Eighty-two percent of the exports of textiles covered under CEPA tariff lines availed of the concessions between 2012 and 2014.[358] The exports of important textile items to Japan from 2010-11 to 2019-20 are shown in Table 6.11.

[355] Seshadri, V.S (2015), India-Korea CEPA An Appraisal of Progress, Research & Information System in Developing Countries (RIS), New Delhi.

[356] Seshadri, V.S (2019), Republic of Korea and its Growing FTA Network, Working Paper No. 54, Centre for WTO Studies, Indian Institute of Foreign Trade, New Delhi.

[357] https://wits.worldbank.org/CountryProfile/en/Country/KOR/Year/2018/TradeFlow/Import/Partner/all/Product/50-63_TextCloth

[358] Seshadri, V.S (2016), India-Japan CEPA -- An appraisal, Research & Information System for Developing Countries (RIS), New Delhi.

Table 6.11: Exports of important textile products to Japan

(in USD million)

ITC (HS) Chapter	2010-11	2011-12	2015-16	2016-17	2018-19	2019-20
52-Cotton (incl. cotton, cotton yarn and cotton fabrics)	80.19	80.60	56.30	53.51	65.61	51.83
61-Articles of apparel and clothing accessories, knitted or crocheted	14.07	18.57	32.17	31.42	31.00	35.24
62-Articles of apparel and clothing accessories, not knitted or crocheted	131.30	199.34	153.24	146.89	184.91	181.38
63-Other made-up textile articles; sets; worn clothing and worn textile articles; rags	32.58	53.47	48.83	49.37	51.33	59.33

Source: Ministry of Commerce & Industry.

From Table 6.11 we find that woven apparel formed the bulk of India's textile exports to Japan. India's exports of woven apparel to Japan increased from USD 131.30 million in 2010-11 to USD 181.38 million in 2019-20 while the corresponding increase in knitted apparel (Chapter 61) was from USD 14.07 million to USD 35.24 million respectively.[359] The CEPA zero duty on these items represent a substantial market access because the MFN duties range from 9.1%-10% for woven and from 5%-10.4% for knitted apparel. However, Japan extends zero duty concession also to some ASEAN countries with which it has EPAs, apart from LDCs like Bangladesh, Cambodia and Laos. It is interesting to note that China's share in Japan's imports of woven and knitted apparel declined respectively from 81% (2010) to 67% (2014) and from 88% to 76% during the same period. The slack was taken up by countries like Vietnam, Indonesia, Cambodia and Bangladesh with India's market share showing extremely modest improvement.[360] The reason for India's inability to increase its share of the Japanese market is attributed to its problems **related to the quality of its fabrics, lack of innovation in bringing out improved varieties of fabrics and the small scale of operations of its garments industry which prevents it from servicing bulk orders.**[361]

6.5 FDI in Textiles (2000-20)

Despite permitting FDI in textiles under the automatic route for many years**,** cumulative FDI inflows into textiles between April 2000 to June 2020 amounted to USD 3.458 billion out of the total FDI flows in all sectors of USD 476.681 billion during that period,[362] accounting for a meagre 0.73% of the total FDI. Among the 63 sectors receiving FDI and listed by the DPIIT (starting from a low base of USD 1 million upwards), textiles figures at a lowly twenty-fifth position as of 2020. It clearly shows that textiles has not been considered an attractive sector by foreign investors for the past 20 years.

[359] https://tradestat.commerce.gov.in/eidb/ecntcom.asp

[360] Seshadri, V.S (2016), India-Japan CEPA -- An appraisal, Research & Information System for Developing Countries (RIS), New Delhi.

[361] Discussion with Secretary General, Apparel Export Promotion Council.

[362] https://dipp.gov.in/sites/default/files/FDI_Factsheet_June20_20October2020.pdf

6.5.1 Analysis of reasons for lack of investments in Textiles and The Way Forward

6.5.1.1 External Factors

The World Investment Report 2019 — Special Economic Zones[363] of UNCTAD brings out several important facts relating to FDI flows in developing countries especially pertaining to investments in the textiles sector. The report states that Developing Asia received the maximum FDI among regions at USD 512 billion in 2018, showing a growth of 4% over 2017. India was placed at ninth globally with total FDI inflows at USD 40 billion and USD 42 billion in 2017 and 2018, respectively. For greenfield projects, the investments in textiles in developing economies declined by 36% to just USD 7 billion in 2018. The other factor highlighted by the report is that the inward FDI rates of return in percent terms between 2010 and 2018 declined for South Asia from 8.9% to 5.3%. The South Asian rates were just above those for West Asia, and far lower than for South East Asia or East Asia. Among the manufacturing sectors attracting the highest FDIs were electricity, gas and water, construction, automotives, electrical and electronic equipments, chemicals, etc. Textiles did not figure in the top 10 sectors attracting FDI.

6.5.1.2 Free Trade Agreements (FTAs)

It has been brought out in the section on FTAs that the four major FTAs, namely with ASEAN, Korea, Japan and South Asian countries, have provided only marginal gains to our textiles sector. Renegotiating the textiles concessions in these FTAs may provide some extra benefits but the point which needs to be underscored is that without modernising our weaving and processing sectors, building scale, and using R&D effectively to make innovative products, our market share in our FTA partner countries is not going to change significantly.

One of the FTA negotiations which has been going on since 2007 and may provide substantial benefits if concluded in the near future, is the India-EU BTIA. Since the EU has the Everything But Arms (EBA) concessions for LDCs like Bangladesh, Cambodia, Laos, other concessional arrangements in textiles and clothing for Pakistan and Sri Lanka, and an FTA with Vietnam, we will have to fight strongly to increase our market share in the EU, even after the BTIA is concluded. However, the removal of the tariff disadvantage of 9.6% for important textile products (e.g. clothing) on account of the BTIA should indeed open up many new opportunities for our manufacturers and exporters, as has been borne out by many analyses. **Concluding the India-EU BTIA should, therefore, be accorded the highest priority in our FTA negotiations**.

6.5.1.3 Domestic Factors

Spinning

Cotton yarn in hank form is used by handloom weavers. With effect from 7 March 2019, a spinning mill producing cotton yarn has to produce 30% of yarn in hank form with 80% of the hank yarn of 80s count or below. In case a spinning mill does not want to produce hank yarn, it can designate another mill to produce hank yarn of equivalent volume on its behalf. One of the problems raised by cotton yarn spinning mills[364] is the **compliance costs associated with the Hank Yarn obligation, in addition to bearing the inventory carrying cost**, which together add to the loss of profitability of a mill, and act as a dampener on fresh investment plans in the spinning sector. The **spinning mills strongly advocated that the Hank Yarn obligation should be reduced from 30% to a maximum of 15%**.

[363] https://unctad.org/system/files/official-document/WIR2019_CH1.pdf

[364] Discussion with exporter members of TEXPROCIL.

A study commissioned by the Ministry of Textiles[365] had estimated the requirement of hank yarn at 327.71 million kg of cotton yarn. It had also noted that the process of transferring the obligation to surplus hank yarn producers through brokers costs between INR 1 to INR 1.50 per kg. The study had inter-alia recommended the reduction of the hank yarn obligation and also for simplifying the burden of filing returns on a quarterly basis.

According to the Ministry of Textiles, handloom units currently produce just 11% of the total cloth in the country (excluding khadi, wool and silk cloth). While the yarn for khadi is hand spun, the yarn for wool and silk is produced using different kinds of spinning machinery. Even if we factor in some volume for reserve stock, the hank yarn obligation should not be more than 15%. The obligation of 30% is not justified from any perspective and needs to be amended.

10% Import tariff on Extra Long Staple (ELS) Cotton

India produces around 5-6 lakh bales (each of 170 kg) of ELS cotton as against the local requirement of about 12 to 15 lakh bales of ELS.[366] Since ELS cotton is used for fine quality fabric, made-ups and garments, the demand for ELS cotton in the domestic market is quite low. The main demand for ELS cotton comes from the export sector. Hitherto, ELS cotton enjoyed duty-free access into India. However, from 2 February 2021, 10% import tariff has been imposed on ELS cotton. This is likely to make our exports of fabrics, made-ups and garments less competitive vis-a-vis China, Vietnam, Pakistan and Bangladesh.[367] Since we are deficient in ELS cotton and duty-free import of this variety does not affect our domestic producers, rather gives us an advantage because of our modernised spinning mills, the import tariff on ELS cotton should be removed. The trade body, the Cotton Association of India (CAI) has also recommended the removal of the tariff.

Trade restrictions on Manmade fibre (MMF)

With the slow growth in the use of cotton and other natural fibres and the rapid global growth in the use of MMF, the bottlenecks identified by the industry, in terms of unfavourable tax treatment of MMF[368] and the frequent recourse to anti-dumping duties[369] on both synthetic and cellulosic fibres,[370] needs to be rationalised so that MMF-based products can be manufactured competitively in the country and exported. The development of MMF products, including non-woven fabrics, will also lead to new opportunities in the production of technical textiles and their increased exports. As brought out in the CITI Diamond Jubilee Conclave of 28 November 2018,[371] there is going to be a substantial shortfall even in meeting our own MMF requirements by 2025. If we aim to reverse the ratio of MMF to natural fibres in consonance with the global norms of 72:28, our requirement of MMF will be even higher. Thus a two-pronged strategy needs to be adopted. First, imports of fibre and yarn must be made hassle free and the import tariff should be reasonably low so as to encourage competition and the growth of downstream user industries. Second, an appropriate incentive structure needs to be devised to fill the demand gap for MMF in the medium term.

---

[365] M/s. Technopak: Trends in Production , Distribution and Demand for Hank Yarn & issues related thereto, available at http://texmin.nic.in/sites/default/files/HankYarnStudyReport.pdf

[366] https://www.thehindubusinessline.com/markets/commodities/scrap-import-duty-on-cotton-as-it-hurts-garment-exports-trade-body-tells-centre/article35024115.ece

[367] Ibid.

[368] http://niti.gov.in/weaving-way-indian-textile-industry

[369] https://www.thehindu.com/business/sima-urges-freeing-viscose-fibre-from-anti-dumping-duty/article33178877.ece

[370] https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1706033

[371] https://citiindia.org/gtc2018/pdf/Pres_2_CITI_CONCLAVE_2018_Shri_Anant_Kishore.pdf

Weaving

One of the issues raised by the mills in the organised sector about their shrinking share in the total fabric production of the country was that they did not enjoy a level playing field vis-a-vis the unorganised sector. The advantages that the unorganised sector had was first in terms of the differential rates of electricity prevailing in many States which provided electricity to powerloom units at roughly half the rate at which they supplied it to the organised sector. Second, there was the compliance burden and attendant costs for the organised sector mills, which powerloom units did not have to bear. Third, the labour costs for the organised sector were much higher because of the regular employees that had to be engaged at higher wages in addition to payment of their EPF and ESI contributions, whereas powerloom units often got work done at piece rates without having to pay regular wages to their workers.

The overall cost disadvantage to the organised mills sector was making their products appreciably costlier than the products of the unorganised sector, thus pushing them out of the domestic market increasingly. **For this reason, apart from mills in the organised sector with a strong export orientation, investments were not forthcoming for expansion or setting up new units.**

We have tried to encourage the setting up of textile weaving units as 100% EOUs or as a unit in SEZs by providing them with various fiscal incentives for decades. However, these incentives have proved to be of no avail. Unless we find a way of incentivising the setting up of large weaving units with modern shuttleless looms, India would continue to export low-value fabrics and made-ups and garments made of these fabrics. As our export figures have shown, we trail China badly for all value- added products starting from dyed and printed fabrics to garments, because of our old technology and lack of scale.

One of the ways of incentivising the setting up of large weaving units and consolidation of several smaller units into one large unit, could be by **supplying electricity to such units at the same rates as available to powerloom units in the state**. This would encourage consolidation and investments as well as provide a somewhat more level playing field for vying for a share of the domestic market.

Processing

Processing attracts the same benefits as standalone weaving units under the ATUFS Resolution dated 13 January 2016 of the Ministry of Textiles. According to estimates, the cost of putting up a large composite processing unit is between INR 80 crores and INR 100 crores.[372] **Since this is the weakest link in our textile value chain, all-out efforts must be made to bring it up to speed. To this end, an upward revision in the ATUFS CIS norms, both in terms of the percentage of CIS (10% currently) as well as the ceiling on total CIS (INR 20 crores currently), to 25% and INR 25 crores, respectively, is called for**.

The machinery for Process Houses (PHs) have a longer lifespan compared to other segments of the industry. PHs also have to do a certain amount of R&D before they establish themselves firmly. Thus, the demand for **a longer bank loan repayment period (10-15 years instead of 7-10 years) needs to be looked at carefully along with the profit projections for a new large-scale PH**.

Technical Textiles and the National Technical Textiles Mission (NTTM)

Technical textiles already account for about 13% of the domestic market and their demand is growing domestically at a CAGR of 12%. We also have to bear in mind that roughly 67% of our production is basically in the form of commodities and only 33% is based on high technology. Thus the value realisation from exporting the current run of technical textiles may be quite low. On the other hand, because of our large

[372] Estimate provided in a TEXPROCIL meeting by Shri Dharmendra Goyal, M.D., Shreedhar Cotsyn Pvt. Ltd.

petroleum refining base, the production of larger quantities of synthetic MMF (the basic raw materials for technical textiles) should be a matter of natural progression. The NTTM does place emphasis on Research, Innovation and Development by earmarking a bulk of the outlay (INR 1000 crores out of INR 1480 crores) for these activities. However, the inadequate emphasis on export promotion (INR 10 crores out of INR 1480 crores) tends to create the impression that the NTTM is primarily geared toward import substitution. While the emphasis on R&D is welcome, there should be a dual focus for the NTTM aimed at both import substitution as well as greater export penetration with more sophisticated and high technology products. The aspect of public private partnership in product development (R&D) also seems not to have received adequate attention till now. This is an issue which needs to be addressed appropriately, because government funds for research need to be leveraged with the infusion of industry funds, and the technology that is developed needs to be commercialised quickly because competitors in other countries will also be trying to develop new technologies all the time.

Withdrawal of Duty Free Imports of Trimmings and Embellishments for Made-ups and Clothing

Indian made-ups and clothing exporters have enjoyed a duty-free import entitlement of 3% of the f.o.b. value of exports of the previous year for trimmings and embellishments, and an additional 2% for lining and interlining materials. Vide notification number 2/2021 dated 1 February 2021, the 3% entitlement for clothing exporters has been discontinued.

The reason for providing this entitlement was that trimmings and embellishments of the kind and quality required for export merchandise are often not being produced in India. Moreover, foreign buyers are increasingly specifying the third country producers from whom the trimmings and embellishments are to be sourced. This leaves our exporters with very little choice but to go by the buyer's directions.

This has caused a lot of problems for exporters because now the recourse available to them for importing the trimmings / embellishments is either the Advanced Authorisation Scheme (AAS) or payment of full duty on the imported items. Since the AAS is not a cost-effective option for the import of small consignments of trimmings / embellishments needed to service an export order by an MSME unit, exporters are being compelled to pay the full import duty for obtaining these items, leading to loss of export competitiveness.

It needs to be mentioned that though India's Duty-Free Import Scheme for Exporters (DFIE) was challenged by the US in the WTO (DS 541) and the Dispute Settlement Panel set up to adjudicate the dispute found certain entries under the DFIE to be violative of the WTO Agreement on Subsidies and Countervailing Measures (ASCM), the US failed to establish that the entry relating to textile products was violative of the WTO ASCM (refer para 7.6.4.3 of the Panel Report[373]). Thus the government is at liberty to continue with the customs duty exemption of 3% of f.o.b. value for trimmings and embellishments for made-ups and clothing as existing before 1.2.2021. This is of course a near-term strategy. In the medium to long run, we must come up with a road map to develop a manufacturing industry for trimmings and embellishments required for our exports.

Implementation Problems with TUFS and its Successor Schemes

The most attractive scheme in recent times for modernisation of the industry and attracting investments was the TUFS. The spinning sector succeeded in reaping the maximum benefits out of this scheme and its successors but the weaving and processing sectors lagged behind in subscribing to the scheme. Considering its success in helping the spinning sector to modernise, it would be important to analyse the reasons for its slowdown and to suggest ways of putting it back on the rails.

[373] https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/DS/541R.pdf&Open=True DETAILS NEEDED

Feedback from the industry suggests the following important problems regarding the implementation of TUFS/ ATUFS by the National Committee on Textiles and Clothing, an umbrella organisation representing different segments of the textile and clothing industry. The suggestions are as below:

The ATUFS procedures need to be simplified radically in line with Ease of Doing Business (EODB) guidelines. Though **GOI had allocated INR 17,822 crores (including INR 5,151 crores for ATUFS), not even INR 3,000 crores could be disbursed since 2016.**[374] Some of the points raised in this regard are as below:

(a) **Highly cumbersome eligible machinery enlistment process** (ISO certification, certificate of incorporation/ turnover details, Embassy/CGI certificate, Undertaking from the machinery manufacturer, etc.)

(b) **Some of the reputed global suppliers of machinery are not willing to comply with these stringent procedures**.

(c) **Lack of clarity between old ATUFS and new ATUFS guidelines relating to date of purchase of machinery**.

(d) **Non-reimbursement** of "Forex loss" due to exchange rate fluctuations.

(e) The Joint Inspection Team (**JIT) disallows cases where machinery purchase has been negotiated through an Indian agent but the final invoice and delivery has been effected by the foreign supplier**.

(f) **Problems of uploading JIT request or other essential documents within stipulated timelines because of problems with the designated iTUFS portal**. Only Loan Sanction letter and payment to machinery supplier should be stipulated to be uploaded on iTUFS portal, the other documents can be verified during physical inspection by JIT.

As regards ATUFS, JIT has inspected 5336 entities (out of 10,718 applications) and claims have been approved for only 2059 cases (as on 20/12/2020) and rejected for 947 cases.

Tables 6.12 and 6.13 about the JIT inspections of previous TUFS schemes will highlight the pendency in the release of subsidies.

Table 6.12: Pending Subsidies[375]

Sr. No.	Particulars	No. of cases	Estimated subsidy (INR crores)
1.	ATUFS cases (as on 30/09/2020)	10,718	3,223
2.	Committed liability	9,303	6,000
3.	Previous TUFS live cases	9,500	5,500
4.	RRTUFS waitlist cases	814	750
5.	Left out Technical Textile cases	62	202

[374] National Committee on Textiles and Clothing powerpoint presentation submitted to the Textile Commissioner on 27 Dec. 2020.

[375] Ibid.

Table 6.13: Progress of physical inspection of accounts under previous versions of TUFS by JIT as on 13 March 2020 (last update available from Min. of Textiles website)[376]

Sr. No.	Particulars	MTUFS List 1	MTUFS List 2	RRTUFS	RTUFS	Total
1.	Accounts for which Claims lodged online by banks	1029	2178	2159	556	5922
2.	Accounts for which Documents uploaded by banks	323	517	1821	345	3006
3.	Accounts returned to banks	198	463	1499	223	2383
4.	Accounts found fit for physical inspection	196	116	1202	209	1723
5.	Accounts assigned to JIT by Tex. Comm.	39	24	447	42	552
6.	JIT report uploaded	19	19	327	31	396
7.	JIT report examined by Tex. Comm. for release of subsidy	5	8	111	2	126

We can see from Tables 6.12 and 6.13 that the **system of Joint Inspections by a JIT needs to be replaced/ modified radically because it has single-handedly led to the maximum delays and is acting as a choke point**. A mechanism for third party inspections by an accredited outside agency in the case of ATUFS and the earlier TUFS schemes could be considered as a solution.

Though the Scheme for Production and Employment Linked Support for Garmenting Units (SPELSGU) under ATUFS provides overall CIS of 25% for clothing and made-up units, the first 15% is available on installation of machinery (up to a maximum of INR 30 crores). The balance 10% (upto a maximum of INR 20 crores) is released only if in the following three years the unit has attained the employment targets listed in its Detailed Project Report, which should be at least 70 persons per INR 1 crore of investment. In addition, a minimum ratio of 1:3.5 for additional investments to additional turnover has also been specified for SPELSGU. It has been reported that the release of the second instalment of subsidies takes a long time because of the onerous guidelines. The SPELSGU guidelines need to be simplified and the implementation of the scheme needs to be made predictable and smooth in order to attract investments for the made-up and garments sectors.

Conclusions and Recommendations

1. Renegotiating the textile concessions in our FTAs with ASEAN, Korea and Japan and conclusion of the India-EU BTIA may lead to some improvements in market access but it is imperative for our textile industry to modernise (especially weaving and processing), build up scale and leverage R&D to create innovative products to increase our penetration of foreign markets.
2. The Hank Yarn Obligation should be reduced from 30% to 15% and the reporting obligations on spinning mills should be reduced.
3. The import tariff of 10% imposed recently on Extra Long Staple Cotton needs to be removed.
4. A level playing field needs to be provided with respect to MMF products and natural fibre products in terms of the tax structure. Also imports of MMF fibre and yarn need to be liberalised and recourse to frequent use of anti-dumping duties needs to be dispensed with in the near term. In the medium term, domestic capacity-building for MMF production needs to be encouraged through appropriate incentives.

[376] Ministry of Textiles.

5. The setting up of large weaving units, and consolidation of several smaller weaving units into one to build up scale, need to be incentivised. The incentive could be given in the form of supply of electricity at the same concessional rates as powerloom units in a state.

6. The setting up of large Process Houses needs to be incentivised. One of the ways of doing it is to allow a longer payback period for bank loans in view of the fact that the life of a Process House is around 20 years.

7. The 3% duty-free import entitlement scheme, for import of trimmings and embellishments for made-ups and clothing, needs to be restored.

8. There has to be dual emphasis on import substitution in technical textiles and greater export penetration under the National Technical Textiles Mission. This has to come through more focused R&D effort and building up successful public private partnerships.

9. The implementation of ATUFS needs to be streamlined significantly, inspections need to be outsourced to third parties, and disbursement of subsidies needs to be fast tracked.

► Chapter 7

Leather Sector in India: Investment and Export Prospects

Introduction

The leather industry in India is richly endowed with the most important raw material base -- domesticated cows, buffaloes, goats and sheep. India accounts for 20% of the world's cow and buffalo population, and about 11% of its goat and sheep population.[377] It produces around 12.9% of the world's hides/skins, converting them to about 3 billion sq. ft. of tanned leather annually.[378] Some varieties of goats/calf/ sheep leather from India occupy a premium position in the world.[379]

7.1 Structure of the Leather Industry in India

The leather industry is an employment-intensive industry providing jobs to more than 4.42 million people, about 30% of them women, and the others mostly from the weaker sections of society.[380] The industry in India has one of the youngest workforces in the world with 55% of the workforce below 35 years of age.[381] India has also built up its base of skilled manpower, is increasingly compliant with international environmental standards, and has a strong eco-sustainable tanning base. Its manufacturing units are modernising and it has the presence of support industries like leather chemicals and finishing auxiliaries.[382]

[377] https://leatherindia.org/industry-at-a-glance/

[378] https://investindia.gov.in/sector/leather

[379] https://leatherindia.org/industry-at-a-glance/

[380] Ibid.

[381] https://www.investindia.gov.in/sector/leather

[382] https://leatherindia.org/industry-at-a-glance/

The leather industry in India is concentrated in the form of clusters in the following areas:[383] Chennai, Ambur, Ranipet, Vaniyambadi, Vellore, Pernambut, Trichy, Dindigul and Erode (all in Tamilnadu); Kolkata (W. Bengal); Kanpur, Agra, NOIDA, Saharanpur (all in U.P.); Mumbai (Maharashtra); Jalandhar (Punjab); Bengaluru (Karnataka); Hyderabad (Telangana); Ambala, Gurgaon, Panchkula, Karnal and Faridabad (all in Haryana); Delhi; Dewas (M.P.), Kozhikode and Ernakulam/Kochi (Kerala); Jaipur (Rajasthan) and Srinagar (J&K).

Of all the states in India, Tamilnadu has the largest tanning and leather products manufacturing capacity and accounts for more than 40% of the output of the country. Tamilnadu also has the largest number of modern tanneries, which lie at the core of the leather industry.

7.1.1 Exports of Leather Products

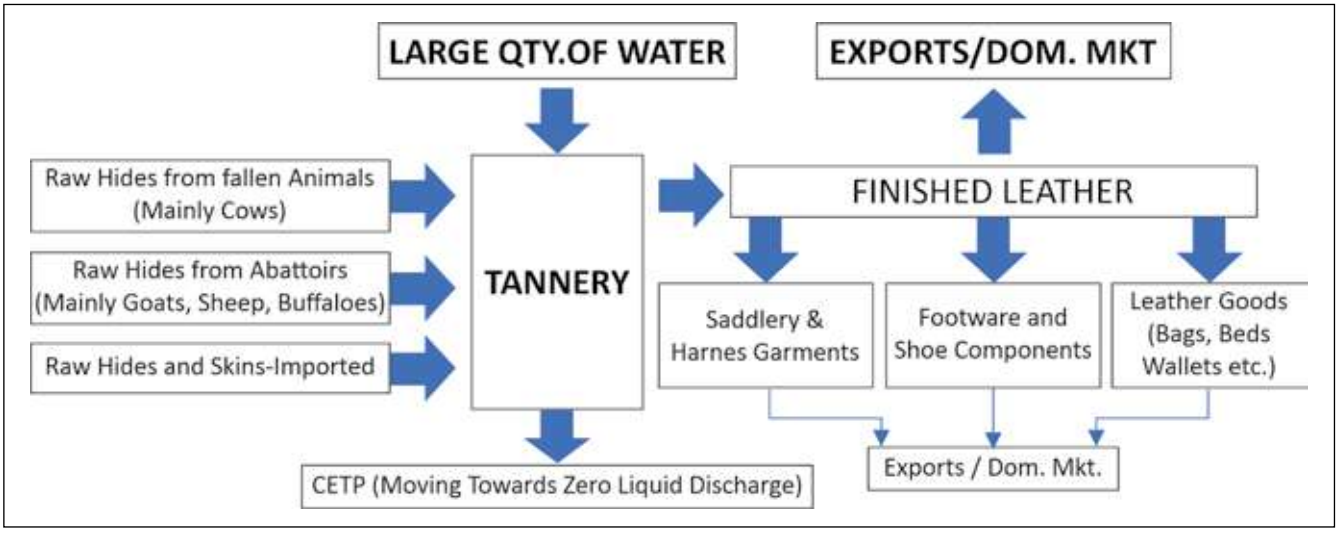
Over 30% of India's leather products are exported; the rest are consumed domestically. The leather sector is known for its consistency in high export earnings and it is among the top 10 foreign exchange earners for the country. The country accounts for 9% of the world's footwear production and is the second largest producer of footwear (after China). It is also the second largest exporter of leather garments, and the third largest exporter of saddlery and harness.[384]

Leather products are divided basically into the following six categories: (i) Finished Leather (ii) Leather Goods (iii) Leather Garments (iv) Leather Footwear (v) Leather Footwear Components (vi) Saddlery and Harness. Since many of the leather footwear manufacturers also produce non-leather footwear, the latter is considered as part of the output of the leather industry and may be taken as the seventh category of products.

On account of the local availability of raw materials and an existing human resource base, different clusters have specialised in different products. For instance, Agra specialises in footwear, Kanpur in saddlery and harness, NOIDA in leather garments, and Kolkata in leather goods like wallets, hand bags, belts, etc. The clusters in Tamilnadu, however, produce almost all the different types of leather products except for saddlery and harness.

A simplified flow chart for the leather industry is provided in Figure 7.1 below to explain the process of producing various leather products for domestic consumption as well as exports.

Figure 7.1: Flow Chart for Leather Products



[383] Ibid.

[384] https://leatherindia.org/industry-at-a-glance/

A break-up of India's exports of leather products since 2015-16 is provided in Table 7.1 below.[385]

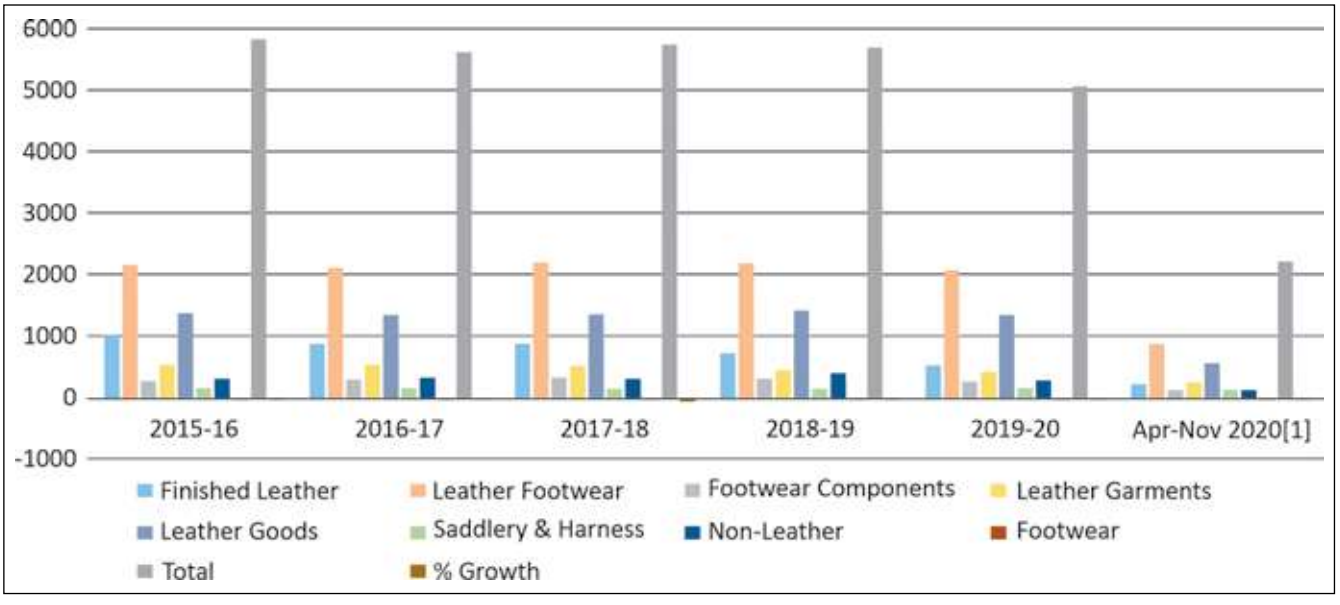
Table 7.1: India's exports of leather products by category, 2015 to 2020 (in USD million)

Product	2015-16	2016-17	2017-18	2018-19	2019-20	Apr–Nov 2020-21[386]
Finished Leather	1046.45	886.39	874.24	721.76	524.15	222.73
Leather Footwear	2147.98	2128.87	2193.86	2195.54	2081.64	880.49
Footwear Components	284.34	298.69	335.24	319.10	261.67	126.27
Leather Garments	553.11	535.66	518.96	468.43	429.11	199.51
Leather Goods	1370.04	1316.63	1365.79	1434.27	1340.56	576.76
Saddlery & Harness	146.38	142.35	155.97	159.35	151.44	108.41
Non-Leather Footwear	306.74	338.21	296.91	392.65	281.97	113.25
Total	**5855.04**	**5646.79**	**5740.97**	**5691.10**	**5070.54**	**2227.43**
% Growth	-9.85%	-3.56%	1.67%	-0.87%	-10.90%	-36.50%

Source: https://dpiit.gov.in/sites/default/files/annualReport-English2020-21.pdf

As is evident from Table 7. 1, our exports of finished leather have been declining appreciably over the past 6 years. The exports of leather garments have also shown a steady decline while leather footwear, leather goods, saddlery and harness, and non-leather footwear have shown a plateauing in terms of exports. Overall, our exports in 2019-20 have shown a 15.5% decrease from 2015-16 in absolute terms. Of course, the last quarter of 2019-20 was very badly affected by the Covid pandemic and therefore, 2019-20 exports are likely to have shown a more than normal decline. However, what needs to be borne in mind is that barring some blips, there is a visible downward trend in exports with every passing year since 2015-16.

Figure 7.2: Export of Different Leather Products (in USD million)



Source: Table 7.1

[385] Dipp.gov.in/sites/default/files/annualReport-English2020-21.pdf MORE DETAILS Source: DGCI&S / Annual Report DPIIT, GoI.

[386] Exports have amounted to USD 3.3 billion during 2020-21 according to a news item dated 23 April 2021 in the newspaper The Hindu, https://www.thehindu.com/news/national/tamil-nadu/indias-leather-exports-decline-283-to-33-billion-in-2020-21/article34388740.ece

The leather export industry is characterised by family-run enterprises, mostly small or medium-sized, with just a few exceptions like Tata International, Liberty Shoes, and Bata India representing public limited companies. Because of the nature of the present ownership and the reported reluctance of the families to dilute their holdings in their enterprises, most firms have not raised capital for expansion from the market but restricted themselves to ploughing back their own profits as also taking bank loans for the purpose. The spread of exporters across regions (Table 7.2) shows that the western region has very scant representation followed by the eastern region.[387] Another fact which deserves to be noted is that the value of the average exports per exporter is only USD 1.5 million per annum (Derived by dividing the total exports in Table 7.1 by number of Exporters in Table 7.2).

Table 7.2: Number of leather exporters across regions in India, 2019 and 2020

Sl. No.	Region	Members as on 28.2. 2019	Members as on 29.2.2020	Variation
1.	Southern	1017	1003	-1.38%
2.	Northern	909	906	-0.33%
3.	Eastern	658	631	-4.10%
4.	Central	737	708	-3.93%
5.	Western	153	154	0.65%
	TOTAL	**3474**	**3402**	**-2.07%**

Source: Council for Leather Exports.

7.1.2 Imports of Leather Products

The imports of leather products from 2015-16 is shown in Table 7.3 below.[388]

Table 7.3: Imports of leather products by category, 2015 to 2021 (in USD million)

ITC HS Chapter/Tariff Heading and brief description	2015-16	2016-17	2017-18	2018-19	2019-20	Apr 2020-Feb 2021
41-Raw hides and skins (other than fur skins) and leather[389]	659.41	609.33	615.52	582.83	550.09	287.01
64-Footwear, gaiters and the like; parts of such articles[390]	474.00	535.18	686.27	746.96	751.16	362.29
4203-Articles of apparel and clothing accessories, of leather or of composition leather[391]	29.14	19.04	27.39	26.68	25.57	13.93
4202-Trunks, suitcases, vanity cases, executive cases, brief cases, school satchels, spectacle cases, binocular cases[392]	275.31	279.24	390.22	451.91	406.94	132.91

Source: Council for Leather Exports

[387] https://leatherindia.org/membership-strength

[388] https://tradestat.commerce.gov.in/eidb/default.asp MORE DETAILS

[389] Includes tanned and crust leather.

[390] Includes leather as well as non-leather footwear and footwear components.

[391] Includes leather apparel accessories (goods) such as belts, wallets, purses, card cases, hand bags, etc.

[392] Includes a large number of leather goods

The following inferences can be drawn from Table 7.3:

(i) The imports of footwear and footwear components (ITC HS Chapter 64) form the largest product group of imports. Imports of these products have been increasing every year since 2015-16. On further analysis at 4 digit level, it is revealed that non-leather footwear imports (ITC HS Heading 6404) has been increasing every year since 2015-16 and in the last two years it accounts for about 40% of the total imports of leather products, followed by footwear components (ITC HS Heading 6406), which accounts for another 10%.

(ii) Raw hides and skins (ITC HS Chapter 41) forms the second largest product group in our leather import basket, though its value has shown a declining trend.

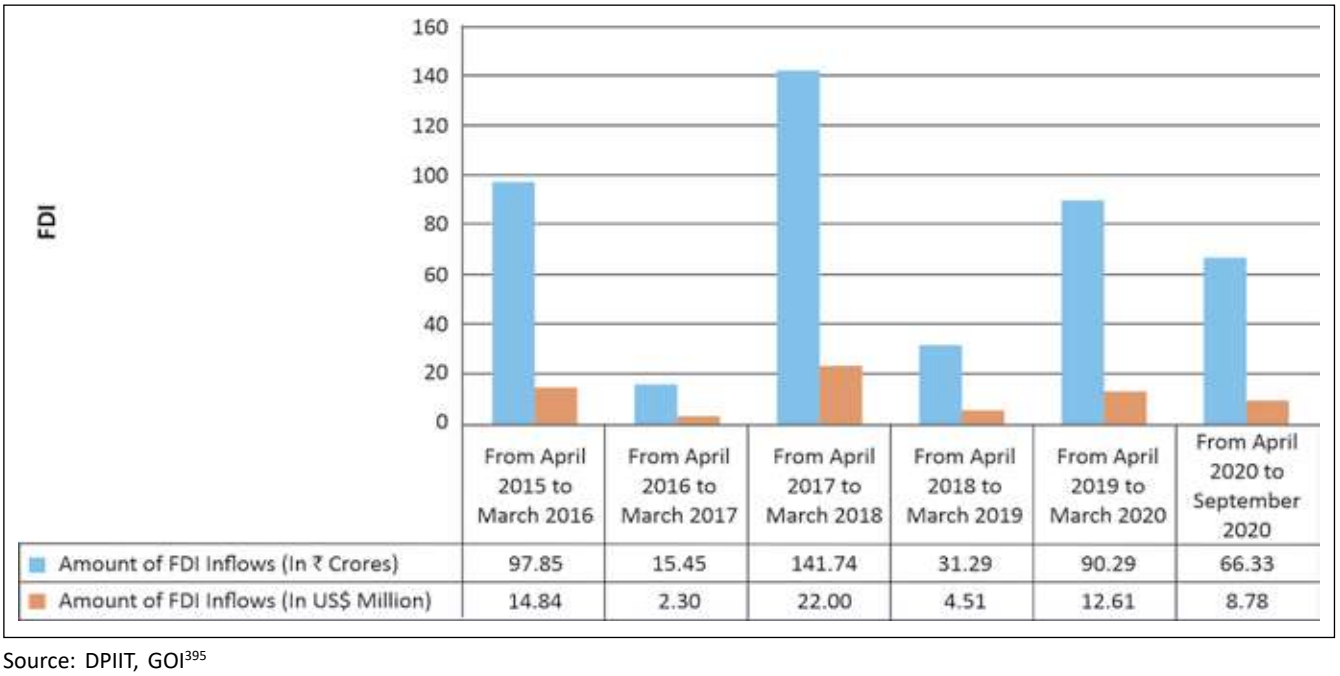
(iii) Leather goods like trunks, suitcases, brief cases, vanity cases etc. (ITC HS Heading 4202) have shown an increasing trend in imports since 2015-16.

(iv) The imports of leather apparel and clothing accessories have remained small and more or less flat since 2015-16.

7.1.3 Foreign Direct Investment in the Indian Leather Industry

FDI in the leather sector has been on the automatic approvals route.[393] Despite this, the total FDI inflow in the sector between April 2000 and September 2020 has remained an insignificant amount of USD 215.11 million. The sector occupies the fifty-second rank in the list of sectors (63 in all) which have received FDI since April 2000, with a meagre share of 0.04% of the total FDI inflows into the country from 2000 to 2021.[394] A few companies like Apache (Taiwan), Feng Tay Shoes (Taiwan), and Itares (Italy) have invested in India in recent years. The FDI flow since 2015-16 is shown in Figure 7.3 below.

Figure 7.3: FDI in India's Leather, Leather Goods & Pickers Sector



	From April 2015 to March 2016	From April 2016 to March 2017	From April 2017 to March 2018	From April 2018 to March 2019	From April 2019 to March 2020	From April 2020 to September 2020
Amount of FDI Inflows (In ₹ Crores)	97.85	15.45	141.74	31.29	90.29	66.33
Amount of FDI Inflows (In US$ Million)	14.84	2.30	22.00	4.51	12.61	8.78

Source: DPIIT, GOI[395]

[393] https://www.fdi.finance/leather

[394] https://dipp.gov.in/sites/default/files/FDI_Factsheet_March%2C21.pdf

[395] https://dipp.gov.in/publications/fdi-statistics/archives

7.2 Government Policies to Support the Indian Leather Industry

7.2.1 Indian Footwear Leather and Accessories Development Programme (IFLADP)

A Central sector scheme called the Indian Footwear, Leather & Accessories Development Programme (IFLADP) with an approved expenditure of INR 2600 crores[396], has been under implementation since 2017-18. The implementation of IFLADP has been proposed to be extended to cover the period 2021-22 to 2025-26. The IFLADP aims to develop infrastructure for the leather sector, address environmental concerns specific to the sector, facilitate additional investments, generate employment, increase production, and upgrade the design capabilities and skills of workers/trainers engaged in the sector.

Details of the Indian Footwear, Leather & Accessories Development Sub-Schemes[397]

(i) ***Human Resource Development (HRD) sub-scheme***: The HRD sub-scheme provides assistance for Placement-Linked Skill Development training to unemployed persons at INR 15,000 per person, for skill upgradation training to employed workers at INR 5,000 per employee and for training of trainers at INR 2 lakh per person.

Primary skill development training has been provided to 3,04,722 unemployed youth and 2,60,880 trainees have been provided placements in the industry under the sub-scheme up to 2019-20.

(ii) ***Integrated Development of Leather Sector (IDLS) sub-scheme***: IDLS sub-scheme incentivises investment and manufacturing, including job creation, by providing backend investment grant/subsidy of 30% of the cost of new Plant and Machinery to Micro, Small & Medium Enterprises (MSMEs), and of 20% of the cost of Plant and Machinery to other units for modernisation / technology upgradation in existing units, and also for setting up of new units.

Financial assistance amounting to INR 250.54 crores has been provided for modernisation and technology upgradation of 536 units in the leather sector (as on 28.2.21) during the period 2017-18 to 2020-21.

(ii) ***Establishment of Institutional Facilities sub-scheme***: The sub-scheme provides assistance to the Footwear Design & Development Institute (FDDI) for upgradation of some of its existing campuses into "Centres of Excellence" and for establishing 3 new fully-equipped skill centres alongside the upcoming Mega Leather Cluster.

Approval has been granted for the upgradation of 7 FDDI campuses located at NOIDA, Chennai, Hyderabad, Jodhpur, Patna, Kolkata and Rohtak into Centres of Excellence with an outlay of INR 129.62 crores. The first instalment of INR 38.88 crores (30% of project cost) has been released to the FDDI till 28.2.21.

(iv) ***Mega Leather, Footwear and Accessories Cluster (MLFAC) sub-scheme***: The MLFAC sub-scheme provides infrastructure support to the Leather, Footwear and Accessories Sector through the establishment / upgradation of manufacturing clusters. Graded assistance is provided up to 50% of the eligible project cost, excluding the cost of land, with the maximum Government assistance being limited to INR 125 crores per cluster.

Final approval has been accorded for the setting up of an MLFAC at Calcutta Leather Complex, Bantala, Kolkata with a project cost of INR 178.84 crores and GOI assistance of INR 89.92 crores. In-principle approval has also been accorded the setting up of MLFAC at Ramaipur, Kanpur Nagar with a tentative proposed cost of INR 451 crores.

---

[396] https://dipp.gov.in/sites/default/files/Brief_IFLADP.pdf

[397] Ibid.

(v) ***Leather Technology, Innovation and Environmental Issues sub-scheme***: Under this sub-scheme, assistance is provided for the upgradation / installation of Common Effluent Treatment Plants (CETPs) at 70% of the project cost. The sub-scheme also provides for support to national-level sectoral industry councils / associations, and support for preparation of vision document for the Leather Footwear and Accessories Sector.

Financial assistance amounting to INR 105.86 crores has been released in respect of 10 CETP projects (as on 28.2.21). Two CETP projects have been approved at Calcutta Leather Complex, Bantala with a project cost of INR 357.57 crores and Jalandhar Leather Complex, Punjab with a project cost of INR 27.26 crores.

(vi) ***Promotion of Indian Brands in Leather, Footwear and Accessories Sector sub-scheme***: Under this sub-scheme, the eligible units approved for Brand Promotion are assisted. The Government assistance is limited to 50% of the total project cost, subject to a limit of INR 3 crores for each brand, each year, for 3 years.

(vii) ***Additional Employment Incentive for Leather, Footwear and Accessories Sector sub-scheme***: Under this sub-scheme, employers' contribution of 3.67% to Employees' Provident Fund for all new employees in Leather, Footwear and Accessories sector, is provided for the first 3 years of their employment, for enrolling in EPFO.

Disbursement of INR 92,27,971 in respect of 48 eligible units/applications under the sub-scheme has been made after physical inspection and financial vetting by the implementing agency.

7.2.2 Remission of Duties and Taxes on Exported Products (RoDTEP)

Government has decided to extend the benefit of the Scheme for Remission of Duties and Taxes on Exported Products (RoDTEP) to all export goods, including leather, with effect from 1 January 2021. The RoDTEP scheme would refund to exporters the embedded Central, State and local duties / taxes that were so far not being rebated / refunded and were, therefore, placing our exports at a disadvantage. The refund would be credited in an exporter's ledger account with Customs and used to pay Basic Customs duty on imported goods. The credits can also be transferred to other importers. RoDTEP rates, notified on 17th August 2021, shall apply with effect from 1 January 2021 to all eligible exports of goods.

7.2.3 Goods and Services Tax (GST) Rates for the following leather industry related items have been reduced

(a) Reduction of GST rate from 28% to 18% for leather goods, leather garments, leather chemicals from 15 November 2017.

(b) Reduction of GST rate from 12% to 5% for finished leather and composition leather from 15 November 2017.

(c) Reduction of GST on job work for manufacturing leather goods and footwear from 18% to 5% from 25 January 2018.

(d) Reduction of GST on Common Effluent Treatment Plants services from 18% to 12% from 25 January 2018.

(e) 5% concessional GST extended to footwear having a retail sale price up to INR 1000 per pair from 27 July 2018, which was earlier available for footwear with retail sale price up to INR 500/-.

(f) GST reduction on Slide Fasteners and Parts of Slide Fasteners (used as inputs) from 18% to 12% from 27 July 2018.

7.2.4 Interest Equalisation Rate for MSMEs increased

The Interest Equalisation Rate was enhanced from 3% to 5% for MSME units from 2 November 2018 on pre-shipment and post-shipment rupee export credit.

7.2.5 Removal of Quarantine clearance for finished and crust leather

Removal of Animal Quarantine clearance for most of the categories of finished and crust leathers imported into India has been notified vide Gazette Notification No. 5758 (E) dated 16 November 2018 issued by the Department of Animal Husbandry, Dairying and Fisheries (DAHD&F).

7.3 Incentives Provided/ Schemes Launched for Leather Exports in a few Competing Countries

7.3.1 Bangladesh Leather Service Centre (BLSC) project

Bangladesh Leather Service Centre (BLSC) for export development had implemented a two-phase project between 2006 and 2011 for encouraging leather product exports. The project comprised the following phases:

1st Phase (3 years 3 months): March 2006-June 2009

2nd Phase -- Follow-up (2 years): July 2009-June 2011

The overall objective of the project was to increase exports of leather products, thus contributing to sustainable export diversification and consequent employment generation through trade-related capacity development. The project encompassed a wide range of technical and marketing services for the leather industries. It was financed by the Government of Italy.[398]

The BLSC Follow-up project (Phase 2) was aimed at:

(a) Keeping the momentum reached during Phase I and maintaining the Centre's supply capacity of specific priority services;

(b) Developing successful models of intervention with a selected group of companies to pave the way for their adaptation and replicability to the whole sector;

(c) Creating the conditions for the industry to progressively acquire full ownership of the Centre and guide its further development;

(d) Enabling the project counterpart, the Leather Sector Business Promotion Council / Ministry of Commerce, to mobilise co-operation alliances with local and international partners, so as to expand the outreach of services and activities.[399]

7.3.2 China Leather Industry Association (CLIA)

Most companies in the leather industry in China are small or medium enterprises (SMEs). SMEs are extremely important to China's economy because it is these companies that provide most of the country's jobs. The biggest challenge these companies are facing at the moment is that their costs have increased because of Covid-19, while orders and revenue have decreased. The government has stepped in with relief measures

[398] http://www.bpc.org.bd/lsbpc_project.php

[399] http://gtad.wto.org/project.aspx?prjCode=BGD%2f37%2f19A DETAILS NEEDED

totalling around USD 85 billion for China's SMEs. Specific to the tanning sector, there is tariff exclusion on imports of US hides that the customs authorities are allowing as a good example of the help that companies can receive.[400]

7.3.3 Italian Leather Research Institute (SSIP)

The Italian Leather Research Institute, founded in 1885, provides research, training, standardisation, laboratory analysis, and technical-scientific advice to the tanning industry and its supply chain. The institute's main goal remains to "consolidate the international leadership of Italian tanneries in terms of quality, technological development and sustainability".

Increasingly closer to addressing the real needs of companies, the research centre, governed by the Chamber of Commerce of Naples, Piza and Vicenza, is also entitled to carry out several research activities to support the tanning industry. The current lines of research focus on three areas: Process Technologies, Environmental Sustainability and Product Technologies for Italian leather.[401]

7.4 Challenges for the Sector

7.4.1 Ensuring Adequate Supplies of Raw Materials

In terms of physical raw materials, the leather sector primarily requires an abundant supply of leather, chemicals required for tanning, and easy availability of components required for shoes, leather goods and apparel. We discuss each of these factors here.

Shortage of raw hides and skins

The leather sector had been chosen as one of the Focus Sectors under the Make in India initiative because of its employment generation and growth potential. A target of USD 23.47 billion had been set for the sector in 2017, which was to be achieved by 2019-20. The contribution of exports and domestic consumption in this target were USD 7.5 billion and USD 15.97 billion respectively. Keeping these targets in view, it was calculated by industry experts that the leather industry would require 5 billion square feet of leather annually to meet the production demand.[402] Since India produces about 3 billion square feet of leather and there are serious limitations to raising the domestic production of raw hides and skins, the only way to bridge this gap was by the imports of raw hides and skins or semi-processed hides and skins. Since we have a strong tanning industry and finished leather is a value added post-tanning product, the imports of finished leather would reduce the value addition in the country and is therefore not the preferred option to address the deficit. In this context, it is important to remember that cow leather, which is considered ideal for many kinds of shoes and leather goods, is not available in adequate quantities in India because slaughtering is only allowed in W. Bengal, Kerala and some North Eastern States, and only the skins of diseased and old fallen animals are available from the other States.

In order to discourage the exports of raw hides and skins, and provide adequate raw materials to our own industry, India has long followed the policy of imposing an export duty on raw hides and skins. Under

[400] http://www.aplf.com/en-US/leather-fashion-news-and-blog/news/44095/china-clia-outlines-aid-available-to-china-s-leather-sector

[401] https://tannerymagazine.com/italian-leather-research-institute-ongoing-research/

[402] http://leatherindia.org/raw-material-sourcing-meet-feb-01-2019/

pressure from the meat exporters of our country, the export duty on raw hides and skins had been reduced from 60% to 40% in the budget 2019-20. The export duty on East India tanned leather had also been reduced from 15% to nil in the same budget. A further reduction in the export duty from 40% in 2020-21 was considered but was opposed by the leather industry.[403]

On the other hand, the import duty on wet blue chrome tanned leather, crust leather, finished leather of all kinds, including splits and sides has been raised to 10%,[404] which has again been criticised by the leather industry[405] because it would make Indian export products more expensive as the price of leather accounts for roughly 60% of the cost of a leather product. It can be argued that exporters can always use the Advance Authorisation Scheme (AAS) route to source raw hides and skins from abroad. However, most exporters of shoes, apparel and leather goods do not have an in-house tannery. Moreover, for every kind of product, the Standard Input Output Norm (SION) laid down by the DGFT may not account for all the wastage involved in making the product, in which case an exporter has to get a specific SION fixed for his export product, which takes a lot of time. Since most exporters are MSMEs, very few of them use the AAS to obtain duty exemption for their imports of raw hides and skins. The AAS is largely used by tanners who are exporting finished leather and not by exporters of downstream products.

Shortage of chemicals used in tanneries

As far as the chemicals used in the tanning process are concerned, most of the chemicals are already being produced in the country.[406] Some of the specialty chemicals under ITC HS Chapter 32 (Heading 3201 and 3204) and Chapter 38 are imported from Italy, Germany, Spain, Peru, Chile, Argentina, Brazil etc. but the amounts involved are not large. The import tariffs on these chemicals is a uniform 10%. Since many of the chemicals that are imported, especially of plant origin, e.g. Quebracho extract (tree mainly found in Argentina, Brazil, Colombia and Paraguay) or Wattle extract (tree found in South Africa and Australia) or Gambier extract (tree found mainly in Indonesia and Malaysia), are not available in India, the import duties on them should be either brought down to zero or to 5% at the most.

7.4.2 Duty-Free Import Scheme for Components and Embellishments

Leather product exporters had been allowed import duty exemption to import footwear components and embellishments (for footwear, apparel and leather goods) to the extent of 3% of the f.o.b. value of exports of the previous year, since 2002. By Customs Notification No. 50/2017 dated 30.6.2017, the duty exemption limit was raised to 5% of f.o.b. value of exports in previous years for manufacturer exporters of footwear and other leather products, while retaining the limit of 3% for leather garment exporters for embellishments. In respect of leather garments exporters, an additional exemption of 2% of f.o.b. value was available for import of lining and interlining materials. This was extremely useful because of the following reasons: (a) the industry producing these goods in India did not enjoy economies of scale, (b) it could not change the designs of the components / embellishments based on the fashion trends in the export market quickly, (c) the products often did not conform to the quality required by the buyer abroad, and (d) the imports under the Duty-Free

[403] https://economictimes.indiatimes.com/news/economy/foreign-trade/govt-considering-proposal-to-cut-export-duty-on-hides-skins-of-bovine/articleshow/76245379.cms

[404] https://www.financialexpress.com/budget/union-budget-2021-leather-products-to-get-costlier-after-10-customs-duty-say-manufacturers/2184942/

[405] https://timesofindia.indiatimes.com/city/kanpur/union-budget-2021-22-10-customs-duty-to-hit-ups-leather-goods-export/articleshow/80637047.cms

[406] https://leatherindia.org/industry-at-a-glance/

Import Scheme were not subject to the submission of detailed documentation as required under the Advance Licence / Advance Authorisation Schemes to the DGFT. Hence the transaction cost was much lower, adding to the competitiveness of our exports.

By Customs Notification No. 2/2021 dated 1.2.2021, while retaining the customs duty exemption of 2% of the f.o.b. value of the previous year's exports for leather garments only for import of lining and interlining materials for leather garments, the exemption of 5% available for footwear components and embellishments for leather garments and leather goods was removed.[407] This has caused a lot of problems for exporters because now the recourse available to them for importing the components / embellishments is either the AAS or payment of full duty on the imported items. Since the AAS is not a cost-effective option for the import of small consignments of components / embellishments needed to service an export order by an MSME unit, exporters are being compelled to pay the full import duty for obtaining the components / embellishments, leading to loss of export competitiveness.

It needs to be mentioned that though India's Duty-Free Import Scheme for Exporters (DFIE) was challenged by the US in the WTO (DS 541) and the Dispute Settlement Panel set up to adjudicate the dispute found certain entries under the DFIE to be violative of the WTO Agreement on Subsidies and Countervailing Measures, but the US failed to establish that the entry relating to leather products was violative of the WTO Agreement on Subsidies and Countervailing Measures (refer para 7.6.4.3 of the Panel Report[408]). Thus the government is at liberty to continue with the customs duty exemption of 5% / 3% of f.o.b. value for components and embellishments for footwear, leather products / leather garments as existing before 1.2.2021. This is of course a near-term strategy. In the medium to long run, we must come up with a road map to develop a manufacturing industry for components and embellishments required for our leather product exports.

7.4.3 Environmental Issues

The tanning process requires large quantities of water and releases many harmful chemicals into the air or soil or as effluents. Chemicals used in tanned leather production increase the levels of chemical oxygen demand and total dissolved solids in water when not disposed of responsibly.

Boiling and sun drying can oxidise and convert the various chromium (III) compounds used in tanning into carcinogenic hexavalent chromium, or chromium (VI). This hexavalent chromium runoff and scraps are then consumed by animals. Up to 25% of the chickens in Bangladesh have been found to contain harmful levels of hexavalent chromium, adding to the national health problem load.[409]

As part of its remit of environmental stewardship, the Leather Working Group (LWG) of the UN assesses the chemical management of leather manufacturers, both via the Environmental Audit Protocol (EAP) and the Chemical Management Module (CMM). LWG aims to make sure leather manufacturers are able to understand, manage and implement chemical management systems, to ensure restricted substance lists are adhered to and ensure that chemicals are disposed of in an appropriate manner to reduce pollution and contamination in the air, water and soil.

In India, since a large number of hides are obtained from fallen animals in villages, common salt is liberally used to preserve the hides till they reach the tanneries. One of the most pressing concerns of the Indian leather industry is the recovery of water and salt from the effluents, re-use of the water, and treatment of

[407] http://leatherindia.org/changes-in-union-budget-2021-22-duty-free-import-scheme/

[408] https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/DS/541R.pdf&Open=True

[409] http://www.gulf-times.com/bangladesh/245/details/398475/toxic-poultry-feed-threatens-bangladesh%E2%80%99s-poor

the other chemicals discharged by tanneries in an environmentally sustainable manner. The standards of effluent treatment vary a lot from one cluster to another in the country.

Deficiencies in the effluent treatment from tanneries in the Jajmau (Kanpur) - Unnao cluster in U.P has been a cause of major concern for the Central Pollution Control Board as brought out in a letter dated 13.5.2019 to the State Pollution Control Board, containing detailed directions.[410] In the said letter, the CPCB asks the UP SPCB inter alia to submit a plan, within the next 3 months, for a zero liquid discharge action plan as well as to ensure the primary treatment of effluents upto the desired levels at each tannery, before the effluents reach the CETP. The follow-up action taken by the UPSPCB on the CPCB directions is not available in the public domain but considering the fact that the root of the problem lies in the small household tanneries and their primitive methods of tackling the effluent problem,[411] it is unlikely that robust compliance of the CPCB's directions would have taken place.

A good example set by the Government of West Bengal is the shutting down of a large number of household tanneries in the Tangra, Tiljala and Topsia localities of Kolkata, and the setting up of modern tanneries in the Calcutta Leather Complex at Bantala with a CETP built largely with government assistance.[412]

The cluster of tanneries in Ranipet in Tamilnadu is the most advanced in India and the Common Effluent Treatment Plant (CETP) run by the Ranipet Tannery Effluent Treatment Company Ltd (RANITEC) caters to the requirements of 92 tanneries[413] which are following international best practices to recover salt and chrome and reduce the usage of water in the tanning process. The CETP has installed a Zero Liquid Discharge (ZLD) system with partial assistance from the Government of India and the Government of Tamilnadu under the Integrated Leather Development Programme (ILDP) at a cost of INR 46 crores.

The primary lessons that need to be drawn from the Bantala (Kolkata) and Ranipet initiatives are: (a) small household tanneries will not be able to bear the expenditure of chrome recovery plant and primary effluent treatment at their end and they need to be shut down, (b) the government needs to help the industry in setting up large tanneries and modern CETPs in the existing clusters, (c) the CETPs could be set up with government assistance but would need to be run by an SPV of the tanneries themselves on the basis of realisation of user charges.

In order to implement some of these learnings and reap benefits, we need to implement the Mega Cluster sub-scheme of the IFLADP quickly and set up Large Leather Parks with common infrastructure including CETPs, near the existing production clusters. Some of these projects could also be linked up with the Sagarmala project so as to benefit from the proximity to ports.

7.4.4 Scaling up Manufacturing, and Attracting FDI

One of the characteristics of the leather sector has been the small scale of operations at the unit level. Most of the enterprises are family run and want to retain family control over the operations. This has resulted in somewhat inward-looking behavior, and a refusal to corporatise and raise money from either the public or go in for FDI. That is why apart from Bata India, Liberty and a handful of other firms, footwear, apparel

[410] https://cpcb.nic.in/openpdffile-direction.php?id=UHVibGljYXRpb25GaWxlLzMxMTlfMTU1NzgzNzA0Ml9tZWRpYXBob3RvMTMxMjEucGRm

[411] http://home.iitk.ac.in/~sgupta/tannery_report.pdf

[412] http://calcuttaleathercomplex.in/new_website/about/

[413] https://tnpcb.gov.in/pdf_2019/TanneryCETP_ZLD15519.pdf

and leather goods manufacturers are not listed on the stock exchange in India. Whenever a foreign investor comes in with investments and advanced technology, it wants to have some say in management so as to protect its interests. The leather sector in India has purchased advanced technology in some cases or acquired franchisee rights over some international brand names but it has not allowed a foreign principal to acquire a stake in an enterprise, howsoever small it might be.

The lack of scale in operations, principally on account of disinclination to raise capital, has proved to be an obstacle in servicing large orders from global brands and large chain stores. In the last decade, Walmart had shown interest in sourcing footwear from India as a means of breaking away from its over-reliance on China but it wanted an Indian supplier to set apart a dedicated facility with the capacity to produce at least a million pairs of shoes per year.[414] In response, only one Indian manufacturer had entered into a contract with Walmart. The situation continues to be the same even today because no other Indian company has risen to the challenge of scaling up. This has serious implications for any plans to expand our exports.

7.4.5 Diversifying Product Base and Brand Development

In terms of footwear, which accounts for almost 40% of our total exports of leather products, our export basket comprises men's shoes (58%), women's shoes (30%) and some children's shoes (9%). In men's shoes also, we export mainly formal or semi-formal shoes and very little of casual shoes. Our presence in the sports shoes segment of the global market is also negligible because we have neither the design capabilities to match brands like Nike, Reebok, Adidas etc. nor do we have the raw material base that China has developed making non-leather shoe uppers and different kinds of synthetic soles.

In the women's shoes arena, where fashions change quickly and design plays a very important part, we export mainly formal and semi-formal shoes and a small amount of fashionwear. In children's shoes, which has a large market, we do not export casual shoes or sports shoes because of a lack of design capabilities and a rather narrow raw materials base.

In non-leather footwear, which is growing fast in the global market, our exports have remained more or less flat since 2015-16 (see Table 7.1). A large chunk of the non-leather footwear does comprise the sports shoes segment and the reasons for our poor show in sports shoes has already been mentioned. Our share of non-leather footwear in the global market can increase if we take a two pronged approach to: (a) liberalise the imports of non-leather footwear upper materials and soles and (b) also take steps to encourage FDI / acquisition of technology to bridge the technology gap in this area.

In leather garments, where the global market itself is not expanding very much, our exports mainly comprise standard wear and not high fashion garments. This is because of the lack of design capabilities and the absence of brands of Indian origin.

In leather goods, which is the second largest product category after footwear in our exports basket, and which also provides employment to a large number of workers / artisans, the absence of a strong design base acts as an impediment to our growth. The lack of a well-developed ancillary industry to manufacture the components and embellishments required not only for leather goods but for garments and footwear (especially ladies footwear) also, has a bearing on our global competitiveness. We must implement a plan in the medium term to bridge this important gap for the sake of achieving our objective of accelerated growth.

The issue of developing our design capabilities and also building internationally recognised brands, has received due recognition in the IFLADP. As far as individual units are concerned, the Government may also

[414] Discussions with footwear exporters

consider giving attractive incentives, including Income Tax benefits, to units which invest in the development of their design capabilities. The Central Leather Research Institute and NIFT could also act as centres of excellence to help in this endeavour.

Finally, it also needs to be noted that the global marketplace is changing rapidly, and no foreign buyer today wants to stock a large inventory. On the other hand, the turnaround times for orders have also shrunk from 90+ days to 60 days in most cases. Thus our supply chain and logistics infrastructure have to keep pace with global demands, if we have to effect robust exports growth.

Recommendations

Based on the foregoing analysis of the challenges facing the leather sector and the possible ways of addressing them, the following recommendations are being made:

(i) India needs to import large quantities of raw hides and skins to expand its domestic production and exports because leather is in short supply and can constrain all other growth initiatives. The tariff of 10% imposed for semi-finished leather in the budget 2021-22 needs to be withdrawn.

(ii) The tariffs on chemicals used for the tanning industry, especially of plant origin and the others which are not being manufactured in India at present, need to be reduced to improve the competitiveness of our exports.

(iii) The entitlement for imports of components and embellishments for footwear, leather garments and leather goods under the Duty-Free Imports for Exporters Scheme need to be restored to pre 1.2.2021 levels.

(iv) Local manufacture of components, accessories and embellishments as well as Non-leather footwear upper materials needs to be encouraged through appropriate policy incentives so as to reduce the turnaround time for exports and reduce our dependence on China.

(v) The Mega Cluster sub-scheme of IFLADP needs to be implemented quickly and more Leather Parks with common infrastructure, including a CETP, need to be set up near existing manufacturing clusters. Some of these projects could be linked up with the Sagarmala project so as to from the proximity to ports.

(vi) We need to diversify our export basket to include casual and sports shoes for men, women and children and lay greater emphasis on increasing our overall share of the global market in women's shoes and children's shoes.

(vii) We need to liberalise the imports of non-leather shoe components and embellishments so as to increase our exports in this fast-growing segment of the global market, where our presence is currently very small and stagnant.

(viii) In leather garments, greater emphasis must be laid on the design element and collaboration with high fashion global brands so that we could move up the value chain and improve our value realisation.

(ix) Attractive incentives, including Income Tax benefits, need to be given to individual enterprises, to improve their design capabilities. The Central Leather Research Institute and NIFT could jointly act as centres of excellence to this end.

(x) The IFLADP has duly acknowledged and provided for a sub-scheme for brand development. However, it appears that the offtake under this sub-scheme has not been encouraging. We need to take a re-look at the parameters of the sub-scheme so as to make the necessary mid-course corrections to make it more attractive for the industry.

Established Sectors:

Automobiles and Pharmaceuticals

► Chapter 8

Automobiles Sector in India

Introduction

The Indian automobile industry accounts for over 7% of the country's GDP, and 22% of the manufacturing sector. According to the industry body, Society of Indian Automobile Manufacturers (SIAM), the industry supports employment of more than 3.7 crores, and with GST collections of around INR 1,50,000 crores, it accounts for nearly 15% of total GST collection of the country in a year.[415] The auto sector is also one of the biggest recipients of foreign direct investment (FDI) and between April 2000 and March 2020, received FDI amounting to USD 24.2 billion.[416] It is the fourth largest at the global level and was expected to become the third largest in 2021.[417] The automobile industry is projected to be the third largest in the world, contributing 12% to GDP. The industry has the potential to generate USD 300 billion in revenue and 65 million additional jobs by 2026. It is one of the prime movers of the manufacturing sector and the "Make in India" initiative. It aims to increase exports of vehicles by five times. The growth of vehicles, particularly passenger vehicles, is expected to triple to 9.4 million units per annum by 2026.[418] Currently, India's automotive industry is in a state of flux because of its rapidly evolving customer needs, the disruptive impact of technology, the dynamic regulatory environment, changing mobility patterns and global interconnectedness, and most importantly the onslaught of the Corona Virus.[419]

Having reached a high level of competence, the next stage of development in the automobile sector will require a foray to medium-sized cars, commercial vehicles, and most importantly electric vehicles. This will require, among other things, technology leapfrogging to the next stage of competence in this sector,[420] and the right mix of supportive policies to make it possible. Lessons from other countries will also help in this context.

---

[415] Indian automotive sector: Creating future ready organisations, March 2019, PwC, https://www.pwc.in/assets/pdf/industries/automotive/Indian-automotive-sector.pdf

[416] https://www.ibef.org/industry/india-automobiles

[417] Ibid.

[418] Make-in-India, https://www.makeinindia.com/sector/automobiles

[419] PwC, 2019, op.cit.

[420] https://auto.economictimes.indiatimes.com/tag/the+society+of+indian+automobile+manufacturers

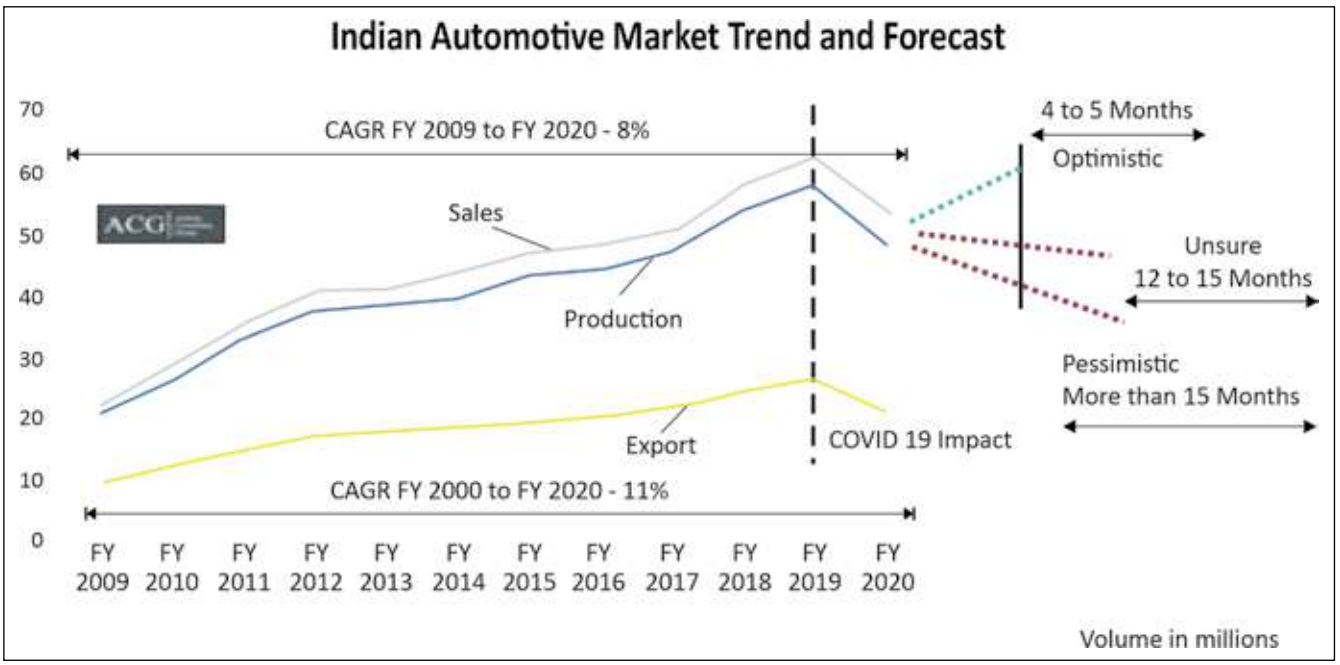
8.1 Impact of Covid-19 on this Sector

8.1.1 Large Concerns

Auto dealers have been unable to deliver vehicles during the lockdown phase, and have reported 30-45 days of finished goods inventory, likely to be heavily discounted in future. Further, with BS6 sales mandated from April 2020 (and sale of 10% of existing BS4 inventory until then), dealers face a significant burden to liquidate unsold BS4 inventory, worth INR 6,300 crores.[421]

Original equipment manufacturers will physically need to financially support dealer groups, further stressing their own balance sheets. Auto suppliers have a high dependence on migrant labour, whose absenteeism resulted in a domino effect on the entire value chain. This may in turn lead to widespread disruption across the entire manufacturing ecosystem. Captive finance companies are also likely to face the brunt, as loan defaults are likely to shoot up, and new loans are expected to drop, given the difficulties in determining customers' creditworthiness, further denting these firms' profitability. Lastly, the lockdown has put a strain on mobility solutions, used-car, and aftermarket service providers, whose funding depends on aggressive growth projections. Shared mobility players (ride-sharing, car-sharing, ride-hailing) may have to rethink their strategy as customers grow averse to transport means that violate social distancing norms.

Figure 8.1: Growth Trajectory of the Automotive Sector

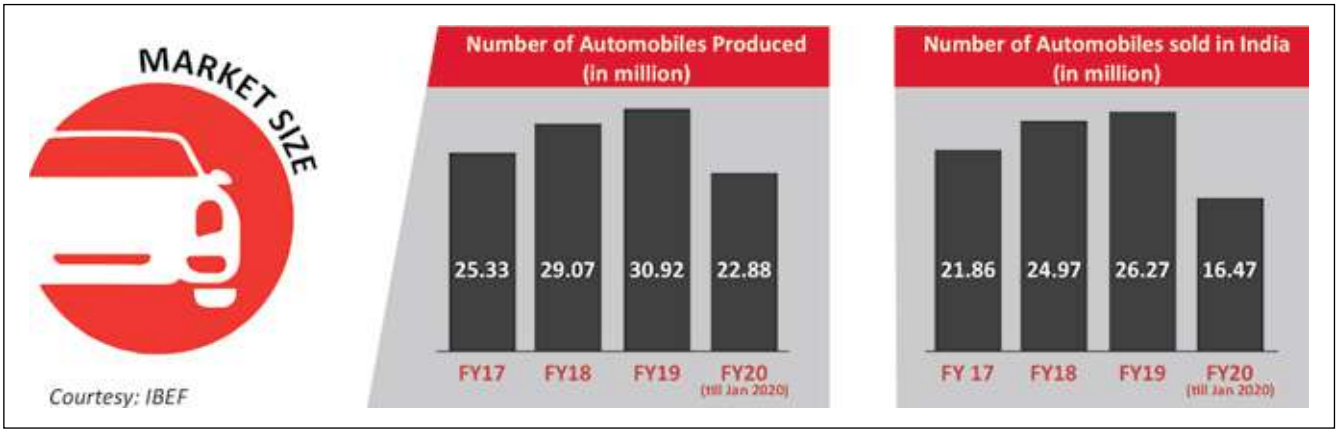


Source: ACG databank

The Indian automotive sector before the Covid-19 crisis was already seeing a downfall of nearly 18% in FY 2020. The situation turned even worse with the Covid-19 pandemic and the subsequent lockdowns across the country and the remaining world. Moreover, there are other challenges like lower consumer footfalls in showrooms, a drastic reduction in vehicle sales, negative consumer sentiment, a liquidity crunch, and potential bankruptcies. Besides these, owing to domestic and global exposure, automotive suppliers in India might face other challenges like lower domestic sales leading to reduced revenues and lower capacity utilisation.

[421] https://auto.economictimes.indiatimes.com/news/industry/another-pan-india-lockdown-will-hit-auto-sector-affect-workforce-capex-plans-care-ratings/76996632. https://www.autopunditz.com/hyundais-ertiga-rival-rnd-cuts-in-auto-and-more/

Figure 8.2: Production of Automobiles in India



According to figures available at the time of writing, original equipment manufacturers (OEMs) laid off about 15,000 temporary workers between April 2020 and June 2020. Nearly 300 dealerships across the country were closed, leading to job losses for 200,000 people. According to the Federation of Automobile Dealers Associations (FADA), the apex national body of automobile retail industry engaged in the sale, service and spares of two- and three-wheelers, passenger cars, utility vehicles, commercial vehicles (including buses and trucks) and tractors, the job losses in the coming months is likely to be more than 10 lakhs.[422]

8.1.2 Impact of Covid-19 in China on India

A huge chunk of Indian imports of automotive components come from China. It is estimated that around **27% of the automotive parts used in India are manufactured in China**.[423] These include crucial parts like **fuel injection pumps, EGR modules, electronic components, turbochargers, airbag components**. **In 2018-19, these imports were estimated to be worth USD 4.5 billion**.

The pandemic has led to automobile and component manufacturing plants across the globe being shuttered. Besides, all the major global automotive part makers have factories located in China. **In China, component manufacturing units have shut down** on account of Covid-19**.** Because of the closure of these factories, vehicle production and delivery in India have been severely impacted.

The only unaffected segment of the automobile industry has been tractors which are largely localized. Switching to alternate suppliers is a long-term process especially as India needs to prepare to meet BS6 standards.

8.1.3 The Industry Post-Covid-19[424]

The industry post-Covid-19 has thrown up some positive features and some negative ones. Among the positive features are:

Preference for personal mobility: There is likely to be a shift away from shared mobility options as people prioritise social distancing and personal hygiene leading to a preference for personal mobility, especially in

[422] https://www.thehindu.com/business/Industry/why-is-the-auto-industry-facing-trouble/article29121023.ece

[423] https://www.livemint.com/market/mark-to-market/india-s-auto-industry-braces-for-a-hit-on-import-of-parts-11582481191524.html

[424] KPMG automobile study, https://home.kpmg/in/en/home/insights/2020/06/auto-sales-post-Covid-19-the-road-to-recovery.html

the entry-level vehicles category. But at the same time strained personal finances with significant job losses across sectors has reduced the consumer's ability to buy cars. The automotive sector will have to devise innovative purchase/leasing schemes to drive automotive sales. As new cars may be unaffordable for certain sections of the population, the two-wheeler and organised used-car market might also stand to gain.

Going digital: Several original equipment manufacturers (OEMs), both premium and mass market, have launched a complete online buying experience[425], starting from initial enquiries and customisation of features, to booking, financing and delivery in a completely contact-less transaction, including test drives. This trend may reduce dealerships and showrooms. Traditional marketing channels have been disrupted and auto fairs may take a backseat.

Innovating with new features: In adapting to the post-Covid-19 world, several consumers will look for better health, hygiene and sanitation features in their vehicles. Certain features like in-built sanitisation, enhanced air-purification systems and anti-bacterial surfaces may see a spike in demand.

Growth of subscription models: A growing shift to asset-light models and preference for experience rather than ownership is fast gaining favour with millennials. In the auto industry, this may translate into greater interest in car subscriptions and short-term leasing models. Several start-ups already exist in this sphere but the focus will now shift to reliable and robust execution to ensure a clear path to profitability.

The future of the automotive sector will depend on how well manufacturers and retailers are able to respond to challenges and adapt to the evolving trends in the post-Covid-19 world.

8.1.4 Recent Recovery of the Automobile Sector

While demand from the consumer side has achieved 80%-85% normalcy, the industry is still at around 50% normalcy when it comes to wholesale sales.[426] India holds a strong position in the international heavy vehicles arena as it is the largest tractor manufacturer, second-largest bus manufacturer, and third-largest heavy truck manufacturer in the world.

However, the decline in FY 2021 vis-a-vis FY 2020, is expected to be around 16%-18% in two-wheelers, 20%-25% in entry-level passenger vehicles, and 25%-28% in commercial vehicles.[427] This was the situation in the second quarter of FY 2021, but there is some scope for optimism.

Outside the Manesar plant of Maruti Suzuki India Limited, local workers from nearby districts in Haryana are helping to increase production. Almost 2,000 of the 4,500 trucks carrying finished vehicles and supplies on a daily basis are back and the number of buses transporting workers has risen from around 100 in May 2020 to around 250 by end-June 2020.[428]

Owing to these challenges, FY 2020 and FY 2021 seem to be daunting for the Indian automotive sector. In fact, it is projected that the automotive industry demand would go down by 15% to 25% in FY 2021. However, it is believed that the sector will see a recovery from the third quarter of FY 2021.[429]

---

[425] Mercedes Benz India, Express Store, accessed 20 May 2020

[426] https://indianexpress.com/article/explained/explained-what-is-fuelling-the-auto-sector-recovery-in-india-6486873/

[427] McKinsey Report, 2020, "Shaping the New Normal".

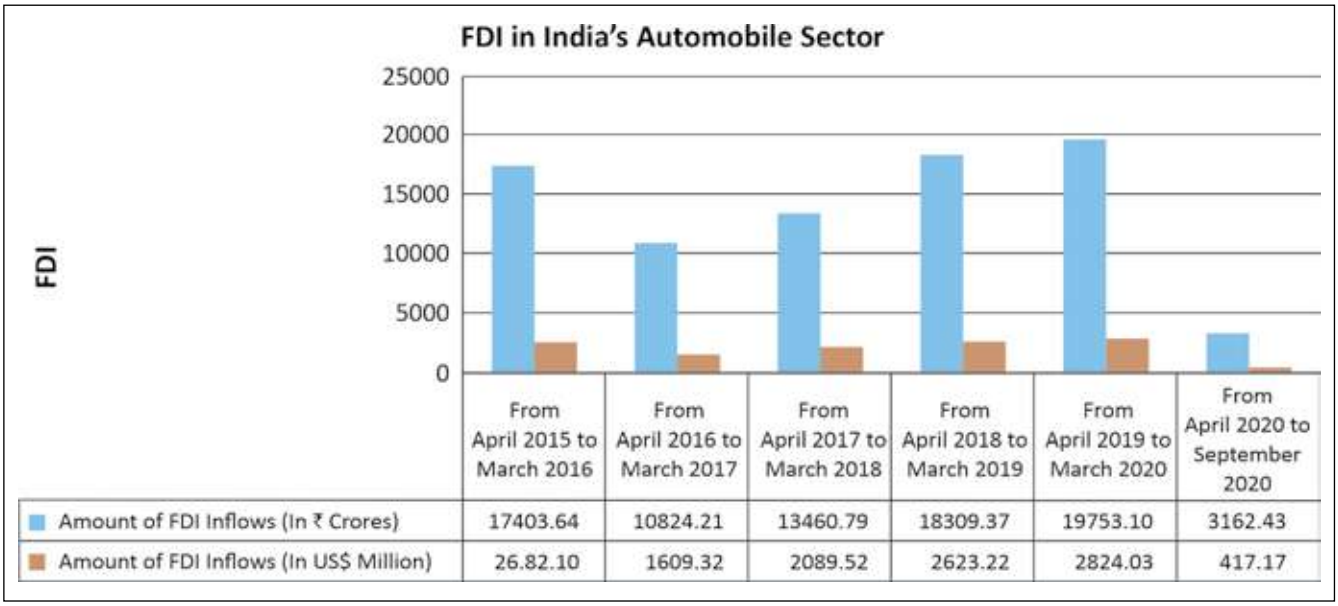
[428] Ibid.

[429] https://www.maiervidorno.com/industry-expertise/automotive/

8.2 Trade and Investment in Automobiles

8.2.1 Investment in Automobiles

Figure 8.3: FDI Inflows in India's Automobile Sector (April 2015 – September 2020)



	From April 2015 to March 2016	From April 2016 to March 2017	From April 2017 to March 2018	From April 2018 to March 2019	From April 2019 to March 2020	From April 2020 to September 2020
Amount of FDI Inflows (In ₹ Crores)	17403.64	10824.21	13460.79	18309.37	19753.10	3162.43
Amount of FDI Inflows (In US$ Million)	26.82.10	1609.32	2089.52	2623.22	2824.03	417.17

Source: DIPP, Ministry of Commerce and Industry, Government of India.

Some of the recent/planned investments and developments in the automobile sector in India are as follows:[430]

- In October 2020, MG Motors announced its interest in investing INR 1,000 crores (USD 143 million) to launch new models and expand operations.
- In October 2020, Ultraviolette Automotive, a manufacturer of electric motorcycles in India, raised a disclosed amount in a series B investment from GoFrugal Technologies, a software company.
- In September 2020, Toyota Kirloskar Motors announced investments of more than INR 2,000 crores (USD 272.81 million) in India directed towards electric components and technology for domestic customers and exports.
- During early September 2020, Mahindra & Mahindra singed a MoU with Israel-based REE Automotive to collaborate and develop commercial electric vehicles.
- Volkswagen announced the merger of its three entities in India. The new entity will be called Skoda Auto Volkswagen India Private Limited.
- In April 2020, TVS Motor Company bought UK's iconic sporting motorcycle brand, Norton, for a sum of about INR 153 crores (USD 21.89 million), making its entry into the top end (above 850 cc) segment of the superbike market.
- As of May 2019, Jaguar Land Rover (JLR) launched its locally assembled Range Rover Velar, making JLR cars more affordable by quite some margin.
- In March 2020, Lithium Urban Technologies partnered with renewable energy solutions provider, Fourth Partner Energy, to build charging infrastructure across the country.

[430] IBEF, op. cit.

- In January 2020, Tata AutoComp Systems, the auto-components arm of Tata Group entered a joint venture with Beijing-based Prestolite Electric to enter the electric vehicle (EV) components market.
- In December 2019, Force Motors planned to invest INR 600 crores (USD 85.85 million) to develop two new models over the next two years.
- In December 2019, Morris Garages (MG), a British automobile brand, announced plans to invest an additional INR 3,000 crores (USD 429.25 million) in India.
- Audi India planned to launch nine all-new models including Sedans and SUVs along with futuristic E-tron EV by the end of 2019.
- MG Motor India planned to launch MG ZS EV electric SUV in early 2020 and have plans to launch affordable EV in the next 3-4 years.
- BYD-Olectra, Tata Motors and Ashok Leyland will supply 5,500 electric buses for different state departments.

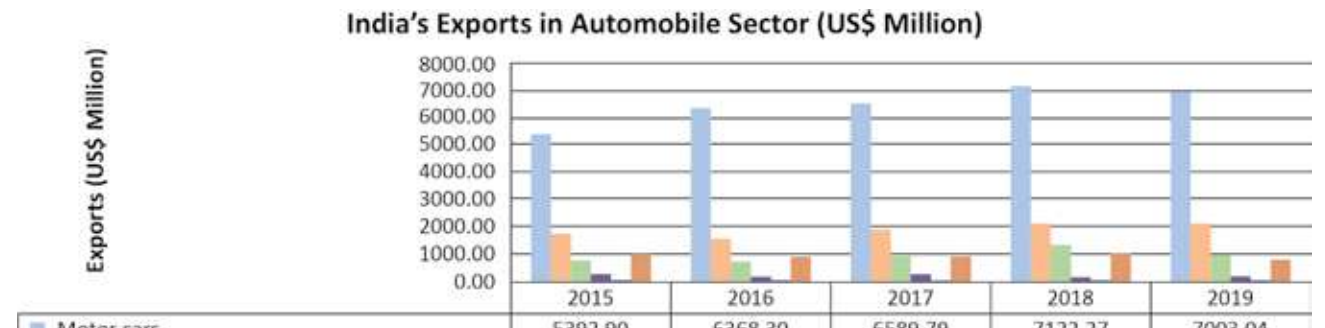
While these were planned investments, data is not as yet available on whether these investments have actually taken place. The intent of firms to invest in India is indicative of the fact that the Indian market holds promise despite Covid-19 induced contraction. Perhaps the announcement of the PLI scheme for this sector may have also induced investment commitments by TNCs located in India.

8.2.2 Trade in Automobiles

Passenger car exports decreased by 64.93% units between April and September 2019. Similarly, utility vehicle shipments decreased by 29.67% from 77,309 units to 54,375 units in the period April 2019-March 2020. Van shipments also witnessed a drop of 80.91% from 1,320 units to 252 units between April-September 2020.[431]

Overall exports from India rose, between 2015 and 2019, in all categories of automobiles (see Figure 8.4). However, there was a small dip in 2019, especially in the motor cars category. The export of trucks and tractors

Figure 8.4: India's Automobile Exports (2015-19)

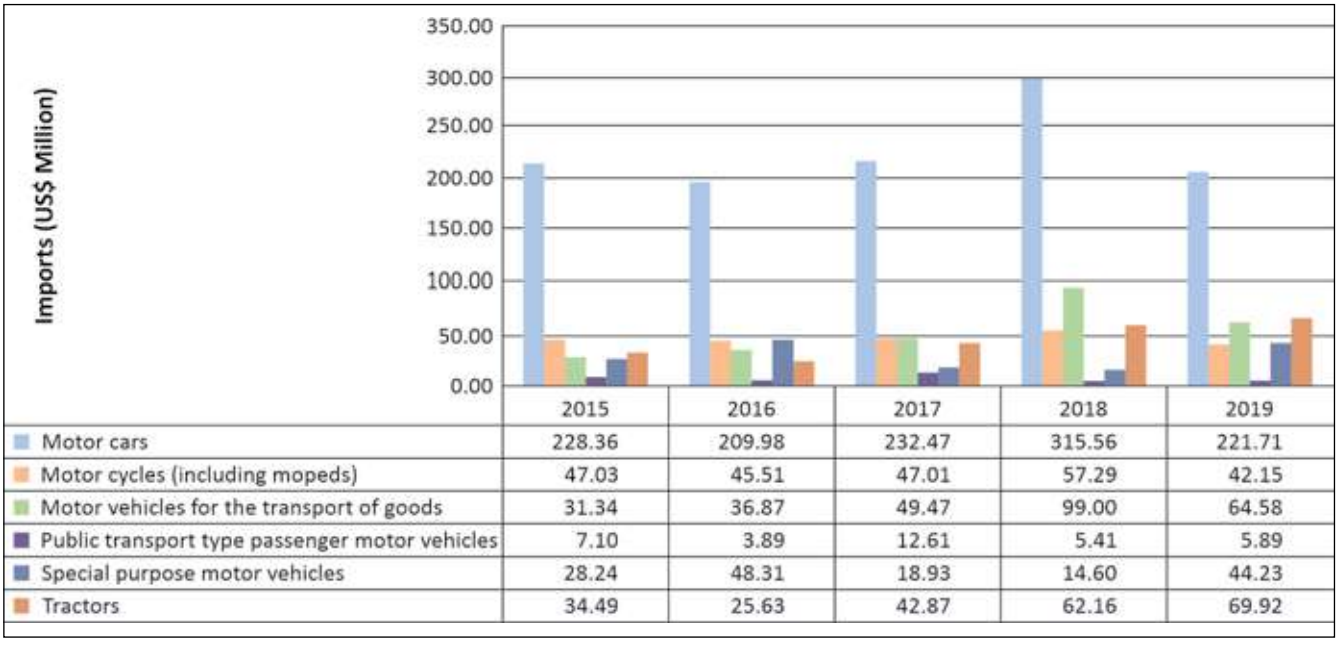


	2015	2016	2017	2018	2019
Motor cars	5392.90	6368.30	6589.79	7122.27	7003.04
Motor cycles (including mopeds)	1783.58	1606.46	1902.43	2140.96	2092.55
Motor vehicles for the transport of goods	780.25	770.30	929.95	1336.64	993.93
Public transport type passenger motor vehicles	260.61	210.37	276.45	171.85	200.97
Special purpose motor vehicles	45.51	38.64	46.31	35.86	27.57
Tractors	1001.84	920.74	908.61	971.59	802.24

Source: Comtrade data base.

[431] https://economictimes.indiatimes.com/industry/auto/auto-news/passenger-vehicle-exports-tumble-58-per-cent-in-h1fy21-as-Covid-19-disruptions-take-toll/articleshow/78729818.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

Figure 8.5: India's Automobile Imports (2015-19)



	2015	2016	2017	2018	2019
Motor cars	228.36	209.98	232.47	315.56	221.71
Motor cycles (including mopeds)	47.03	45.51	47.01	57.29	42.15
Motor vehicles for the transport of goods	31.34	36.87	49.47	99.00	64.58
Public transport type passenger motor vehicles	7.10	3.89	12.61	5.41	5.89
Special purpose motor vehicles	28.24	48.31	18.93	14.60	44.23
Tractors	34.49	25.63	42.87	62.16	69.92

Source: Comtrade.

also declined in 2019 after remaining relatively stable over the previous 5-year period. In quantitative terms, automobile exports reached 4.77 million vehicles in FY 2020, growing at a CAGR of 6.94% during FY 2016 to FY 2020. Two wheelers made up to 73.9% of the vehicles exported, followed by passenger vehicles at 14.2%, three wheelers at 10.5%, and commercial vehicles at 1.3%.[432]

Overall, exports of automobiles have outpaced imports and given its importance in the Indian manufacturing sector, a strong export base is required. Imports (see Figure 8.5) have followed the same trend as exports with a greater dip in 2019 than that of exports. The imports of trucks have been rising over the last five years, as have the imports of tractors. There has also been a near doubling of imports of special-purpose motor vehicles. While these trends indicate the pattern of growth of the Indian economy, when coupled with exports they cannot be considered significant. However, the demand for automobiles in India, including imports is likely to increase because of:

- Growing income,[433] a threefold increase in average household income from USD 6,393 in 2010 to USD 18,448 in 2020.
- India becoming the world's 'youngest nation' by 2025 with an average age of 25 years.
- Vehicle penetration, expected to reach 72 vehicles per 1000 people by 2025.
- Covid-19-induced preference for personal mobility.

8.3 Government Policies

8.3.1 Recent Government Initiatives

The Government of India encourages foreign investment in the automobile sector and has allowed 100% FDI under the automatic route.

[432] IBEF, op.cit.

[433] https://www.investindia.gov.in/sector/automobile

Some of the recent initiatives taken by the Government of India are:

- Under Union Budget 2019-20, the Government announced additional income tax deduction of INR 1.5 lakh (USD 2,146) on the interest paid on the loans taken to purchase EVs.
- The Government aims to develop India as a global manufacturing centre and a R&D hub.
- Under NATRiP, the Government of India is planning to set up R&D centres at a total cost of USD 388.5 million to enable the industry to be on par with global standards.
- The Ministry of Heavy Industries, Government of India has shortlisted 11 cities in the country for introduction of EVs in their public transport systems under the FAME (Faster Adoption and Manufacturing of (Hybrid) and Electric Vehicles in India) scheme. The Government will also set up incubation centre for start-ups working in the EVs space.
- In February 2019, the Government of India approved FAME-II scheme with a fund requirement of INR 10,000 crores (USD 1.39 billion) for FY 2020 - FY 2022.

8.3.2 Achievements

Following are the achievements of the Government in the last four years:

- In H1 2019, automobile manufacturers invested USD 501 million in India's auto-tech start-ups according to Venture intelligence.
- Investment flow into EV start-ups in 2019 (till end of November) increased nearly 170% to reach USD 397 million.
- On 29 July 2019, an Inter-ministerial panel sanctioned 5,645 electric buses for 65 cities.
- NATRiP's proposal for "Grant-In-Aid for test facility infrastructure for EV performance Certification from NATRIP Implementation Society" under the FAME Scheme was approved by Project Implementation and Sanctioning Committee (PISC) on 3 January 2019.
- Under NATRiP, the following testing and research centres have been established in the country since 2015:
  - International Centre for Automotive Technology (ICAT), Manesar
  - National Institute for Automotive Inspection, Maintenance & Training (NIAIMT), Silchar
  - National Automotive Testing Tracks (NATRAX), Indore
  - Automotive Research Association of India (ARAI), Pune
  - Global Automotive Research Centre (GARC), Chennai

8.3.3 Major Schemes for the Automobile Sector[434]

Fame India Scheme Phase II[435]

The Fame India Scheme II, implemented over a period of 3 years from 1 April 2019, is aimed at electric mobility. The Department of Heavy Industries (DHI) is the nodal Department, responsible for planning, implementation and review of the scheme. The funding for this scheme will be USD 1.39 billion for FY 2020-2022. The letter of awards were issued to 173 Charging stations (50 in the city of Surat, 25 each in the cities of Prayagraj, Tiruchirappalli and Srinagar, 20 in Udaipur, 10 each in the city of Karnal and UT of Andaman

[434] https://www.makeinindia.com/sector/automobiles

[435] Ibid.

and Nicobar (A&N), and 8 in Gurugram.

Automotive Mission Plan 2016-26 (AMP 2026)

The Automotive Mission Plan 2016-26 (AMP 2026) outlines the trajectory of growth of the automotive ecosystem in India, including the glide path of definite regulations and policies that govern research, design, technology, testing, manufacturing, import/export, sale, use, repair, and recycling of automotive vehicles, components and services. The plan also foresees India to be the first in the world in production/sale of small cars, two wheelers, three wheelers, tractors and buses; and third in passenger vehicles and heavy trucks.

Draft National Automotive Policy 2018

The Department of Heavy Industries formulated a draft National Automotive Policy, for the holistic development of the automobile industry in India. The policy is based on the scaling up of exports by 35%-40% and making India one of the major automotive export hubs in the world. The following propositions are made in the policy:

- Adopting a long-term roadmap for emission standards beyond BS6 and complement the same with the global standards by 2028.
- Rollout of CAFÉ (Corporate Average Fuel Efficiency) norms till 2025.
- Adopting a differential taxation method based on a composite criterion, including parameters such as CO2 emissions and length.
- Associating AIS and BIS standards on safety of critical parts over the next 3 years.
- Fast track adoption of Bharat New Vehicle Safety Assessment Program.

National Automotive Testing and R&D Infrastructure Project (NATRiP)

The project has been set up at a total cost of USD 573 million to enable the industry to adopt and implement global performance standards. The main area of focus is on providing low-cost manufacturing and product development solutions. The Ministry of Heavy Industries and Public Enterprises has constituted NATRiP Implementation Society (NATIS), an autonomous body, for the execution of NATRiP.

As a part of the programme, 7 test centres have been finalised to set up the test facilities – iCAT, GARC, NATRAX, ARAI, VRDE, NIAIMT, NCVRS. Under the Samarth Udyog, 'Demo cum experience' centres are being set up in the country to promote smart and advanced manufacturing, serving SMEs to implement Industry 4.0 (automation and data exchange in manufacturing technology).

National Electric Mobility Mission Plan 2020 (NEMMP)

The NEMMP initiative has been taken up to encourage consistent, affordable and competent xEVs (hybrid and electric vehicles) that meet consumer performance and price expectations through government-industry collaboration. Promotion and development of indigenous manufacturing capabilities, required infrastructure, consumer awareness and technology are additional objectives of NEMMP. The aim was to have 6 million electric and hybrid vehicles per year on the road by 2020. A cumulative cost of USD 2.15 billion was estimated for this initiative, which also includes industry collaboration.

Green Urban Transport Scheme (GUTS) 2017

The Green Urban Transport Scheme has been executed with the help of the private sector including assistance from the Central and State Governments under a 7-year mission with a total cost of USD 10.76 billion. The scheme promotes a low-carbon sustainable public transport system in urban areas. For the first phase, 103

cities were identified. These cities are either capital cities or have a population of 0.5 million and above. The scheme encourages the promotion of Non-Motorized Transport (NMT), public bike sharing, Bus Rapid Transit (BRT) systems, Intelligent Transport Systems (ITS), urban freight management etc.

8.3.4 Other Incentives at the National Level

R&D incentives for industry and private sponsored research

A weighted tax deduction is given under Section 35 (2AA) of the Income Tax Act. A weighted deduction of 200% is granted to assessees for any sums paid to a national laboratory, university or technological institute. The said sum is used for scientific research within a programme approved by the prescribed authority. Section 35 (2AB) of the Income Tax Act 26, 1961 provides a weighted tax deduction of 150% of the expenditure incurred by a specified company, on scientific research in the in-house R&D centres as approved by the prescribed authority. This does not include expenditure on the cost of any land or building. The weighted tax deductions of 150% were effective until 31 March 2020. The weighted tax deductions will be 100% in future. Eight per cent of the country's R&D expenditure is in the automotive sector.[436]

Production Linked Incentive (PLI) scheme

The Hon'ble Prime Minister, Shri Narendra Modi has given his approval to introduce the Production-Linked Incentive (PLI) scheme in the automobiles and automobile components sector with a financial outlay of INR 57,042 crores over a five-year period, with the aim of enhancing India's domestic capabilities. This will be done through the Department of Heavy Industries. A Special economic and comprehensive package of INR 20 lakh crores is also earmarked towards promoting manufacturing in India.

Export incentives

- Under the Merchandise Export Incentive Scheme (MEIS), automobile manufacturers get a benefit of 2% on vehicle exports.
- About 20 tariff headings have been considered as "Sensitive Items" to be maintained in the negative list of India in most of the trade agreements.

Area-based incentives

Incentives will be given for units set up in SEZ (Special Economic Zones) and NIMZ (National Investment Manufacturing Zones), as specified in respective Acts, as well as for projects set up in special areas like the North-east, Jammu and Kashmir, Himachal Pradesh, and Uttarakhand.

8.3.5 State Incentives[437]

Each state in India offers additional incentives for industrial projects. Incentives are provided in the following forms: rebates in land cost, relaxation in stamp duty exemption on sale or lease of land, power tariff incentives, a concessional rate of interest on loans, investment subsidies/tax incentives, backward areas subsidies, special packages for mega projects. A few examples are given below.

Andhra Pradesh

The Government of Andhra Pradesh is committed to providing land at concessional rates, along with non-stop power supply. It plans to provide a capital subsidy of 50% for common infrastructure in auto clusters and ASMC developers, upto a maximum of USD 3.07 million. It hopes to provide financial assistance upto 75%

[436] Ibid.

[437] Ibid.

of the cost, subject to a maximum of USD 38,461 for obtaining patent registration. It plans to pay 50% of all charges subject to a maximum of USD 7,692 for obtaining quality certification. This is applicable to only MSME units. Under marketing incentives, 50% of participation cost with a maximum amount of USD 7,692 would be reimbursed to, at most, 10 MSME units annually, for participating in international trade fairs.

Gujarat

Auto component manufacturers can either avail general incentives under the Gujarat Industrial Policy 2015, or under the scheme for Mega/Innovative Projects.

Jharkhand

Jharkhand introduced the Automobile and Auto Component Policy, 2016 with an aim to make Jharkhand, a preferred destination for automobile and auto-component manufacturing units. Under this policy, there is a provision of financial assistance of 50% for fixed capital investments in building and common infrastructure up to a maximum of USD 3.07 million. Complete (100%) exemption from dues for electricity shall be provided for 10 years from the starting date of production.

8.4 Assistance Received by the Automotive Industry of Other Countries[438]

Germany provided €115 billion ($A172.5b) in federal government assistance to its car industry from 2007 to 2017. The Australian government earmarked $2.5 billion in direct assistance to the local automotive industry from 2011 to 2020.

Daimler was the biggest beneficiary of the R&D aid in Germany, taking €191 million in the last decade, while the Volkswagen Group took €110 million and Daimler's premium rival, BMW, was given €107 million. Further down the list was MAN, a truck and bus manufacturing company, (€16 million), Opel (€14 million), Ford (€13 million), and Audi (€9 million).The German government has also spent about €800 million on 25,000 vehicles over the past decade, most of which were designed and built in Germany.

The Merkel government had set a domestic sales goal of a million electrified (battery electric and plug-in hybrid) cars a year by 2020, which was not met. Only 80,000 electrified cars were sold in Germany last year. Instead, Chinese car-makers have taken the lead on sales of electric vehicles, while California's Tesla has demonstrated a market for the technology at the premium end of the market, albeit while making consistent losses. The German government also has targets to cut emissions by 40% by 2030 and to slash it to zero by 2050. The car industry directly employs 800,000 people in Germany, many of whom have been hit by the sudden decline in diesel sales in the country, where volumes have fallen by 8.1% since the beginning of this year, leading to Bavaria's governor Horst Seehofer calling for a subsidy on diesel cars to lift sales. Oddly enough, a diesel subsidy would most benefit BMW, which is based in Bavaria's capital city, Munich, because it has the highest proportion of diesel sales out of all of Europe's main players, at 71%. The next highest diesel model mix is Daimler's, at 64%.

[438] https://www.motoring.com.au/secret-german-auto-subsidies-exposed-107275/

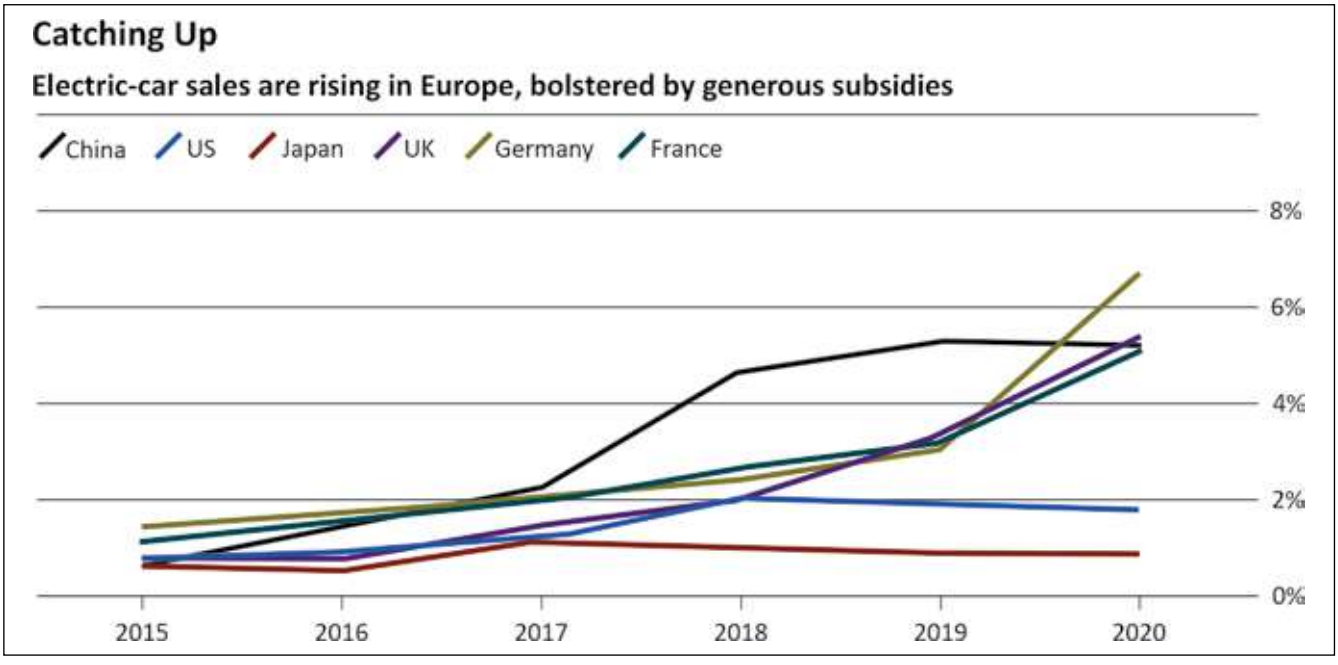
Figure 8.6: Leading R&D Investors

Leading R&D investors by countries (Europe)

EU rank	Company	Country	Industry	R & D 2016/17 (€million)
1	VOLKSWAGEN	Germany	Automobiles & Parts	13672.0
2	DAIMLER	Germany	Automobiles & Parts	7536.0
3	ROBERT BOSCH	Germany	Automobiles & Parts	5587.0
4	ASTRAZENECA	UK	Pharmaceuticals & Biotechnology	5658.1
5	BMW	Germany	Automobiles & Parts	5164.0
6	SANOFI	France	Pharmaceuticals & Biotechnology	5156.0
7	SIEMENS	Germany	Electronic & Electrical Equipment	5056.0
8	NOKIA	Finland	Technology Hardware & Equipment	4904.0
9	BAYER	Germany	Pharmaceuticals & Biogechnology	4774.0
10	FIAT CHRYSLER AUTOMOBILES	Netherlands	Automobiles & Parts	4219.0

As Figure 8.6 shows, Automobiles and Parts have the largest research budgets amongst all investors in Europe. Five out of the top ten investors in Europe are in the automobile sector. In fact the maximum R&D spend will go to electric vehicles globally as is indicated by Figure 8.7.

Figure 8.7: Subsidies to Electric Vehicles



Source: BloombergNEF

https://www.bloombergquint.com/business/electric-car-subsidies-have-rendered-renaults-free-in-germany

The share of companies from the European Union in global R&D in the automotive sector has increased from 36% to 44%. While US companies increased their R&D expenditure in the ICT sector (from 66% to 75%), their share in global R&D expenditure of the automotive sector went down (from 25% to 19%).[439]

[439] https://home.kpmg/pl/en/home/insights/2018/03/r-and-d-in-the-automotive-sector.html

8.4.1 New Directions of R&D

Till 2017, the automotive sector was the world's third largest industry in terms of R&D and the largest one in the European Union and Japan. Currently, electric mobility is rising in prominence. British and French governments have announced that all cars marketed after 2040 must be fitted with an electric drive. Meanwhile, Volvo has communicated that all cars manufactured after 2019 will be powered with an electric or hybrid engine. The cost of components, including electric batteries, is constantly declining, which makes prices of electric cars more affordable -- the price of Tesla 3 is expected to start from USD 35,000.

Current producers of Internal Combustion Engines (ICE) vehicles are also announcing their plans to launch production of electric vehicles -- this group features Volkswagen (50% electric vehicles and 30% hybrids by 2025), Daimler (all-electric vehicles only by 2022), Renault (50% electric or hybrid vehicles by 2022), and Honda (two-thirds of all new cars sold in Europe to be offered with an optional hybrid drive by 2025). Meanwhile, new players are also coming into the game -- Dyson plans to invest GBP 2.5 billion in production of an electric vehicle by 2020. In addition, Shell plans to install fast chargers across its gas stations, initially in the UK and the Netherlands.

Despite technological delays, the European Union will also produce batteries, including traction batteries for electric vehicles. To date, the competitive edge of the European automotive sector was mainly underpinned by ICE-oriented innovations, but it seems that this approach must be radically changed to maintain its competitive market advantage.

8.4.2 What is the Learning for India from these Initiatives

ICE-powered vehicles consist of more than 20,000 parts, while EVs feature only approximately 7,000 components, which will change the operations of the motor industry. The sub-suppliers are being forced to switch to production that contributes to electrification of vehicles. For example, it is production of parts and accessories that remains the backbone of the Polish motor industry with an employment level estimated at approximately 147,000 people.

These figures reflect strong ties of the automotive sector with R&D efforts that poses an enormous challenge but also opens up prospects for development and marking India's presence in world markets, especially in the EV sector. In a longer perspective, growth will not be possible without boosting the R&D potential of Indian companies as well as development and implementation of innovative products, services and processes. The fundamental issue that hampers improvement of the competitive edge of the Indian economy in the automotive industry is the limited number of competitive and innovative solutions created by Indian research centres and companies.

There are several reasons behind this issue: National players from the automotive industry demonstrate little interest in implementing and funding innovation-oriented R&D projects. This is mainly related to the weak financial situation of SMEs from the motor sector compared to European and other companies and the high cost of implementation of new technologies and products. As a result of their capital links, large companies from the automotive industry in India are usually rolling out R&D projects outside India. The situation is further aggravated by the not very effective cooperation between automotive companies and R&D centres that benefit from modern research infrastructure and highly qualified researchers. Indian entrepreneurs often opt for ready-to-use foreign innovative products which are freely available on the market (e.g. licensing) as in-house R&D efforts fail to guarantee innovative solutions and hence involve high financial risk.

Low development dynamics of Indian research centres with an automotive profile is the fall out of insufficient resources to fund projects (including procurement and development of modern research infrastructure) dedicated to development of innovative R&D solutions as well as limited cooperation of research centres with businesses and other scientific centres in India and beyond.

Automotive organisations also project that profit growth in the near term may decline as R&D expenditure essential to develop new technologies for electric vehicles and autonomous cars must be increased.

As a result of numerous links between the automotive industry with other sectors, including financial and business services related to sales and maintenance of cars, road transport, fuel production and sales and road infrastructure, it is expected that the competitive and innovative edge of other industries would also improve with the development of overall infrastructure. India should also invest in technological solutions for EV batteries for export purposes.

8.5 How to Merge Trade and Investment Policies in the Automotive Sector

8.5.1 Solutions for the Sector in Covid-19 times

The automotive sector was bracing for a difficult year even before the Covid-19 pandemic.[440] Auto sales had been tepid for 12 to 15 months when the outbreak stalled production and overall economic activity. The industry now faces concerns on short-term liquidity as well as long-term growth in revenue and profitability, even as automakers restart production and dealerships record sales again. As it emerges from this crisis, the industry will need to realign itself to some of the new realities of the post-Covid-19 world.

The Indian automotive industry should formulate an action plan to acquire multiple vendors on a global scale, rather than limiting imports from one region entirely. Importing from other countries can be a step taken in the right direction, as can be launching a domesticised production system. This, though, remains a shot in the dark.

The Indian ecosystem may take inspiration from Chinese OEMs to fight the slowdown. A few players such as Volkswagen, SAIC, Nissan and BMW in China have turned to online sale of cars, using virtual reality and live broadcasts to stimulate sales.[441] Another Chinese player, Geely, introduced contactless delivery, where social distancing is maintained throughout the journey, including the keys being delivered using a drone.[442] These initiatives have found traction, with Geely reporting 10,000 bookings for contactless delivery within a month of its launch. SAIC, BYD, GAC along with parts suppliers have begun production of facemasks and disinfectants to support the healthcare system.

The path to revival for other players in the ecosystem is multi-phased. While they may respond with some actions immediately, they also need to think of initiatives to recover lost value after the COVID period. Additionally, they need to consider appropriately reacting to permanent disruptions caused by the pandemic, and reinvent their businesses with long-term interventions. Some of the key interventions which may be considered are listed below.

---

[440] https://home.kpmg/in/en/home/insights/2020/06/auto-sales-post-Covid-19-the-road-to-recovery.html

[441] 'This industry was crippled by the coronavirus -- here's how it's fighting back', World Economic Forum, 25 Feb. 2020, https://www.weforum.org/agenda/2020/02/coronavirus-china-automotive-industry/

[442] 'Geely auto goes full contactless with new car keys being delivered by drone', Geely Global, 23 March 2020, http://global.geely.com/media-center/news/geely-auto-goes-full-contactless-with-new-car-keys-being-delivered-by-drone/

8.5.2 Re-energising the Internal Combustion Engine Sector

Automobiles & Components			
Section – 1 Demand Enablers			
Issues	**Key Enablers**	**Timeline**	**Implementing Agency/ Concerned Authority**
Need for Volumes for ICE Vehicles	• Bringing down GST rates from 28% to 18% (automobiles attract the highest GST in manufactured products) • Uniform 18% GST for all auto components • Announce implementation date of an 'incentive-based vehicle scrappage scheme'. Incentives proposed are: ❑ 50% rebate in GST, Road Tax and registration charges • Announcing a major Procurement programme backed by adequate funding for diesel / CNG buses by STUs, similar to EV buses under the FAME II scheme • Road tax varying across country, with 21% in some states. Road tax to be made uniform across states at a lower rate.	• Short • Short • Short • Short • Medium	• MoF • MoF • MoRTH+MoF • MoF + NITI • MoRTH + State Govt.
Demand Generation - EVs	• Support all xEVs • Target Electrification in government fleets in a phased manner • Expedite notification of long-term policy roadmap for charging infrastructure	• Short • Short • Medium	• All Govt. Dept. • MoF • DHI
Section – II Competitiveness			
Generate Volume through Exports	1. Need for Brand Building Support – There should be a major Programme to establish Indian brands in overseas markets. Lack of Made in India automobiles and auto components in International markets. 2. Free Trade Agreements / Preferential Trade Agreement should be signed with Markets of the world and not with countries where automobile factories are located. Custom duty disadvantage in many of these markets leads to loss of business to competing auto manufacturing countries with lower duty access. 3. Automotive Industry is highly regulated and any change in regulation in any market can impact exports – MRA or Auto Annex for acceptance of Indian certification and regulations are required with all critical markets.	• Medium • Medium • Medium	• MoCI + DHI • MoCI • MoCI
Cost of Logistics	1. The cost of logistics in India at 14% of GDP is much higher than the global counterparts. A comprehensive policy to improve logistics infrastructure is required to reduce inefficiencies in logistics 2. Rail transportation hubs to be created/augmented in and around auto hubs for example Gurgaon, Chennai, Pune Sanand	• Medium • Medium	• Dept. of Logistics • Ministry of Railway
R&D Infrastructure	• Set-up xEV components and vehicle R&D funds and infrastructure • SPV can be explored	• Medium • Medium	• NITI Aayog • NITI Aayog
Single Nodal Agency	Announce and appoint single Ministry/Department for policy making and regulation formation for the auto sector by the start of next financial year.	• Long-term	• PMO
Lack of stable policy	A stable and consistent long-term policy will help automobile and auto component manufacturers grow sustainably.		

Source: R.Abhishek

8.5.3 Solutions for EV

India should investigate making EV batteries for exports even though its own demand may not be very high right now, just as China exported Solar PVs when its own demand for renewable energy was low. Several considerations are important in this context.

Cost

An EV uses the same rechargeable lithium-ion batteries as a laptop or mobile phone. However, they are just much bigger to enable them to deliver far more energy. The most expensive component in each cell is the cathode, because it uses metals like cobalt, nickel, lithium and manganese. They need to be mined, processed and converted into high-purity chemical compounds. The difference in cost between an ICE battery and that for an EV is 56%. Replacing cobalt with nickel will significantly reduce the cost though cobalt is safer. Panasonic Corporation in Japan plans to commercialise a cobalt-free version of a high-energy battery in two to three years; other suppliers already produce lower-energy ones. There is also attention required for the battery packs, often resembling oversized suitcases, that house rows of individual cells. Simplifying the design, and using a standard product for a range of vehicles -- rather than a pack tailored to each model -- will deliver additional savings. As Panasonic is already present in India, it should leverage its network with Panansonic to produce these cutting-edge batteries. Production and innovation incentives along with good IP protection should be offered by India to enable this company to produce these batteries in India. Even if domestic demand is insufficient, regulations in various European countries suggests that the scope of lower cost efficient batteries from India may be high.

Biggest manufacturers

While China plays a dominant role in battery manufacture, for EVs, Panasonic was the largest in 2020. South Korea's LG Chem Ltd. occupied about a quarter of the market in the first eight months in 2020. Tesla and Panasonic's joint venture is the biggest battery producer in the US. Emerging producers include Northvolt AB in Sweden, founded by former Tesla executives. Panasonic has a major presence in battery manufacture in India and, with incentives such as PLI and RoDTEP, could be encouraged to produce for the export market. It is important to achieve economies of scale to lower costs.

Can India overcome China's pole position?

China is responsible for about 80% of the chemical refining that converts lithium, cobalt and other raw materials into battery ingredients, though the metals themselves are largely mined in Australia, the Democratic Republic of Congo, and Chile. China also dominates processes to make battery parts including capacity for cathodes, anodes, electrolyte solutions, and separators. But China faces a rare challenge when it comes to advanced semiconductor design and software, components that are increasingly important as vehicles become more connected and autonomous.[443] Less than 5% of automotive chips are made in China, according to China EV 100, a think-tank. For example, major players in so-called insulated-gate bipolar transistors (IGBTs) include Infineon Technologies AG and Semikron AG in Germany and the Japanese companies Mitsubishi Motors Corp., Fuji Electric Co. and Toshiba Corp. These high-efficiency switches reduce power loss and improve reliability in electric cars.

India can seek collaborations with these companies with its software advantages to enter this segment of the industry.

[443] Ibid.

Some key innovations that India requires

A host of innovations are seen moving from laboratories to production lines by 2020. California-based Sila Nanotechnologies Inc. is adding silicon into battery anodes in place of graphite to allow a single charge to last at least 20% longer. Toyota Motor Corp. and US startups including QuantumScape Corp. are racing to commercialise solid-state lithium-ion batteries, which overhaul a cell's architecture to replace the flammable liquids that enable charging and discharging with ceramic, glass or polymers. This will boost energy storage, lower costs, improve safety, and cut recharging times. CATL is ready to produce a super long-life battery that lasts 16 years and 2 million kilometres (1.24 million miles) -- a typical battery warranty today covers about 150,000 miles or 8 years. That means a single pack could be deployed in multiple vehicles or for several different tasks. As early electric cars retire, there's also a fast-developing sector aimed at reusing batteries for less-strenuous tasks, or recycling the metals within them. India can get into this segment and then through reverse engineering and collaborations improve its batteries gradually.

8.5.4 The Road Forward in the Commercial Vehicles Sector[444]

India is one of the leading manufacturers and exporters of commercial vehicles. Karnataka, Madhya Pradesh, Tamil Nadu, Maharashtra, and Himachal Pradesh are the major commercial vehicles manufacturing states in India, with Tamil Nadu manufacturing the highest number of commercial vehicles.

Commercial vehicles account for approximately 4% of India's total domestic automotive production volume (as of FY 2019). Favourable government policies like the Make in India campaign, the Automotive Mission Plan (AMP), and the National Electric Mobility Mission Plan (NEMMP) have enabled the country to develop into one of the most important commercial vehicles manufacturing hubs in the world. In FY 2019, India accounted for the production of 1,112.18 thousand units of commercial vehicles. In the same year, the sales volume of commercial vehicles in India stood at 1,007.32 thousand units. Furthermore, the sale of commercial vehicles in the country is expected to reach a volume of 2,059.95 thousand units by FY 2024, expanding at a compound annual growth rate (CAGR) of approximately 15.23% during the FY 2020 - FY 2024 period.[445]

Exponential growth in online retailing and logistics services, along with the implementation of BS6 norms has bolstered the growth in the commercial vehicles market in India. Moreover, the implementation of the revised corporate tax rate (reduced from 35% to 25.17%) has attracted huge FDI from global investors for both manufacturing purposes and R&D in the commercial vehicles segment, leading to further expansion of the market. However, a surge in the operating costs of running these vehicles, rising customs duty, and a lack of demand in the market due to the existing liquidity crisis in the economy are some of the factors impeding the growth of the market.

Based on product type, the commercial vehicles market in India can be segmented into light commercial vehicles (LCV), and medium and heavy commercial vehicles (M&HCV). In FY 2019, the light commercial vehicles segment accounted for approximately 55.65% of the total sales volume of commercial vehicles. Further, during the FY 2020 - FY 2024 period, sales volume of LCVs is expected to expand rapidly at a CAGR of approximately 16.34% compared to that of M&HCVs. On the other hand, by FY 2024, the M&HCVs segment is expected to account for approximately 41.30% of the total sales volume of commercial vehicles in India. Also, with the implementation of the vehicles electrification policy, the operating cost for running LCVs is expected to decline, leading to a rise in the sale of LCVs. This development can be attributed to the

[444] https://www.businesswire.com/news/home/20200424005188/en/Commercial-Vehicles-Market-in-India-2020-to-2024---Featuring-Ashok-Leyland-Force-Motors-and-Mahindra-Mahindra-Among-Others---ResearchAndMarkets.com

[445] Ibid

requirement for logistics services growing in tandem with the operations of the e-commerce sector. LCVs like commercial vans and three-wheeler cargo vans are mostly used for logistics services.

Recommendations for the Automotive Sector[446]

Commercial vehicles, construction equipment and tractors are strongly correlated to growth in GDP, industrial output, agricultural output, and infrastructure spending (correlation coefficient of approximately 84%). Money and capital will also need to flow back into the infrastructure sector, particularly for settling existing contractor dues and re-oiling supply chains. Investment projects – with new project announcements having fallen by 79% in Q1 of FY 2019 vs. the previous year – must pick up pace again. Hence, revival of the economy would automatically lead to a revival of the commercial vehicle sector which had sunk significantly since 2018.

Key enablers such as growing disposable income, easy credit availability, and keeping the product pricing and usage costs optimal are key to the growth of this sector. The NBFCs (Non-Banking Finance Company) have been significant credit providers to the automotive sector across segments – fleet owners (commercial vehicles, construction equipment), farmers (tractors) as well as consumers (cars, two wheelers). The tightening of credit lines to and by the NBFCs has resulted in 60%-70% fall in automotive loan disbursals, impacting sales volumes. The overall credit availability in the economy must go up, perhaps enabled by a faster clean-up of NBFCs' balance sheets. The recent announcement to infuse INR 1 trillion as partial guarantee to public sector banks for purchase of high-rated assets of NBFCs should help.

Lower cost of credit through cheaper loans is another strong enabler. The third enabler is putting more disposable income into the hands of consumers. The consumer sentiment is down 14 percentage points over 2020 due to higher personal debt and low employment confidence. Recently, with the move towards lower corporate tax rates, a positive impact on private investments is expected, eventually creating jobs and putting more money in the hands of consumers.

Scale is the key learning to take to heart from China's growth model. Keeping the cost of production and indirect taxation low, so that it reflects in optimal pricing and lifecycle usage costs that drives consumption up exponentially, thus creating scale effects to fuel rapid growth. India, at present, is not on this path. Both the India and China car markets were similar in size in 2000 (0.6 vs. 0.7 million car sales per annum, respectively), but China leapfrogged to approximately 23 million car sales by 2018, while India reached 3.3 million car sales. The key enablers for China have been lower tariffs – VAT in China is now 13% (reduced earlier this year from 16%) vs. 29%-50% GST in India, approximately 40% fuel taxes vs. 49% in India, and lower real interest rates (2% vs. 5% in India). These lead to an overall vehicle ownership cost per capita income of 450% in India, which is just 97% in China, rendering vehicles relatively "unaffordable" in India.

In the automotive sector, scale-effects benefit the entire ecosystem across vehicle manufacturers and suppliers (with cost structure reducing by 12%-15% with a doubling of scale), dealers, consumers, and the government. Building scale requires moving towards a lower tariff structure (e.g., optimal GST for the sector, simplified and lower taxation on fuel) and optimal credit rates.

Regulations should be framed from the point of view of outcomes (e.g., particulate matter emission standards, fleet emission norms, safety requirements), rather than to prefer one technology over the other. Let market forces decide between an internal combustion engine (i.e., petrol, diesel, CNG- fuelled) vehicle and a hybrid-electric vehicle (HEV) or a battery-electric vehicle (BEV), let consumers take a view based on their usage

[446] https://www.livemint.com/industry/manufacturing/6-ways-to-reignite-india-s-auto-industry-11571157981126.html

requirements and total cost of ownership (TCO). For example, in 2022, it will make complete commercial sense to run BEVs for taxis with a daily usage of approximately 200 kms, while for a light user with a daily use of 20-30 kms, a petrol/CNG vehicle will be most economical.

The current slowdown provides the automotive industry with the opportunity to build resilience across the entire ecosystem. The Indian automotive industry lags in its overall productivity, being at approximately 40% of the level of the Japanese automotive industry and approximately 60% of the level of China's. The big agenda for vehicle manufacturers is reducing operational complexity and lowering cost structures – there is an opportunity to rationalise their variant spreads, optimise supply chain workflows by consolidating their supplier base, and imbibe new-age manufacturing 4.0 practices.[447] Structurally, a strong re-look at the platform strategy is needed to significantly bring down the cost base through modularity of product design – a case in point being a leading car manufacturer which has more than 7 of its car models (representing more than 60% of its sales volume) on just one platform architecture, leading to lower cost structure and much faster time-to-market for new products. Digital and advanced analytics (DnA) are transforming businesses, and the entire automotive ecosystem should embed DnA in its core processes, unlocking a potential of 4%-5% return on sales (RoS) from such DnA transformation.

The ecosystem must also address what could be roadblocks to all-round growth in the future. The structural problems likely to spring up pertain to ensuring adequate road density in cities (where peak-time traffic speed has come to 13 km per hour); enough alternative fuel availability, especially CNG; a sufficiently-developed EV supply chain to support vehicle manufacturers' electrification journey; adequate technology access by suppliers to participate through exports in the ACES[448] adoption of OEMs globally; and availability of sufficient and optimally-priced credit.

► Chapter 9

Pharmaceuticals

Introduction

India ranked third worldwide in total production of pharmaceuticals by volume and eleventh by value in 2019.[449] As of 2020, the Indian pharmaceutical industry was valued at USD 41 billion. It is the largest producer of generic medicines and vaccines, occupying 20% volume share in generics and 62% in vaccines.[450] The Indian drug industry has an extraordinary foundation which lies in the long stretch of the first four decades of independent India.

9.1 Growth of India's Pharmaceutical Sector

In 1969, Indian pharmaceuticals had only a 5% share in the domestic market. By the year 2020, Indian pharma has acquired an almost 85% share, showing the tremendous growth of this sector.[451] Generic drugs, with 71% market share, comprise the largest segment of the pharmaceutical industry in India. The industry is expected to reach a size of 65 billion dollars by 2024, and 120 billion dollars by 2030.[452] India's domestic pharmaceutical market turnover reached INR 1.4 lakh crores (USD 20.03 billion) in 2019, up 9.8% year-on-year from INR 129,015 crores (USD 18.12 billion) in 2018.[453] Given this growth scenario, the industry is expected to create an additional 58,000 jobs by the year 2025.[454]

---

[449] 'Investment Opportunities in India's Healthcare Sector', 2021, NITI Ayog.

[450] https://www.equitymaster.com/research-it/sector-info/pharma/Pharmaceuticals-Sector-Analysis-Report.asp

[451] https://groww.in/blog/overview-of-pharma-industry-in-india/

[452] Srividhya (2020), 'Indian pharmaceuticals - a formula for success', Invest India, available at: https://www.investindia.gov.in/sector/pharmaceuticals

[453] IBEF, available at: https://www.ibef.org/industry/pharmaceutical-india.aspx#:~:text=India's%20domestic%20pharmaceutical%20market%20turnover,%24%2018.12%20billion)%20in%202018.

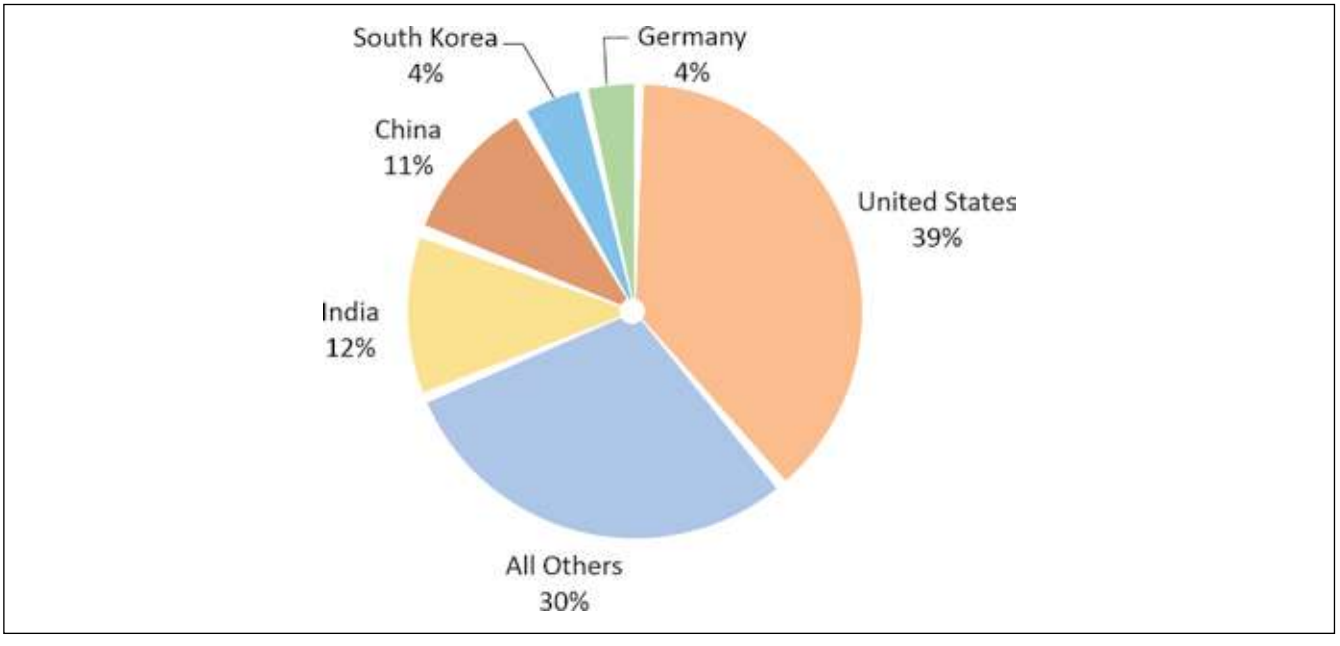
[454] 'Pharma sector to create 58,000 more jobs by 2025, feel experts', The Hindu Business Line, available at: https://www.thehindubusinessline.com/companies/pharma-sector-to-create-58000-more-jobs-by-2025-feel-experts/article9564251.ece

Over time, India has gained worldwide acknowledgment as a wellspring of affordable, accessible, high- quality drugs and emerged as the main provider of generic medicines to significant markets, such as the US and the EU. The Indian pharmaceutical sector supplies over 60% of global demand for various vaccines, 40% of generic medicines in the US, and 25% of all medicines in the UK[455] and many other developed countries, despite challenges at home and abroad.

The following chart shows major countries' manufacturing sites catering to the US pharma market (holding 25% of the global generic market and the largest destination of India's exports) in 2018.[456]

India has the highest number of US-FDA recognized pharma plants (more than 262 including APIs) outside of the US. India has more than 2000 WHO-GMP approved pharma plants, 253 European Directorate of Quality Medicines (EDQM) approved plants with modern state-of–the-art technology. India is the wellspring of 60,000 generic brands across 60 restorative classes and produces in excess of 500 distinctive APIs. The API business is positioned third biggest contributing 57% of APIs to the prequalified list of the WHO.[457]

Figure 9.1: Country-wise comparison of percentage of manufacturing sites catering to the US pharmaceutical market



Source: USFDA

9.1.1 Trade

India exports half of its total production of pharmaceuticals to more than 200 countries in the world.[458] In 2019, India contributed around 2.6% in world pharmaceutical exports.[459] Indian exports grew at 18% to USD 24.44 billion in 2020-21.

---

[455] India Brand Equity Foundation (2020), India Pharmaceutical Industry Report, available at: https://www.ibef.org/industry/pharmaceutical-india.aspx

[456] https://pharmexcil.com/uploads/files/16thAnnualReport.pdf

[457] Srividhya (2020), op. cit.

[458] https://www.india-briefing.com/news/indias-pharmaceutical-industry-investment-trends-opportunities-incentives-18300.html/

[459] ITC Trade Maps.

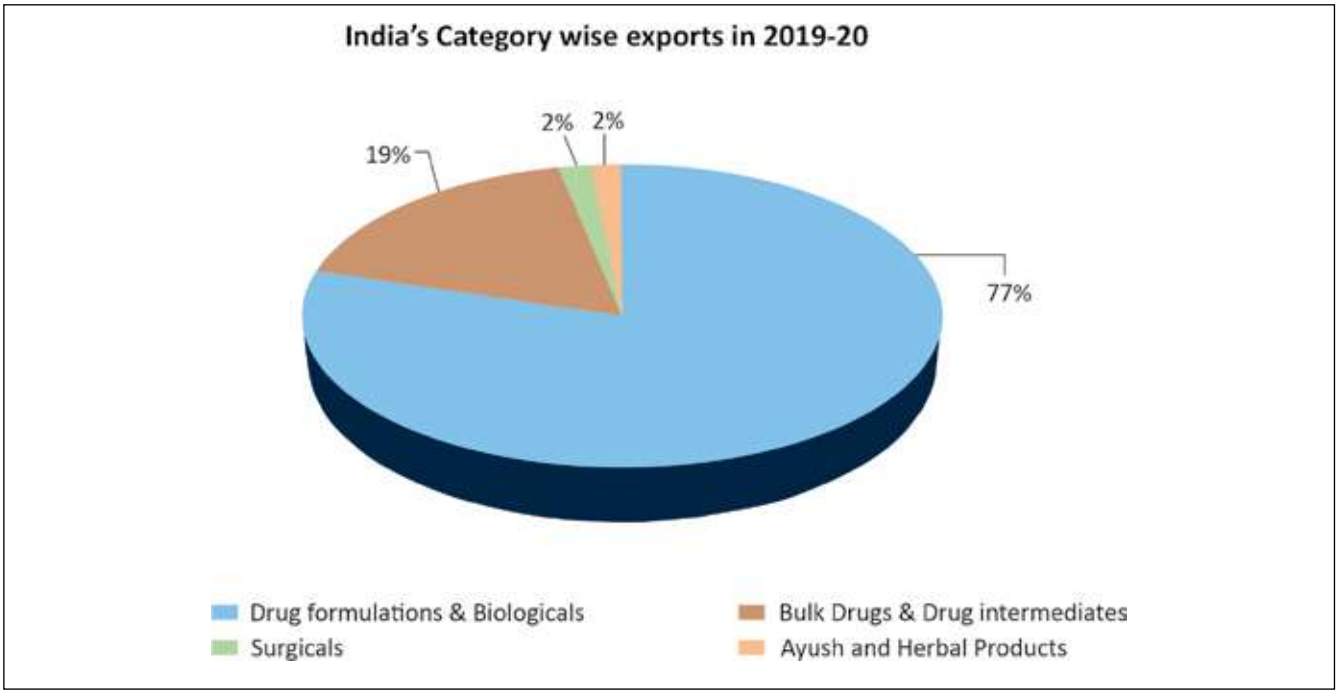
Table 9.1: Value of India's Exports by Category (2017-20)

India's Category-wise Exports Value (USD million)				
Category	**2017-18**	**2018-19**	**2019-20**	**Growth rate**
Drug Formulations & Biologicals	12747.9	14223.5	15826.64	11.27%
Bulk Drugs & Drug Intermediates	3525.65	3895.14	3882.87	-0.32%
Surgicals	552.16	569.77	448.29	-21.32%
Ayush and Herbal Products	456.12	446.12	428.09	-4.04%
Grand Total	**17281.81**	**19134.49**	**20585.89**	**7.59%**

Source: Ministry of Commerce and Industry.[460]

Fifty-five percent of Indian exports are to highly regulated markets.[461] India has experienced a persistent rise in exports of Drug Formulations & Biologicals. It has increased at an annual growth rate of 11.27% year-on-year.

Figure 9.2: Percentage Share in Value of India's Pharmaceutical Exports in 2019-20



Source: Ministry of Commerce and Industry.[462]

India's pharmaceutical exports are highly concentrated — to North America, Africa, and the EU. Country-wise its major export destinations are the US (32.7%), South Africa (3%), UK (2.7%), Russia (2.7%), and Germany (2.4%). The percentage share of the top 10 countries in India's pharmaceutical exports is around 52.5%, of which the share of the US is more than half. Exports to the US have expanded every year at around 15.79% between 2017 and 2020, whereas India's overall pharmaceutical exports grew at the rate of 7.59% only.

[460] Available at: https://commerce.gov.in/about-us/divisions/export-products-division/export-products-pharmaceuticals/

[461] Op. cit. Footnote 458

[462] See Footnote 460.

Table 9.2: Top Ten Export Destinations for India's Pharmaceuticals[463]

India's Pharmaceutical Exports to Top Destinations (USD million)						
S. No.	**Country**	**2017-18**	**2018-19**	**2019-20**	**Growth rate**	**% share**
1	US	5118.20	5820.41	6739.43	15.79%	32.7
2	South Africa	582.99	619.08	610.79	-1.34%	3.0
3	UK	556.65	630.17	557.86	-11.48%	2.7
4	Russia	468.77	485.55	552.41	13.77%	2.7
5	Germany	389.24	445.78	504.05	13.07%	2.4
6	Brazil	383.72	452.05	473.10	4.65%	2.3
7	Nigeria	466.67	447.95	419.43	-6.37%	2.0
8	Canada	229.80	325.26	334.54	2.85%	1.6
9	Netherlands	233.71	205.92	319.29	55.05%	1.6
10	France	252.12	276.66	309.23	11.77%	1.5
	Total of top 10	8681.87	9708.83	10820.13	56.00%	52.5
	Total of top 25	11620.41	13028.22	14410.97	10.61%	70.0
	Grand Total	**17281.81**	**19134.49**	**20585.89**	**7.59%**	**100.0**

Source: Derived from source in footnote 460

India's trade performance has been facilitated by many factors such as cost competitiveness, coverage across a broad spectrum of diseases, and almost universal availability. Trade promotion has played an important role in this pursuit. A dedicated institution to pursue interests in pharmaceutical exports, namely Pharmexcil, has been a very important step in this direction. Schemes such as Market Access Initiatives (MAI) and particularly Market Development Assistance (MDA) have been valued by the industry, but on account of constrained size and resources, have not been able to access markets far and wide. The export incentives under various schemes, though not big by any assessment, have been very helpful to a large number of entrepreneurs particularly from the MSMEs as most operate on very low margins. Now with most of India's export incentives under threat of withdrawal due to a WTO ruling, the Indian industry is faced with a serious challenge. Government's nurturing of the sector through proactive export facilitation and brand-building has been very valuable to the industry in achieving its global objectives. The effect of trade promotion and proactive facilitation in accessing external markets for the pharmaceuticals sector is a comparatively less-studied aspect, though well acknowledged by the industry itself.

India levies **higher tariffs** for medical product imports than the average applied tariff rates of the member countries of the World Trade Organisation (WTO), a report on trade in medical products critical of the global response to the Covid-19 pandemic released by WTO on 3 April 2020 says. While the average tariff rate of all WTO member countries for medical products is 4.8%, it is 11.6% for India. More specifically, India levies a 10% tariff on medicines as against a WTO average of 2.1%, 15% on medical supplies as against 6.2% (WTO average), and 9% on medical equipment as against a WTO average of 3.5%. In the case of personal protective products, the Indian tariff of 12% is closer to the WTO average of 11.5%.[464]

[463] Ministry of Commerce and Industry

[464] https://www.businesstoday.in/sectors/pharma/india-levies-116-tariff-on-medical-product-imports-against-wto-average-of-48-says-study/story/400122.html

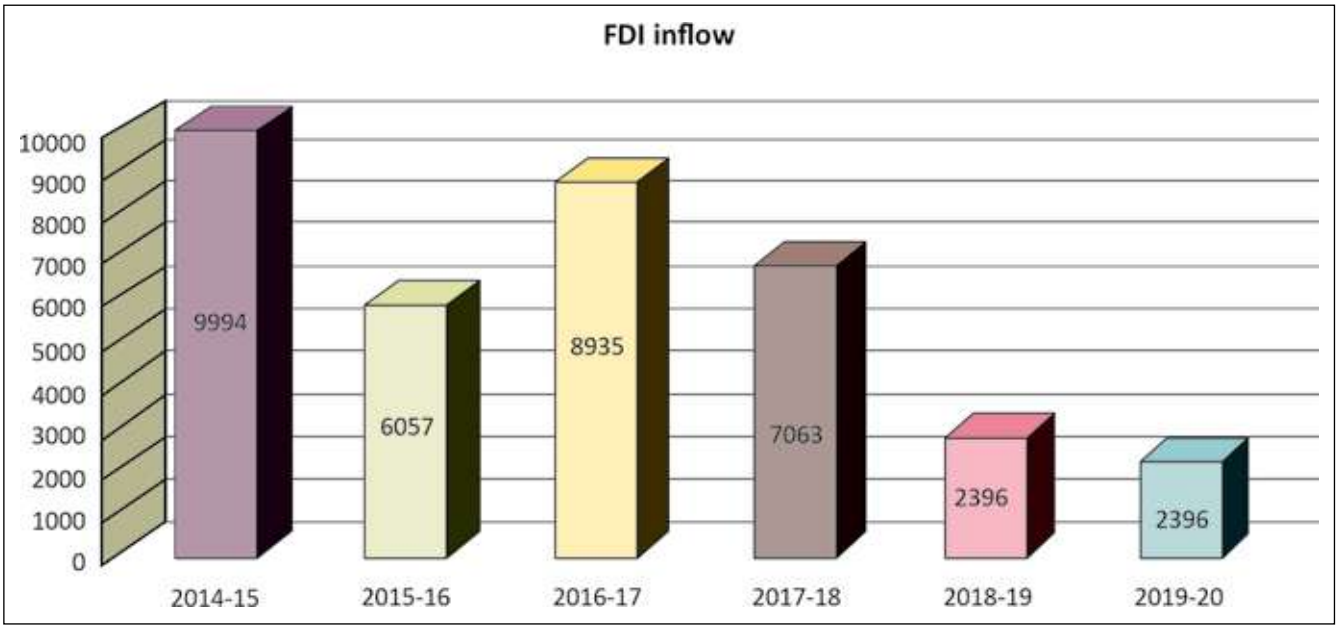
India's competitiveness has sustained its enviable position as global supplier of pharmaceuticals and despite relatively higher tariffs, has not been threatened by competitors so far, as the range of products in their basket and their competitiveness has been nowhere near India's. It is however important to note that India has, over the years, lost its unique position of global supplier of APIs to China, which is inching closer even in the formulations segment. Newer producers in the developing world such as Bangladesh are also following fast.

Pharmaceuticals is a heavily **regulated sector** in most geographies. Chemicals-based pharmaceuticals are manufactured in accordance with composition and recipes standardised in leading Pharmacopia. The processes and their integrity and record-keeping are as important as the composition of the product itself. Each manufacturing facility is certified by relevant regulators. While WHO-GMP is the global standard, national standards are followed in different jurisdictions. In most regulated jurisdictions, national standards could be equivalent to WHO-GMP or even higher than it. This complexity opens up huge regulatory challenges to those who want to access global markets, and therefore regulatory policies at home play a significant role in supporting the trade endeavours of a country. In addition, addressing non-tariff measures adopted by various importing jurisdictions constitutes an important factor in securing market access to that jurisdiction.

9.1.2 Foreign Direct Investment

FDI inflows have generally been slow in the Indian pharmaceuticals sector and this has had an impact on the growth of the industry.[465] During the past two decades (April 2000 to September 2020), India has attracted FDI worth of only USD 16.89 billion which is just 3% of overall FDI inflows into India.[466] It is the second time since 2014 that a steady decline was reported in 2019-20.

Figure 9.3: FDI inflow in the pharmaceuticals sector, 2014-15 to 2019-20



Source: DPIIT/RBI (figure for 2019-20 is up to December 2019).

To address the issue of low FDI inflows in country, the Government of India has begun examining ways to shore up foreign investments, including a fast-track mechanism to clear applications of companies, especially

[465] https://www.expresspharma.in/latest-updates/fdi-in-pharma-and-related-implications-of-Covid-19/

[466] https://dipp.gov.in/sites/default/files/FDI_Fact_sheet_September_20.pdf

in the pharmaceuticals sector, that are looking at India with the US pushing its companies to relocate from China. As part of the exercise, the Department for Promotion of Industry and Internal Trade (DPIIT) plans to put in place a database of all FDI applications, as well as queries from investors and the problems they have faced, so as to generate confidence in global investors that India is quick to respond.[467]

The Government of India has allowed 100% FDI in the pharma sector, with the condition that FDI upto 100% in greenfield pharma projects, and upto 74% in brownfield pharma projects, is permitted under the automatic route. FDI in brownfield projects (under the automatic approval route) will be required to comply with the conditions that:

(a) The production level of National List of Essential Medicines (drugs and / or consumables) and their supply to the domestic market at the time of induction of FDI to be maintained over the next 5 years at an absolute quantitative level;

(b) The research and development expenses in value terms to be maintained for the next 5 years at an absolute quantitative level as at the time of induction of FDI; and

(c) The relevant investee company to provide all information pertaining to the transfer of technology, if any, along with induction of foreign investment into the investee company to the Ministry of Health and Family Welfare and the Department of Pharmaceuticals.

This legislative framework is with a view to protect the domestic pharma industry, ensure that the supply of essential medicines is not adversely impacted, and increase research and development.[468]

9.1.3 The New Paradigm in Pharmaceuticals

Today the pharmaceuticals sector is poised at a critical juncture where major shifts are overdue, as the global paradigm is changing fast. These shifts are necessitated because the sector has become more technology-oriented, competitive pressures are increasing in conventional product areas, and India seems to be missing out in some critical areas of policy-making and regulatory development. The major elements of this paradigm change include: a) emerging prominence of biopharmaceuticals, b) growing opportunities in speciality generics and new therapies such as gene therapy, c) prominent role of new technology, innovation, and research and development, d) importance of protection of intellectual property contained in new products and technology, e) need for strengthening capacities for onboarding distribution chains in lucrative markets. In this scenario, there is a strong need for ensuring convergence in manufacturing, investment and trade policies relevant for the sector. Since this is a regulated sector, adoption of appropriate regulatory policies can help in expanding markets and realising greater value from exports. The Department of Pharmaceuticals launched Pharma Vision 2020 that aims to make India a major hub in end-to-end drug discovery and development as well as the production of low-cost generic medicines. The goal is laudatory but requires transformational policies to achieve it.

India's pharmaceutical industry-related policies have been examined in many studies since 2008 and recommendations made from time to time. Three of them are of particular importance, viz. a comprehensive report of a Task Force set up by the Department of Commerce in 2008[469], and internal export study of the

[467] https://economictimes.indiatimes.com/industry/healthcare/biotech/pharmaceuticals/mega-fdi-plan-to-focus-on-faster-pharma-approvals/articleshow/75664593.cms?from=mdr

[468] https://www.expresspharma.in/latest-updates/fdi-in-pharma-and-related-implications-of-Covid-19/

[469] https://commerce.gov.in/wp-content/uploads/2020/02/MOC_635567633057176521_Report-Tas-Force-Pharma-12th-Dec-08.pdf

Department of Commerce[470], and Report of the Katoch Committee on Active Pharmaceutical Ingredients[471]. A more recent Government Report that has discussed pharmaceuticals among a number of sectors is the Report of the HLAG set up by the Minister of Commerce and Industry[472]. Three of them are of particular importance, viz. a comprehensive report of a Task Force set up by the Department of Commerce in 2008[473], and internal export study of the Department of Commerce[474], and Report of the Katoch Committee on Active Pharmaceutical Ingredients[475]. A more recent Government Report that has discussed pharmaceuticals among a number of sectors is the Report of the HLAG set up by the Minister of Commerce and Industry[476]. Recent adoption of ambitious schemes for promoting pharma manufacturing parks for APIs and KSMs and the Production Linked Incentive schemes are an indication that the Government is keen to address many challenges that the sector faces. Exim Bank in its study of Domestic Policy Constraints against Exports published in 2020[477] had taken a deeper view of inadequacies in domestic policies and actions. Many of those recommendations remain relevant for this study because they originated out of absence of policy(ies) or discordance between two or more policies. The pharmaceuticals chapter in that study complements this chapter as it goes deeper into sector policies in relevant areas. Trade, manufacturing, investment, regulatory, R&D and innovation policies will play a prominent role in the days to come to keep India in the leading position in the sector**.** The following discussion is therefore organised accordingly. Each section takes a look at the present state of relevant policies and tries to draw attention to what is required or what needs to be avoided to keep or create coherence or strengthen it. From the discussion in the following paragraphs, the chapter concludes with key recommendations for action.

9.2 Manufacturing and Investment Policy

9.2.1 FDI Policy

The limitations on the brownfield investments were contemplated following the acquisition of the then pharma flagship, Ranbaxy. However, experience since then has shown that India has a significant lineup of both first- and second-tier good performers and such apprehensions may be misplaced. Experience did show that mergers and acquisitions created shortfalls in supplies and price increases in the short run, till the market adjusted itself. As a matter of strategy, if conditionalities are at all necessary, they should be connected to investments in R&D in pre identified technologies. Mere maintenance of R&D expenses for 5 years is not an assurance of their being directed in the desired direction or even the authenticity of the expenses.

[470] This was a Report by J. S. Deepak (Department of Commerce), Lanka Srinivas (Industry Expert), and Samuel Joseph (EXIM Bank of India).

[471] https://pharmaceuticals.gov.in/sites/default/files/Katoch%20Committe%20Report.pdf

[472] https://commerce.gov.in/wp-content/uploads/2020/02/NTESCL637084602888237192_HLAG-Report-.pdf

[473] https://commerce.gov.in/wp-content/uploads/2020/02/MOC_635567633057176521_Report-Tas-Force-Pharma-12th-Dec-08.pdf

[474] This Report was written by J. S. Deepak (Department of Commerce), Lanka Srinivas (Industry Expert), and Samuel Joseph (EXIM Bank of India).

[475] https://pharmaceuticals.gov.in/sites/default/files/Katoch%20Committe%20Report.pdf

[476] https://commerce.gov.in/wp-content/uploads/2020/02/NTESCL637084602888237192_HLAG-Report-.pdf

[477] 'Domestic Policy Constraints for Exports in Select Sectors -- Main Report', 2020, Exim Bank, available at: https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/SpecialPublications/Report-on-Domestic-Constraints-on-Exports-of-Selected-Sectors-new.pdf

A significant proportion of FDI inflows in pharmaceuticals are brownfield investments through mergers and acquisitions. Global multinationals would normally invest in the following situations:

a. To acquire additional capacities to scale up their global capacity of a particular drug, or

b. To add a product to their basket of products at the global level, to broaden their reach, or

c. To increase their market share in India, or

d. To invest in a contract manufacturing or research facility as part of a commercial contract.

It is only in the last two categories that foreign investment may actually create additional investment in technology, or research and development. The first two cases may simply lead to removal of competition and India does not benefit from them.

9.2.2 Contract Manufacturing and Research

India's presence in the area of contract manufacturing is a tribute to its wide and in-depth capacities in pharma manufacturing. Its adoption of the Product Patent regime has opened up the opportunities for Contract Manufacturing as patent owners can assign manufacturing to a contractor without the fear of losing their business, which was possible in the old regime of process patenting. **Contract manufacturing** and **research** offer a broad and diverse experience to the economic entity but the business is relatively unpredictable in nature and demands nimbleness of operations as well as of the policy environment. The dynamic action will lie in approval mechanisms, taxation policies, labelling and certification policies, and quick action under trade mechanisms such as negotiating new market opportunities or mutual recognition and equivalence arrangements.

Many major global multinationals have their research establishments in India. However, taxation policies in India need to be harmonised with trade opportunities in the sector. A differentiated taxation policy based on sector preference for incentivising research, is the need of the hour. When viewed in a 'secular' manner, such benefits are thinly spread and may not bring about the desired impact because the beneficiary is driven simply by an accountant's zeal to save tax, but when identified sectors serving specifically national objectives are addressed, the fiscal policy intervention becomes motivational and desired objectives targeting specific R&D activities are dealt with. That raises the need for the important task of delineating national objectives. There is no doubt that in the context of recent experiences with respect to providing for the Covid-19 pandemic, as well as for addressing India's own capacities to remain a sustainable producer of generic pharmaceuticals, the sector has proved to be strategically important. This should inform decisions about what needs to be prioritised in this sector and how. (See Annex 9.1 for details of R&D in the pharma sector).

9.2.3 The Balance Sheet Conundrum

9.2.3.1 Price Control

India's evolution as the 'Pharmacy of the World' has been facilitated by the affordable nature of its pharma products. The production of affordable generics has been helped principally by process patenting between 1970 and 2005. This facilitated competitive pricing by selection of the cheapest route of manufacturing. A **rigorous price control regime** on selected products which covered a large number of products also forced prices down and kept margins very low. To begin with, price control was exercised through a cost-plus mechanism. Much later, it moved to a reference price based process. While this helped in keeping pharma products available domestically at affordable rates, it very systematically **killed innovation** and investment in technology development as it sealed the opportunity to make profits through innovation. Why invest when returns will remain fixed? It has also not been an incentive for foreign investors. Price regulation mechanisms

prove a roadblock for technological innovations for patent-expired drugs.

The Central and State Governments, as bulk buyers, can help domestic companies improve their margins and keep the prices down at the same time, by adopting auction-based acquisition processes and e-platforms such as GEM. In the face of this, it would be preferable from the Government standpoint to focus on competitive bidding for supplies of a product as a means to control costs[478] rather than expand the scope of DPCO.

9.2.3.2 Domestic Trade

Domestic medicine trade has been another controversial area requiring policy intervention. It is well known that chemists charge trade commissions as high as 35% to 45% from the manufacturers exercising the threat of their 'power of substitution' as they have the choice to offer a substitute of another manufacturer offering better commissions to them. Even doctors have huge leverage on what they would like to push and what they would not. Thus, though routine vanilla products may cost little in manufacturing, their distribution costs are astronomical leaving limited resources with the manufacturers for reinvestment. A voluntary code of ethics without an ombudsman is of no avail in this respect. There is a strong need to regulate distribution through legislation by pegging margins to the trade at a reasonable level. Many countries even from the developed world such as Japan and Germany have done so. Since these excessive expenses cannot be allowed under taxation laws as legitimate business expenses, the impact can be seen on the balance sheets and consequent capacities of these companies to reinvest.

9.2.3.3 Fragmented Industry

The Indian pharma industry is highly fragmented. Several operators file Drug Master Files (DMFs), which are documents voluntarily filed with exhaustive information and data with the foreign regulators, for registration of a product for sale in the relevant market. This exercise costs millions of dollars in the US, for example. So, while DMFs are routinely filed, very few have the capacity to actually produce and export to the relevant markets. Apparently, they lack strategic business thinking and would often refrain from taking sensible professional advice apprehending breach of confidentiality. Huge sums are thus wasted. On the contrary, in China, very few DMFs are filed, with clear thought and strategy behind those that are filed. The traditional mindset in India, influenced by mutual suspicion and absence of strategic thinking, needs to be addressed through institutionalised education and awareness. Thus, low margins of profit, expanded price control regime, imprudent business decisions, and a rent-seeking distribution system, combine to leave little investible surpluses with the manufacturers.

Major inadequacies in the small sector are the unavailability of highly-skilled manpower, an ever-expanding list of essential medicines reducing the possibility of growing reserves for investment particularly in R&D, lack of consistency and standardisation in drug quality requirements, and relative absence of awareness of the legal and institutional provisions. Small operators provide the nimbleness required for operations in an extremely competitive environment. The technology landscape particularly in the biopharmaceuticals segment is full of small but niche operators who have the flexibility and acute technology focus to produce state-of-the-art products. But the industry requires some sort of consolidation particularly to respond to quality challenges. A well-conceived regulatory framework, 'enforced' objectively and strenuously, is required to achieve consolidation.

9.2.4 Intellectual Property Regime

There may be a case for improved registration processes and more efficient dispute resolution. An annual exercise by the US Government identifying India for a Section 301 investigation has not helped either. Though

[478] https://www.who.int/phi/publications/indian_policies_promote_local_production_pharm/en/

the US, despite its best efforts, has not found even one reason to lodge a complaint of any violation by India, this particular action has remained in the US diplomatic armory to be used at will.

At the time TRIPS was ratified (1995), approximately 100 countries already permitted some sort of compulsory licensing under their national rules.[479] The only case of **compulsory** license in India was a grant of patent in 2012 to Natco Pharma, an Indian company, for generic production of Bayer Corporation's Nexavar, a drug used for the treatment of liver and kidney cancer.[480] There are many high-, middle- and lower-income countries that have used compulsory licensing for various reasons (Table 9.3).

Table 9.3: Examples of Countries that use Compulsory Licensing

High-Income Countries	Middle-Income Countries	Low-Income Countries
Canada	Malaysia	Cameroon
United States	Indonesia	Eritrea
Germany	Korea	Ghana
Italy	South Africa	Mozambique
Israel	Brazil	Zambia
BRAC Disputes	Thailand	Zimbabwe

Source: http://www.cptech.org/ip/health/cl/recent-examples.html

New drug discovery being an extremely resource-intensive and time-consuming exercise, ever greening is the best bet for the big pharma companies to maintain their edge but they have not succeeded in making India give up its opposition to ever greening. Thus, major investment flows have remained slow. The frequent hue and cry about India's use or potential use of flexibilities is to a large extent a bogey used by the big pharma industry.

9.3 Investment Issues

9.3.1 Financing the New Paradigm

Technology has become the most important differentiator. India's pharma landscape has many shining examples of technology and research and innovation-based producers. But that needs a significant push. This would require many policy shifts. A move from chemistry to biology-based drug manufacturing is the most crucial of all. This is accompanied with many other modifications in the nature of pharma products, for example, gene therapy. These are capital-intensive and intensively research-based areas. Thus, while the conventional strength of Indian pharma needs to be sustained, these newer areas are required to be promoted. Therefore, the focus should now be on sustainability and growth of the existing product basket, and additions to the portfolio of **biopharmaceuticals**. For a research-based sector, at the corporate level profit ploughback is possible only when large margins are made. Since the Indian business model dwells more on low margins, capex promotion is possible through either creation of new fiscal instruments or inviting foreign investments.

[479] https://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ip_econ_ge_4_12/wipo_ip_econ_ge_4_12_ref_saggi.pdf

[480] https://www.mondaq.com/india/patent/576540/compulsory-licensing-every-request-for-compulsory-license-will-not-be-granted-and-special-powers-of-the-government-in-exceptional-circumstances#:~:text=In%20India%2C%20the%20first%20compulsory,of%20grant%20of%20compulsory%20license.

9.3.2 Need for Special Financing Instruments

From an investment point of view, the pharmaceutical product basket needs to be divided into three categories, namely, the conventional vanilla products from the generic stable; the new breed of biopharmaceuticals; and the products coming out of R&D and innovation efforts. The first of these categories at present constitutes the bulk of India's production, and India's edge in this segment needs to be maintained and restored where lost (such as APIs). This can be achieved through new investment initiatives such as the Production Linked Incentive (PLI) programme and the Pharma Parks Development Programme. The investment needs of some basic elements of the biopharmaceuticals segments will be addressed by both the PLI scheme and the Pharma Park programme. The innovative initiatives for seed funding through different schemes of the biotechnology sector can help the emerging area of biopharmaceutical startups. But commercialisation of the outcomes of such initiatives as well as extensive work in the area of new drug development will have to be supported through financial instruments which are unique to the sector.

There are many important categories such as monoclonal antibodies, peptides and biotech products, in which India is weak, foregoing a global opportunity. Further, several technologies are not attempted in India. These include sustained controlled / modified release, lyophilised pharmaceuticals, biopharmaceuticals, speciality generics, several drug intermediates, Non-Infringing Patent (NIP) process- based APIs or bulk drugs and formulations. Some of these product areas have been included now in the PLI scheme -- phase 2, but as the guidelines are yet to be notified their contours are not known.

Despite a large presence in the US, India's penetration in 36 other highly regulated markets which account for nearly 80% of world pharma imports, has been almost negligible (as seen in Table 9.2 which gives the percentage share of the top 10 export destinations). The reasons for this are primarily the **high cost of registration** and **product testing and dossier filings** which are not within the reach of Small & Medium Enterprises (SMEs) which constitute a large proportion of the pharma sector. The domestic pharma sector has over 3,000 registered companies mostly in the small and medium sector though 80% of the market share is held by 50 large units.[481] The SME sector companies have the potential for exports but lack the wherewithal for the same. They lack investment capabilities such as the following, to undertake long gestation, endure high risk, and pursue opportunities for high returns:

- Drug discovery;
- Development of non-infringing patent processes;
- New product development;
- Investments in R&D manufacturing/testing facilities;
- Regulatory Affairs Services;
- IPR Services; and Electronic Libraries

In view of the above and in the face of aggressive international competition, the Government needs to think of solutions beyond conventional practices, and to draw on examples from other countries. The present quantum of funds from the Government in all programmes except the recently announced PLI and Pharma Park programmes, is very meagre and is not available to stakeholders other than the Government agencies in any significant way. Thus, the present funding is insufficient to bring in the radical transformation required for the next big leap. Any policy intervention needs to take place at a rapid pace as the drug registration process and subsequent exports take 3-5 years for regulated markets and 1-3 years for other markets.

[481] Centre for Monitoring Indian Economy (CMIE)

9.3.3 Innovation Parks

The 2008 Report of the Task Force set up by the Department of Commerce recommended an Innovation Park Scheme corresponding to world class centres of excellence for seeding, nurturing and promoting entrepreneurs and technocrats. At the core of the Innovation Parks are state-of-the-art R&D, testing and common facilities which seamlessly facilitate all the activities in the value chain of product development and registration in foreign markets. This in turn would lead to promotion of exports. The scheme will promote pharmaceutical R&D through creation of SPVs for funding 'Innovation Parks/Centres' and provide R&D financing by Exim bank to enhance innovation and exports. It will target development of hard and soft infrastructure facilities required for export development. The recommendations even identified the hard and soft infrastructure, such parks will provide. The soft infrastructure included patent libraries, regulatory filing support, common sourcing and export facilitation centres, liaison offices in foreign countries and market intelligence dissemination on products, therapies and market competition analysis, information on regulatory changes, etc. A funding pattern was also suggested.

9.3.4 Financing R&D through Creation of Special Purpose Vehicles

Pharmaceutical exports are fraught with long-drawn-out and complex registration processes, be it for bulk drugs, formulations or medical devices. Every regulatory authority requires detailed 'dossiers' to prove 'bio-equivalence' of manufacturers' products with innovator products for market approvals. Exports can happen only after registration/market authorisation. Elaborate standards are prescribed by each country in their 'Pharmacopoeias', CGMP (Current Good Manufacturing Practices), etc., which Indian manufacturers are strictly required to adhere to.

The financing challenges faced by pharmaceutical companies are as follows:

- R&D expenses are written off by pharmaceutical companies in their balance sheets. However, this expenditure is not separately taken into consideration by bankers for funding.
- The size of balance sheets of most companies is small and non-conducive for R&D. Average spends on R&D by the API industry tend to be in the 3%-4.5% range, which is low by global standards. Average R&D spends for larger pharma formulation companies has been in the region of 6%-6.5%, while for smaller companies it tends to be in the region of 3%-3.5%. Sizeable R&D costs incurred in P&L have one effect of adversely impacting the capital-raising plans of companies, thus affecting future cash flows and hence their ability to invest further. The present balance sheets are not capable of supporting large investments.
- Venture Capital funding for R&D in pharma sector is meagre.
- Diffusion from universities or government labs is almost non-existent.

  Fixed assets are very important in the pharmaceutical industry. High quality assets meeting gold standards are needed to compete with leading companies of the world. Unlike most other industries where the units can be set up and, in general, can become commercially viable in less than 24 months, the pharma industry takes almost 5 years to be cash flow positive, and even longer to be profitable.

Table 9.4: Time Frames for Implementation of Pharma Projects

Process	Typical Time Frame (months)	Cumulative Time Frame (months)
Time to build a regulated market site	10-18	
Validation & Commissioning	2-4	12-22
Completing Scale-up / Exhibit Batches	4-6	16-28
Filing with the FDA	4-6	20-34
FDA Inspection	12-18	32-52
Approvals	2-6	34-58

Source: From the report of the Department of Commerce cited above

9.3.5 Special Funding Needs for Market Access

The third scheme proposed by the 2008 Task Force Report addresses the insufficiencies at the external level. The Market Access Initiative and the Marked Development Assistance schemes have a broad remit for trade promotion. Though activities like construction of warehouses, upgradation of laboratories, developing common facilities, reimbursement of registration charges of medical products abroad, market and export studies, displays at international departmental stores, etc., are funded by the scheme, not much progress has been achieved as the focus of the scheme has been more towards trade fair participation, buyer-seller meets, and reverse buyer seller meets, and here too the funding is mostly available to Government organisations only. The present scheme shows gaps such as no funding for liaison offices, warehouses, market intelligence on products, therapy and market competition analysis, regulatory changes, regulatory support in foreign countries, etc.

The 2008 Report had recommended partial grants for opening liaison / sales / marketing / distribution offices set up to support SSI clusters, patent-filing expenses -- where the patent is owned and assigned on Indian soil, DMF, ANDA filing expenses (paid to foreign regulatory authorities), costs associated with travel and stay of visiting inspectors of foreign regulatory authorities, bioequivalence expenses incurred upon demonstrating an export sale value of at least ten times the investment, patent libraries and patent departments in 5-10 identified pharmaceutical clusters, training of at least 1,000 executives in IPR-related courses. This support would have been extremely valuable to the smaller players in the sector.

9.4 Manufacturing Policy for the Sector

India's price competitiveness came from its being an early mover in the sector besides having many other supporting advantages, some of them stated in the introductory paragraphs. A major feature of this competitiveness has been India's presence all along the small molecule value chain. It started as a producer of the entire value chain comprising key starting materials, active pharmaceutical ingredients, and formulations -- one feeding into the other. Even in biopharmaceuticals it had the early mover's advantage. As early as in the late fifties, HAL could bring in fermentation technology to produce all the Pen-G required by India. Further, India made it obligatory for the domestic privately-owned businesses and MNCs to produce APIs. Prior to implementation of this policy, foreign firms and MNCs imported all APIs to produce FPPs. This policy, however, ensured the continuance of production of APIs and the maintenance of domestic production capacities which had been created in the phase when Indian businesses were transitioning towards privatisation and there was a wave of MNCs across the globe. A study by RIS shows that, in 1996, India had price competitiveness in most of the pharmaceutical products over major exporters of these products, and it was able to maintain this

competitiveness till 2009. In the last 10 years, however, India has lost its price competitiveness with almost all major exporters, most significantly with China, in a number of pharmaceutical products. Some studies[482] also attribute some loss of competitiveness to the shortage of generics on account of mergers and acquisitions and thinning of competition in some segments leading to higher prices. The Indian pharmaceutical industry has also encountered challenges in relation to output efficiency.[483] This problem of output efficiency is mainly pertaining to small firms while big firms have been able to do comparatively better.

9.4.1 Manufacturing Support Schemes

The government has attempted to address the manufacturing gaps by instituting support programmes for technology upgradation and cluster development. The technology upgradation initiative has been addressed with a view to help MSME companies achieve WHO-GMP standards by improving their quality through machinery upgradation. The scheme provides interest subvention up to a maximum of 6% subject to a limit of INR 4 crores of bank borrowing. Under the Cluster development scheme, financial assistance would be provided for creation of common facilities in any pharma clusters including Bulk Drug, Medical Device, Ayurvedic, Unani and Cosmetics Units. The scheme would be implemented on a Public Private Partnership (PPP) format through one-time grant-in-aid to be released to a Special Purpose Vehicle (SPV) set up for the purpose. Maximum limit for the grant-in-aid under this category would be INR 20 crores per cluster or 70% of the cost of project whichever is less, in four instalments. The SPV is required to obtain the requisite land and a DPR (Detailed Project Report) needs to be submitted to the Department for consideration.[484] These schemes are distributed among several departments with ridiculously small budgets making it difficult for small producers to navigate the process.

9.4.2 Manufacturing Support by the States

Some states have attracted investments in the sector by offering sector-specific incentives. These incentives broadly cover a medley of schemes, such as cluster development (Odisha, Haryana, Uttar Pradesh), employment incentives (Odisha, Haryana, Himachal Pradesh, Mizoram), capital subsidy (Odisha, Haryana, UP, Gujarat, Himachal Pradesh, Jammu & Kashmir, Madhya Pradesh, Uttarakhand), environmental protection infrastructure (Odisha, UP, HP, J&K), interest subsidy on working capital (Haryana, Gujarat, J&K, MP, Bihar, Uttarakhand), exemption from stamp duty on land registration (HP, Karnataka, UP, Arunachal Pradesh, Bihar, Uttarakhand), and a few others. Some visionary planning and investments in Andhra Pradesh, Telangana, Gujarat and Karnataka have put these states in leading positions. They also benefit by their proximity to ports. The most important investment incentive available so far is common scientific and industrial infrastructure in identified manufacturing zones such as a Pharma Park or an SEZ.

9.4.3 Bulk Drugs and Active Pharmaceutical Ingredients

India last year announced major investment commitments for setting up of three bulk drug parks and a Production Linked Incentive scheme for promotion of domestic manufacturing of critical Key Starting Materials (KSMs), drug intermediates and APIs under which they will be eligible for financial incentives on the basis of their sales for the first five to six years. This is a welcome move and will help in restoring the availability of APIs and KSMs. The success of the schemes will depend on many other elements of a healthy manufacturing ecosystem, for example, the standards regime such as testing facilities, the technology promotion and absorption capacities, industrial environment, logistics and trade infrastructure etc.

---

[482] Gagnon and Volesky (2017)

[483] Mazumdar et al. (2012)

[484] https://pharmaceuticals.gov.in/sites/default/files/Scheme%20for%20Development%20of%20Pharmaceutical%20Industry%20updated.pdf

The contours of the schemes are as follows:

Development of 3 bulk drug parks

The scheme was approved by the Government of India on 20 March 2020. The stated objectives of the scheme are to promote setting up of bulk drug parks in the country, by providing easy access to world-class Common Infrastructure Facilities (CIF) to bulk drug units located in the park, in order to significantly bring down the manufacturing cost of bulk drugs. By increasing the competitiveness of the domestic bulk drug industry, India is expected to become self-reliant in bulk drugs. Under the scheme, a one-time grant-in-aid will be provided for creation of common infrastructure facilities in selected bulk drug parks proposed by a State Government. The grant-in-aid will be 70% of the project cost of the common infrastructure facilities. In the case of the North-Eastern States, and the hilly States (i.e. Himachal Pradesh, Uttarakhand, UT of Jammu & Kashmir, and UT of Ladakh), the grant-in-aid will be 90% of the common infrastructure facilities. INR 3,000 crores has been earmarked for the development of 3 bulk drug parks. The salient features include a minimum area of 1,000 acres of land to be arranged by the State Government and a maximum of Rs 1,000 crores as grant-in-aid to the State for providing common facilities such as solvent recovery plants, distillation plants, power and steam units, effluent treatment plants etc. for manufacturers. One of the critical areas in manufacturing in India is the absence of scale which is where India lags behind China, where huge facilities with large fermenters / digesters that extend for miles have been built over 5 years and with millions of litres capacity. Such facilities require large tracts of land, water availability, fermenters, capex investment, and environment management as these facilities also emit odour and effluents. The proposed parks will serve as the core of the new manufacturing paradigm in the pharma sector. Comprehensive park development within stipulated timelines is most important to regain India's competitiveness in APIs. Recognising the potential of India's pharmaceutical sector, merely three parks will not be enough, therefore a cluster development approach will have to be pursued for other product areas such as formulations, too.

9.4.4 Production-Linked Incentive (PLI) Scheme

The first tranche of the scheme was announced in March 2020. The salient features are as follows,

- INR 6,940 crores will be allocated over the next 8 years under the PLI scheme.
- Financial incentives will be given to eligible manufacturers of 53 critical bulk drugs, KSMs / APIs and drug intermediaries on incremental sales for a period of 6 years.
- Out of identified 53 critical bulk drugs, 26 are fermentation-based and 27 are chemical-based.
- Fermentation-based bulk drugs will get a 20% incentive for the first 4 years, 15% for the fifth year, and 5% for the sixth year.
- Chemical synthesis-based bulk drugs will get a 10% incentive for a 6-year period.

The second tranche of the scheme worth INR 15,000 crores (USD 2.04 billion) **was announced i**n September 2020.The objective of the scheme is to enhance India's manufacturing capabilities by increasing investment and production in the sector and contributing to product diversification of high-value goods in the pharmaceuticals sector. The manufacturers of pharmaceutical goods registered in India will be grouped based on their Global Manufacturing Revenue. The qualifying criteria for the three groups of applicants will be as follows[485]-

(a) Group A: Applicants having Global Manufacturing Revenue (FY 2019-20) of pharmaceutical goods more than or equal to INR 5,000 crores.

[485] Department of Pharmaceuticals: https://pharmaceuticals.gov.in/sites/default/files/Gazette%20Notification%20of%20PLI%20scheme%20for%20Pharmaceuticals_0.pdf

(b) Group B: Applicants having Global Manufacturing Revenue (FY 2019-20) of pharmaceutical goods between INR 500 (inclusive) crores and INR 5,000 crores.

(c) Group C: Applicants having Global Manufacturing Revenue (FY 2019-20) of pharmaceutical goods less than INR 500 crores. Within this group, a sub-group for MSME industry will be made, given their specific challenges and circumstances.

Quantum of Incentive: The total quantum of incentive (inclusive of administrative expenditure) under the scheme is about INR 15,000 crores. The incentive allocation among the Target Groups is as follows: (a) Group A: INR 11,000 crores. (b) Group B: INR 2,250 crores. (c) Group C: INR 1,750 crores.

Rate of Incentive: The rate of incentive on incremental sales (over base year) of pharmaceutical goods covered under Category 1 & 2 will be 10% for FY 2022-23 to FY 2025-26, 8% for 2026-27 and 6% for 2027-28. The rate of incentive on incremental sales (over base year) for pharmaceutical goods covered under Category-3 will be 5% for FY 2022-23 to FY 2025-26, 4% for 2026-27, and 3% for 2027-28.

Category of Goods: The scheme shall cover pharmaceutical goods under 3 categories as mentioned below:

Category 1: Biopharmaceuticals, Complex generic drugs, Patented drugs or drugs nearing patent expiry, Cell-based or gene therapy drugs, Orphan drugs, Special empty capsules like HPMC, Pullulan, enteric etc., Complex excipients, Phyto-pharmaceuticals, Other drugs as approved.

Category 2: Active Pharmaceutical Ingredients / Key Starting Materials / Drug Intermediates

Category 3: (Drugs not covered under Category 1 and Category 2): Repurposed drugs, Auto-immune drugs, Anti-cancer drugs, Anti-diabetic drugs, Anti-infective drugs, Cardiovascular drugs, Psychotropic drugs and Anti-retroviral drugs, In-vitro diagnostic devices, Other drugs as approved, Other drugs not manufactured in India.

These schemes come at a time when the global economy is going through a major churn and supply chains are being reconfigured. Recognising the recent initiatives such as the US decision to review its pharmaceutical supply chains, the Resilient Supply Chain Initiative announced by Japan, Australia and India, and the declaration made in the Quad Heads of Governments Summit on Vaccine Manufacturing offer India attractive opportunities for the pharmaceutical sector.

9.4.5 The Biopharmaceuticals

China is presenting a strong competition to India in the global biological market. According to Frost and Sullivan, China's biological drugs market expanded from USD 9.13 billion in 2012 to USD 22.13 billion in 2016, an annual growth rate of 25%. China was ranked as the world's fastest-growing biologicals market. Contrary to this, the Indian market for biologicals was valued at USD 0.92 billion in 2016. Though India's take-off in the area happened two decades ago, the pace of growth has been tardy.

The Department of Biotechnology (DBT) has envisioned creating a biotech industry that will be worth USD 150 billion by 2025. Biopharma is expected to drive over USD 750 million through the bio manufacturing of drugs, vaccines, diagnostics, and therapies. Many new opportunities in biological drugs are likely to open due to patent expiry by 2023 and beyond. Indian companies need to make their presence felt in this fast-emerging space.

The outsourcing of biopharmaceuticals manufacturing is becoming increasingly attractive, driven by the lack of captive manufacturing capacity with international mid and small biotechnology companies that drive the R&D pipeline. Another new value differentiator is in digital technologies that are tied to the demonstration

of outcomes and aid in medication adherence and monitoring, e.g., through digital biomarkers. India must be at the forefront of these innovations.

The business model of contract manufacturing organisations (CMOs) is rapidly evolving to suit the changing demands of biopharmaceutical innovation, with over 50% of biopharmaceutical companies outsourcing some form of their biopharmaceutical production. CMOs have also adapted well to the change by offering value-added services such as packaging, logistics and anti-counterfeiting in addition to traditional manufacturing, making outsourcing an increasingly attractive option. This would harness the strengths of the biotech and IT capability in India to acquire a front-running position globally in this emerging area.

Several initiatives have been taken to promote the startup ecosystem in the biotechnology sector and the pharmaceuticals sector will be a major beneficiary of these programmes. A single window clearing mechanism for all bio-safety products to create efficiencies and streamline the drug approval process, is proposed to be set up and christened as the National Biotechnology Regulatory Authority (NBRA). **Biotechnology Industry Research Assistance Council (**BIRAC) has been set up to promote research and innovation capabilities in India's biotech industry and to provide funding to biotech companies for technology and product development. BIRAC under Small Business Innovation Research Initiative (SBIRI) scheme aims to support biotech innovations. **National Biopharma Mission**, launched in June 2017, aims to boost development of biopharmaceuticals in India. These initiatives will bring results over the next several years.

States and Biotechnology Promotion

- Several State Governments have chosen to promote biotechnology industry. The major incentives are listed below, with the States offering them given in parenthesis.
- Subsidy on Power Tariffs (Andhra Pradesh, Assam, Chhattisgarh, Gujarat, Uttarakhand),
- Subsidy on Electricity Duty (Assam, Bihar, Gujarat, Rajasthan),
- Technology Acquisition and Development Fund (Andhra Pradesh, Chhattisgarh, Karnataka, Odisha, Rajasthan, Telangana, Tamilnadu),
- Interest Subsidy for Purchase of Technical Equipment for Upgradation (Andhra Pradesh, Chhattisgarh, Karnataka, Odisha, Rajasthan, UP, Uttarakhand),
- Reimbursement of Cost of Land and Space (Bihar, Rajasthan),
- Cost Incurred on Change of Land Use (Assam, Rajasthan),
- Reimbursement of State GST (Assam, Bihar, Odisha, Rajasthan, Uttar Pradesh, Uttarakhand),
- Some Exemptions for Mega-Projects (Uttarakhand),
- Capital Subsidy (Assam, Chhattisgarh, Gujarat, Odisha, Rajasthan, Uttarakhand),
- Environment Protection Infrastructure (Rajasthan),
- Biotechnology Education (Assam, Odisha, Tamilnadu).

It can be seen that States have taken significant measures to attract investment. Yet, barring a few, major investments have eluded them. The main reason lies in the absence of technology and scientific infrastructure and low-cost mechanisms for use of such infrastructure such as 'Plug and Play' facilities.[486]

[486] For a complete list of domestic policies see Chapter 6 of https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/SpecialPublications/Report-on-Domestic-Constraints-on-Exports-of-Selected-Sectors-new.pdf

9.4.6 Regulatory Policies

A discussion on policy coherence in a regulated sector will not be complete unless some regulatory policies are also reviewed. The Exim bank study on Domestic Policy constraints published in 2020 had reviewed multiple policies and programmes which create constraints on the growth of the sector.[487]

There are small but important measures on the regulatory policy side which require action to align it with the trade policy. For example, licenses are required for import and export of clinical material for clinical trials. If an accreditation system could be established providing for one-time clearance for such material, it will simplify the conduct of clinical trials and make them cost-effective.

A seamless certification system in a regulated sector can be a great boon for efficient management of the sector. Inspections are an important step towards certification. In this context, India's joining the **PIC/S** (Pharmaceutical Inspection Convention/cooperation scheme) will help immensely. It will align the domestic industrial, regulatory, and trade policies in a significant way.

The biggest facilitation on the regulatory side would however come from harmonising and optimising powers among, and actions by, the central regulator and the various state regulators. This would require action on many aspects of regulation. Structural harmonisation among these agencies is warranted. The central agency needs to be adequately staffed with high levels of skills in relevant areas of science and technology. A regular mechanism to expose regulatory personnel at all levels to international best practices is necessary to keep them well informed on global developments. Biopharmaceutical regulation requires even greater attention in this respect. Similarly, in chemical synthesis-based production systems, environmental regulation is of great importance. Though some helpful regulatory developments have taken place recently, the need for central coordination is strongly felt. This will be even more important now as the government has launched time-bound incentive programmes such as the PLI and Pharma Park programmes. Regulatory improvements are particularly important because seamless regulatory functioning and time-bound execution bring in prospects of better and timely returns from investments.

9.5 Trade Policy

As per the report issued by the World Trade Organisation on trade in medical products critical for the global response to the Covid-19 pandemic, India levies higher tariffs for medical product imports than the average applied tariff rates of the member countries of the World Trade Organisation (WTO). While the average tariff rate of all WTO member countries for medical products is 4.8%, it is 11.6% for India. More specifically, India levies a 10% tariff on medicines as against a WTO average of 2.1%, 15% on medical supplies as against 6.2% (WTO average) and 9% on medical equipment as against a WTO average of 3.5%. In the case of personal protective products, the Indian tariff of 12% is closer to the WTO average of 11.5%.[488]

The average MFN applied tariff on medicine is the lowest among different categories of medical products, at 2.1%. More than half of the Members have no tariff in place on medicines. Thirty-nine Members impose tariffs at 5% or below and no Member levies a tariff higher than 15%.[489]

[487] Ibid

[488] https://www.wto.org/english/news_e/news20_e/rese_03apr20_e.pdf

[489] https://www.wto.org/english/news_e/news20_e/rese_03apr20_e.pdf

Table 9.5: Number of WTO Members per average MFN applied tariff band; and average MFN tariff

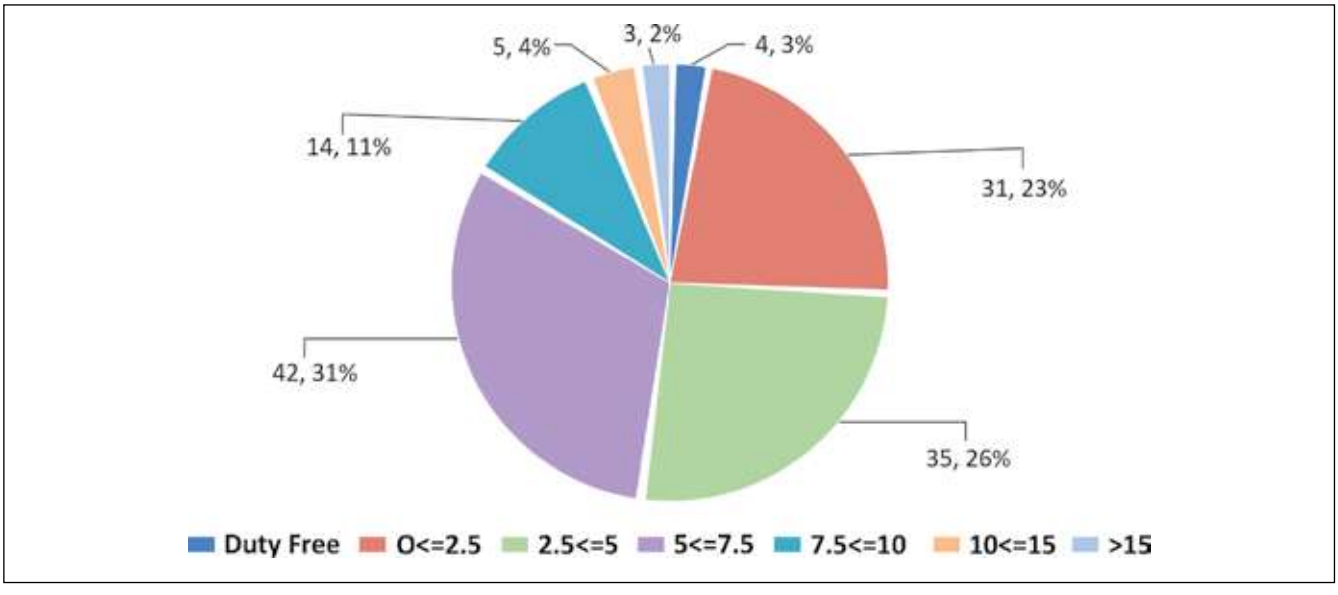
Duty range	All products	Medicines	Medical supplies	Medical equipment	Personal protective products
Duty Free	4	72	6	19	5
0 <=2.5	31	21	20	51	5
2.5 <=5.0	35	18	34	18	19
5.0 <=7.5	42	9	42	28	19
7.5 <=10	14	11	15	15	9
10 <=12.5	5	3	11	2	30
>15	3	0	6	1	47
Average MFN Tariff	**4.8%**	**2.1%**	**6.2%**	**3.4%**	**11.5%**

Source: WTO Secretariat.

The statistics show that more than half the Members (70 of 134 Members or 52%) impose MFN tariffs of 5% or lower. Among them, 4 Members do not levy any tariffs at all for all medical products (i.e., these essential products enter duty-free). They are Hong Kong (China), Iceland, Macao, and Singapore. Thirty-one Members (23%) have average tariffs between 0 and 2.5% and 35 Members (26%) have average tariffs between 2.5% and 5%.[490] India imposes a 10% tariff on the 53 APIs identified for the PLI programme. In 2017, these tariffs were increased to 12.5% but were soon restored to 10% indicating their criticality as inputs for formulations. The government has rightfully chosen not to increase tariffs on these products during the implementation of the support programmes.

Since India participates in international trade in the pharmaceuticals sector in a very significant way, the sector policies draw significant strength from the trade policy. The preceding discussion in this section clearly indicates that India has adopted tariffs higher than the global average in the sector. Indian producers have

Figure 9.4: Number of Members per range of average MFN applied tariffs



Source: WTO Secretariat.

[490] https://www.wto.org/english/news_e/news20_e/rese_03apr20_e.pdf

a competitive advantage in a large number of product areas. Further, India produces a large part of the pharmaceutical product spectrum. It has the advantage of having accessed almost every country of the world. In view of the recent experiences of protectionism displayed by many in the sector during the pandemic, there is a good case for India to consider lowering its tariffs on some pharmaceutical products as a response, and not to use restrictive trade policies unless strategically required.

It is also desirable that India's trade policy pursues an aggressive market access agenda for the sector which will translate into three kinds of actions besides the ones stated above. Firstly, it should negotiate a sector-specific section in all its existing and future FTAs which must contain protocols on 'effective' market access with a clear understanding of the regulatory commitments by the parties. Secondly, irrespective of the FTAs, India must negotiate cooperation arrangements and regulatory facilitation (to deal with Non-Tariff Barriers) including transparency commitments with major markets of India's interests. This will bring a distinct flavour to the trade policy by making it specific and persuasive to further sectoral interests, which unfortunately at present it lacks. Thirdly, India must review its excessive dependence on exports to the US (more than 32%) to hedge against a future regulatory shock. India's intertwining with the US is natural both because of historic interplays and a strong potential for science and technology cooperation in the sector. But while that is required, India's acute dependence on the US market can be counterproductive at times when economic nationalism is rising and the US has undertaken a short-term review of its pharma value chains. Therefore, strong market diversification efforts are necessary. In this context, targeted trade promotion is of great relevance. It has shown results in the past and needs to be pursued vigorously. India's quality of medicines has been questioned by vested interests in the West as a competitive tool against Indian medicines. Therefore, adoption of trace and track mechanisms on an industry-wide basis is also highly desirable.

Conclusion and Key Recommendations

The above discussion begins with tracking very briefly the legacy of the pharmaceuticals sector in India and identifying the strengths of the sector rooted in its evolutionary process. It then brings in the paradigm shift being witnessed by the sector and tries to identify core drivers of the new paradigm. This is followed by an assessment of the relevant policies which govern the sector, and tries to identify areas where policies are not aligned with the national objectives of developing a robust sector capable of exploiting the global opportunities available, and achieving global goals. It broadly discusses core policy areas, namely investment, trade, industrial, and regulatory policies. Since the sector has become increasingly technology-based, its capacity to respond to technology challenges will be determined by the sector's dynamism and flexibility. From day one of its evolution, the sector has been helped immensely by an array of government policies and actions. The sector has created a position for itself in the global market-place.

There are large segments of the market which actually depend on the versatility of the sector in providing affordable and responsible healthcare products. India has a global responsibility in that sense, but it can discharge this responsibility only when it keeps up with developments at the world stage, and continues to produce the best at the least cost. This challenge when disaggregated, throws up many smaller ones in the areas of investment, fiscal management, industrial development, trade promotion, education, regulation and technology-related policies. Some of these challenges and the responses that need to be addressed are identified in the above paragraphs.

The key recommendations which emerge from these paragraphs are listed below,

1. The restriction on 100% investment in the brownfield segment of the sector for foreign direct investment should be taken off as it does not stand to reason any more. Instead, the Government should link

investment in pre-identified technologies, establishment of R&D, or products with fiscal incentives such as tax exemptions, IGST reimbursements, and other similar instruments.

2. Contract Manufacturing and Research has huge prospects of growth as the IPR remains with the owner and India's low-cost manufacturing and knowledge base provides appropriate incentives for such investment. Therefore, the Government must review relevant trade, regulatory, and tax policies to align them with the objectives of growth in investment in this segment and also promote investment by creating the right ecosystem for this segment.

3. While price control may have served the social objectives of the country, it has done equal harm in disincentivising innovation. Therefore, the Government should reduce the NLEM to only core products, keep controlled dosage form or Novel Drug Delivery systems out of price control, and leverage its own position as the largest bulk buyer to get optimum prices. In order to get competitive prices, several state governments or the central and willing state governments could establish unified buying mechanisms. All government buying must shift to E-platforms such as GEM over a stipulated period of time.

4. The Government must bring in appropriate legislation to regulate distribution margins and code of ethics among members of the distribution business and medical practitioners to optimise margins to them and make available opportunities for investment to the industry.

5. Recognising the value involved in the size of operations as well as disadvantages inherent in the smaller size of some segments of business and its impact on areas such as compliance, quality, access to knowledge, and business practices, the Government may constitute a committee of experts to look into the merits and demerits of consolidation and suggest policies which will help in optimisation of size with the objectives of different segments of the sector. This recommendation should not be construed to mean discouragement of smaller enterprises but a means to bring in a strategic insight into size, performance and nature of business.

6. The new paradigm of the sector can only be responded to by promoting investments in all aspects of R&D covering both innovations and drug discovery. Private investments are constrained and in some areas because of the vastness of scope of required investments, there is complete justification for the Government to make adequate investments. A programme to set up Innovation Parks in addition to the Pharma Parks under development, on the lines recommended in the study carried out by the Department of Commerce and referred to, extensively, in this chapter, should be taken up.

7. To support specialised financing needs of the sector, particularly in the technology segment, the Government must promote a venture capital fund through a special purpose vehicle to be created by two or more banks and the Exim bank in accordance with the recommendations of the study referred to here.

8. It is quite expensive to access highly regulated markets. Even after receiving registration, there are distribution challenges. The relatively small size of the operators does not allow such investment, restricting their potential. Hence the scope of ongoing schemes such as Market Access Initiative and Market Development Assistance should be expanded in line with the recommendations made here.

9. It lies in India's 'strategic interest' that API manufacturing is restored in India at the earliest. Therefore, time-lines conceived in the schemes are required to be maintained. A real-time monitoring mechanism must be institutionalised in the highest executive office, if not already done.

10. A National Action Plan on Biopharmaceuticals must be institutionalised immediately. The startup segment of biopharmaceuticals is evolving well and should begin to show results in due course, but commercial expansion is possible only when corresponding investment promotion and regulatory changes are made post haste. Therefore a national plan including elements suggested in this chapter and the Pharmaceuticals chapter of the Domestic Constraint study of Exim Bank must be put in place.

11. The regulatory organisation in the Centre and the States needs harmonisation in terms of distribution of responsibilities based on their respective capacities and the gravity of these responsibilities. The central institution needs to harmonise interpretations and enforcement practices to create a regulatory environment for growth. The same holds true for other regulations such as environment and labour-related regulatory practices.

12. There should be emphasis on time-bound adoption of WHO-GMP by all operators. A time-bound initiative to join PIC/S, as it will require systemic improvements, is required. Adoption of a uniform template for COPP will help facilitate exports.

13. Government must avoid all pressures for increase of tariffs on any product stream as the sector is closely knit with global supply chains and any such increase is bound to initiate a ripple effect. In all existing FTAs and future FTAs, India must negotiate a regulatory and market access protocol with its preferential trade partners. Even without entering into FTAs, India must develop sector cooperation agreements with major countries of its interest to ease market access, particularly by securing commitments to regulatory processes and simplification of procedures to facilitate market access.

14. India's exports to the US constitute a large chunk of its export basket. While the US will remain a very prominent market for India, any adverse regulatory event can impact its industry. Hence market diversification is of critical interest, particularly to China, Japan, South East Asia, Latin America. Targeted trade promotion programmes and bilateral or regional negotiations with these countries / blocks over a period of time can help improve India's market share in these countries.

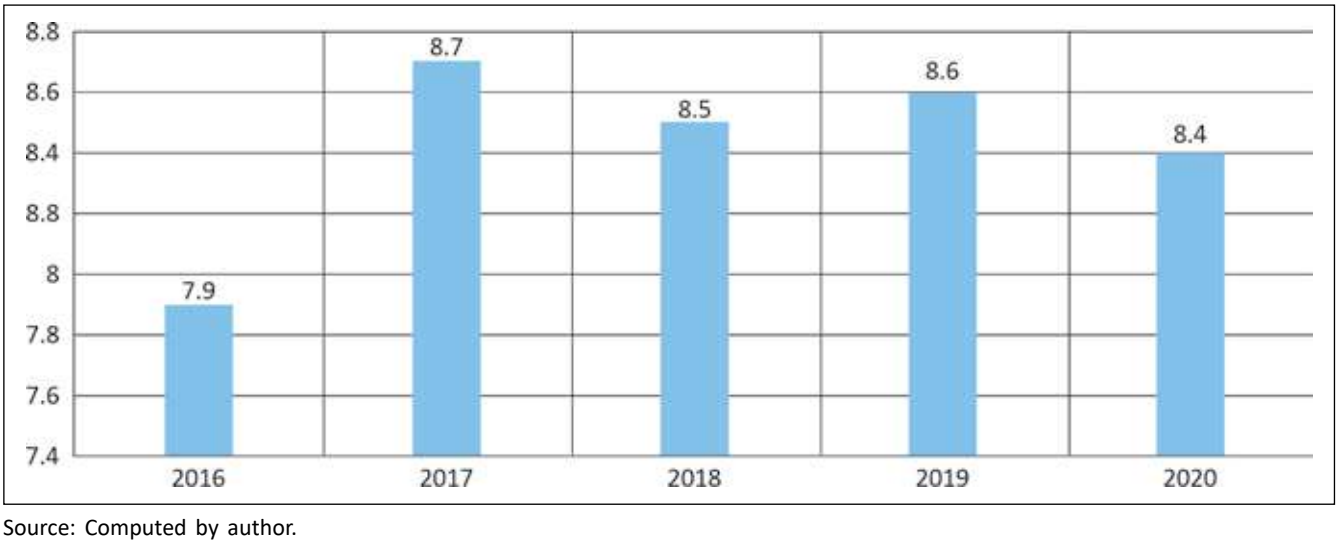
Annex 9.1

R&D and Innovation in Pharma

The core thrust of research in the Indian pharmaceutical industry, for the period post-independence till the seventies, has been largely (government funded through PSUs) development of technologies for production of already known molecules and process upgradation in order to improve local manufacturing facilities of APIs. The Indian Patents Act, 1970 allowed Indian establishments to work on patented molecules for developing new and novel non-infringing processes. Research geared towards the development of new NCEs and new APIs was less intense at the PSUs but certain initiatives of the above mentioned establishments with the private sector were significant. As a matter of fact, some public-funded Indian research institutions worked towards new drug development, and met with a decent level of success too. India's legislative initiatives ,like the Indian Patents Act, 1970, and others, such as eligibility of exemption from price control for new drugs invented through indigenous R&D, or developed through new processes (somewhat akin to the Bayh-Dole Act of the US) were, however, not commensurate with ensuring higher returns for those who were able to achieve some success. The cost incurred in the development of new drugs is exorbitant both in terms of money and time, with the time element usually stretching over a decade. The earning from the sale/transfer of technologies from new APIs somehow managed to keep the government-funded institutions afloat, but these were again meagre and did not match the investments made.

The Indian pharmaceuticals market is argued to be quite concentrated in terms of the number of players. For the period 1995-2005, we see that only 25 companies in India could capture 85% of the market.[491] The figure below illustrates this point well. Figure A9.1 shows the R&D expenditure as a percentage of sales in the top 10 pharmaceutical companies in India. The percentage hovers around 8% for the past 5 years, but is much lower at the global level. Figure A9.2 gives a disaggregated picture by giving the R&D expenditure of the top 5 pharmaceutical companies in India. Nevertheless, The Indian Patents (Amendment) Act, 2005 is considered a boon by many units, which intensified their R&D expenditure for the development of new APIs. In retrospect, the efforts of the industry helped the discovery of more than 120 NCEs, which are being evaluated through stages of clinical experimentation in search of new APIs.

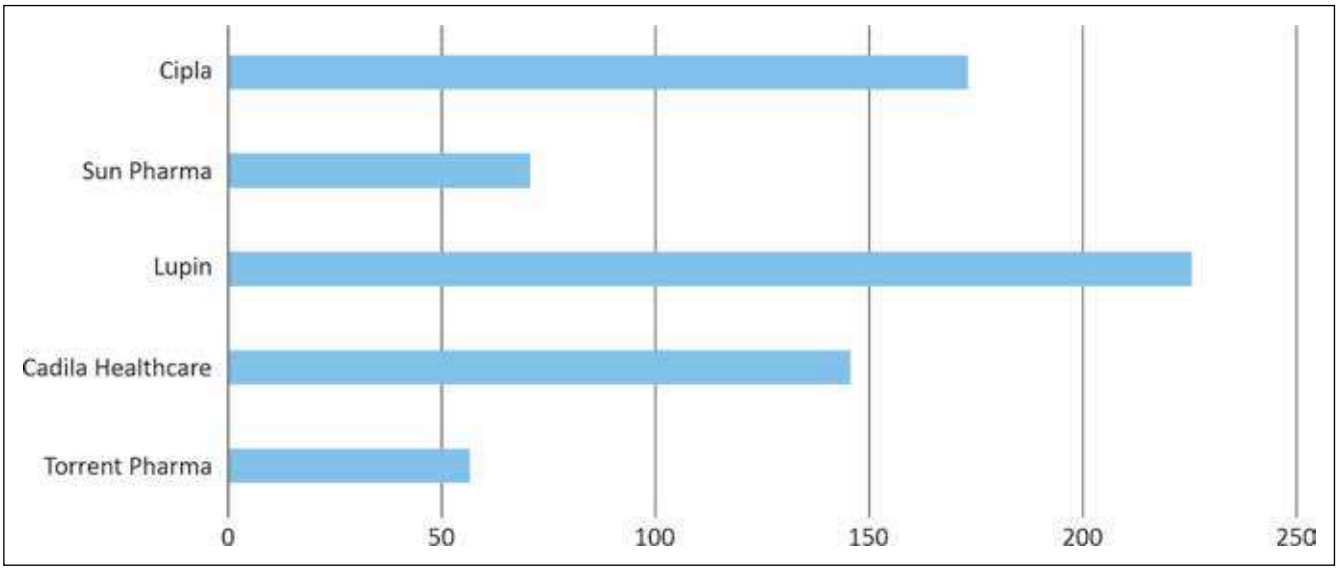
Figure A9.1: R&D investment by top ten Indian pharma firms (as % of sales)



Source: Computed by author.

[491] http://ris.org.in/sites/default/files/Publication%20File/DP%20236%20P%20K%20Ghosh%20DP-min.pdf

Figure A9.2: R&D Spending of Top Indian Pharma firms in FY20 (USD million)



Source: Computed by author.

In the post-patent 2005 period, the R&D expenditure of all major Indian pharmaceutical companies hovered in the range of 5%-10% of the sales value.[492] While this is higher than 2% for the pre-TRIPS period,[493] it is considerably lower than what MNCs spend on R&D.[494] Nevertheless, this increased R&D expenditure by the Indian pharmaceutical companies enabled them to increase the number of product pipelines for the US market. But in the arena of NCE development, the impact is very limited as a much smaller portion (20%-30%) of this expenditure goes into research related to NCEs, while a larger chunk of it goes to generics development, formulation and drug delivery technologies, or process R&D.

The process of developing a new drug is highly capital-intensive and time-consuming. Even those who do engage in drug discovery, focus on developing and manufacturing cost-effective generic products for US and European markets in key therapeutic segments, because that is where the research capital comes. There is irony in the fact that few clinical trials are being conducted for drugs fighting typhoid, jaundice, sickle-cell anaemia and diarrhoeal diseases like amoebiasis, diseases endemic to the indigenous population. Moreover, R&D often requires contract sites to take it ahead, which makes it even more expensive. These concerns can be mitigated by the adoption of the three schemes recommended in the section on investment policy.

Furthermore, the efficiency of the R&D expenditure of the Indian pharmaceuticals industry remains significantly lower than the industry average, with respect to both the success rate and the time spent across all the stages, except phase 1 of the success rate (see Table A9.1).

[492] https://pubmed.ncbi.nlm.nih.gov/28464443/

[493] http://nopr.niscair.res.in/bitstream/123456789/16392/1/JIPR%2018(2)%20105-110.pdf

[494] http://nopr.niscair.res.in/bitstream/123456789/42676/1/JIPR%2022%283%29%20136-145.pdf

Table A9.1: Success rates and timelines

	Stage	Indian Companies	Industry Average
Success Rates (%)	Preclinical	50.3 (82/163)	63-69
	Phase 1	54.0 (34/63)	48-64
	Phase 2	17.4 (4/23)	29-34
	Phase 3	33.3 (1/3)	60-70
Timelines (years)	Preclinical	1.90	1.0
	Phase 1	2.50	1.5
	Phase 2	3.40	2.5
	Phase 3	3.00	2.5

Source: Reproduced from Differding (2017),[495] p. 806.

A sound drug development programme rests on impeccable academic expertise spanning both chemistry and biology. It is Indian academic skill in biology that impedes serious R&D efforts in new drug development. A renewed focus of academia on higher educational attainment and training in microbiology could go a long way in this area. One of the many strategies that worked for China in this regard is an incentive scheme it devised for those of its expats who were trained in this field, which enabled the industry to be established and flourish. India, on the other hand, faces a serious brain drain in this field, among others. So a proper incentive scheme to prevent and maybe reverse the out- migration of skill and talent in chemistry and microbiology might be something to consider.

In general both trade and investment policy should be geared to promoting innovation.

[495] Differding, 2017

[This Page Intentionally Left Blank]

New and Emerging Sectors :
Medical Devices, Solar, and Electronics

► Chapter 10

Medical Devices – The Sunshine Sector

Introduction

The medical devices industry has experienced enormous growth in the preceding decade. Yet per-capita consumption of medical devices in India is far behind some other major economies. This growth is propelled by a number of factors, including the needs[496] of a large population and growing incomes in some segments of it. The Government has also played a significant role through its increased attention to strengthening healthcare services. In addition, the presence of an evolved and globally recognized pharmaceutical sector, a mix of R&D-focused[497] scientific institutions, and the availability of a large engineering workforce have helped the growth of the sector.

The Government has also paid pointed attention to the development of the electronics sector which will contribute greatly to the most valued segment of the medical devices sector. The recent international focus on de-risking manufacturing has manifested in its spread to different geographies rather than it being concentrated in a few locations. This is likely to further help India experience significant growth in this sector. India's stated focus on digital technology particularly Machine Learning, Artificial Intelligence and Robotics will, over the medium to long term, also help it move up the ladder significantly.

The medical devices industry in India consists of large multinationals as well as small and medium enterprises (SMEs), all growing at an unprecedented scale. The sector's current market size is estimated to be USD 11 billion. It is forecast to grow to USD 65 billion by 2024. For the development of this sector, the Government has allowed 100% FDI under the automatic route for both brownfield and greenfield investments. Since April 2000, India has received FDI[498] inflows of USD 2.1 billion. Out of this, USD 600 million was received in the last

[496] India's per capita consumption in 2014 was reported to be USD 3 billion in comparison to Brazil's USD 28 billion, Russia's USD 43 billion, China's USD 178 billion, Germany's USD 313 billion, and USA's USD 415 billion. Source: Deloitte and NATHEALTH (2016), Medical Devices Making in India - A Leap for Indian Healthcare, available at https://www2.deloitte.com/content/dam/Deloitte/in/Documents/life-sciences-health-care/in-lshc-medical-devices-making-in-india-noexp.pdf

[497] Focused on Research and Development

[498] Foreign Direct Investment

5 years. Singapore, United States, Europe, and Japan are key investors in this sector. In the medical devices industry, Equipment and Instruments, Consumables and Implants have attracted the most FDI.[499]

10.1 Trade in Medical Devices

India exported medical devices worth USD 2.8 billion during the year 2019 whereas its imports stood at around USD 7.2 billion in the same year. Its imports have consistently risen (41%) over the past 5 years (2015-19). They constitute about 80% of the demand for high-value medical devices in the country and about 70% of the low-value devices. The United States' estimated share of Indian imports is 30%.[500] India's exports in the medical equipment and diagnostic kits segments have experienced a consistent rise during 2015-18 with a marginal decline in 2019.[501]

The impact of Covid-19 on export growth is visible, particularly in the low-tech segment. The onset of the pandemic brought in feverish development in several areas such as Personal Protective Equipment (PPE) for doctors and paramedics, ventilators for emergency care, and diagnostic test kits for RT-PCR tests (Table A10.1 of Annex 10.1). Above all, it galvanised the Indian healthcare industry and the Government into taking some long-awaited decisions such as the Production Linked Incentive (PLI) scheme and industrial park development for pharmaceuticals and medical devices. Global mobilisation for vaccination against Covid-19, in turn, created a huge demand for products like syringes. India's exports of medical devices are expected to be around USD 10 billion by 2025.[502]

Table 10.1: India's exports of medical equipment and diagnostic kits in 2015-19

Code	Categories	Product label	Exported value in 2015	Exported value in 2016	Exported value in 2017	Exported value in 2018	Exported value in 2019
9018	Medical Equipment	Instruments and appliances used in medical, surgical, dental or veterinary sciences	625	619	654	789	953
9019	Medical Equipment	Mechano-therapy appliances; massage apparatus; psychological aptitude-testing apparatus	5	6	8	11	11
9022	Medical Equipment	Apparatus based on the use of X-rays or of alpha, beta or gamma radiations	175	238	230	302	284
9033	Medical Equipment	Parts and accessories for machines, appliances, instruments or other apparatus in chapter 90	80	84	77	80	69
3822	Diagnostic Kits	Diagnostic or laboratory reagents on a backing, prepared diagnostic or laboratory reagents	35	45	52	47	69

[499] Akriti Bajaj (2020), Invest India, available at: https://www.investindia.gov.in/sector/medical-devices

[500] Ritika Ganju (2018), 18 October, India: The Sunshine Sector In "Make In India" – Medical Device Industry Shines As Never Before, available at: https://www.mondaq.com/india/inward-foreign-investment/745722/the-sunshine-sector-in-make-in-india-medical-device-industry-shines-as-never-before#:~:text=The%20sector%20has%20been%20recognized,of%20medical%20devices%20in%20India.

[501] ITC trade maps

[502] Bajaj (2020).

Code	Categories	Product label	Exported value in 2015	Exported value in 2016	Exported value in 2017	Exported value in 2018	Exported value in 2019
3907	Diagnostic Kits	Polyacetals, other polyethers and epoxide resins, in primary forms; polycarbonates, alkyd resins	735	909	1198	1539	1214
9027	Diagnostic Kits	Instruments and apparatus for physical or chemical analysis, e.g. polarimeters, refractometers	66	111	90	119	110
		Total Exports (USD Million)	**1756**	**2058**	**2361**	**2934**	**2778**

Source: ITC Trade Map

Tables 10.1 and 10.2 show first of all that India's imports have been far higher than exports. The rate of growth of exports and imports have been about the same. As it is an emerging sector the highest exports and imports are at the same codes. For example, India exports and imports the same category of medical equipment. The only difference is that India exports low value products and imports high value products.

The second important point to note that the trade deficit in this sector has remained more or less constant and has increased just a little. However growth in exports of diagnostic kits which are relatively easier to make on account of a vibrant chemical and pharma sector has been impressive. The highest growth in imports has also been in diagnostic kits.

Table 10.2: India's imports of medical equipment and diagnostic kits in 2015-19

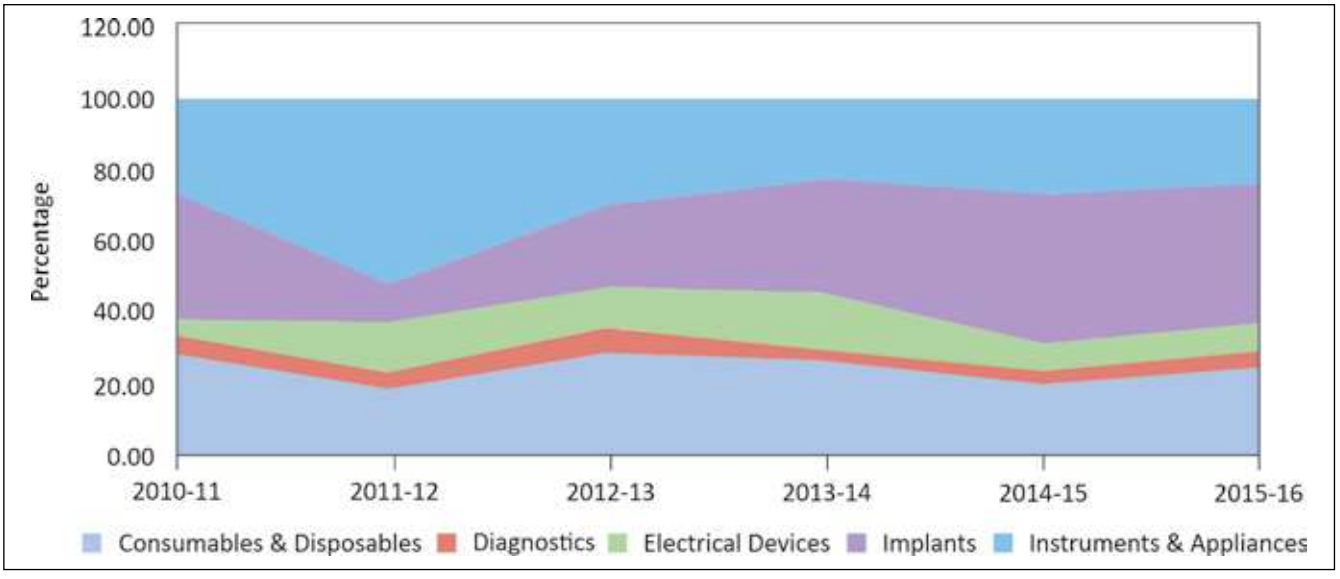
Code	Categories	Product label	Imported value in 2015	Imported value in 2016	Imported value in 2017	Imported value in 2018	Imported value in 2019
9018	Medical Equipment	Instruments and appliances used in medical, surgical, dental or veterinary sciences	1316	1317	1494	1717	1798
9019	Medical Equipment	Mechano-therapy appliances; massage apparatus; psychological aptitude-testing apparatus	121	127	159	186	192
9022	Medical Equipment	Apparatus based on the use of X-rays or of alpha, beta or gamma radiations	543	535	639	792	777
9033	Medical Equipment	Parts and accessories for machines, appliances, instruments or other apparatus in chapter 90	195	227	221	165	124
3822	Diagnostic Kits	Diagnostic or laboratory reagents on a backing, prepared diagnostic or laboratory reagents	329	355	412	461	515
3907	Diagnostic Kits	Polyacetals, other polyethers and epoxide resins, in primary forms; polycarbonates, alkyd resins	1267	1193	1443	1936	1882
9027	Diagnostic Kits	Instruments and apparatus for physical or chemical analysis, e.g. polarimeters, refractometers	1005	1077	1188	1298	1369
		Total Imports (USD Million)	**5105**	**5185**	**5968**	**7015**	**7174**

Source: ITC Trade Map

10.2 Medical Devices: A Disaggregated View

A disaggregated analysis is useful to reveal the production intensity across product categories. Figure 10.1 gives the share of medical devices by category produced from 2010-11 to 2015-16. It can be seen that production of implants has shown a consistently rising trend after 2011-12, growing from 10.4% to 39.6% in 2015-16. This can be partly attributed to the rising demand for affordable devices.

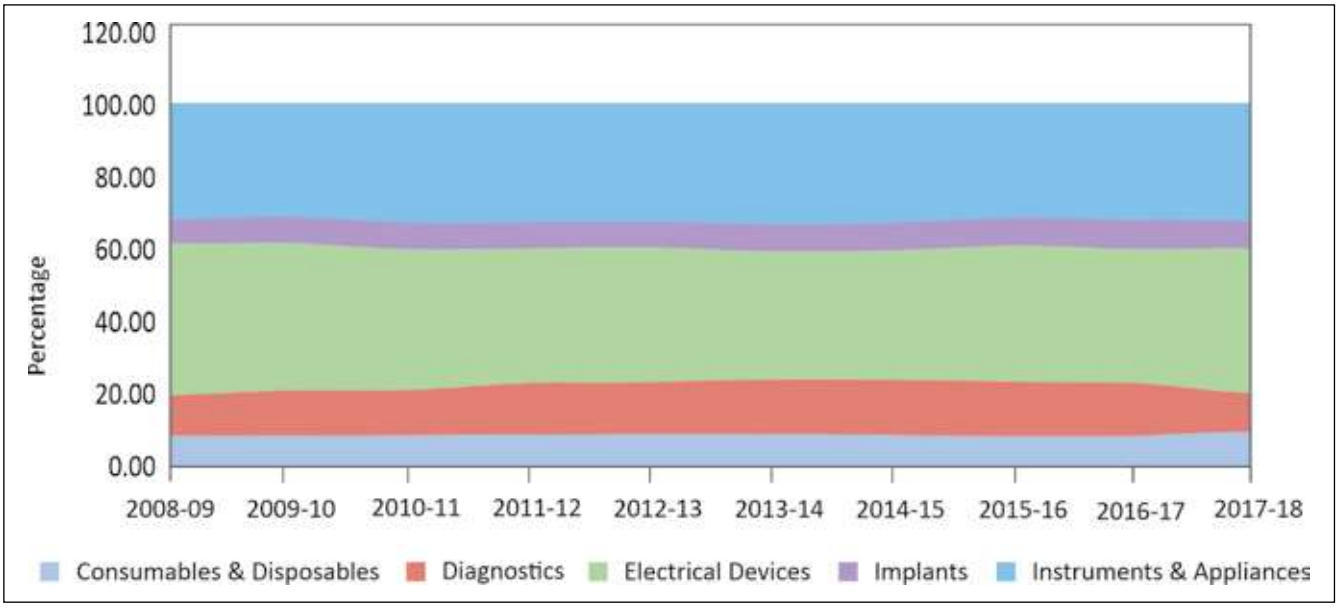
Figure 10.1: Percentage share of medical devices production by category (2010/11 to 2015/16)



Source: Reproduced from James and Jaiswal (2020), RIS report.[503]

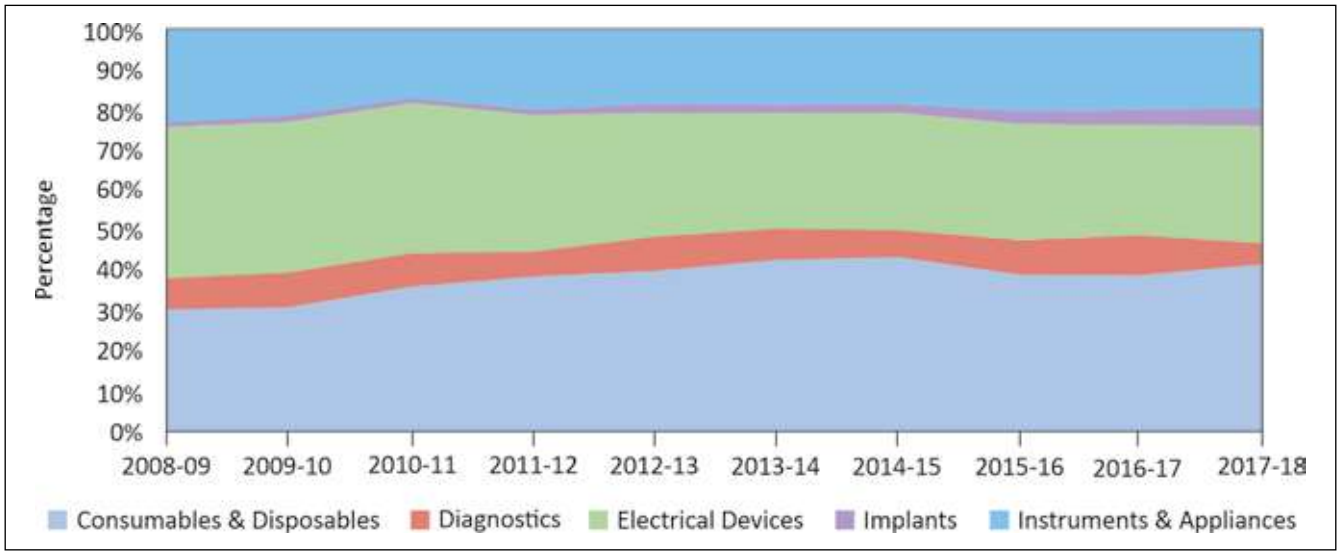
Figure 10.2: Imports and exports of different categories of medical devices from 2008-09 to 2017-18

Imports
(2008-09—2017-18)



[503] T. C. James and Abha Jaiswal (2020), Medical Devices Industry in India: Local Manufacturing and Trade, RIS, available at http://www.ris.org.in/sites/default/files/Medical%20Devices_Report.pdf

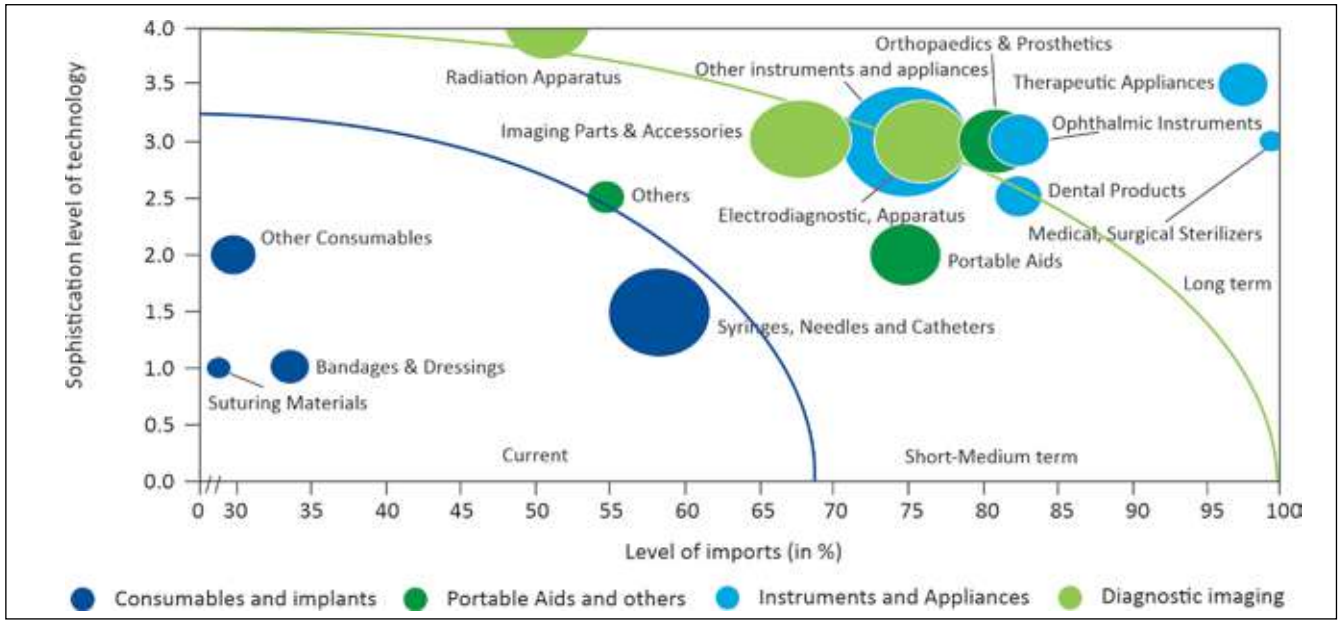
Exports
(2008-09—2017-18)



Source: Reproduced from James and Jaiswal (2020), RIS report.[504]

The trade picture depicted by the two panels of Figure 10.2 indicates that higher-technology products like electricals and electronic devices comprise a bulk of imports by the country. The scenario is diametrically opposite in the case of exports which is dominated by low-technology and low-value consumables and disposables. The entire sector is technology-intensive as can be seen in the following exhibit extracted from a study by Deloitte and NATHEALTH.[505] Therefore, policies which will help R&D and the absorption of new technologies, promote innovation, facilitate investments, and offer conducive regulatory frameworks will encourage growth of the sector.

Figure 10.3: Sophistication level of technology vs. level of imports by medical device type



Source: Deloitte and NATHEALTH (2016).

[504] Ibid.

[505] Deloitte and NATHEALTH (2016).

10.3 Government Policies to Encourage Manufacturing of Medical Devices

The Government of India has taken several measures in the recent past to encourage the growth of a vibrant ecosystem for manufacturing of medical devices in India. The Government has been helped by its experience of the growth models in both the automobile and pharmaceutical industries. Some of the important steps taken by the Government are:

1. **Recognition of Medical Devices** as a "Sunshine Sector" in the Make in India campaign launched in 2014, promotes and encourages FDI and domestic investment in manufacturing of medical devices in India.[506] The same year a multi-stakeholder task force was formed by the Department of Pharmaceuticals to highlight the challenges and suggest policy recommendations for cost-effective manufacturing of medical devices in India. The recommendations put forward by the Committee included strengthening the regulatory landscape, modification of the inverted duty structure with financial incentives by way of tax subsidies, and promotion of synergies in the healthcare sector.

2. **Schedule M III for medical devices under the Drugs & Cosmetics Act, 1940 was amended and delinked with Schedule M for pharmaceuticals**, in January 2015. This step ensured that ISO 13485 was complied with as the Quality Management System for manufacture and import of medical devices. Also, it paved the way for 100% FDI in medical devices companies by the automatic route for brownfield as well as greenfield companies.[507] The equipment, instruments, consumables, and implants proved to be the most attractive segments for FDI. Subsequently, import duties on as many as 67 categories of medical devices were raised from 5% to 7.5%. The basic intent behind these moves was to foster domestic manufacturing and import substitution.

3. **The Medical Devices Rules of 2017** were introduced with the intention to distinguish medical devices from pharmaceuticals for the purpose of regulation. In tune with global practice, the 2017 Rules have introduced a risk-based classification system for regulation of medical devices. The Government has brought in certainty with respect to timelines for each regulatory function, and has rationalized the time required to obtain licenses to market medical devices. Under the 2017 Rules, applicants can be certain of the time within which they will get a decision with regard to their applications, and also the time within which they can expect an audit or inspection to happen. The 2017 Rules have done away with the requirement of certificates for registration of foreign manufacturers, their manufacturing site, and the products. The only regulatory requirement to be able to import and market products in India is to appoint an authorized agent in India and apply for an import license through him. The immediate outcome of this change is that the hassle of making two separate applications (registration and import license) has vanished and the timeline for obtaining the import license (of nine months) is known.[508]

4. **A Single Window Clearance** has been put in place. All applications for import, manufacture, sale or distribution and clinical investigation, whether to be assessed by the DCGI or State licensing authority, have to be made through a single online portal of the Central Government.[509]

5. **Perpetual licenses for manufacturers** will be granted under the 2017 Rules meaning they will continue to be valid unless they are cancelled. In order to save a license from getting cancelled, the licensee is

[506] Ganju (2018).

[507] GOI, 2018, FDI policy further liberalized in key sectors, s.l.: Press Information Bureau.

[508] Analysis of Medical Devices Rule, 2017, available at: nishithdesai.com/fileadmin/user_upload/pdfs/NDA%20Hotline/Analysis_of_Medical_Devices_Rules-2017.pdf

[509] Ibid.

required to pay a prescribed license retention fee every 5 years. A delay of 90 days past the 5 years is acceptable provided the licensee pays a prescribed late fee. However, if the licensee fails to deposit the license retention fee within the aforementioned time-limit, then the license is deemed to have been cancelled.[510]

6. **A risk-based classification based on the Global Harmonisation Task Force (GHT) guidelines** has been adopted in tune with global practice under the 2017 Rules. The classification is as follows: a. Low (Class A); b. Low Moderate (Class B); c. Moderate High (Class C); and d. High (Class D). The method of classification is described in detail in the first schedule of the 2017 Rules.

7. **Infrastructural support to R&D** efforts for electronic devices like MRIs, electronic health records, and assisted devices has been established by the Ministry of Electronics and Information Technology (MEITY). Some examples of this are the National Resource Centre for Telemedicine and Biomedical Informatics at the Sanjay Gandhi Postgraduate Institute of Medical Sciences, Lucknow, and the Medical Electronics Labs (for calibration, repair and maintenance of medical electronics equipment) set up at the National Institutes of Electronics and Information Technology (NIELIT) in Aizawl, Agartala, Shillong, and Kohima. Adding to these efforts are the setting up of a batch fabrication unit of Linac tubes at SAMEER, Khargar Campus at Navi Mumbai, and an ICT centre of excellence on tactile graphics at IIT Delhi.[511] The National Electronics Policy, 2019 proposes various such schemes that support the manufacturing of electronic medical devices.

8. **The Medical Devices Amendment Rules of 2020** have introduced a major amendment by way of a new chapter on registration of medical devices by their respective manufacturers and importers. Thirty seven categories of already regulated or notified medical devices have been exempted from the need for registration. A staggered license liberalisation program for import, manufacturing and distribution between April 2020 and August 2023 has been notified to cover all categories of devices according to their risk profile.

9. **A Production Linked Incentives (PLI) Scheme for Medical Devices, 2020** has been introduced. This scheme for manufacturing of medical devices offers financial incentives to boost domestic manufacturing and attract large investment in medical devices segments such as cancer care devices, radiology and imaging devices, anaesthetics devices, implants, etc. Production-linked incentives of upto INR 3,420 crores will be awarded during the tenure of the scheme.[512]

10. **The promotion of Medical Devices Parks** aims to strengthen the infrastructure base and develop a robust manufacturing ecosystem for medical devices to position the Indian industry as global leader. One of the objectives of the Parks scheme is to create infrastructure facilities for increased competitiveness with a view to leading to better availability and affordability of medical devices in the domestic market. Another objective is to exploit the benefits arising due to optimization of resources and economies of scale. Grants under the scheme for development of world-class standard testing and infrastructure facilities will build momentum for domestic production and deepen the value chain of medical devices in India. Additionally, these are expected to reduce the cost of manufacturing significantly, leading to better accessibility and affordability of medical devices in the country. Financial assistance up to INR 400 crores will be provided for the creation of common infrastructure facilities in 4 Medical Devices Parks

[510] Ibid.

[511] MEITY (2018), Capacity Building, available at: http://meity.gov.in/content/capacity-building-2

[512] Invest India, 2020. " Schemes for Medical devices Manufacturing". Available at: https://www.investindia.gov.in/schemes-for-medical-devices-manufacturing

that are proposed by State Governments and selected under the scheme.[513] The Andhra Pradesh Medical Technology Zone and a Kalam Institute of Health Technology has already been set up in Visakhapatnam (see Box).

The Covid 'Opportunity'

India stared with serious inadequacies in its preparedness to deal with the unprecedented challenges of Covid-19. The most critical were the availability of ventilators, then believed to be the most critical of the biomedical devices for patient care, and PPE for healthcare workers. Most of these and many other products came through imports. Annex 10.1 gives the impressive growth achieved through remarkable initiatives taken by the Government in strong partnership with the private sector.

An empowered group of secretaries (EGoS) was tasked with the responsibility of ensuring availability and production of essential medical equipment along with their procurement, import, and distribution. The estimates were that the country would need 75,000 ventilators by June 2020 and in 3 months, India had manufactured some 60,000 ventilators. The Covid-19 pandemic and the need for ventilators brought to the forefront not just India's manufacturing prowess, but also its capacity for innovation and collaboration.

These times of turmoil triggered a wave of design, manufacturing, and innovation in the country. Indian industry, with its big manufacturers and start-ups, collaborated swiftly with engineering and technological institutions from across the country to boost production. In February 2020 there were only 8 ventilator manufacturers who manufactured 2,500 ventilators that month. The figure rose to between 5,500 and 5,750 in March. In the same month, EGoS placed orders for 60,884 ventilators with HLL Lifecare Limited, a public sector undertaking under the aegis of the Ministry of Health and Family Welfare, the central procurement agency during the Covid-19 crisis. Of these, 59,884 were ordered from domestic manufacturers, and the balance was imported.

Many major domestic players were given orders to manufacture ventilators including Bharat Electronics Limited (in collaboration with Delhi-based Skanray Technologies), NOIDA-based AgVa Healthcare (in collaboration with Maruti Suzuki Ltd. and the Andhra Pradesh MedTech Zone (AMTZ). Subsequently, about a dozen entities have shot up the ventilator manufacturing capacity of India. These range from large-scale automobile and Information Technology (IT) companies to universities and even independent start-ups. Furthermore, there are three Indian companies that were selected and licensed to manufacture NASA's coronavirus ventilators — Alpha Design Technologies Pvt. Ltd., Bharat Forge Ltd., and Medha Servo Drives Pvt. Ltd.

The ventilator experience highlighted the value of prompt opportunity assessment, quick decision-making, the tremendous contribution of the public procurement process in promoting healthcare, and the positive role of public-private partnership. However, it turned out that in India the requirement of ventilators was much less than expected on account of the infection being relatively less intense, as well as the alternative lines of treatment adopted in the treatment protocol which relied less on ventilators and more on high-flow nasal oxygen therapy. At the peak of manufacturing, the ventilator manufacturing capacity went from 300 per month among 8 manufacturers to over 30,000 from 16 manufacturers. As the COVID 19 severity declines, a glut in the ventilator market shows the need to open and promote exports.

At the beginning of the pandemic in January 2020, not even a single PPE kit including full body coverall was manufactured in India, and only a few N95 masks were available. Today 2 lakh PPE kits and 2 lakh N95 masks are manufactured in India on a daily basis (PM in his speech on 12 May 2020). Ministry of

[513] Ibid.

Textiles (MoT), was given the responsibility of setting up an indigenous value chain for manufacturing high-quality PPE kits including body coveralls and N95 masks locally. MoT launched "Operation PPE Coverall" on 24 March 2020. The whole operation was divided into key focus areas and MoT officers were divided into different groups as per specified focus areas to achieve the specific targets. Further, on April 2020, the MoT launched another initiative called "Indigenous End to End Capacity Building" for manufacturing of PPE kits. Consequently, within 60 days of launching the PPE indigenisation initiative, India became the second largest PPE producer in the world, manufacturing more than 4.5 lakh PPE kits per day.

India also has a reasonable presence of related and supporting industries in terms of educational institutions training the youth in textile technologies, availability of logistic companies, and increasing number of PPE Specialized fabric manufacturers. In addition to these factors, India has a significant competitive advantage compared to other nations in terms of demand conditions, factor conditions, and a context in which competition between manufacturers can thrive. India's healthcare market and hospital industry are expected to reach USD 372 billion and USD 132.84 billion respectively in 2022, making India one of the prominent players in the global arena. What India has achieved in its indigenisation journey is really amazing, moving from producing testing swabs during lockdown to emerging as a major supplier of ventilators and PPE kits besides many other products mentioned in Table A10.1 of Annex 10.1. This is a clear indication of how a unified strategy and co-ordinated public-private partnership were successful in creating new opportunities and a new line of products with global capacities.

Source: How Ministry of Textiles Developed the Indigenous Supply Chain in India for Manufacturing of High-Quality PPEs and Testing Swabs during Covid-19 Pandemic Situation? IFC and HBS study

10.4 Policies Adopted by Other Countries to Facilitate Exports

Many important players in the sector have adopted supportive policies for the growth of the sector. It can be safely inferred from these policies that even in some developed countries medical devices continue to be clubbed with pharmaceuticals in some aspects of regulations such as pricing and standards.

Japan

To promote exports of medical devices from their country, the Government of Japan used policy measures such as accelerating regulatory approvals and eliminating so-called "medical device lags" and "drug lags" in market introduction as well as rewarding manufacture of innovative medical devices and pharmaceuticals. Government reforms like greater harmonization with EU and US regulatory regimes and R&D tax credits have helped persuade companies to set up shop in Japan.[514] The objectives of the Drugs and Medical Devices Law are to improve public health through regulations required to assure quality, efficacy, and safety of drugs, quasi-drugs, cosmetics, medical devices, and regenerative medicine products and to prevent hazard and expansion of hazard in public health caused by use of these products. The Pharmaceutical Affairs Law was amended in 2013 to strengthen safety measures, to establish regulations and control on medical devices, and to recognise them as separate from pharmaceuticals for the purpose of regulations.

Appropriate pricing policies have been adopted to bring down reimbursement rates. Almost all medical devices sold in Japan are ultimately paid for by Japan's National Health Insurance (NHI) system. In fact, it is illegal in almost all cases for the Japanese to purchase medical devices that their government has not set up reimbursement for. Reimbursement prices for medical devices are revised approximately every 2 years based on one of two factors: the "reasonable zone" (R-zone) and foreign average pricing (FAP). R-zone reductions

[514] http://www.mitc.com/wp-content/uploads/2015/04/2015-Medical-Devices-Resource-Guide-Japan-and-China.pdf?29e721

are based on the margins that distributors offer to hospitals for products in a specific functional category. The MHLW conducts a distributor pricing survey to assess the prices being charged to hospitals and the resulting margin as a percentage of the prevailing reimbursement rate. FAP reductions only occur when reimbursement rate is 1.5 times higher than the average price of the product in the same STM category in major foreign reference countries. The reference countries are the U.S., U.K., Australia, France, and Germany.[515]

China

In response to criticism of the quality of medical devices manufactured in China, the State Council issued the Twelfth Five-Year Plan for Drug Safety (2011–15) that emphasised raising the standards and quality of drug products in order to reach the advanced international level of medical devices produced in China. Effective 1 April 2020, the Chinese Government requires medical equipment exporters to declare that the products meet the standards of the importing country as well as proof of registration certifications from the China National Medical Products Administration and relevant provincial-level Chinese authorities.

Germany

The Healthcare/Life Sciences (HCT) industry is a priority both for the European Union (EU) and Germany as reflected in the European Regional Development Fund[516] (ERDF) program, 2014-20 and the German Länder implementation and tendering of this program. "Horizon Europe", a European Incentive Program for Research and Innovation agreed upon by the EU Council and Parliament and scheduled to begin on 1 January 2021, also focuses on health, and health-sector, related R&D and innovation. Projects will focus on smart health and ageing, rollout of digital models of care, and value-based care.

10.5 Challenges Holding the Sector Back

The medical devices sector is, arguably, an important growth node for future. The industry has responded effectively to the global stimuli of opportunities and domestic potential for growth. The growing focus on healthcare coverage, extensive implementation of schemes such as Ayushman Bharat, and expanding coverage of health insurance programs, is bound to further galvanise the sector and significantly raise demand for products. Since there is a large space between the demand in the very fast-moving healthcare space and the supply of medical devices there is a huge opportunity for global suppliers as well. Therefore, this is an ideal arena for 'domestic versus imported' contest which was witnessed in cases such as pricing of cardiac stents and some implants. Interestingly the external pressures for regulatory and institutional reforms and articulation of an emerging and ambitious domestic industry on these concerns have reinforced each other which has helped the evolution of the sector.

The Central Government, in 2018, decided to set up the **National Medical Devices Promotion Council (NMDPC)** to boost manufacturing, attract investments, and promote exports in the medical devices sector which is seen as a sunrise sector. It was finally set up in January 2020, with the Secretary to the Department for Promotion of Industry and Internal Trade (DPIIT) as its head. It aims to create a predictable and staged regulatory structure for medical devices, enabling an environment to receive representations and grievances from the industry, discussing trade margin rationalisation and tariff protection for devices. This was again a reflection of the sensitivity of the policy-makers to respond in a timely manner to the potential demands of a promising sector. It provides a lesson in policy-making for many other sectors in India, which also have a

[515] https://www.pacificbridgemedical.com/regulatory-services/medical-device/reimbursement/#:~:text=Reimbursement%20for%20Medical%20Devices%20in%20Japan,not%20set%20up%20reimbursement%20for.

[516] This is known as EFRE in German.

promising future. The mandate of the Council is to design and suggest policy interventions that promote local manufacturing of high-quality medical devices, in order for India to be able to cut down its import burden while also generating export revenue. The multidisciplinary council is coordinated by the DPIIT. It may prove to be more effective if it is headed by an office higher than the Secretary to the Government to bring in greater cohesion and accountability from other departments and stakeholder.

The All-India Medical Devices Industry Association in its paper titled 'Indian Medical Devices Sector --Blue Print and Regulatory Policy Roadmap',[517] discusses its perspective on the growth of the sector. Industry representatives and some knowledgeable experts recommend adoption of a **P3 growth strategy**, i.e., PLI (Production Linked Incentives), PMP (Phased Manufacturing Program) and PPO (Public Procurement Opportunities).

The domestic industry is growing well at the lower end of the technology ladder and has achieved good market access abroad in a short span of time. However, India will be able to capture greater value for its economy not merely by expanding this segment but also by accessing the middle segment, and then the upper one. As per capita consumption rises, demand is bound to grow in all spheres so while volumes will come from the lower end of consumables and disposables, the value will come out of implants, diagnostics, and electrical and electronic products. Most of the over one-thousand odd players in the domestic industry are from the MSME segment, therefore it is unlikely that they can commercially propel the technology engine forward by themselves. An ideal mix will be investments by the Government itself in institutions for technology development and promotion besides creation of fiscal instruments for promotion of R&D in the private sector. The Departments of Science and Technology (DST) and Biotechnology (DBT) have created an effective mechanism for **growth of start-ups** and technology incubation involving reputed technical institutions such as the IITs. The results will be visible only after 5 to 10 years. **Foreign investments** are required to keep up the present momentum, particularly in the higher-technology segments of the sector. This will require two types of interventions, namely facilitation in setting up businesses and providing regulatory frameworks in line with the best in the world, and adopting trade and industrial policy instruments to expand market opportunities to sustain manufacturing in India at a global scale. The medical devices sector distinguishes itself from some other promising sectors in its **multi-faceted character**. On the one hand, products and technologies exist which are simple and pervasive but, on the other hand, new complex technologies make manufacturing within the country difficult in the short run.

10.6 Merging Trade and Investment Policies in this Sector

In this background, a **National Program for the Growth of Medical Device Industry** with focus on the following instrumentalities should be launched:

Set the tariffs right: While the Government has set right many instances of inversion in duties in the recent past, there are still some cases of **inversion** reported. The domestic industry would like tariff walls for protection, in a classical adoption of a phased manufacturing program, but an indiscriminate tariff rise may not be conducive to the domestic needs of healthcare expansion in the short run, and is also not recommended by experts in the sector. There are **two types of products** as far as tariffs are concerned — the spares and components, and the final products. In the first category, existing tariffs within a range of 0% to 2.5% appear reasonable depending upon the availability of production capacities for the specific product within the country. For final products, the existing tariff range of 5% to 7.5% may be justified again depending upon domestic production capacities with respect to the selected product. This will take away

[517] This was published in the International Journal of Drug Regulatory Affairs, June 2020.

the possibility of inversion on some of the remaining product lines. Hence a judicious mix of segment-by-segment, and product-by-product, **examination of value chains** is necessary to see that no inversions or unwarranted tariff walls are created, to avoid increases in healthcare costs in the short run. With the fall of nominal tariff rates for some components, some Indian players resort to importing Chinese products and then export them, labelled as Indian medical devices. The reduction of tariffs to a minimum has resulted in almost complete import dependence in some cases. This is partly aggravated by the inertia of Indian manufacturers to invest, given the option of cheaper components, completely avoiding the huge capital outlay. Therefore, a comparative assessment of the **strategic importance** of the product for use in domestic healthcare and downstream production will help to safeguard national interest. Adoption of an internationally acceptable ecosystem, comprising technical standards and conformity assessment procedures and institutions, is also of great importance here in checking imports of substandard products. Therefore, a cohesive treatment of both tariff and non-tariff aspects of the trade policy is desirable. It is quite clear that as the sector evolves further India will need much greater infusion of technology and investment, therefore low to moderate tariffs and an international standards system will come handy for growth. The Government must eschew pressures for any tariff rise from the domestic manufacturers citing the need for a phased manufacturing program. This will have to be further supported by development of an appropriate ecosystem for manufacturing suggested later in this chapter.

Set the governance and regulatory framework right: Much forward movement has been made in this direction but the Government has shied away from addressing two basic concerns, firstly, creation of a legal and regulatory framework outside the Drugs and Cosmetics Act, and secondly, setting up a dedicated regulatory institutional framework for the medical devices sector. These initiatives are needed because the basic disciplines and use ecosystems of the two sectors differ, and require differentiated approaches. While one discipline is led by pharmacists, the other is a mix of engineering and several science disciplines termed as Biomedical Engineering. Even the rigour and orientation of two disciplines varies. Hence a dedicated institution for medical devices governance and regulation appears desirable. Some medical devices fall under the ambit of the Drugs and Cosmetics Act, and hence are governed in line with drugs. The regulatory treatment of some of these devices like drugs causes unnecessary delays and inefficiencies because approach to pharma regulation is based on its own unique character for example the environmental footprint of synthetic chemistry- based pharmaceuticals. There are life cycle differences between the two broad categories of products and principles and approaches for regulation vary. The human resource skills for the two sets of disciplines are also different. Howsoever new infusion of required skills is promoted the institutional culture is difficult to harmonise.

The Medical Technology sector is of recent origin in India. Government initiatives in **PPP (Public Private Partnership)** mode since 2012 in various healthcare programs seeded the sector. Taking a myopic view born out of administrative exigencies, the Government nominated the Department of Pharmaceuticals as the department in charge of the sector. This department is a constituent of the Ministry of Chemicals and Fertilizers, and is unsuited to the task of developing this sector. Medical devices are dependent on an amalgamation of disciplines such as engineering, electronics, information technology and material sciences, which is not the case with pharmaceuticals. Ideally speaking, recognising the content of the sector and the similarity of the ecosystem for the growth of the sector, it should have been housed in the **Department of Biotechnology** by renaming it as **Department of Medical and Biotechnology**. That would have brought synergies and uniformity of approach. There can be an alternative view to bring the Medical Technology function under the umbrella of the Ministry of Health but that can be counter productive as the latter will have a user or beneficiary perspective which alone may not be conducive to the growth of the domestic

industry. Ideally health ministry perspective should inform the governance of the sector rather than take charge of it.

In particular, there are concerns regarding the regulatory capacity of the CDSCO and State Regulatory Authorities (SRA), which mostly regulate drugs, with respect to their approach to regulation of medical devices. The sector has enormous diversity and the covered products range from simple surgical gloves, thermometers and syringes to highly complex technology products covering physical sciences, biosciences and material sciences at the frontiers of those respective technologies. This diversity is further reflected in the **multitude of regulations** that the sector faces including atomic energy regulations. The sector is regulated by **12 regulators** which means it is simply impossible to be regulated unless a **multi-disciplinary regulatory architecture** is established. The inadequacy of human resources available to the drug regulator for this sector is glaring. Since the sector has huge potential for growth, a **dedicated regulatory architecture** is required.

Standards and Technical Regulations: It is imperative, in the context of the globalised nature of the medical devices industry, that India follow **international standards** and not repeat the same mistakes as in the pharmaceuticals sector. Here even till today, we respond to a multiplicity of standards rather than follow global standards uniformly, which in turn greatly pushes up the costs of accessing global markets. From a purely consumer-centric sensitivity too, it is important that the best standards be followed, as far as possible, though adoption of national standards may be a temptation in order to promote protectionist barriers. The adoption of **ICIMED** (developed by QCI) standards framework equivalent to international standards is a welcome move and would also allow domestic innovations to address the unique demands of other developing regions. Adopting international standards is beneficial on many fronts -- it allows domestic producers easy access to global markets, and also offers domestic buyers unhindered access to global products. Since the medical devices sector is a regulated sector and has important connections with human and animal health, compliance with standards related to quality is of prime importance. As the implementation of the new rules unfolds over time, **investments** in a sound **testing infrastructure** will become increasingly important. Further, **conformity assessment procedures** through **third party certification** will become the imperative for a fast-moving sector to improve its credibility and therefore its **brand equity**, and also to provide consumer satisfaction. India's pharmaceuticals sector developed strong brand equity through a process of trials and tribulations, whilst adhering to a mantra of accessibility, affordability and accountability. It offers a great learning experience for this sector. Adoption of a sound implementable **Trace and Track system**, where applicable, will be of great advantage in building a solid brand India for medical devices.

Support through Public Procurement: India is not a signatory to the WTO's Public Procurement Agreement. It is guided by the provisions of Article 3(8) of the GATT. Hence it is not bound to follow pluri-lateral discipline on public procurement. Whereas the relevant rules have internalised provisions for giving preference to domestic manufacturers, they are still not implemented in many cases. One reason could be to offer a wider choice to the consumer as the sector is still evolving and some product streams may not have a large spectrum of product choice. Apart from this, health is a State subject and public procurement agencies functioning at State level do not have proper understanding related to implementation of this order. Indian companies also find it difficult to compete with Chinese prices, even though Indian products may be superior in quality. The tendering procedure may also be discriminatory. An **adequate price preference** to domestic manufacturers provided the product meets the **notified standards** is well within the realm of permitted action. Since the larger part of the healthcare industry is covered by Government hospitals, this provision alone can help in expanding the domestic industry to make it globally competitive. It is also important that purchase requirements are **standardised** in terms of specifications etc., so that elements of discretion, when not required, are kept out and red tape is avoided. To begin with a more desirable approach could

be to introduce selected medical devices on the **Government e-Marketplace (GEM)** portal for Government procurement through **rate contracts**. A large number of devices are used by the Government hospital system both at the Central and State level, therefore a rate contract mechanism may help in making the process more transparent, cleaner and faster. It will help the domestic industry at least at the lower levels of technology to function on a level playing field. GEM accompanied with a high-standards regime can help all the stakeholders in the sector. Indian manufacturers are mostly MSMEs with limited operating funds, so a **delay in payments** from the Government puts a strain on their operation and capacity. A mechanism of faster payments can ensure smooth and timely conduct of operations.

Health Insurance: India's health insurance penetration has a long way to go. Deeper and wider penetration of Health insurance and good and expansive implementation of Ayushman Bharat offer a great opportunity for this sector to benefit. In many countries reimbursements are allowed on the basis of government approved rates wherein lies this potential. Therefore, government's supportive policies in this respect can make significant improvements in helping promote domestic manufacturing and give the benefit of scales to the domestic industry.

Promoting Investments and Technology: Since this is a technology-dominated sector investment potential and technology flow are intertwined. As already stated, domestic manufacturing is largely offering products at lower levels of technology. India will benefit if high- technology low-volume products are also manufactured within the country for domestic and global markets. Consistently growing domestic demand will be a major enabler. Since it is largely the MSME segment of industry which pervades the sector, access to **R&D, new technology and corresponding finance** is the most crucial requirement for the industry. The initiatives taken by the Government in facilitating incubation of new technology will take some time to bear fruit. Therefore, foreign **investment in high- and medium-technology products** will be required. The FDI route is already open 100% and ease of setting up business is equally relevant to this industry as it is to others.

Technology-seeking interventions are required at **three levels**. Firstly, promotion of technology development as already envisaged in the S&T policy on developing **incubators** and **start-up ecosystems**; secondly, making investments in **technology institutions**, setting up technology development centres in collaboration with global and domestic institutions of high capacities with a targeted and time-bound **R&D agenda;** and thirdly, identifying entities with access to pre-identified technologies of national importance from the global pool and making special arrangements for their inflow into the country. Any policy promoting investment and technology flow should address facilitation in procedures, the institutional ecosystem, and relevant fiscal policy.

There are **three kinds of products** on the technology ladder. Firstly, there are those which are or can be produced at home without any further effort -- mostly domestic producers at current levels of capacity will prefer investing in such areas. **Foreign investors** will invest in India in order to consolidate their global production either to add to their capacity to produce an existing product or to expand their product basket in a brownfield facility or to make a greenfield investment for a traditional product. Secondly, there are those which involve use of **components**, which are not being produced in India, or cannot be, in the short run. Thirdly, there are those where there exists a **knowledge gap** which needs to be filled even before we can plan domestic production. There is a significant **technology dependence** in the last two categories of products, and requires interventions at several levels from a policy perspective. This requires us to work with those who are ahead in the learning curve globally through **joint ventures**.

As stated earlier the high-value products have significant dependence on the **electronic manufacturing ecosystem**. The recent focus on promoting the latter should help in this effort to some extent. But some

areas require major efforts where **backward integration** is critical, for example, in products involving Magnetic Resonance Imaging (MRI), where a superconductivity magnet is the foundation for such production. There exists a **knowledge gap in complex-technology areas** such as radiation, non-ionic radiation, laser-based machines, opto-electronics, robotics etc. Similarly, capacities for manufacturing **core electronic components** and spares such as sensors, micro-controllers, extrusion mechanisms need to be developed in India. In both these cases, a foreign partner is essential. There are some products which are so expensive or so highly technology-intensive that they are produced by very few producers globally, for example, Linear Accelerators for cancer therapy. In this case only two producers existed, namely Electra and Variant, till Siemens decided to enter the arena in a big way. However, instead of setting up a new facility it preferred to acquire Variant. Global players may not consider shifting their production from existing facilities for many reasons. An interested investor may simply acquire an existing facility instead of creating one. The global market is growing only at 3% annually, leaving little space for investments to pay off within a reasonable time. Therefore, most of the investment in the last decade has been in the nature of **consolidation investment** through mergers and acquisition. Such investment will come only when there are companies worth acquiring. In their absence, investment is unlikely to take place. India is still on a lower trajectory in that sense and attractive acquisition targets are yet to evolve. Since India's healthcare coverage is bound to expand significantly over time investments in technology intensive manufacturing may not be attractive at the moment. Global demand for such equipment is growing albeit at a low rate. Therefore, in some cases neither the domestic market may be attractive nor there be the temptation of producing for the global market. In such situations it is neither wise to raise tariff walls assuming investments will jump these walls nor assuming that keeping low or no tariffs will significantly help in changing the demand. Therefore, investments are **tariff-agnostic** in such situations. This explains the relative lack of investment flows into the domestic sector. In this background, there is no alternative to the Government itself paving the way for attracting investments in core platform technologies which form the base of a large stream of products.

Among the components, medical devices have two kinds -- those which are sector-agnostic and those specific to the sector. Sometimes sector-agnostic components can be critical in nature and can actually trigger an entire value chain. For example, Saint Gobain are the largest makers of toughened glass. They have factories in India. They also make high-precision glass for CT tubes but make it only in Germany. Thus, manufacturing of this high-precision glass can actually create a whole value chain in India if the corresponding tariff policy and a promotional fiscal policy specially tailored for such kinds of cases are made to encourage promising investments. There are 24 products which are based on core platform technologies which can trigger specific value chains if appropriately supported (please see Table A10.2 of Annex 10.1). It is notable that almost 75% of our imports are of products from this Annex Table. Support could be provided also by reimbursement of up to 100% of the cost of plant and machinery for manufacturing the products mentioned in the medical devices' PLI scheme, by setting off the amount of cost against the CGST component of sales invoices through input credit or other such mechanisms, for a period of 5 years, or earlier if 100% cost of plant and machinery is recovered before 5 years. For the components / accessories used for medical devices covered by the PLI scheme, a similar reimbursement to the extent of 50% of the cost of machinery for these components / accessories, through CGST linked reimbursement / input credit could be considered. These would be game-changers. While PLI will incentivise sales, the CGST refund / rebate would incentivise investment itself. These incentives should be seen from a perspective that the sector at present is at a nascent stage and national healthcare expenses are bound to rise very significantly. Therefore, if takeoff can be adequately managed, the relevant segments will become self-propelling over time as volumes increase.

In the section on **Tariffs**, it has been stated that two levels of tariffs work best for a technology sector. Lowering of tariffs alone at the pre-components stage is not enough to encourage assembly of components.

Raising tariffs beyond the present 7.5% will be counter-productive and is considered investment-averse for a technology sector. It requires a **complete production ecosystem** which should include common facilities, scientific and general manufacturing infrastructure, R&D facilities, knowledge-supporting institutions, etc. This implies the need for **comprehensive Medical Technology Parks** with all of these facilities, as well as facilitation such as **plug and play**. Lessons are being learnt from the twin institutional development of **Andhra Pradesh Medical Technology Zone (AMTZ) and Kalam Institute of Medical Technology and Health (KIMTH)** (see Box).

Government's recent announcements on the Production-Linked Incentive program and the development of 4 Industrial Parks must internalize these learnings to be successful. The PLI and the Park schemes have addressed the issue of **disabilities to domestic manufacturers** with respect to other competitive manufacturing nations to a limited extent only, as there is uncertainty about the calculation of disability levels in the design of the scheme. The larger issues of setting up an **ecosystem for high-technology manufacturing** in India, and inviting investment in pre-identified technologies which can help to build value chains here, still need to be addressed. In this context, **3 factors are of prime importance**. Firstly, investments need to be made in the scientific and industrial infrastructure on the lines made in the AMTZ. The location of the zone will determine the nature of such investment and its magnitude. The Medical Devices Parks scheme will support 4 such Parks at the cost of INR 400 crores. The nature of facilities at these places will vary according to the product streams selected, on the basis of markets, healthcare segments they address, technology institutions available for affiliation, location of the Park, for example, coastal or otherwise, and so on. The AMTZ has hugely benefited from the presence of the Kalam Institute which has turned into a technology advisory institution and a knowledge partner. This underlines the need for a **technology institution to be attached to an Industrial Park** to promote manufacturing. **R&D are intrinsic to the sector's development**. Each Park may have a network of academic and research institutions dedicated to specific areas in their knowledge domain tasked with pre-defined objectives. The central institution at the Park could work as the hub and all the regional institutions could be associated as spokes. Besides existing fiscal instruments to promote technology development and sharing, patent registration and licensing will be required. This could be achieved through a process of **e-auctioning** of the patents developed for use. Corresponding fiscal incentives such as higher-weighted deduction for direct taxes is a long- pending demand of technology-based industry but has gone unattended by the Government.

The Andhra Pradesh Medical Technology Zone

(Special thanks to Dr. Jitendra Kumar Sharma, Managing Director, AMTZ for his very valuable inputs)

India consumes about INR 55,000 crores worth of medical devices per annum which is met predominantly by imports. In the high-end category, the dependence is as high as 80% while for others it is still a whopping 60%-70%. In order to facilitate domestic manufacturing, the Government has to provide exemptions on duties on capital equipment imported for the purpose of manufacturing the medical devices. Moreover, what is needed for manufacturers are basic facilities such as uninterrupted power, water, and other amenities such as testing, packaging, and quality assurance. The concept of medical technology zones provides exactly that and a stellar example is given by the Andhra Pradesh MedTech Zone (AMTZ) in Visakhapatnam.

At AMTZ, apart from the said basic amenities, the supporting infrastructure called Common Scientific & Manufacturing Facilities (CMFs) which include specialised laboratories, warehousing, and testing centres have been made available to device manufacturers. Since these shared services are not needed on a full-time basis by these manufacturers, they can be outsourced to specialized service-providers who can provide the services simultaneously to multiple manufacturers located in proximity to each other. Common

Scientific Facilities (CSFs) are provided on a PPP basis, where plant, machinery and equipment are provided by the Central government departments/ministries and private players, and land and buildings are provided by the State government.

Private companies have an option to either pay for their built-up factory, or take a factory on a 20% down-payment and a monthly lease, or take developed land and build their own factory. Services of CMFs are available for the manufacturers and they need not invest in these facilities themselves (Plug and Play). This enables them to concentrate on their core competencies.

Kalam Institute of Health Technology (KIHT) was conceived as a hub of 'technology banking services' that would act as a valuable bridge between innovators, research institutions, and the manufacturers. Backed by the Department of Bio Technology and Department of Health Research, Government of India, KIHT supports technology transfers and serves as the Technical Secretariat for drafting standards for medical equipment for Bureau of Indian Standards (BIS). It is also the GeM (Government e-Marketplace) for enabling transparent public procurement.

The Principal Scientific Advisor to the Government of India has nominated KIHT as the program management unit for all healthcare technology projects in the country, thus making KIHT the nodal Institution to provide policy support and highly-focused funding for medical technology research. KIHT is positioned as the knowledge destination because AMTZ is primarily conceived of as an investment and manufacturing destination. The presence of KIHT puts AMTZ in a different sphere compared to any SEZ because this kind of knowledge institution in nowhere else within a SEZ's campus.

'Biovalley' in AMTZ supports start-ups through its unique ecosystem, providing unlimited access to cutting edge technologies, as well as assistance with market access. Biovalley offers very high support to the incubates from product concept stage to marketing stage including product development assistance, feasibility study, business plan development, market access, and assistance in obtaining statutory clearances. Additionally, Biovalley also provides financial support through access to angel and venture capitalists and Government grants.

The inclusive ecosystem of Biovalley facilitates focused research and policy on medical devices by supporting institutions involved with R&D, industry, policy-makers and knowledge repositories. At present, the majority of sophisticated medical devices and high-technology equipment are imported from other countries and used in India. This leads to not only higher costs, but also a mismatch between the need and the solution. This gap and resultant needs mapping and assessment led to the set up of 'Medivalley'.

It has a clear mandate to encourage and incubate medical technology-based new enterprises with innovative products and services. Their value ecosystem encompasses all facilities, and equips, enriches, and enables incubates in their efforts to develop the medical technology of tomorrow. Medivalley has world class infrastructure and co-working space, a Center for MedTech Innovation and Rapid Prototyping, Biomaterials and EMI/EMC Testing Facility, Testing and Calibration Laboratory, Pre-Compliance Testing (PCT) Laboratory, Mechatronics Laboratory, and this list is still expanding.

Source: AMTZ and ecosystem for MEDTECH. Available at: https://www.medgatetoday.com/

It may not be possible or even be necessary to develop all the Medical Devices Parks as comprehensively as the AMTZ but the basic contours of such endeavor are well laid out and must be followed. The quintessential features of a manufacturing zone in a technology sector are common scientific infrastructure, a plug and play facility and an institutional knowledge support.

Foreign investment in a technology sector has a close association with the state of the domestic Intellectual Property (IP) regime. Cases where investment is not accompanied by patented technology are influenced, in general, by the broader ecosystem for investment in the country, and particularly in the given sector. In such cases, the regulatory environment, the taxation policy, the availability of adequately-trained human resources, and other such aspects are crucial for investment to materialise. However, where investment is accompanied with patented technology there are additional factors – the most important being the credibility and robustness of the **IP regime** in the country. There are no noticeable inadequacies in the Indian Patent Law nor are there violations of international laws on the subject, as far as their substantive content is concerned, but there are reports of **delays in patent registrations** and dispute settlements. It was reported by some industry experts that in India, on average, 4.8 years are taken for a patent examination as against less than 24 months in several other important national jurisdictions though this fact is disputed from government reports indicating possible grey areas in communication which may require to be addressed. Mere commitment to increase the number of examiners is of no value as the investor is concerned with outcomes and not output. Since in a developing economy seriousness about **intellectual property protection** often comes at a discount for various reasons, the patent holder is legitimately worried about losing his most valued property to piracy or registration with some flimsy modification as well as fears of potential litigation. As a result, investments accompanied by patented technology are severely handicapped. Besides, a greater **focus on patenting** within India's own technology stratosphere is urgently required in the nature of incentive programs, particularly in the mammoth industrial research establishment in the public sector. An added action point here will be the establishment of an institutional action oriented tripartite linkage between industry, selected academic institutions and the relevant government agencies. Though this recommendation has been made by several experts in the past very little has been achieved. An ideal cooperation framework could be constructed, by government providing the rules framework and seed capital and appropriate fiscal policy support, and the industry contributing through financial resources, technical participation, and relevant research questions for the academic institution to work upon. Each pharma park could be assigned identified technology areas and associated with academic/research institutions in a hub and spoke framework and the relevant segment of the industry. This arrangement will help in producing time bound focused research and development outcomes. The relevant guidelines broadly enlist the technology areas the scheme wishes to address.

Trade Margins: The highly sensitive issue of **price control** often engages attention in any discussion on healthcare. As a matter of principle, the Government should avoid interfering with the price of a product unless warranted due to issues of access on grounds of health equity. There are instances galore, both in the pharmaceuticals and medical devices sector, when consumer prices have been allowed to rise in an unbridled way, contrary to ethical norms. The argument put forward is that the profits are ploughed back into R&D, and therefore the Government should keep its hands off. This may be a difficult issue to resolve but ethical pricing is an important consideration for the Government of a developing country in its governance of healthcare services. A rational capping of trade margins for products of mass consumption is required, even while appreciating that profits are required for ploughing back into ensuring development in the sector. Thus, price control in a more strategic sense may be acceptable but its coverage should be limited. The Governments both at the centre and the states are major procurers of health care products and services and through a mix of judicious and strategic approaches, can influence pricing to the benefit of average consumer. Further, health insurance penetration can play an important role in this respect. Therefore, greater reliance on these instruments will give the appearance of even- handed treatment rather than a capping through mandatory price control mechanism.

Conclusion

Medical Devices sector is of comparatively recent origin in India. Through a thoughtful intervention the central government has taken policy and regulatory measures which have helped the sector set on a course for healthy growth. Several factors in India's growth process indicate a high potential for growth of this sector if policies and investments are made thoughtfully. This is a technology driven sector where Indian industry has performed well on the lower part of the technology ladder. In order to improve the technology content of the sector, investments need to flow into those segments and policy actions must be taken post haste. Trade and Investment policies for the sector so far have shown harmony and narrow protectionist considerations by and large have been avoided. The government has been less innovative in using fiscal policy instruments and taking bold decisions on organisational issues. The critical areas of intervention are organisational structure for governance and regulation, the standards and technical regulations, promotion of investments and novel financing instruments for the upper technology segment, use of public procurement policy as an influencer for affordability, and above all critical support to manufacturing through production subsidies and provision of common scientific infrastructure. The preceding paragraphs identify some action points which will help India develop a robust globally oriented medical devices sector.

Annex 10.1

Table A10.1: Galvanization of Indian Industry as a Response to Covid-19

Products Categories	PPE		Gloves		Ventilators		Sanitizers	
Comparison	Before	After	Before	After	Before	After	Before	After
Total No. of Manufacturers	20	140	20	27	8	17	35	49
Total Manufacturing Capacity	~8.24 million+ pcs/ annum	~258.83 million+ pcs/ annum	~2.11 million+ pcs/ annum	~2.50 million+ pcs/ annum	~3,360 pcs/ annum	~396,280 pcs/ annum	~19.48 million+ ltrs/annum	~54.39 million+ ltrs/annum

Products Categories	Goggles		Surgical Mask (2&3 Ply Mask)		Swabs		RNA Extraction Kit	
Comparison	Before	After	Before	After	Before	After	Before	After
Total No. of Manufacturers	0	17	25	73	0	5	0	18
Total Manufacturing Capacity	0	~27.47 million+ pcs/ annum	~313.6 million+ pcs/ annum	~3.37 billion+ pcs/ annum	0	~336 million pcs/ annum	0	~265.4 million+ pcs/ annum

Products Categories	Diagnostic Kit (PCR Kit)		Covid-19 Rapid Diagnostic Test Kit		N95 Mask		VTM	
Comparison	Before	After	Before	After	Before	After	Before	After
Total No. of Manufacturers	0	8	0	3	5	37	0	10
Total Manufacturing Capacity	0	~1.47 billion+ pcs/ annum	0	~46.5 million+ pcs/ annum	~13.82 million pcs/ annum	~823.24 million+ pcs/ annum	0	~3.77 billion+ pcs/ annum

Source: Association of Indian Medical Device Industry (AIMED)

Table A10.2: Products covered under the PLI scheme- also recommended for coverage under the proposed setting off against CGST component

Sr. No.	Category	Products	HS Codes
1	Cancer care / Radiotherapy medical devices	Brachytherapy Systems, Rotational Cobalt Machine, Radiotherapy Simulation Systems, Linear Accelerator (LINAC), Workstations- Radiotherapy Planning, Proton therapy system and other products* in this target segment	* Brachytherapy Systems - 90222100 * Radiotherapy Simulation Systems, Linear Accelerator (LINAC), Workstations- Radiotherapy Planning, Proton therapy system and other products - 90229090, 90229020
2	Radiology & Imaging medical devices (both ionizing & non-ionizing radiation products) and Nuclear Imaging Devices	CT Scan, MRI, Ultrasonography, X-ray equipment, mammography, C-arm, Cath-Lab, Positron Emission Tomography (PET) Systems, Single photon emission tomography (SPECT), Cyclotrons and other products* in this target segment	* CT Scan - 90221200, * MRI - 90181300, * Ultrasonography - 90181210, * C-arm, Cath-Lab, Positron Emission Tomography (PET) Systems, Single photon emission tomography (SPECT), Cyclotrons and other products - 90229090, 90229020 * X ray equipment - 90221900 * Rotational Cobalt Machine - 90229020
3	Anesthetics & Cardio-Respiratory medical devices including Catheters of Cardio Respiratory Category & Renal Care Medical Devices	Needles-Anesthesia, Syringes-Anesthesia, Anesthesia workstation, Anesthesia Unit Gas Scavengers, Anesthesia Kits, Masks –Anesthesia, Anesthesia Unit Vaporizers, Anesthesia Unit Ventilators, Automated external defibrillators (AEDs), Dialyzer, Dialysis Machine, Peritoneal dialysis kits, Biopsy Kits-Renal, Dialyser reprocessing system, Lithotripters-Extracorporeal –Renal and other products* in this target segment.	* Needles-Anesthesia - 90183230,90183290 * Syringes-Anesthesia - 90183100 * Anesthesia workstation, Anesthesia Unit Gas Scavengers, Anesthesia Kits - 90189041 & 90189099 * Anesthesia Unit Ventilators - 90192010 & 90192090 * Automated external defibrillators (AEDs) - 90189094 * Dialyzer, Dialysis Machine, Peritoneal dialysis kits, Biopsy Kits- Renal, Dialyser reprocessing system, Renal and other products - 90189031 & 90189033 * Lithotripters-Extracorporeal - 90189097 & 90189099 * Syringe Pump (main unit) - 90189041, 90189091, 90181290 * Syring pump (Parts) - 90181290 * Peritoneal Dialysis Kit - 90183990 * Stress Test Systems - 90181100, 90181290 * Oxygen Concentrator - 90192010, 90192090 * Patient Monitoring Systems - 90189019,90181990, 90181290

Sr. No.	Category	Products	HS Codes
4	AII Implants including implantable electronic devices	Cochlear Implants, Hip Implants, Knee implants, Spinal and neuro-surgical implants, Urogynecologic Surgical Mesh Implants, Hernia Surgical Mesh Implants, Cerebral Spinal Fluid (CSF) Shunt Systems, Implanted Pacemakers, insulin pump, implanted neuro-stimulated device like Deep Brain Stimulator, Intraocular lenses, heart valves, stents and other products* in this target segment.	* Hip Implants, Knee implants, Spinal and neuro-surgical implants, Urogynecologic Surgical Mesh Implants, Hernia Surgical Mesh Implants - 90211000, 90213100, 90213900 * Urogynecologic Surgical Mesh Implants - 90219090 * Cerebral Spinal Fluid (CSF) Shunt Systems & Hernia Surgical Mesh Implants - 90213900 * Pacemakers - 90215000 * Cochlear Implants - 90214090,90214010 * Insulin Pump - 90183990 * Deep Brain Stimulator - 90189098 * Intraocular Lenses - 90213900 * Heart Valves, Stents and Other Products – 90219090

Source: Kalam Institute

► Chapter 11

Electronics and Electronic Components

Introduction

The vision of the National Policy on Electronics 2019 (NPE 2019) is "positioning India as a global hub for Electronics System Design and Manufacturing (ESDM) by encouraging and driving capabilities in the country for developing core components, including chipsets, and creating an enabling environment for the industry to compete globally".[518] Three schemes were announced in March 2020 to implement the NPE 2019 policy vision and objectives. These include the Production Linked Incentive (PLI) Scheme for Large-Scale Electronics Manufacturing, the Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS), and the Electronics Manufacturing Clusters 2.0 (EMC 2.0) Scheme. These schemes aim to offset the disabilities faced by this industry and incentivise development of a robust electronics manufacturing ecosystem in the country. However, the combined impact of these schemes may not be sufficient to compensate for these disabilities, and make India a truly competitive manufacturing destination, particularly as the major existing scheme for export promotion, namely MEIS, is being withdrawn.

While making policy recommendations for promoting exports from a sector, it is important to consider the major factors that influence global investment decisions. An earlier study by ICEA has identified ten major factors (with different individual weights) that should be examined to analyse the relative attractiveness of different nations to potential investors in the electronics manufacturing sector.[519] This study revealed that in comparison to India, Vietnam is 1.7 times more attractive for investors, while China is twice as attractive. The study report identified eight broad types of incentives and support policies, common to both China and Vietnam, which are offered to investors. They comprise: making available quality infrastructure and skills; low charges for the use of infrastructure made available; subsidies for reducing costs and improving competitiveness; improving the ecosystem for the development of the supply chain in the domestic market; stability of policy; ease of doing business; focus on attracting mega-firms or "lead firms" in Global Value Chains; and periodic reviews to revise the incentive and facilitation schemes. The incentives are aimed mainly

[518] https://www.meity.gov.in/esdm/policies#:~:text=The%20National%20Policy%20on%20Electronics%202019%20(NPE%202019)%2C%20prepared,chipsets%2C%20and%20creating%20an%20enabling

[519] IKDHVAJ Advisers LLP, 2019, A Study on Disabilities and Smart Policy Measures including Replacement of Merchandise Export Incentive Scheme (MEIS)

at reducing costs and increasing retained profits, both leading to higher competitiveness. The cumulative impact of all these incentives in Vietnam vis-a-vis India has been estimated as a "disability" faced by Indian producers/exporters. This assessment reveals that if similar policies were implemented in India, the cost reduction or competitiveness gains for investors would range from 9.4% to 12.6%. A similar exercise for China estimates that the weight of disability vis-a-vis China for investors in India ranges from 19.2% to 21.7%.

11.1 Production of Electronics in India

The electronics industry has made rapid strides in the four-year period 2014-18. It has shown significant growth in the mobile devices sector, growing to more than ten times its size. The other segments of the electronics sector have also grown significantly though not as much as the mobile devices sector. The sector as a whole has grown to nearly two and a half times its size, just in the space of four years, largely driven by mobile devices which account for around 40% of the sector.

This sector has responded well to the schemes by the Government of India to encourage production. The Phased Manufacturing Programme (PMP), though not an unqualified success has helped promote production in India. Other schemes discussed below have also had positive effects on this sector. However, India is far from achieving its potential in this sector as East Asia is far more competitive. Proper support policies would help to reduce this.

The doubling of production in the space of four years is an encouraging sign and policies to encourage further growth of this sector need to be carefully calibrated. Economies of scale can, however, only be achieved by promoting exports. Hence, export promotion policies must go hand in hand with investment and production support policies.

Figure 11.1: Production of Electronics from 2014-2018

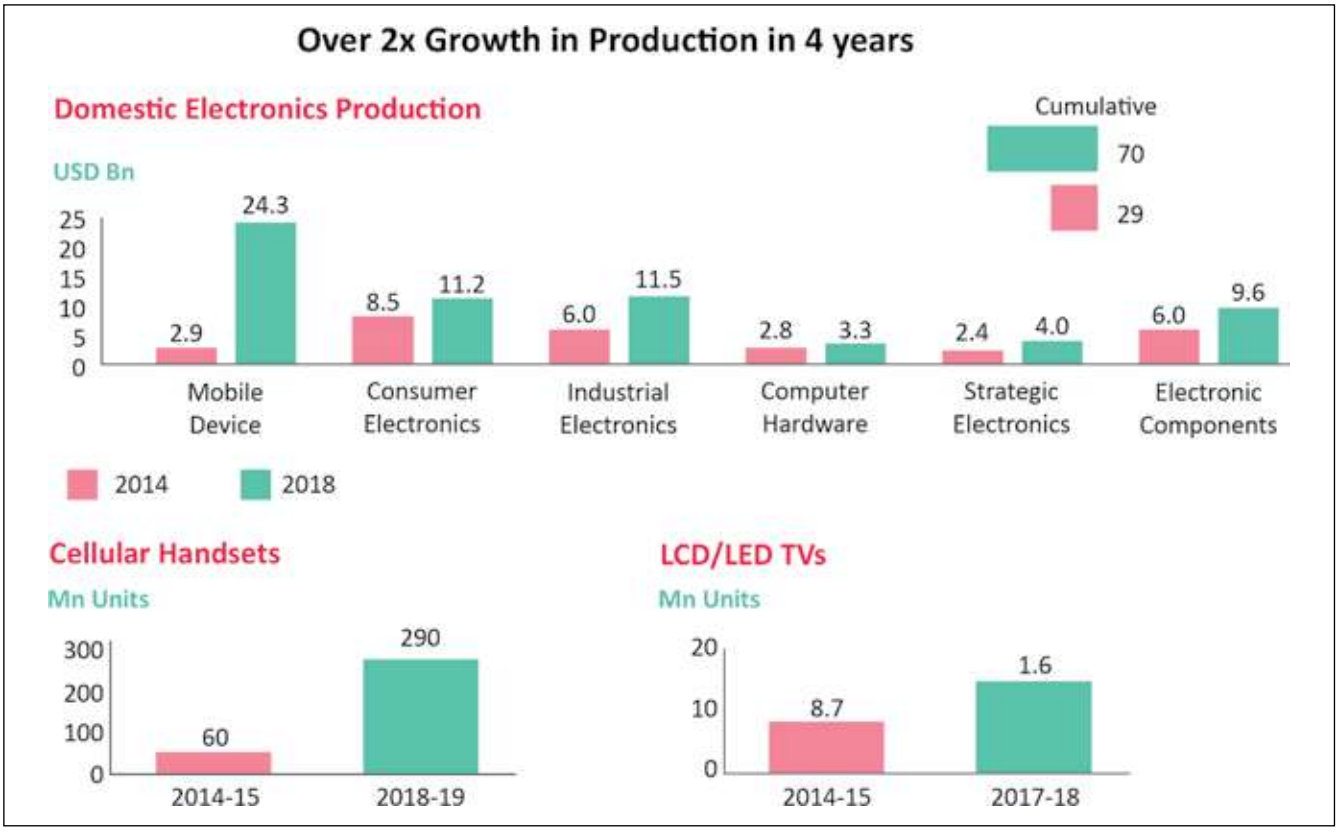
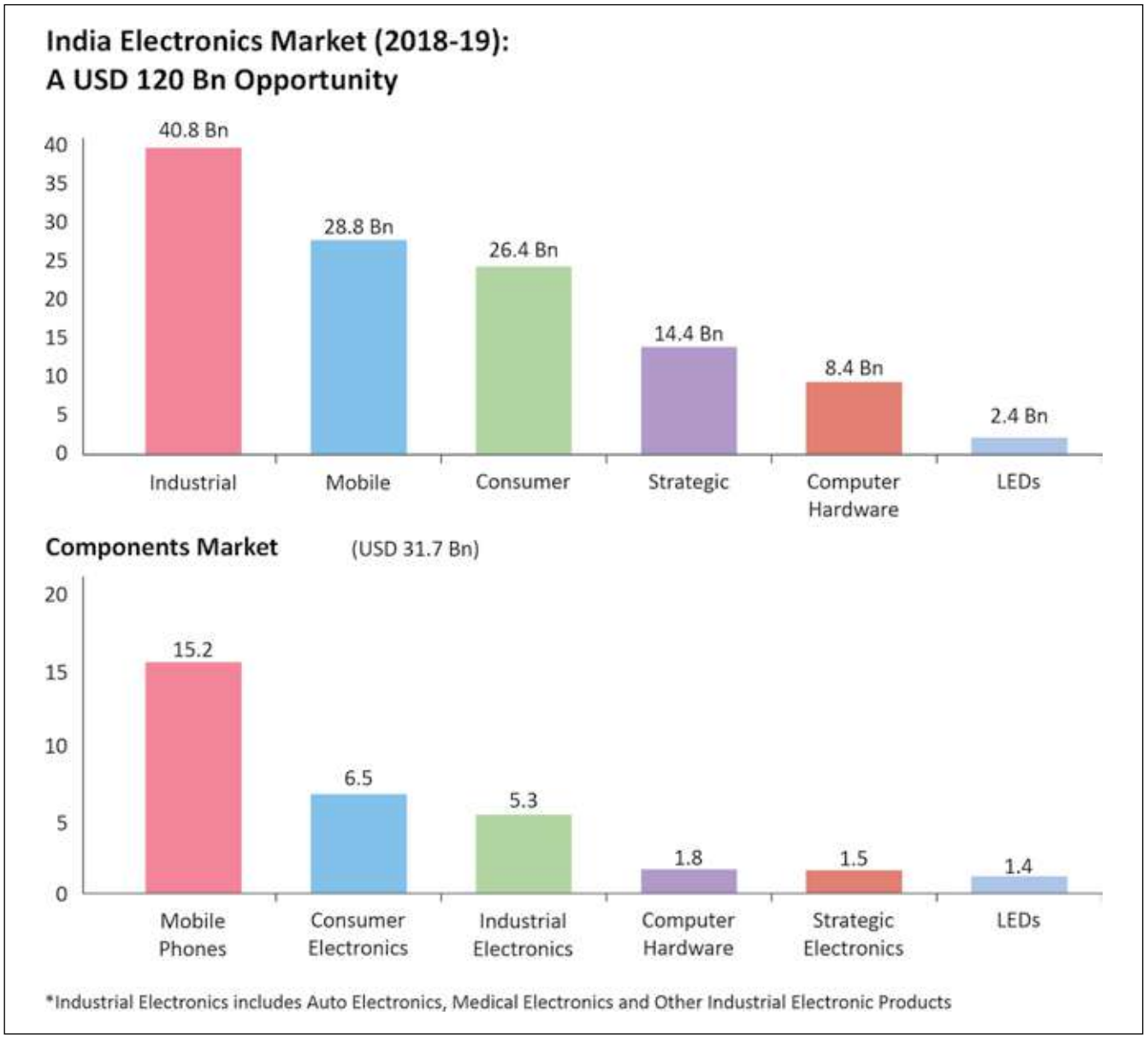


Figure 11.2: The Electronics Market in India (2018-19)



Source: MeitY.

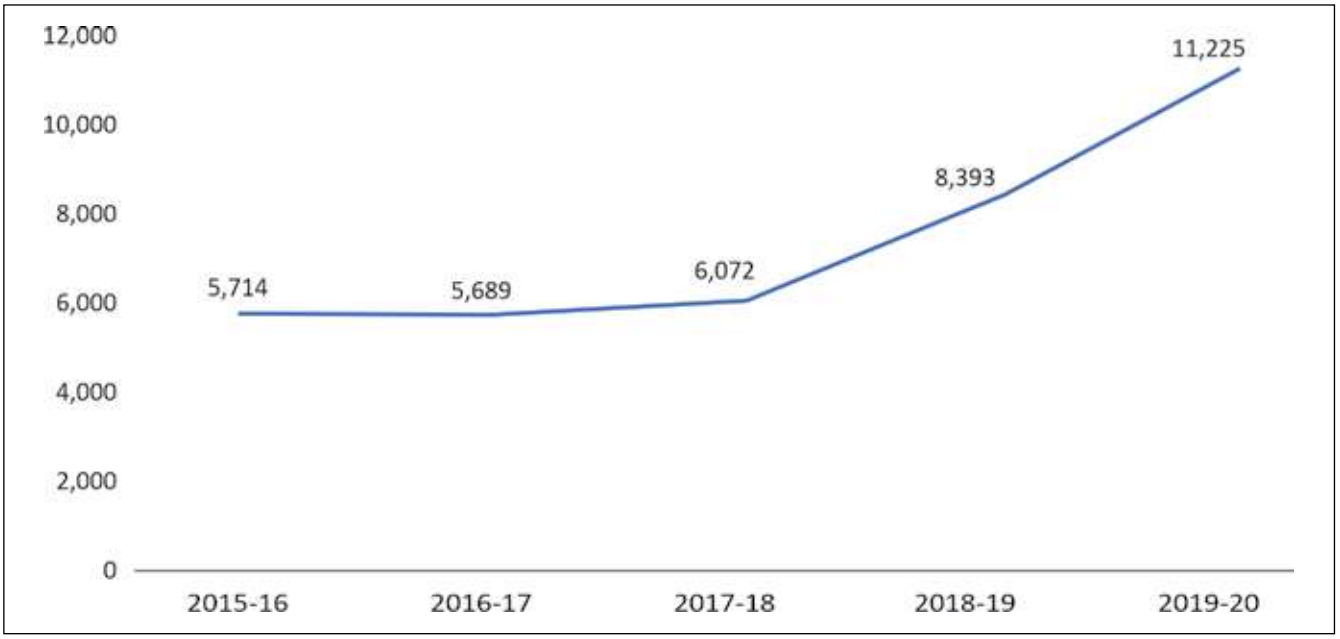
11.2 Electronics Exports from India

Electronics exports from India reached USD 11.8 billion in the FY 2019-20. Export incentive schemes like MEIS played a major role in boosting exports and localising manufacturing capacity. The export incentive of 2% under MEIS was offered for 372 electronic product lines (HS 6-digit Code) from 2015 onwards. An additional 2% MEIS was notified for 121 tariff lines in December 2017 in response to the demand from the industry. The impact of such an increased rate of export subsidy was immediately visible as the export of electronic goods increased substantially from USD 6.4 billion in 2017-18 to USD 11.22 billion in 2019-20, exhibiting a growth of 85%.

In absolute terms, over a five-year period, exports of electronics grew by 96% from 2.2% to 3.6% share of the total exports from India. The exports of electronic goods grew by over 34% within a year itself, increasing

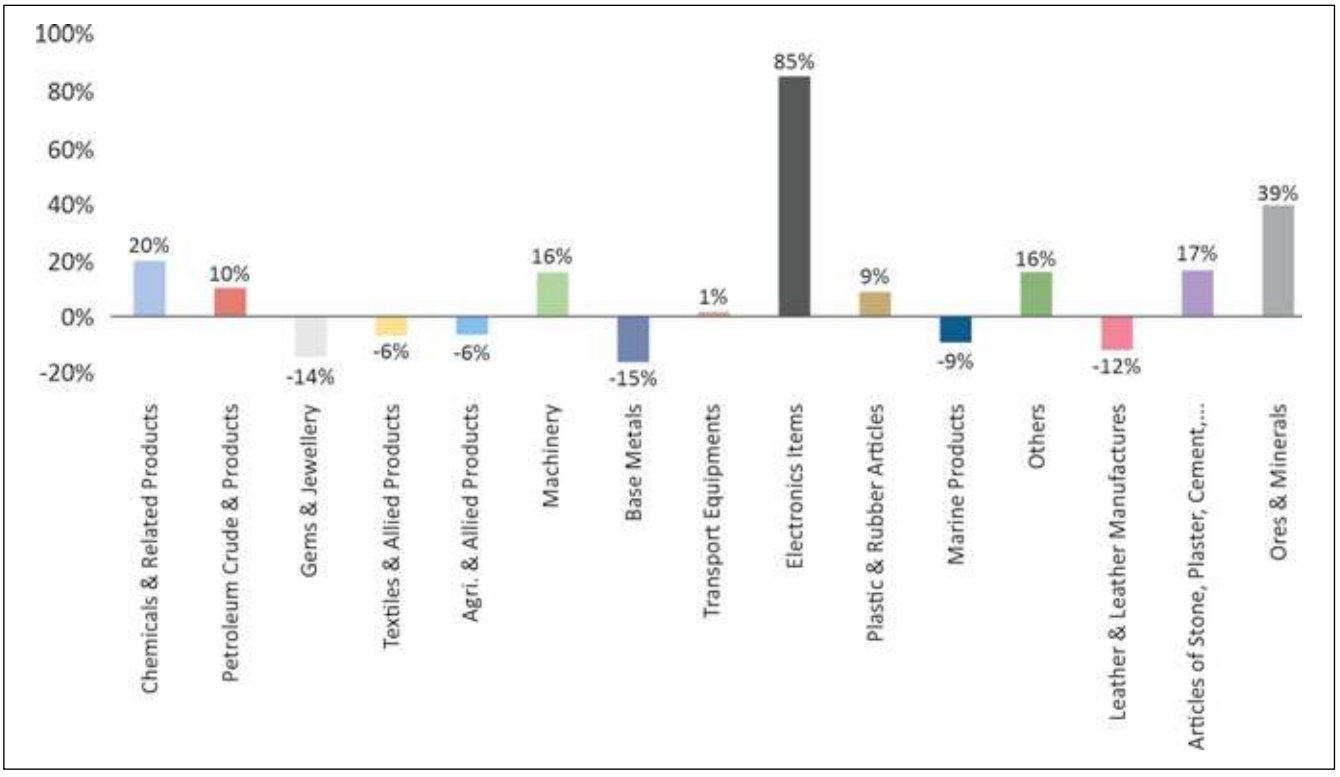
from USD 8.8 billion in 2018-19 to USD 11.2 billion in 2019-20. Thus, an increase in the MEIS rate amply demonstrated the positive impact it had on exports of electronic goods over the last two years, making this sector one of the top performers in terms of percentage growth in exports.

Figure 11.3: Export of electronic items between 2015 and 2020



Source: Ministry of Commerce & Industry

Figure 11.4: Export growth during 2017-18 to 2019-20



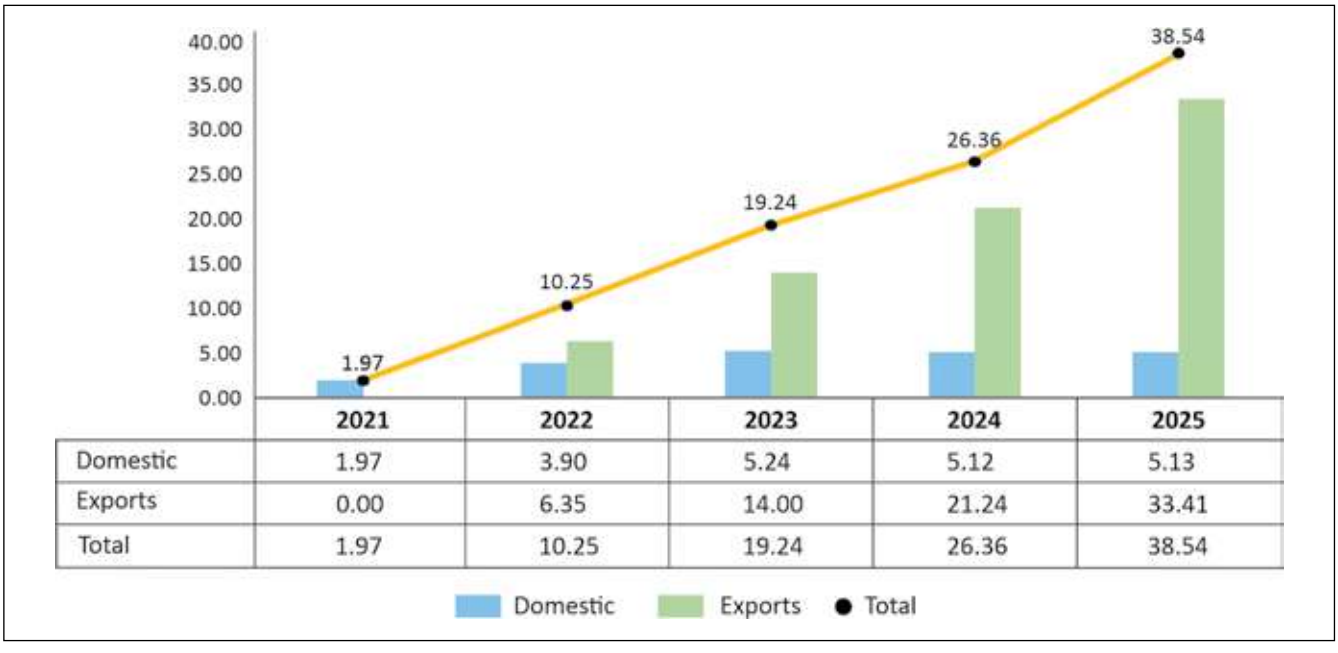
Source: DoC/ ICEA

As illustrated in Figure 11.3 above, the export performance of the electronics sector has shown immense promise under enhanced MEIS rates prioritised for 121 tariff lines since the year 2017. The phenomenal growth in exports at 85% for the electronics sector makes it one of the highest growth sectors of India. Taking account of the highly ambitious export targets announced in NPE 2019 and the potential shown by this sector in export performance, it is very important to sustain the incentives for this sector's exports.

11.3 Prioritising Electronic Products for Support

With an increase in domestic production and export incentives, the export of mobile handsets increased significantly between 2017 and 2020. In 2019-20 alone, the export of mobile phones grew by almost 240% as compared to the previous year. This pattern is consistent with the likely emergence of India as an assembly centre for mobile handsets, especially with the investment planned post the announcement of the Production Linked Incentive (PLI) scheme in March 2020. One estimate suggests that India could manufacture around 1.25 billion handsets across various segments by 2025, firing up an industry worth USD 230 billion (ICEA-McKinsey, 2018). The NPE 2019 also seeks to increase the export of mobile phones to USD 110 billion by 2025. This implies an increase of almost 30 times the exports in 2019-20. With the projected growth in the production and export of mobile phones, there will naturally be simultaneous growth of other products linked to mobile phone production.

Figure 11.5: Laptops, tablets and desktop computers manufacturing (USD billion)



	2021	2022	2023	2024	2025
Domestic	1.97	3.90	5.24	5.12	5.13
Exports	0.00	6.35	14.00	21.24	33.41
Total	1.97	10.25	19.24	26.36	38.54

Source: IDC Personal Computing Device Tracker; IDC Tablets Tracker http://idctracker.com/

Along similar lines, exports of laptops and tablets seem to have the potential for exponential growth. The global market for these two products is expected to be largely around USD 220 billion per year over the next five years. This presents an opportunity for India to ramp up the export of 'Made in India' laptops and tablets. It will achieve the twin objectives of reducing dependency on China, and making in India for the world, attaining a sizeable share of the global market. There are other benefits too -- such as employment creation by way of 5 lakh additional jobs; 1.26% contribution to India's GDP by 2025; a cumulative inflow of foreign exchange to the tune of USD 75 billion; and investment of over USD 1 billion. This may result in manufacturing value of USD 100 billion.

Other products which are linked to the possibility of shifting a global export hub to India are discussed below:

a) **Products for which a major part of global export capacity could shift to India:** Each country has a distinct combination of factors and resources that give it a unique competitive advantage. In light of that, it is important to see which value chains have a significant potential to shift to India. It may be possible to produce a lower-quality version of a particular product faster in India than the higher-quality one, which may take considerable time. For example, the supply chain for high-quality display is based out of Japan and USA, whereas that for products like mechanics and PCBA[520] is likely to shift to India earlier. Therefore, it is critical that India prioritises incentivisation of those products whose major global manufacturing can be attracted to India soon.

Based on feedback from the industry, Table 11.1 shows those products whose manufacturing (including export hubs) could be shifted to India in the near future. With a large-scale shift in production capacity of firms with established links to global markets, India could become a significant export-oriented economy in the electronics sector.

Table 11.1: Products for which major part of export capacity could shift to India

Type of Product	Products for which a major part of global export capacity could be shifted to India
Finished Products	Mobile Phones (Feature Phone/Smartphone)
Sub-Assemblies	Power Adapters/Chargers for Mobiles, PCs, Laptops, Tablets, Watches, Speakers
Sub-Assemblies	Battery Packs
Sub-Assemblies	Camera Module
Sub-Assemblies	PCBA
Sub-Assemblies	Cables
Sub-Assemblies	Display Assemblies for Mobiles, PCs, Tablets
Components	Coils

Source: ICEA, RoDTEP Study, 2020

b) **Products that will increase domestic technological capacity:** Electronics is a technology-intensive industry. While assembly operations have started in India, manufacturing at larger scale will require significant strides in global value chains. The presence of leading global firms, coupled with an export-oriented policy, may provide the necessary trigger to enable technology transfer.

Table 11.2: Products that will increase domestic technological capacity

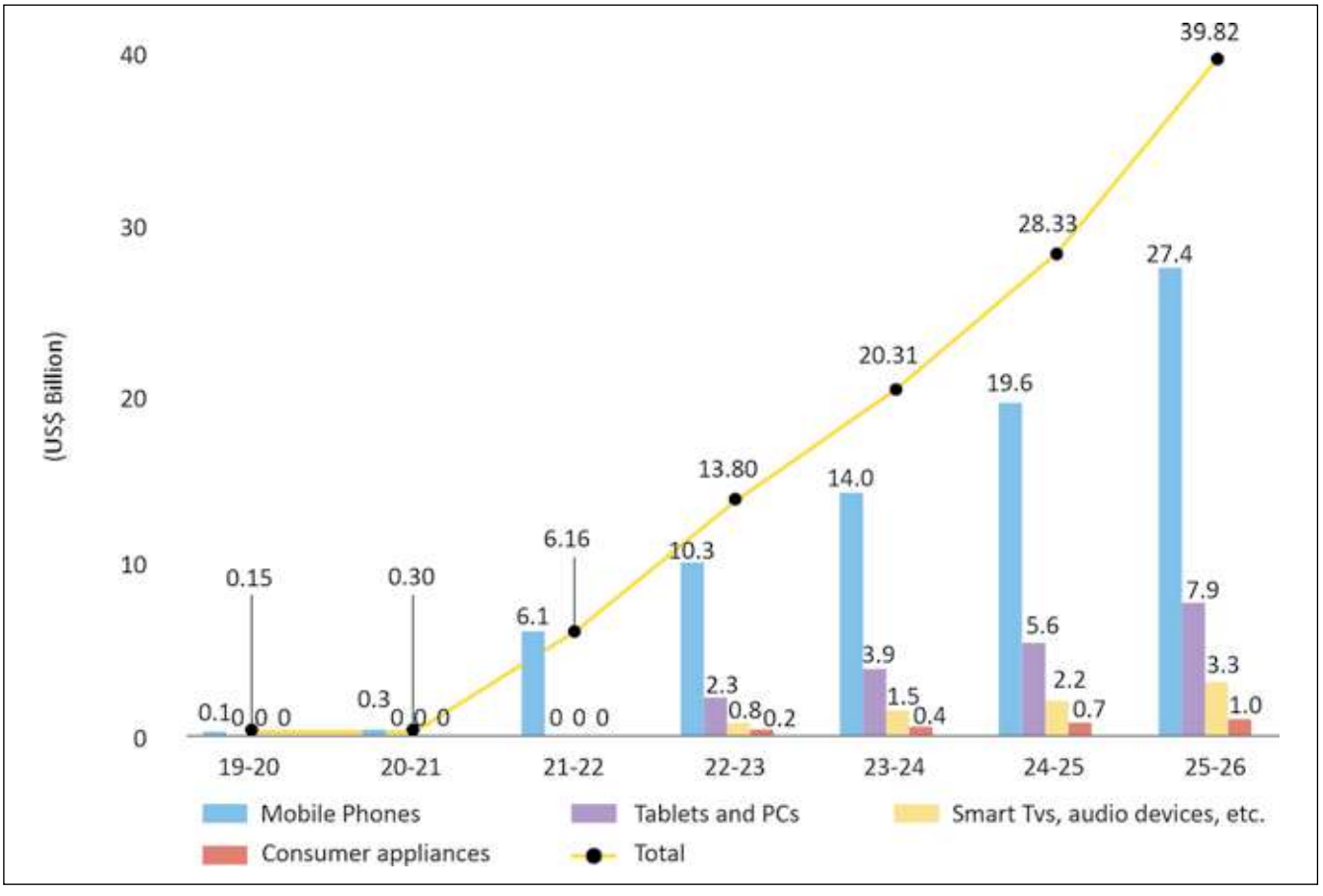
Type of Product	Products that will increase domestic technological capabilities and strengthen/ improve the domestic ecosystem
Finished Products	Mobile Phones (Feature Phone/Smartphone)
Sub-Assemblies	Power Adapters/Chargers for Mobiles, PCs, Laptops, Tablets, Watches, Speakers
Sub-Assemblies	Battery Packs
Sub-Assemblies	PCBA
Finished Products	Smart Watches
Finished Products	Bluetooth Speakers, Ear Phones

Source: ICEA, 2020, op.cit.

[520] Printed Circuit Board Assemblies.

A specific example is the PCBA, which not only constitutes core technology across multiple finished products, but also presents a massive export potential from India over the next five years. A study by ICEA and Ernst & Young shows that PCBA exports from India propelled by an appropriate incentive scheme have the potential value of approximately USD 100 billion during the period 2021-26, as shown in Figure 11.6**.** Moreover, the export of PCBAs will lead to developing not just core competence and competitiveness, but also expand the domestic ecosystem for components, since PCBA is considered the engine of the components sector.

Figure 11.6: Export opportunity for PCBAs from India



Source: Department of Commerce, Exports of HSN 85177010 and ICEA estimates

Therefore, India should incentivise the manufacturing of those products that will attract new technology to the country or provide a basis for domestic producers to upgrade their technological capabilities. This is likely to push up the manufacturing frontier of the country and lead to conditions that will sustain the momentum for growth and exports over a long period. Hence, RoDTEP[521] should cover those products that will increase domestic technological capabilities and further develop the domestic ecosystem.

11.4 Electronic Components Sector

To make India a global hub for electronic components manufacturing, major investments from global as well as Indian companies, including SMEs, are required. Components manufacturing is a high value addition segment and creates more employment opportunities in comparison to other segments. The average BoM

[521] Return of Duties and Taxes on Exported Products

(bill of materials) for components accounts for approximately 50% of the cost of most electronic devices; so for a market of USD 400 billion by 2025, the demand for components would be to the tune of USD 200 billion. Currently, domestic component manufacturing in India is worth USD 10-12 billion.

A recent report from ELCINA featured in electronicsb2b.com stated that demand for electronic components in India in 2020 was about USD 32 billion, of which locally manufactured components amount to almost USD 10 billion. The remaining USD 22 billion is split between imported components and PCB assemblies. Reaching even 40% of the original target, i.e. USD 100 billion, seems difficult at the moment. Hence components manufacturing in India should aim to grow by at least 25%-30 % to reach a turnover of USD 40 billion by 2025.

11.4.1 Components Manufacturing in India

Indian industry is still operating at the lower end of manufacturing. In 2018, an EY report showed that the Indian market is dominated by electro-mechanical components (such as PCBs and connectors), which accounted for around one-third of the total demand, followed by the demand for passive components (such as resistors and capacitors). However, in recent times, active electronic components (like integrated circuits, diodes, etc.) and the associated components (like optical discs, magnets, RF tuners, etc) have also witnessed significant growth in demand, though production capacities still remain in the passive components. This trend is because India does not have the IP and infrastructure to build active components. To circumvent these problems, India should leapfrog the current stage of technology and instal capacity for futuristic technologies such as components for 5G. However, another view from ELCINA is that low value-added components may attract foreign investment if India makes them cost-effectively. Further, investments required to manufacture chip capacitors and resistors, diodes, bridge rectifiers, MOSFETs, etc, are far lower than that needed to set up a fab to make chips. By starting at the bottom of the pyramid, components factories in India can start building the supply chain.

11.4.2 Major Challenges of Electronic Components Manufacturing in India

The challenges the Indian electronic components manufacturing sector faces are:

- Basic raw materials still need to be imported from other countries on which there are high import and custom duties.
- Zero duty imports on the components for the assembly of high-volume and high-growth products such as mobile phones, PoS machines, micro ATMs, set-top boxes, etc, has lowered the demand for locally-made components and discouraged new investments in this segment.
- Many tedious processes need to be followed to avail benefits under Customs Notification 25/99 on the inputs for the manufacture of components.
- The high cost of finance is also a great disadvantage for local manufacturers.
- Duty-free import of PCBAs reduces the demand for domestically-manufactured PCBs and components.
- The existing components manufacturing ecosystem in the country lacks global scale and capabilities, and thus remains uncompetitive.
- More and more sustainability regulations and standards are being enforced every year, forcing manufacturers to consider the complete product life cycle when making decisions.
- The current concern in the electronics industry is e-waste. The industry has to find better solutions for how the products will be disposed of when they reach the end of their lives.

11.4.3 Dealing with the Challenges

To tackle the major challenges, some suggest that India should focus on key, high-volume components, such as discrete and analogue semiconductors (which require less investment), passive components and displays. If local manufacturers are offered incentives, and entry barriers are created for the imported components for which there is a thriving local industry, the Indian electronic components industry can hope to do reasonably well.

Some of the PSUs like BEL, ITI (SITAR) and SCL (now owned by ISRO) have already got components manufacturing facilities, and the government has invested more than USD 500 million in them. There is a proposal to upgrade the SCL (Semiconductor Complex Ltd.) facility to increase its capabilities and capacities. However, these projects are growing very slowly. The government needs to fast track the projects and invest in upgrading the facilities so that they can produce most low-end components, which will serve the requirements of strategic electronics.

Some additional measures that can help to overcome common constraints include:

Direct tax holiday: Indian manufacturers have to bear high costs of finance, energy, and logistics/transportation. ELCINA recommends that a tax holiday for a five-year period be offered during the first ten years after the commencement of commercial production of components. Keeping in mind the competitiveness of existing units, they should also be provided a 50% rebate on corporate tax, subject to their investing in substantial expansion.

Plug-and-play facilities in EMCs: To support infrastructure development, it is recommended that plug-and-play units be provided to components manufacturers. The Central Government should incentivise State Governments to take ownership of Electronics Manufacturing Clusters (EMCs). The PPP model is the most effective, since the hassles of acquiring land are reduced. Ready-made factories can be provided to interested manufacturers at reasonable terms, on a lease basis. The infrastructure facilities should include, among other things, all the essential services such as electricity, water, transport, logistics, single-window approvals, and social infrastructure. This will allow manufacturers to invest in manufacturing rather than blocking their capital in the acquisition of land at a premium price, and struggling to comply with complex State and Central Government rules/approvals.

Availability of funds to acquire technology from abroad: A corpus of funds should be made available to facilitate the acquisition of technology for components manufacturing, including the payment of royalty. The size of the fund may be decided upon after due deliberations with industry players and senior government officials. This is because there are a number of units in developed countries with contemporary technology that are becoming unviable due to higher costs. These companies are keen to relocate to lower-cost economies and India provides an excellent opportunity for them. The technology costs can be paid for through this fund, and the technology can then be transferred to interested investors in India.

11.5 Schemes for Electronics and Components Manufacturing in India

In response to the challenges and suggestions, the Government of India has launched several schemes to promote the manufacture of electronics in India. Initiatives like Make in India, Digital India and Startup India have given the much-needed thrust to the Electronics System Design and Manufacturing (ESDM) sector in India. Moreover, the government's endeavours such as Phased Manufacturing Programme (PMP), Modified Special Incentive Scheme (M-SIPS), Electronics Manufacturing Clusters (EMC), Electronics Development Fund, and the National Policy on Electronics 2019 (NPE 2019) have led to several positive outcomes.

These schemes have been very successful. India has shown remarkable progress in the sector -- production of electronics has increased from USD 29 billion in 2014 to USD 70 billion in 2019. From a country that had only two mobile phone manufacturing facilities in 2014, India now stands as the second-largest mobile phone manufacturer in the world.

As mentioned earlier (see p. 226), to further strengthen the ESDM ecosystem with a complete value chain and position India as the global hub for ESDM, the Ministry of Electronics and Information Technology (MeitY) has notified three new schemes: The PLI Scheme, SPECS and EMC 2.0. However, before examining these new schemes, a review of the previous PMP scheme and its shortcomings will help understand why investment policies alone can be unsuccessful in promoting trade.

11.5.1 Achievements and Shortcomings of the Phased Manufacturing Programme (PMP)

The Phased Manufacturing Programme (PMP) was reviewed in 2018, after the industry pointed out that it would not help India become an export hub for handsets. It now wants to postpone the plan to 2023.

The mobile handset industry had backed the implementation of PMP, with its graded import duties on devices and components. While the PMP has helped in the development of the ecosystem, it has reached its natural limits. A thorough review of the levels of indigenisation is required.

More than 268 units have been set up in India since 2015, when PMP was implemented, churning out over 225 million mobile handsets every year and creating around 0.67 million jobs. Some of the biggest names in global contract manufacturing such as iPhone makers Foxconn and Wistron have set up shop in India.

While the levies helped create a local ecosystem for batteries, chargers and PCBAs, duties on components did not yield the same effect. For example, facilities for manufacturing mechanics, camera modules, connectors and speakers have not been set up. Further it is futile to have a basic custom duty-led regime when zero-duty imports on the same products are permissible through all of Asean, primarily Vietnam, Korea and Japan under FTAs or CEPAs with these countries.

The PMP was an import substitution scheme which reached its natural limits as it did not have any provisions to encourage exports or investment. Some tariff-jumping investment did take place to gather the low hanging fruits such as batteries, chargers, and assembly of PCBAs. However, large investments in more complicated components and exports need targeted policies.

Exports went up as shown in Figure 11.4 because of the MEIS scheme. In fact when MEIS rates were augmented for the electronics sector, exports showed a disproportionate increase. MEIS was challenged at the WTO and needed to be substituted by other schemes such as the RoDTEP. PMP has also been challenged at the WTO by Japan and EU on the grounds that it violates the commitments of the ITA agreement.

To provide policy certainty, it would be prudent to formulate WTO-consistent schemes to begin with. Further schemes designed to promote investment and exports simultaneously would bring larger benefits as is the case with the PLI scheme. Further, all schemes require mechanisms for review and course correction. For example, after the PMP scheme did not yield the desired benefits, it had to be put on hold.

11.5.2 Production Linked Incentive (PLI) Scheme

The Production Linked Incentive (PLI) scheme has been notified for Large-Scale Electronics Manufacturing in India.[522] The scheme aims to attract large investments in the mobile phone manufacturing and specified electronic components, including Assembly, Testing, Marking and Packaging (ATMP) units.

[522] https://www.meity.gov.in/esdm/pli

Under the PLI scheme, a 4% to 6% incentive will be provided on incremental sales of goods manufactured in India. These incentives will be offered for a period of five years subsequent to the base year (FY 2019-20). The applicant companies will be required to meet minimum thresholds of investment and production, apart from the eligibility criteria, to receive incentives under the scheme which has an outlay of about USD 5.5 billion.

11.5.3 Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS)

The Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS) has been notified with an aim to strengthen the value chain for the manufacturing of electronic products in India.[523] The target segment comprises the downstream value chain of electronic products, i.e. electronic components, semiconductors/display fabrication units, ATMP units, specialised sub-assemblies, and capital goods for manufacture of the aforesaid goods. The scheme will lead to higher domestic value addition and strengthen the existing ecosystem of ESDM in India.

Under the scheme, financial incentives of 25% will be provided on capital expenditure (on reimbursement basis) in new units and expansion/modernisation/ diversification of existing units. The scheme will be open for applications for a period of three years from the date of notification. All investments made within five years from the date of acknowledgment will be eligible for receiving incentives under SPECS which has an outlay of about USD 440 million.

11.5.4 Modified Electronics Manufacturing Clusters Scheme (EMC 2.0)

The Modified Electronics Manufacturing Clusters (EMC 2.0) scheme has been notified to support creation of quality infrastructure with common facilities and amenities, including Ready Built Factory (RBF) sheds / Plug and Play facilities. This will attract major global manufacturers along with their supply chains to set up a production base in India.

Under the scheme, financial assistance of 50% of the project cost will be provided to EMC projects subject to a ceiling of INR 70 crores for every 100 acres of land, while 75% of the project cost will be provided for Common Facility Centres (CFCs) subject to a ceiling of INR 70 crores. The scheme will be open for applications for a period of three years from the date of notification and disbursement of funds to the approved projects will be done in a period of five years. EMC 2.0 scheme has an outlay of about USD 500 million.

11.5.5 Return of Duties and Taxes on Exported Products (RoDTEP)

RoDTEP, announced on 13 March 2020, will cover taxes/duties/levies at the central, state and local levels that are not reimbursed currently under any other mechanism, but which are incurred in the process of manufacture and distribution of exported products. These include duty on electricity charges; VAT on fuel used in transportation, captive power generation; duties imposed on the farm sector; stamp duty on export documents; CGST and compensation cess on coal in power generation; central excise duty on fuel used in transportation; and CGST and any other levies that still remain unrebated.

The rebate through RoDTEP will be claimed as the percentage of the realised FOB value of exports. As per a Cabinet decision,[524] the sequence of introduction of the scheme, prioritisation of the sectors to be covered,

[523] https://www.meity.gov.in/esdm/SPECS#:~:text=The%20vision%20of%20National%20Policy,environment%20for%20the%20industry%20to

[524] https://pib.gov.in/PressReleseDetail.aspx?PRID=1606281

degree of benefit to be given on various items within the rates set by the Committee[525] will be decided and notified by the Department of Commerce.

Although MEIS will be available upto 31 December 2020,[526] even during the period till end-December 2020, the RoDTEP scheme may be notified for any specific product. When the rates under RoDTEP are announced for a tariff line/item, MEIS benefits on it will be discontinued.

A monitoring and audit mechanism, with an information-technology based Risk Management System, will be set up to physically verify the records of exporters. Unlike MEIS's transferable scrips, RoDTEP will create an electronics credit ledger in the customs system, which will enable digital refund to exporters.

Refund of indirect taxes under RoDTEP will be a step towards "zero-rating" of exports, along with other reimbursements such as Drawback and IGST. This scheme will improve the cost competitiveness of India's exports and provide a level playing field for Indian producers in comparison to exports from competing countries in the international market.

RoDTEP will introduce measures allowed under WTO, creating an initiative similar to those taken by other economies. It will help address the disability faced by Indian exports by reducing the burden due to non-remission of indirect duties and taxes on exported products. Certain policies such as the recent amendment in the GST Act to restrict the valuation of goods by exporters has impacted the working capital of businesses and created an additional cost burden on exports. Thus, a WTO-consistent policy such as RoDTEP should be implemented, to improve the operational conditions and benefit both exports and investment.

11.5.6 Electronics Development Fund (EDF) Policy

EDF was one of the important strategies which would enable creating an electronics industry ecosystem in the country. **Creating a vibrant ecosystem of innovation, R&D** with active industry involvement is essential for a thriving electronics industry. It is with this objective that an Electronics Development Fund (EDF) is set up as a "Fund of Funds" to participate in professionally managed "Daughter Funds" which provide risk capital to companies developing new technologies in the area of Electronics, Nano-electronics and Information Technology (IT).[527]

11.6 Some Implementation Issues with the Schemes, PLI an Example

Ease of doing business should be seen in terms of facilitating the operations of the support schemes to achieve national objectives. The PLI scheme for large-scale electronics manufacturing has very significant aims. Devised after intense consultations at senior levels over about a year and a half, the final PLI scheme aims for a huge increase in domestic production capabilities, employment, and exports, and a reduction in imports of mobiles and specific electronic components. For example, the five-year outcomes for the sector are expected by MeitY to be INR 11,000 crores of additional investment, domestic production of INR 11.5 lakh crores, and exports of INR 7 lakh crores. Most of the contribution would be by the mobile phone sector as shown below, with investment by global companies creating a strong base for export hubs in India.

[525] See the notification at https://www.cbic.gov.in/resources//htdocs-cbec/Constitution-RoDTEP-Committee.pdf

[526] http://www.eepcindia.org/download/200610224418.pdf

[527] https://www.meity.gov.in/esdm/emc2.0

Table 11.3: Targets of the PLI Scheme

Domestic Production	Five Year Outcomes
Sector Total (mobile phones)	INR 11.5 lakh crores
Mobile Phones (global companies)	INR 9 lakh crores
Mobile Phones (domestic companies)	INR 2 lakh crores
Specified Electronic Components	INR 45 thousand crores

Source: MeitY, Press Release, https://www.meity.gov.in/writereaddata/files/PIB1642823.pdf

According to MeitY, the scheme will generate over 10 lakh additional employment opportunities in the next five years, and domestic value addition will grow from the current 15%-20% to 35%-40% in the case of Mobile Phones and 45%-50% for electronic components. The huge ongoing increase in domestic demand would be dominantly catered to by domestic production, thus resulting in a huge saving of foreign exchange that would otherwise be spent on imports of these products.

These are very significant national objectives and it is extremely important that this scheme be run effectively and efficiently so as to achieve them. What is required is giving attention to improving ease of doing business in terms of:

(a) the procedural requirements of the scheme;

(b) clarity and ease of the conditions which relate to the operation and implementation of the scheme;

(c) enabling the operational conditions so that any unanticipated difficulties are taken into account and adjustments made without any substantive or major changes in the scheme itself;

(d) ensuring that the basic requirements of the scheme are not challenged by others (as was done for MEIS), thus resulting in a major change in the underlying conditions of the scheme;

(e) operate the scheme in a manner that it serves as a signal to the global investment community that India is an investment destination where a win-win situation could be created for both the investor and the country.

Attention to the above points would pave the way for both achieving the objectives of the present major PLI scheme for electronics, as well as for similar schemes in the future. It would promote ease of doing business, and create the operational conditions which enable the firms engaged in PLI-related production to achieve the national objectives encompassed in the scheme. The relevant points in this regard are discussed below.

11.6.1 Ease of Providing the Information requested for in the PLI Scheme

In general, the format for information is relatively simple and the data required can be provided by the relevant firms. However, there are some parts of the scheme / guidelines which create difficulties and uncertainty for the firms in terms of the expected implementation of the scheme. This uncertainty is based on the prior experience of firms with some previous major support schemes which required scrutiny for long periods, and resulted in avoidable costs, long delays, and lack of credibility.

11.6.2 Implementation and Credibility: Certain Conditions of the Scheme Create Uncertainty that would affect the Credibility of the Scheme

Two related parts of the Guidelines create uncertainty and potential operational difficulties. Section II of Annexure 3 (Application Form) in the Guidelines requires an annual forecast for five years for revenues, exports, domestic sales, exports and employment generation. In Annexure 6 (on disbursement) of the

Guidelines, Section 13 asks for certificates/undertakings stating/covering the following requirement: "No deviation in Eligible Product and Target Segment".

(i) Holding the producer to such strict standards over a five-year period, and potentially creating difficulties in disbursement of the financial support due to this, is likely to create problems in achieving the expected objectives of the scheme. The approach should have some flexibility to allow for unforeseen circumstances. There is a very real possibility that at least for production, exports, etc. unforeseen market conditions may make it difficult to meet forecasted estimates precisely.

(ii) In this context, the intent and engagement of the firm is likely to be much more visible through the investments that have been made. This suggests that closer consideration could be given to the proposed investments by the firm in comparison to other forecasts. The firms which meet the investment requirements should be given positive consideration for disbursement of PLI subsidies. Further, the operational procedures of the Empowered Committee (mentioned in paragraphs 1.4, 2.8 and sections 8 to 10 and 13 of the Guidelines) should allow for explicit consideration of unforeseen circumstances.

It is noteworthy that paragraph 2.23 provides for *force majeure* or unforeseen circumstances, but the definition of force majeure is quite narrow, and not wide enough in this context. The definition is: "Force Majeure: Extraordinary events or circumstances beyond human control such as an event described as an act of God (like a natural calamity) or events such as a war, strike, public health emergency, riots, crimes (but not including negligence or wrong-doing, predictable /seasonal rain and any other events specifically excluded)."

11.6.3 Implementation and Credibility: Need to Recognise the Situation due to Covid-19. The PLI Scheme's Implementation should be adjusted without any Substantive Change in the Scheme

The impact of Covid-19 has resulted in major disruption in market conditions and, in effect, should be considered as meeting the condition of force majeure. Though the Indian and global economies have begun to recover, even reaching the pre-Covid-19 level of economic activity will take a significant part of 2021. According to the World Bank, India's GDP growth is expected to be -7.7% in 2020-21, and 5.4% in 2021-22, thus not recovering the level of 2019-20.

The base year for assessing incremental changes was 2019-20 (paragraph 2.14 of the Guidelines), but recognising the impact of Covid-19, the Government has given flexibility to the beneficiaries of the PLI scheme by extending the period of the scheme till 2025-26 (Notification of 23rd September 2021, for Extension of Tenure of the Production Linked Incentive Scheme (PLI) for Large Scale Electronics Manufacturing - reg.).

11.6.4 Implementation and Credibility: The Time Period within which the PLI Funds would be provided in General should be Specified

The Government has provided predictability in the scheme by mentioning in the Guidelines the time period within which certain actions will be taken, and also by specifying in the approval letter the ceiling amount of the financial support that is relevant for each eligible firm. However, there is no reasonable time limit specified for the period by when the amount due to the firm each year would be provided. Such a time limit should be provided to give certainty, with any relevant caveat necessary. This is important because in some previous schemes, such as M-SIPS, delays have been extraordinary. In other cases, the scheme is over but certain firms have reportedly still not received the funds for which they had applied.

11.6.5 Information Sought on Domestic Value Addition would Result in the Scheme Violating WTO Conditions, Similar to the MEIS Scheme which was found to Violate WTO.

The Guidelines seek information on domestic value addition. This could result in a WTO dispute settlement challenge against the scheme similar to the challenge to the MEIS scheme. At present, the written documents show that the PLI subsidy depends on product and sales criteria. However, seeking of the information on domestic value addition within the PLI scheme could be seen in two different ways.

(a) Domestic value addition is a criteria based on which PLI subsidy is provided. In this case, the WTO violation is clear-cut, as shown for example by two earlier cases against India itself. The conclusions of the Panel Reports for those two cases are in Annexures 2 and 3 of this Note. In addition to the GATT and WTO provisions which were found to prohibit domestic value content, the PLI would also violate Article 3.1(b) of the Agreement on Subsidies and Countervailing Measures. The text of the relevant Article is in Annexure 4 to this Note.

(b) The Government could argue that domestic value addition is not a criteria which determines the PLI subsidy. It is thus not, in effect, a criteria based on which the subsidy is being granted. However, the Guidelines also seek a five-year forecast for domestic value addition and a certificate stating that the forecast has been met. The WTO Panel would first examine whether there was any link between the PLI benefits and the data collected on domestic value added. The jurisprudence is that even if the condition is not in law but in fact required for the benefit to be received, it would be a prohibited subsidy. To quote from the Analytical Index which reports on the WTO jurisprudence:

"65. Thus, the Appellate Body in Canada – Autos interpreted **Article 3.1(b) of the SCM Agreement to cover contingency both in law and in fact**. This **interpretation was reiterated in "US Tax Incentives"**.[528] Similar views can be seen from the jurisprudence of other WTO provisions, where the term "requirement" is considered as having an extended coverage (text of the Analytical index is in Annexure 5).

Therefore, the text of the Guidelines and the implied conditions are such that the conditions could be challenged at WTO and the Indian measure be found to violate WTO. This would result in a need to remove the measure sometime during the period covered by the PLI scheme, thus adversely affecting the process of achieving important national objectives through the scheme.

11.7 Conclusion: Merging Export and Investment Promotion Policies

Digital India started in July 2015 and Make in India started in September 2014. The mobile phone manufacturing sector was an excellent performer, where production went up by 1,100%. The success of the mobile phone industry in India is a combination of many factors. The Government and the industry acted together to focus on moving towards self-sufficiency and import substitution, while giving priority to exports and value addition. At the same time, they tried to make sure that they didn't create an industry which was dependent and uncompetitive.

Currently, India manufactures over **1 lakh crore** electronic components required to produce mobile phones. India has to import several components, add value and export them to the rest of the world. In volume terms, India is the second largest producer of mobile phones in the world. The other leading producers in the world are China and Vietnam. Although Indian exports have grown very rapidly, currently they are worth **USD 3.6**

[528] https://www.wto.org/english/res_e/publications_e/ai17_e/subsidies_art3_jur.pdf

billion (*INR 28,000 crores*); which is just about 1.5% of the world exports. The target is however **USD 110 billion** of mobile phone exports by 2025.

The recently announced trilogy of schemes – PLI, SPECS and EMC 2.0 amounting to INR 50,000 crores – has laid the foundation for merging export expansion and investment promotion. PLI is the engine of growth for the entire electronics industry. It combines investment promotion with domestic production and exports. It will also help build an ecosystem for domestic companies thus enabling them to become global players and forming an export hub.

Currently, India does not have in-house technology and R&D. Global lead firms (for example, Samsung, Apple, Huawei, Oppo and Vivo) can bring in advanced and cutting-edge technology that may not only aid their production processes, but also that of domestic firms. Domestic companies can initially begin by becoming white label suppliers to some of the global lead firms and in turn, improve their production systems. With the right policy environment and stimulus, these Indian companies could reach global scale.

In the global electronics industry, large companies lead the industry. Hence encouraging investment from global champions is a large part of the PLI scheme. The SMEs are second and third tier suppliers to these companies. So the best thing for India to do is to build large global companies and, automatically, SMEs will start getting built accordingly.

The spread of Covid-19, and the subsequent lockdown of countries, has brought economic activity to a standstill across the globe. As a result, supply chains stand disrupted globally. In addition, the ongoing crisis has also highlighted the vulnerability of the domestic mobile phone manufacturing system, being heavily dependent on imports of parts and components for undertaking manufacturing/assembly operations in India. This calls for proactively seeking investments through global lead firms and re-orienting supply chains from being import-led to domestic production.

However, it is also relevant to highlight the importance of exports in the creation of a domestic manufacturing ecosystem and the economic advantages it holds. The present crisis may provide a conducive environment for global firms to diversify supply chains and establish production capabilities in the country. India needs to move purposefully, approaching companies and supply chains in a targeted manner, and address their particular concerns with alacrity.

► Chapter 12

Solar Panel Industry

Introduction

The demand for transition to renewable energy had been on the rise both due to India's renewable energy policy and because of the increased manufacture of solar modules and panels. According to the latest data made available from the Ministry of New and Renewable Energy (MNRE), as on 29 February 2020, a cumulative renewable energy capacity of 132.15 GW had been installed in the country, with an additional capacity of 46.69 GW under various stages of implementation and 34.07 GW under various stages of bidding. Of these, grid-connected solar power capacity was at 35.07 GW, with 21.35 GW in implementation and an additional 31.27 GW at various stages of tendering.[529] Modules account for around 60% of a solar project's cost and Chinese companies supply around 80% of solar cells and modules used in India.[530] The COVID outbreak has already disrupted Chinese supplies leading to delays in production, quality checks and transport of components. Indian suppliers also have started facing a shortfall of raw materials needed in solar panels and cells, and have limited inventories.[531]

It is expected that by 2040, around 49% of the total electricity will be generated by renewable energy as more efficient batteries will be used to store electricity, which will further cut the solar energy cost by an estimated 66% as compared to the current cost.[532] Use of renewables in place of coal will save India INR 54,000 crores (USD 8.43 billion) annually.[533] Renewable energy will account for 55% of the total installed power capacity by 2030. Yet, while India's annual demand for solar cell manufacturing is 20 GW, its current

---

[529] https://www.saurenergy.com/solar-energy-blog/top-10-solar-pv-module-suppliers-in-india-for-2019

[530] https://energy.economictimes.indiatimes.com/news/renewable/coronavirus-solar-power-prices-expected-to-rise-in-india-industry-demands-projects-review/74218646

[531] Ibid.

[532] IBEF (2020), Renewable energy.

[533] According to Renewable Energy Country Attractiveness Index 2018 by EY; as per data from the Economic Survey; *according to the Bloomberg New Energy Outlook 2018; 3 – Greenpeace India, Union Budget 2020 21, SPV – Solar Photovoltaic System, MWeq - Megawatt Equivalent
Note: Conversion rate used in April 2020, INR 1 = USD 0.013123

average annual capacity is just 3 GW.[534] India has been one of the largest exporters of solar modules till 2011 but subsequently lost its competitive edge to China.[535] Chinese Modules are cheaper by a large margin than Indian ones. Hence using Indian modules raises the cost of generation of solar power. Protection for Indian modules is provided by tariffs, but the user industry does not buy power at higher rates, hence there is a clear conflict between tariff-based trade policy on modules, and investment-based PLI policy on generating solar power. Even with incentives provided for the manufacture of solar modules, the cost of generating power is higher than that which is generated by Chinese modules.

This study attempts to understand the current state of play in this sector (sections 12.1 and 12.2), the disadvantages and the advantages faced by the industry (section 12.3), and what should be done to integrate trade and investment policies in this sector to make it competitive.

12.1 Current State of Solar PV Manufacturing in India

A solar PV module consists of a cell, a module and a wafer. Figure 12.1 below shows the supply chain of a solar PV module.

India's current domestic manufacturing capacity stands at around 11 GW for panels and 3 GW for cells, although some capacity remains unutilised due to price and quality concerns.[536] By and large, Indian solar industry has been dependent on imports of critical raw materials such as EVA, Back-sheet, Reflective Glass, Balance of Systems (BOS) for Solar Thermal and PV, as also core machinery.[537] At this point of time, India imports nearly all the components of a solar PV cell, the Balance of Systems, and the solar panels. However, it can relatively easily develop a manufacturing base in some parts of the supply chain. The goal of the National Solar Mission for local components will be truly achieved only when materials like EVA, Back-sheet, Junction Boxes, Low Iron tempered Glass, and Aluminium Frames are available indigenously with competitive quality and cost advantage.[538] In module manufacturing, the cost difference between an Indian and Chinese manufacturer is around 26%, in cell manufacturing, nearly 50%, and in wafer manufacturing, around 30%.[539] This implies that domestic competitiveness is comparatively higher in cell manufacturing and lower in wafer manufacturing. Hence domestic manufacture of cells may be the explored in the first manufacturing phase.

In devising any strategy of indigenisation it is important to focus both on India's comparative advantage as shown by the relative cost differential above, as well as the value added at different stages of the supply chain. Figure 12.2 shows that, in recent times, the value added in cell and module manufacture is relatively high accounting for over 50% of the total value added. Given its relative competitiveness, India should first enter the cell and module manufacturing phase as part of a Phased Manufacturing Programme, followed by wafer manufacture. Now ITA 1 includes these products, hence while safeguards can be used, basic customs duties cannot be increased for these products as it would be in violation of WTO. Hence, production incentives and other policies which would make FDI attractive should be introduced in these two parts of the supply chain. The Government is already thinking on these lines.[540]

---

[534] https://www.orfonline.org/expert-speak/why-india-needs-to-nudge-domestic-manufacturing-for-solar-industry-67388/

[535] Ibid.

[536] Ibid.

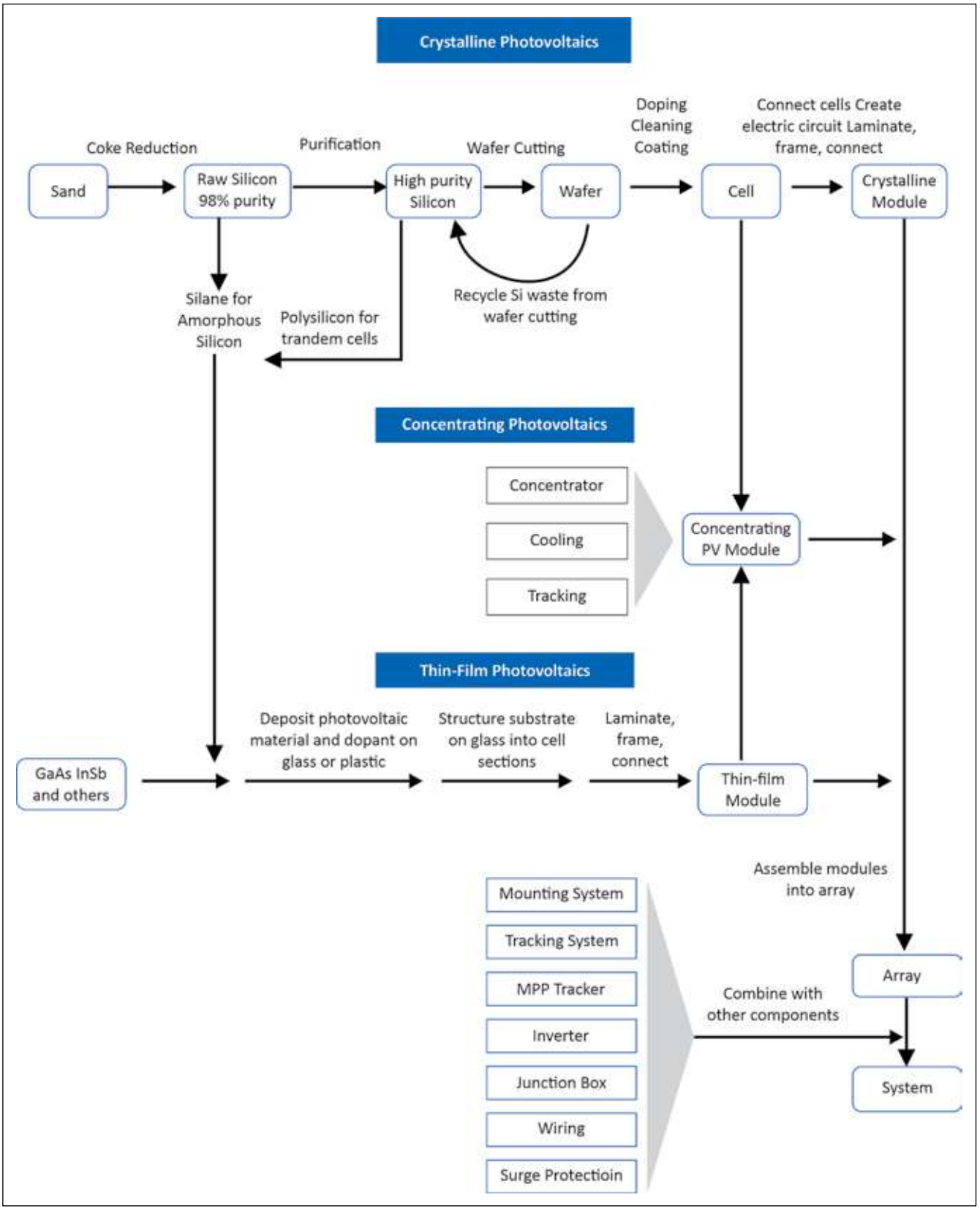
[537] http://www.ficci.in/spdocument/20294/Supply-Chain-paper.pdf

[538] Ibid.

[539] Ibid.

[540] http://www.solarmango.com/ask/2016/02/10/top-5-states-solar-energy-investments-india/

Figure 12.1: Supply chain of a solar photovoltaic crystalline module



Source: PV supply Chain from Green Rhino Energy, http://www.greenrhinoenergy.com/solar/technologies/pv_valuechain.php

Figure 12.2: Value added at different stages of solar PV module manufacture

Source: SOLAR MARGO ASK, http://www.solarmango.com/ask/

Another issue of importance is the efficiency of India-assembled solar panels compared with that of China. Table 12.1 shows a comparison of the efficiency of solar panels used in India by different firms in India.

Table 12.1: Comparison of efficiency of solar panels[541]

Solar Panels Manufacture	Wattage (W)	Efficiency (%)	Temp Coefficient	Product Warranty
Loom Solar	375 W	19.50	-0.43	10 Years
Vikram Solar Somera Grand	375 W	19.33	-0.39	10 Years
Renewsys DESERV Series	375 W	19.40	-0.36	10 Years
Waaree Solar Aditya Series	375 W	19.33	-0.37	10 Years
Tata Solar Triple Black Series	330 W	17.00	NA	10 Years
Adani Solar Eternal Series	375 W	18.58	-0.39	12 Years
Canadian Solar HiDM Series	400 W	19.40	-0.37	15 Years
Trina Solar TallMax Plus Series	375 W	19.30	-0.39	10 Years
Jinko Solar EagleSeries	375 W	19.30	-0.37	10 Years
Axitec AxiPremium Series	370 W	19.07	-0.39	15 Years

Source: https://www.greenworldinvestor.com/2016/07/26/solar-panel-efficiency-comparison/

Note: Most companies in this list manufacture higher wattage solar panels which have more efficiency, but here only 370 watt 72 cell monocrystalline solar panels are considered for comparison because they are the maximum wattage solar panels most widely used in India.

[541] https://letsavelectricity.com/best-solar-panels-in-india-in-2020/

12.2 Top Solar Module Manufacturers in India

According to the latest data made available by the Ministry of New and Renewable Energy (MNRE), as on 29 February 2020, a cumulative renewable energy capacity of 132.15 GW had been installed in the country, with an additional capacity of 46.69 GW under various stages of implementation and 34.07 GW under various stages of bidding.[542] Of these, grid-connected solar power capacity is at 35.07 GW, with 21.35 GW in implementation and an additional 31.27 GW at various stages of tendering.[543]

In 2019, roughly 70% of the Indian solar PV demand was met by Chinese and other foreign suppliers. Even with a 15% safeguard duty, Indian suppliers were still uncompetitive. In line with this thought, new announcements have been made which will see import duties on Chinese imports rise to (at its highest) 40% of the cost of the modules.[544] This may be the tipping point, but India is largely reliant to the tune of around 90% of its inputs for solar PVs on China.[545] This implies that tariffs on inputs must be kept at 0, even if that on modules is increased. For 2019, while the safeguard duty of 15% was in place, the total modules supplied to the market were estimated to be around 8,366 MW, largely dominated by Chinese manufacturers. The top ten solar PV module manufacturers are listed below.[546]

Risen Energy

The leading module supplier in the Indian market for 2019 was Chinese brand Risen Energy with 11.6% of the Indian market.

Waaree

Mumbai-headquartered solar PV module manufacturer Waaree secured a 10.6% market share in 2019, finishing second in the overall market behind Risen Energy.

Znshine

Another Chinese manufacturer, Znshine, grabbed a 9.6% share of the market. The firm's exports to India declined in 2019, from over a gigawatt in 2018 to roughly 800 MWs.

Vikram Solar

Kolkata-based manufacturer, Vikram Solar, grabbed a market share of 9.5%. The firm has received a 300 MW solar project from NTPC and is expected to stay firm at the top of the list for 2020.

Adani

Adani grabbed 9.5% market share. Adani perhaps is one the largest IPPs and project developers in the country, and it won the country's first manufacturing-linked tender (annual mandatory manufacturing capacity of 2000 MW).

Trina Solar

The firm grabbed an 8.5% share in the Indian market. It is believed that the company was actually leading the market for the first half of the year but then lost out to the others by year-end.

---

[542] https://mnre.gov.in/

[543] Ibid.

[544] https://energy.economictimes.indiatimes.com/news/renewable/solar-gear-imports-from-china-may-attract-higher-20-per-cent-duty/76530976

[545] FICCI, Securing the Supply Chain of Solar PV for India.

[546] https://www.saurenergy.com/solar-energy-blog/top-10-solar-pv-module-suppliers-in-india-for-2019

Renesola

Renesola bagged a 6% market share in 2019, to slot in at seventh position behind Trina Solar.

JinkoSolar

JinkoSolar finished eighth in the list with a 4.6% share in the market. The manufacturer was the leading solar module supplier in India in the first quarter of 2020.

LONGi Solar

One of the world's leading manufacturers of high-efficiency monocrystalline solar cells and modules, LONGi Solar only managed to finish ninth in the list of leading suppliers in India for 2019 with a 4.5% share in the market but will hope to improve on that in 2020, as it has signed a 1.2 GW multi-year module supply agreement with Adani Green Energy.

Canadian Solar

Canadian Solarheld had a 3.8% share in the Indian market in 2019.[547]

12.3 Disability of the Indian Industry

12.3.1 The Largest Imports are from China

India's solar panel industry relies in a major way on imports, with most of the imports coming from China. China is fully integrated with polysilicon production, of wafers, cells and modules and they cost, on average, a third less than Indian modules. While the user industry (generators of solar power and distribution companies also called discoms) finds it beneficial to import modules from China for solar energy deployment, the cheap Chinese imports have deterred the growth of Indian industry which was globally competitive till 2011.The Covid-19 crisis has shown a need for greater resilience in the domestic value chain. The government needs to start taking steps to address this situation by creating a stronger basis for domestic capabilities and phasing in a diversification of import sources.

While India imports various parts from a number of countries (see below), China has gained a strong position in global markets, including India, based on its subsidy policy regime for installation, reducing the costs of inputs, land, training, the price at which the product is purchased, and support for improving domestic technological capabilities in the sector.[548] From a small industry, oriented towards its rural economy in 1990, China is today a dominant presence in the global solar industry based on its policies, and the demand generated for its products by a number of countries in Europe, and also through, later, incentivising demand in its own domestic markets.[549] An Asian industry expert has concluded: "If there was ever a situation where the Chinese have put their whole governmental system behind manufacturing, it's got to be solar

[547] It must be noted here that this list was sourced from a research report by JMK Research and Analytics. However, a report by Bridge to India has a slightly different ranking for the top module suppliers for the year 2019. Similarly, other reports may rank the firms differently based on different criteria.

[548] "Historically, the key determinants of cyclicality have been the Chinese government's subsidy policies and new solar technology cycles. … the government introducing special incentives to complete last-year build-outs by 1H2020. As a result, new capacity installations should double in 2020, sparking strong demand growth across the solar module supply chain. … New technologies have reduced the production cost per watt of a module by an estimated 41% to 18.3 cents between 2017 and 2020, and have been a driver of lower solar installation costs." https://www.ubs.com/global/en/wealth-management/chief-investment-office/market-insights/regional-outlook/2020/solar-energy-in-china.html

[549] https://www.scientificamerican.com/article/why-china-is-dominating-the-solar-industry/

modules".[550] After a period of considerable policy support, now with the help of technological changes, China appears to be moving towards grid parity without subsidies.[551]

The other countries from which India imports its requirements for solar panel manufacturing, have also used policy support to establish and develop their solar industry. The import sources for India include a few countries, but the predominant share is accounted for by China. The discussion below focuses mainly on a comparison of India with China.

Table 12.2: Sources of inputs of solar PV

Product	Important source of Indian imports
Solar cells	China, Vietnam, and Thailand
TPT/PVDF sheets	Vietnam
EVA backsheets	Malaysia
Glass	Malaysia
Ribbons, aluminium frames, junction boxes	China

Source: Page 10, https://cef.ceew.in/solutions-factory/publications/scaling-up-solar-manufacturing-to-enhance-India-energy-security.pdf

12.4 Why do Solar PVs Cost Less in China

The cost difference between India and China arises mainly due to China's higher capacity utilisation which significantly reduces average costs per unit output, and its subsidies including the much lower financing costs (interest rates) which are nearly 10% to 15% below Indian rates.[552] The subsidies in effect reduce the establishment and operational costs in China. In addition, there is a cost difference of each component, and the difference in return to equity included in that price. The impact on competitiveness depends on both the difference in cost of each input as well as the share of these inputs in total costs or selling price.

A recent Report by the Council on Energy, Environment and Water (CEEW) has analysed the costs for India and China based on a situation of 50% capacity utilisation for India and 100% utilisation by China (see source of Table 12.2). Based on that analysis, the following conclusions are relevant for comparative cost items (Table 12.3 below). Key findings from the CEEW Report are the following:

- Indian solar modules are nearly 33% more expensive than Chinese modules.
- Around 56% of this difference in selling prices (INR 3.32/Wp) is due to differences in the bill of materials (BOM) costs.
- In India, BOM costs account for nearly 86% of the selling price, while labour, electricity, utilities, land, logistics, and finance costs make up the remaining 14%.
- In China, 92% of the module selling price is based on BOM costs, while other costs account for 8% of the price.

[550] Quotation in https://www.scientificamerican.com/article/why-china-is-dominating-the-solar-industry/

[551] "We forecast that these cost declines will enable China's solar power industry to achieve grid parity by 2021. This means that the retail cost of solar-generated electricity will be on par with, or below, fossil fuel-powered electricity costs in most of China by this time."
https://www.ubs.com/global/en/wealth-management/chief-investment-office/market-insights/regional-outlook/2020/solar-energy-in-china.html

[552] http://www.solarmango.com/2016/08/07/indian-solar-panels-cost-lot-chinese-panels/

- This implies that China's BOM costs are about 80% to 82% of India's BOM costs, and other costs are about 45% of the corresponding costs of China.
- Large-scale and automated manufacturing lowers labour and overhead costs in China, which also has better financing options.
- Indian solar manufacturers import most components and raw materials.

As mentioned above, the CEEW Report shows that at 50% capacity utilisation for India and 100% for China, the overall difference in selling price is 33% higher for India. A 100% capacity utilisation by India would reduce this price differential to 22%, i.e. India's average cost differential would be one-third lower.[553] Tables 12.3 and 12.4 below show that the bulk of the difference in costs between India and China arises due to the difference in the costs of BOM. Further, the Chinese costs for most cost components are significantly lower than the percentage reduction in India's selling price if India operated at 100% capacity utilisation. This reflects a combination of the impact of subsidy and the use of technology with higher productivity in China. The main areas for which a subsidy is implied on this basis include depreciation, electricity, other utilities, land lease, other overheads, and cost of debt.

Table 12.3: Comparison of cost components of Indian and Chinese PV modules, for India's 50% capacity utilisation and China's 100% capacity utilisation (costs in INR/wp)

Cost Category	Difference in Indian and Chinese Costs for Each Category as Percentage of the Total Difference in Selling Price of PV in India and China	Share of India's Cost Components in Indian Selling Price of PV Module (50% capacity utilisation)	Share of China's Cost Components in Chinese Selling Price of PV Module (100% capacity utilisation)
Bill of Materials (BOM)	**37%**	**78.7%**	**92.5%**
Labour	**6%**	**3.0%**	**2.0%**
Depreciation	**16%**	**5.9%**	**2.6%**
Logistics	5%	2.5%	**1.6%**
Electricity	3%	0.8%	0.1%
Other Utilities	4%	1.2%	0.1%
Land Lease	1%	0.2%	0.0%
Other Overheads	**15%**	**3.9%**	0.4%
Cost of Debt	3%	1.1%	**0.4%**
Return to Equity	**10%**	**2.7%**	0.3%
Total Selling Price	100%	100.0%	100.0%

Source: Based on data in the CEEW Report.

Note: The highlighted estimates in the columns are the five largest numbers in each column.

[553] Page 7 of https://cef.ceew.in/solutions-factory/publications/scaling-up-solar-manufacturing-to-enhance-india-energy-security

Table 12.4: Cost components of Indian and Chinese PV modules, in INR/wp

	Indian PV Module (50% Capacity Utilisation) – INR/wp	Chinese PV Module (100% Capacity Utilisation) – INR/wp	Difference Between Indian and Chinese Cost Estimates	Percentage Share of Item in Total Difference
Bill of Materials (BOM)	16.04	14.17	1.87	**37%**
Labour	0.62	0.30	0.32	6%
Depreciation	1.20	0.40	0.8	**16%**
Logistics	0.50	0.25	0.25	5%
Electricity	0.17	0.02	0.15	3%
Other Utilities	0.24	0.02	0.22	4%
Land Lease	0.04	0.00	0.04	1%
Other Overheads	0.80	0.06	0.74	**15%**
Cost of Debt	0.22	0.06	0.16	3%
Return to Equity	0.54	0.05	0.49	**10%**
Total Selling Price	**20.37**	**15.32**	5.05	100%

Source: Figures 1 and 2 of https://cef.ceew.in/solutions-factory/publications/scaling-up-solar-manufacturing-to-enhance-India-energy-security.pdf

Note: The highlighted estimates in the last column are those which contribute a double-digit percentage to the difference between Indian and Chinese costs/selling prices.

The items which form the bulk of costs for BOM are also worth further consideration. These are shown in Table 12.5 below. The top six items which account for most of the cost difference of BOM have been highlighted. Amongst these, the largest cost difference arises for "Cell". The top five components of BOM mentioned in the Table account for 77% of the total cost of BOM. The significance of these items does not change even if we consider India's production at 100% capacity utilisation (see for example, Tables 12.3 and 12.4 above for India and China's cost components in total sale price, estimated for 100% capacity utilisation for both countries). The items highlighted in the two Tables here are the items which would require higher priority focus when planning policy initiatives for PV production in India.

China's competitiveness is driven largely by lower cost of power, especially for polysilicon production, higher efficiencies, economies of scale, government incentivisation of investment into R&D, mature ancillary manufacturing supply chains and massive subsidization of capex and financing costs.[554] Table 12.5 below shows the disadvantages faced by Indian industry vis-a-vis its competitors.

[554] https://energy.economictimes.indiatimes.com/news/renewable/opinion-how-india-can-become-atmanirbhar-in-solar-pv-manufacturing

Table 12.5: Cost components of the Bill of Materials (BOM) of Indian and Chinese PV modules, in INR/wp

	Indian PV Module (50% Capacity Utilisation) – INR/wp	Chinese PV Module (100% Capacity Utilisation) – INR/wp	Difference Between Indian and Chinese Cost Estimates	Percentage Share of Item in Total Difference in India's and China's BOM components
Cell	9.26	8.40	0.86	**46%**
TPT/PVDF Backsheet	0.79	0.67	0.12	**6%**
EVA Backsheet	0.86	0.73	0.13	**7%**
Glass	1.73	1.52	0.21	**11%**
Aluminium Frame	1.64	1.51	0.13	**7%**
Ribbon	0.49	0.41	0.08	4%
Silicon	0.15	0.14	0.01	1%
Packing Material	0.26	0.26	0.00	0%
Junction Box	0.58	0.51	0.07	4%
Others	0.27	0.02	0.25	**13%**
Total BOM	**16.04**	**14.17**	**1.87**	**100%**

Source: Figures 4 and 5 of https://cef.ceew.in/solutions-factory/publications/scaling-up-solar-manufacturing-to-enhance-India-energy-security.pdf

Note: The highlighted estimates in the last column are those which contribute a double-digit percentage to the difference between Indian and Chinese costs/selling prices.

12.5 Calculating the Disabilities Faced by the Indian Solar Panel Industry

Countries competing with India, particularly China, have used a mix of investment and trade policies to promote their domestic solar industry. It is useful to examine these policies as well as their impact.

Using the cost structures shown above in Tables 12.3-12.5, the disability of the Indian industry is as shown below.

1. 'By lowering the costs of capital, subsidized credit supports PV manufacturers regardless of their productivity levels, even if some of these loans may face high risk of default'.[555] The variable cost is around 72% of the total cost, whereas the capex cost is around 20%. The interest cost differential gives India a disadvantage of around 7.2% (72%*10%) on variable cost and around 2% in capital cost (20%*10%). In China the interest cost was often written off at the initial stage.[556]
2. Raw material costs are around 13% cheaper in China, giving India a disadvantage of (48%*13%) or around 6.3%.[557]

[555] See page 97 of the article by Chen Gang at the weblink https://rauli.cbs.dk/index.php/cjas/article/view/4813.

[556] Based on data provided in the CEEW Report.

[557] https://www.pv-magazine-india.com/2020/08/31/scaling-up-solar-manufacturing-in-india/#:~:text=At%20full%20capacity%20utilization%20levels,14.17%2FWp%20for%20Chinese%20manufacturers.

3. Most PV producers need sizeable industrial land for assembling production lines, R&D, logistical purposes, and waste and pollution treatment, but in the start-up phase, they usually lack sufficient funds or collateral to acquire this. In China, the local governments, through acquiring land from villagers, urban residents or other factories at very low prices, often have abundant land banks to support all kinds of industrial enterprises.[558] A simple rule of thumb is to take 100 sq ft or about 2.5% for every 1kW of solar panels given the land cost in India.[559] Hence, assuming that this is given free of cost in China, it adds another 2.5% to the cost of production in India.

4. Power costs for India and China are very similar. However, China has provided a subsidy of over 10% to energy-intensive sectors such as solar PVs.[560] This implies a cost disadvantage of around 0.6% to the Indian industry.

5. China also gave technological, infrastructure and personnel support to local solar-panel producers to enhance their competitiveness. For example, Yingli Solar, the world's biggest manufacturer of solar PV, succeeded in setting up two laboratories for photovoltaic technology, with substantial technical, financial and personnel support from the Chinese Ministry of Science and Technology and the National Energy Commission under China's National Development and Reform Commission (NDRC), respectively. The government provided these renewable energy labs with generous hardware (facilities, infrastructure and funding) and software (policy, research staff) support, which could help local enterprises to cut the costs of R&D.[561] For instance, Yingli Solar set up its own PV laboratory in January 2010, but a large part of its initial investment of 540 million yuan actually came from the Government instead of Yingli. Using Figure 3, this implies that per module the cost disadvantage to India is around 1.4%.

6. Of the capex cost, machinery accounts for a large proportion. It is estimated that the average machinery cost annualised would be roughly 17.5% of the cost of the module.[562] Under M-SIPS the Indian Government provided 20%-25% of this cost, but the Chinese Government covers over 75% of this cost. Hence the cost disadvantage to the Indian producer is in the range of 8.5% or 50% of 17.5%.

Adding up all these disabilities, Indian producers face a cost disadvantage of over 28%. This does not include other intangible costs such as ease of doing business and logistics cost. The price difference as shown above between a Chinese module and an Indian module is about 33%.[563] However, this price differential assumes 50% capacity utilisation. If Indian capacity utilisation were to improve to 100%, the cost differential between India and China would be around 22%.[564] Hence, to move towards a higher capacity utilisation and overtime achieve greater competitiveness as well, the disability faced by the Indian industry needs to be addressed. This would require a support of about 28% to 30%, to establish the momentum of investment and productivity, phasing in an industry that would be globally competitive. This support could be gradually withdrawn after a specified time period, say five years.

---

[558] Chen Chang, op.cit.

[559] http://www.solarmango.com/scp/area-required-for-solar-pv-power-plants/#:~:text=A%20simple%20rule%20of%20thumb,acres%2C%20or%201%20hectare.

[560] Chen Chang, op.cit.

[561] See Yingli Solar at http://www.yinglisolar.com/en/

[562] https://www.ifc.org/wps/wcm/connect/a1b3dbd3-983e-4ee3-a67b-cdc29ef900cb/IFC+Solar+Report_Web+_08+05.pdf?MOD=AJPERES&CVID=kZePDPG

[563] https://www.pv-magazine-india.com/2020/08/31/scaling-up-solar-manufacturing-in-india/#:~:text=Cost%20differential,Indian%20and%20Chinese%20manufacturers%2C%20respectively.

[564] Ibid.

Four important aspects are significant in this context. One, technological change is a major factor affecting competitiveness, and that should be part of the policy framework. Therefore, a specific focus on technology upgradation together with training and improving operational facilities is required. The support needed in this context is not only financial, as shown by the example of China discussed above. Two, since increasing capacity utilisation is important for improving cost efficiency, policy objectives need to mesh-in an increase in demand. While initiatives for higher domestic demand are part of India's policy framework, the aim should be also to improve export capabilities/opportunities over time. Three, the policy measures used for support include both trade measures and investment measures, and these may possibly have the opposite impact on the user industry and on incentives to reduce costs over time. Four, normally the assessment of policy support includes the factor of revenue outgo (say, through subsidies). The assessment of such revenue outgo should also take account of the revenue inflow due to GST from domestic sales and other taxes which will accrue from the higher economic activity. The main point in this context is that if one takes a medium-term perspective (e.g. three to five years), then the revenue outflow is much lower than what is assessed in a static short-term perspective.

12.6 Drivers of Solar Energy Investment in India

12.6.1 Achieving Grid Parity

The prime reason for the focus on solar is that it is approaching grid parity. For instance, for the 1-5 MW scale solar projects, the LCOE (levelised cost of energy) is about INR 5.5/kWh. For power plants that are 50 MW and above, the LCOE has gone below INR 5/kWh. Solar grid parity signals that from now on, investments going into power might as well go into solar instead of into conventional power.[565]

12.6.2 Power Shortage in most States

Apart from the western and eastern grids, there is a power deficit in most parts of the country with this deficit being the highest in the southern States. Solar brings along a great promise of energy security at lower costs. States like Karnataka, AP and Telangana are already witnessing the change.[566]

12.6.3 Land Availability

Then, of course, there is the factor of land availability. Solar plants require an area of around 5 acres per MW. Due to this, states like Madhya Pradesh and Rajasthan are witnessing foreign investments as land availability in large tracts is much less of a concern in these states than it is in some others.[567]

12.6.4 Criteria for Selecting the Best Solar States

Three vital factors are considered in basing this evaluation. Solar irradiation, which is a measure of solar energy falling on the earth's surface per unit area over a period, is a decisive factor in the selection. It is measured in kWh/day. Some States have higher radiation compared to others. For example, Rajasthan, Gujarat and Madhya Pradesh have a higher irradiation level, with some parts receiving even up to 6.5 kWh/day.[568]

[565] https://www.sciencedirect.com/science/article/pii/S2214157X13000117

[566] http://indianpowersector.com/home/tag/power-shortage/

[567] http://www.solarmango.com/ask/2016/02/10/top-5-states-solar-energy-investments-india/

[568] http://www.gise.in/uploads/downloads/1490881948_site-selection.pdf

12.6.5 Power Evacuation Infrastructure

Sometimes, due to ineffective system operation and grid management, there are significant losses during transmission and this problem is amplified in certain States resulting in the poor health of discoms.[569]

12.6.6 Policies and Regulations

For the next few years at least, policies will be the most important driver of investments into the solar sector. States with more friendly and transparent policies will take the lion's share of solar power investments. Although most States have or are in the process of framing a solar policy, some States have solar-specific schemes and incentives which attract the common public to go solar. For example, Karnataka recently introduced the Land Owning Farmer's Scheme for which the tariff rate is INR 8.4/kWh and is considered very lucrative.[570] Many States are currently easing regulations for setting up solar plants.

12.7 Policies on Solar Energy and Solar Modules

Some initiatives by Government of India to boost India's renewable energy sector are as follows:

- In August 2020, the Government announced plans to offer land near its ports to companies for building solar equipment factories.
- India plans to add 30 GW of renewable energy capacity along a desert on its western border, such as in the States of Gujarat and Rajasthan.
- The Delhi Government decided to shut down its thermal power plant in Rajghat and develop it into a 5,000 KW solar park.
- The Rajasthan Government, in Budget 2019-20, exempted solar energy from electricity duty and focused on the utilisation of solar power in its agriculture and public health sectors.
- The Ministry of New and Renewable Energy (MNRE) has decided to provide custom and excise duty benefits to the solar rooftop sector, which will lower the cost of setting up as well as generating power, thus boosting growth.
- Indian Railways is making increased efforts through sustained energy-efficient measures and maximum use of clean fuel to cut down emission levels by 33% by 2030.

12.7.1 Investments in the Solar Industry

Some major investments and developments in the Indian renewable energy sector are as follows:

- The Solar Energy Corporation of India (SECI) implemented large-scale central auctions for solar parks and has awarded contracts for 47 parks with over 25 GW of combined capacity.
- In April 2020, Vikram Solar bagged a 300 MW solar plant project for INR 1,750 crores (USD 250.39 million) from National Thermal Power Corporation Ltd (NTPC) under CPSU–II scheme in a reverse bidding auction.
- Adani Group aims to become the world's largest solar power company by 2025 and the biggest renewable energy firm by 2030.
- Around INR 36,729.49 crores (USD 5.26 billion) investment was made during April-December 2019 by private companies in renewable energy.
- Brookfield will invest USD 800 million in ReNew Power.
- ReNew Power and Shapoorji Pallonji will invest nearly INR 750 crores (USD 0.11 billion) in a 150 MW floating solar power project in Uttar Pradesh.

[569] Ibid

[570] http://www.solarmango.com/ask/2016/02/10/top-5-states-solar-energy-investments-india/

- In November 2019, ReNew Power, Avaada, UPC, Tata unit won solar projects in 1,200 MW auction of SECI.
- As of 2019, India was set to open its solar power plant, Bhadla Solar Park in Rajasthan, which will be the world's largest solar plant with a capacity of 2,255 MW.
- As of March 2019, Eversource Capital, a joint venture between Everstone and Lightsource planned to invest USD 1 billion in renewable energy in India through its Green Growth Equity Fund.
- The international equity investment in India's clean energy sector was USD 283 million in 2016, USD 532 million in 2017, and USD 1.02 billion in 2018.

12.7.2 Incentives

Comparisons of incentives for solar energy across States[571]

1. Karnataka — 7,100 MW

In addition, 1,000 MW of projects are in the pipeline. Karnataka's 13,000-acre Pavagada Solar Park (or Shakti Sthala) in Tumakuru district is one of the biggest solar plants in India, with a production capacity of 2,050 MW. The state may get three more solar power plants with a capacity of 2,500 MW each, in the districts of Bidar, Koppal and Gadag.[572] There is also a rooftop scheme under BESCOM in Karnataka where solar power can be sold at a lucrative rate for the provider of INR 9.56/unit on a net-metering basis.[573] However, as the price of power has fallen to around INR 2.00 per unit, discoms may be reluctant to buy power at this price leading to huge losses for the State Government.

2. Telangana — 5,000 MW

Telengana has met its own target for 2020, including standalone rooftop solar units as well as grid-connected ones. It opted for a distributed solar-installation model, which has managed to earn it about INR 450 crores in the form of savings. Instead of concentrating these projects at a single location, Telangana has spread them across more than 180 locations.[574] But this relates to the target for solar power generation and not for solar PVs.

3. Rajasthan — 4,400 MW

An additional 1,900 MW more are in the pipeline. By 2025, Rajasthan aims to instal a total capacity of 30,000MW of solar energy. As mentioned earlier, the 14,000-acre Bhadla Solar Park in Jodhpur is currently the world's largest fully operational solar park, with a capacity of 2,245 MW of installed solar energy. Rajasthan is also home to India's only tower type solar thermal power plant.[575] Rajasthan is the largest state in the country with huge availability of unused land and has the added appeal of irradiation levels. This was a key factor in the State receiving the maximum share of the JNNSM Phase-1 allocations with 873 MW out of 1100 MW. And under the second phase of JNNSM, 355 MW was allotted to Rajasthan out of 750 MW.[576]

---

[571] This section draws heavily on the solarmango report cited in Footnote 570.

[572] https://www.nsenergybusiness.com/news/top-states-solar-power-production-india/

[573] Net Metering is a system that gives solar energy owners credits for the power that they add to the grid. When solar panels produce excess power, that power is sent to the grid. And this power can be 'taken back' when the solar plants are not functioning – for example, during the night. When a unit of solar energy that has been 'net metered', the bi-directional electricity meter will run backwards. Customers are billed only for the 'net' energy use. This scheme is akin to an advanced system of feed-in-tariff in the western world. https://www.cleanmax.com/solar-net-metering.php

[574] Footnote 572.

[575] Footnote 572.

[576] See Solarmango report cited in footnote 570.

4. Andhra Pradesh — 3,470 MW

Due to the rising demand for power in the State, the Government of Andhra Pradesh is planning for a 10 GW mega solar power project, and intends to supply this power without interruption and free of charge to the agricultural sector.[577] The pace of implementation has picked up in the last two years.[578]

5. Gujarat — 2,654 MW

Out of Gujarat's current total renewable energy production of 9,670 MW, about 2,654 MW consists of solar energy. It is planning to boost its renewable energy capacity to 30,000 MW by 2022. The State is at the top in India for domestic rooftop solar installations — a total of 50,915 — which account for nearly 64% of the country's total of 79,950, as of 2 March 2020.[579] Being a power-surplus State, incentives to solar are lagging behind other States such as Karnataka.

Although, currently the above States seem to be attractive in general for production of solar power in India, there are States like Madhya Pradesh, Punjab, Telangana and Maharashtra which are not far behind. In fact, these dynamics will keep changing over the next couple of years and will depend mostly on solar policies implemented by individual State Governments.[580]

12.7.3 Incentives for Solar PV

Higher Import Duties

While the recent proposal of 15% safeguard duty (SSG) for another one year may provide temporary relief to the Indian solar-module manufacturing sector, it is not enough to aid them to grow exponentially and showcase their true potential, as the disability factor is about 28%. Hence, incentives plus SSG need to be considered. In addition, full capacity utilisation should be encouraged. For this, both an increase in demand and an interest subvention scheme for working capital in this sector become relevant. This will encourage local production and competition between local players, thus boosting the domestic manufacturers.

Make manufacturing a focused engine for growth with ease of doing business

Today India imports many components which could be manufactured in India, but are not because it costs less to import them. This is because investment inflow in core industries such as basic raw materials and infrastructure is low. With Covid-19, schemes such as PLI can attract investment and promote locally-manufactured modules, moving India to aim at becoming one of the largest suppliers of high-class modules.

Clarity in policies and a long term vision in place (minimum 10 years)

Return on investment in manufacturing takes much longer in solar, so an investor will look for clarity in policies over a six-to-eight-year period before investing. This policy needs to be countered with some form of a phased manufacturing programme.

[577] Footnote 572.

[578] Footnote 570.

[579] Footnote 572.

[580] http://www.solarmango.com/ask/2016/02/10/top-5-states-solar-energy-investments-india/

The ALMM

In October 2018, the MNRE brought out an order to enlist eligible models and manufacturers of solar modules and published a list called the 'Approved List of Models and Manufacturers (ALMM)' to monitor the quality and reliability of components being used in government-owned solar projects.[581] According to the ALMM Order 2019, List I will consist of models and manufacturers of solar PV modules, and List II will comprise models and manufacturers of solar cells.

It is important to assess certain features of the scheme which create concerns for suppliers of PV products. The points below relate to both domestic and foreign manufacturers, because the scheme applies to both.

Costs of inspection: Applicants are required to pay for the charges involved in the inspection, including the cost of travel, accommodation, and other allowances for both the domestic and international officials deputed with the task of inspection. These fees start at INR 500,000 (about USD 6,583) and go all the way up to INR 3 million (USD 39,500) per visit, depending on the capacity and location of the manufacturing site.[582]

Considering the travel restrictions due to the Covid-19 situation, travelling within the country is not considered safe, let alone international site visits, which again will be extremely unsafe, expensive, and impractical. There is uncertainty as to when these international travel restrictions could be lifted.

Table 12.6: Fee Structure of ALMM

Fee Structure for Enlisting Under Approved List of Models and Manufacturers (AMLL)
Application Fees
The Application fee for one model of module/cell is ₹5,000 (~$66)/MW of total installed module manufacturing capacity and ₹5,000 (~$66)/MW of total installed cell manufacturing
In case the application consist of multiple models, the application fees shall be as above for one model and additional 1$ of this for every additional model
Preliminary Inspection Fees for SAARC Countries
Upto 100 MW - ₹500,000 (~$6,583) 100 MW - 250 MW - ₹1.5 million (~$13,166) Above 250 MW - ₹3 million (~$39,500)
Preliminary Inspection Fees for Non-SAARC Countries
For All Capacities - ₹3 million (~$39,500)

Source: MNRE (Mercom India Research)

Delays: The user industry claims that the entire process of getting listed in the ALMM is time-consuming, and leads to delays and supply chain disruptions.[583]

Duplication: Further it claims that the whole process is redundant since the Bureau of Indian Standards (BIS) certification has already implemented standards for quality control. They believe that the BIS certification is very similar to the International Electrotechnical Commission (IEC) standards.[584]

[581] https://mercomindia.com/mnre-issues-requirements-solar-manufacturing/

[582] Ibid.

[583] https://energy.economictimes.indiatimes.com/news/renewable/mnre-asks-stakeholders-for-strict-compliance-of-almm-order-for-solar-pv-modules-cells/75274107

[584] Mercom, op.cit.

These fees might be prohibitively expensive, especially for Chinese manufacturers with high-capacity manufacturing units in China. For example, if a company has an installed capacity of 10 GW but only supplies 1 GW to India, they are still expected to pay for the entire 10 GW capacity, according to the rules.[585] Since BIS certification is a prerequisite for enlisting in ALMM, the user industry could see an increase in lead times for Chinese companies to sell existing products or launch new ones in the Indian market.

BIS and ALMM: The difference between BIS and ALMM certification is that BIS certifies the product while ALMM certifies the company producing the product. The ALMM order would also deter foreign players from entering the market for reasons other than high costs and the long lead times. The application for ALMM listing currently requires companies to share information regarding the manufacturing units' production, purchase of raw materials, sales, profit and loss account, statement of assets and liabilities, and balance sheet over the last three years. Certification of this kind has been the standard practice in ISO standards.[586]

On the other hand, some companies feel that implementing ALMM would be a good move for the solar industry. They believe that this would help increase the quality of PV products entering the Indian solar market, force companies to up their game in terms of production efficiency, and result in longer-lasting products that would help bring down tariffs.[587]

As a result, the industry might start to see increased performance and reduced degradation rates. This could also lead to a reduction in power tariffs, with the industry considering a longer usable product lifecycle for their project. A small cost increment to the end consumer would be a worthwhile trade-off to avoid the risks of degradation and other cost consequences of untested panels.[588]

While taking steps to ensure product quality would have its benefits in the long run, if not done correctly, it may end up harming the growth of the industry. Solar installations in 2020 are due to decline from 20 to 5 GW due to the Covid-19 effect on the markets. Foreign suppliers have expressed the view that the Government must work on its ALMM guidelines to make it fairer towards all manufacturers. The Government needs to revise the harsh fee structures, remove procedural redundancies, and in general, make amendments to the regulations that are impractical at this time.

Local Content in Public procurement

The DPIIT recently issued a revised Public Procurement Order on 4 June 2020 (Revised Order).[589] The Revised Order applies to all "procuring entities" i.e. a Ministry or Department or attached or subordinate office or an autonomous body controlled by the Government of India (and includes "government companies" as defined under the Companies Act, 2013).

Types of Procurement Governed

The Revised Order applies to the procurement of all goods, services or works. Separately, a list of approved product categories and Nodal Ministries is available.

---

[585] Ibid.

[586] https://advisera.com/9001academy/blog/2018/03/27/certifying-different-legal-entities-under-one-certification-scope-in-iso-9001/

[587] Mercom, op.cit.

[588] Ibid.

[589] https://elplaw.in/wp-content/uploads/2020/06/Public-Procurement-Policies-Are-they-WTO-compliant.pdf

Classification of Suppliers

The local suppliers under the Revised Order have now been classified into 3 categories as follows:

- Class-I local supplier – A supplier or service provider, whose goods, services or works offered for procurement, has local content equal to or more than 50%, as defined under the Revised Order.
- Class-II local supplier – A supplier or service provider, whose goods, services or works offered for procurement, has local content more than 20% but less than 50%, as defined under the Revised Order.
- Non-local supplier – A supplier or service provider, whose goods, services or works offered for procurement has local content less than or equal to 20%, as defined under the Revised Order.

Preference to Class-I local suppliers

Different classes of suppliers shall be eligible to bid for supply of goods or services depending on whether there is sufficient local capacity and local competition. Preference is first given to Class-I local suppliers, and only when the procuring agency seeks to issue a Global tender enquiry, with approval from the Department of Expenditure, are Non-local suppliers eligible to make a bid. Even where Non-local suppliers are eligible to bid, they are not awarded the entire portion of the contract as Class-I suppliers are invited to match their bid for 50% of the quantity ordered.[590]

This scheme could encourage local production of solar PV modules though the WTO provisions need to be kept in mind.[591]

Production Linked Incentive (PLI) Scheme

High efficiency solar PV modules have been identified as potential recipients of INR 4,500 crores worth of the PLI scheme. Depending on the yearly investment, it remains to be seen whether this allocation will sufficiently meet the viability gap funding or counter the disabilities of this sector.

Conclusions and Recommendations

There appears to be a trade-off between generating cheaper solar power and producing solar PVs in India, at least in the short run. To scale up local manufacturing of solar PV cells, a sequential long-term policy, coupled with infrastructure and the right incentives are required. Investment in R&D is imperative. India needs to think about complete vertical integration if Atma-nirbharta objectives in solar equipment manufacturing are to be met, starting with priority areas of focus. It is not enough to just set up units to make cells, modules or wafers. It also important to gear up production of ancillaries including inverters, glass, backsheets and other products, i.e. develop the domestic ecosystem for the industry. Technology is key to the industry. Annex 12.1 provides a short discussion on the emerging technologies in this area.

Trade restrictions

Trade restrictions on China may actually force India towards a more robust R&D. Trade restrictions, if placed, have to be done in a planned and phased manner in order to ensure the existing pipelines are not disturbed and without impacting the costs of generating solar power. An important part of this process would be to

[590] Ibid.

[591] Ibid.

incentivise the local manufacturers. The Government will have to take a long-term view and stay committed to the notion of making India a manufacturing hub.[592] Specific issues which need to be addressed are the following:

- A combination of trade and investment policies are required.
- At current levels of solar power tariff and solar module prices, it is expected that with a 10% and 20% increase in module prices, the power tariff may increase by 5% and 10%, respectively. So a 20% BCD may lead to an increased tariff of INR 0.20 to 0.25 per unit of electricity.[593] Hence tariff increases have to be clearly thought through.
- India should investigate production along the entire value chain (see Figure 12.1). For this it may need a PMP approach with selective tariffs followed by liberalisation as the industry matures and becomes competitive.
- Reduced reliance on imported products have to be planned in such a way that over time the sector moves towards being self-sufficient, competitive, and becoming resilient to supply chain disruptions.

Apart from increasing India's energy security, the domestic solar manufacturing industry would also help in the creation of jobs and growth of the economy. An integrated cell and module manufacturing initiative would generate around 2.6 full-time equivalent jobs per MW of output.

Key Recommendations

Short-term interventions

- Provide visibility of a demand pipeline and develop an ecosystem by providing policy stability and continuity, quality infrastructure, and a mature banking system.
- Provide clear information on the implementation timelines and tenure of the proposed BCD.
- Levy higher duty on modules and lower duty on cells to ensure that module facilities can increase their capacity utilisation factor (CUF), and new cell-manufacturing facilities can be commissioned.
- Introduce new domestic-procurement programmes such as the Central Public Sector Undertaking Scheme (CPSU) which entails production of solar power for government units and has an element of local content.
- Record data in both capacity terms (kW units) and monetary value (INR) to accurately estimate imports, and design policy interventions accordingly.
- Set a national target of installing at least 50 GW of manufacturing capacity by 2030.
- Incorporate solar manufacturing as a focus industry in foreign policy and collaborate with governments and private parties in Europe, Japan, and the United States of America.

Medium to long-term interventions

- Encourage public sector undertakings (PSUs) such as Bharat Heavy Electricals Limited (BHEL) and Bharat Electronics Limited (BEL) to lead the solar manufacturing indigenisation effort.
- Consider materials that can be sourced within the country. Engage micro, small, and medium enterprises (MSMEs) to source these materials.

---

[592] https://www.theweek.in/news/biz-tech/2020/06/25/solar-companies-dependence-on-china-may-prove-to-be-a-challenge.html

[593] CEEW report, op.cit.

- Set up large 10 GW solar equipment manufacturing parks near ports in Maharashtra, West Bengal, Andhra Pradesh, and Tamil Nadu.
- Establish collaborative schemes with technological institutions like Indian Institute of Technology (IIT) Bombay, IIT Delhi, IIT Madras, and the Indian Institute of Science (IISc) Bengaluru to develop novel solar technologies and commercialise them.
- Provide access to low-cost capital to scale up polysilicon and wafer manufacturing facilities in the upstream part of the value chain.
- Set up an inter-ministerial body for ministries with overlapping mandates to work in tandem.

Annex 12.1

In November 2020, MNRE organised a conference to understand the new solar technologies. Over 20 R&D companies and experts from across the world provided a snapshot of the future of solar manufacturing and presented their unique technologies to Indian stakeholders.[594] The sessions even brought forward new indigenous technologies, which are patented by Indian companies. The pitching sessions highlighted that giga-scale solar manufacturing stands on three pillars: (i) disruptive PV chemistries; (ii) manufacturing by custom-engineered advanced production equipment; (iii) utilisation of innovative BoM components such as special glasses and coatings.

During the third session, 'Investment Conclave', officials from the State Governments of Tamil Nadu and Andhra Pradesh shared their efforts to attract investments. The session highlighted what makes India's solar manufacturing sector attractive to global institutional investors and included a high-profile panel discussion with executives from international finance corporations, major developers and Coal India Limited on how to catalyse investment momentum in breakthrough PV technologies.

India's Nationally Determined Contributions under the Paris Agreement in 2015 call for extraordinary vision, leadership, compassion, and wisdom to combat climate change. India PV Edge-2020 has served as a small step towards that ambition by bringing together cutting-edge R&D companies, RE[595] developers, policy-makers and investors under one platform and will go a long way in making India the giga-scale manufacturing destination for breakthrough PV technologies.

Solar technologies have evolved a lot since they first made their debut in the 1960s.[596] While previously solar photovoltaics (PV) were seen as a thing of the future, today, technological breakthroughs have positioned the industry for huge growth. A series of new developments in solar PV technology also promise to contribute to the industry's success.

Advances in Solar Cell Technology

Researchers have looked for ways to improve the efficiency and cost-effectiveness of solar cells -- the life blood of solar PV systems. A solar PV array is comprised of hundreds, sometimes thousands of solar cells, that individually convert radiant sunlight into electrical currents. The average solar cell is approximately 15% efficient, which means nearly 85% of the sunlight that hits them does not get converted into electricity. As such, scientists have constantly been experimenting with new technologies to boost this light capture and conversion.

Light-Sensitive Nanoparticles. Recently, a group of scientists at the University of Toronto unveiled a new type of light-sensitive nanoparticle called colloidal quantum dots, that many believe will offer a less expensive and more flexible material for solar cells. Specifically, the new materials use n-type and p-type semiconductors — but ones that can actually function outdoors. This is a unique discovery since previous designs weren't capable of functioning outdoors and therefore not practical applications for the solar market. University of Toronto researchers discovered that n-type materials bind to oxygen — the new colloidal quantum dots don't bind to air and therefore can maintain their stability outside. This helps increase radiant light absorption. Panels using this new technology were found to be up to 8% more efficient at converting sunlight.

[594] https://economictimes.indiatimes.com/topic/MNRE

[595] Real Estate

[596] https://www.altenergy.org/renewables/solar/latest-solar-technology.html

Gallium Arsenide. Researchers at Imperial College University in London believe they have discovered a new material -- gallium arsenide -- that could make solar PV systems nearly three times more efficient than existing products on the market. The solar cells are called "triple junction cells" and they are much more efficient, because they can be chemically altered in a manner that optimises sunlight capture. The model uses a sensor-driven window blind that can track sunlight along with “light-pipes” that guide the light into the system.

Advances in Energy Storage

Another major focus of scientists is to find new ways to store energy produced by solar PV systems. Currently, electricity is largely a “use it or lose it” type resource whereby once it’s generated by a solar PV system (or any type of fuel source), the electricity goes onto the grid and must be used immediately or be lost. Since the sun does not shine twenty four hours a day, this means that most solar PV systems are only meeting electrical demands for a portion of the day -- as a result, a lot of electricity is lost, if it’s not used. There are a number of batteries on the market that can store this energy, but even the most high-tech ones are fairly inefficient; they’re also expensive and have a pretty short shelf life, making them not the most attractive options for utility companies and consumers. That is why scientists are exploring different ways to store this electricity so that it can be used on demand.

Molten Salt Storage Technology. A company called Novatec Solar recently commissioned a promising energy storage solution for solar PV systems using a molten salt storage technology. The process uses inorganic salts to transfer energy generated by solar PV systems into solar thermal energy, using heat transfer fluid rather than oils as some storage systems have. The result is that solar plants can operate at temperatures over 500 degrees Celsius, which would result in a much higher power output. This means that costs to store solar would be lowered significantly and utility companies could finally use solar power plants as base load plants rather than to meet peak demand during prime daylight hours.

Solar Panel with Built-In Battery. In a project funded by the United States Department of Energy, Ohio State University researchers recently announced that they have created a battery that is 20% more efficient and 25% cheaper than anything on the market today. The secret to the design is that the rechargeable battery is built into the solar panel itself, rather than operating as two standalone systems. By conjoining the two into one system, scientists said they could lower costs by 25% compared to existing products.

Advances in Solar Cell Manufacturing

Another area that has made costs of solar PV technologies prohibitive compared to traditional fuel sources is the manufacturing process. Scientists are also focused on ways to improve the efficiency of how solar components are manufactured.

Magnesium Chloride. While over 90% of solar panels on the market today are comprised of silicon semiconductors, the key ingredient to converting sunlight into electricity, many believe the next generation of solar panels will be made of a thin-film technology that uses narrow coatings of cadmium telluride in solar cells -- this technology promises to be a much cheaper and more efficient way to engage the photovoltaic process. One major obstacle for cadmium-telluride thin-film cells is that they become highly unstable during the manufacturing process, which currently uses cadmium chloride. Researchers have devised a new, safe and seemingly low-cost way to overcome this hurdle by using a material called magnesium chloride in place of cadmium chloride. Magnesium chloride is recovered from seawater, an abundant resource, which makes the resource very low cost, as well as non-toxic. Replacing cadmium chloride with this material promises to increase the efficiency of these solar cells from 2% to up to 15%.

New Solar Applications

When most people think of solar PV systems they think of them atop roofs or mounted for industrial-scale use. But researchers are exploring a number of unconventional solar applications that could promise to transform the industry.

Solar Roadways. Scientists are exploring ways to actually line highways and roads with solar panels that would then be used to deploy large amounts of electricity to the grid. This would help overcome a major barrier to industrial-scale solar, which opponents say threatens to take up too much land. Solar roadways have already popped up in the Netherlands.

Floating Solar. Another way to address land-use concerns associated with wide-scale solar is to erect solar plants on the water, since over 70% of the Earth's surface is covered in water. Some researchers, including a French firm called Ciel et Terre, are experimenting with this technology. The company has projects set up in France, Japan, and England. Other parts of the world are also piloting projects including one in India and one in California in the US.

Space-based Solar. Scientists are resurrecting a technology that was first tested over 40 years ago in which space-based satellites capture sunlight and convert it into microwave energy that is then beamed back to earth. This type of technology promises to capture significantly more amounts of sunlight (nearly 90%), since satellites can be positioned to optimise light capture round the clock. India, China, and Japan are investing heavily in these technologies right now.

► Chapter 13

Improving Design Capabilities in India: Essential for Suitable Value Chain Approach

Introduction

In India, the significance of design capabilities is both not properly understood and highly undervalued. Proper understanding of design is crucial for industry, infrastructure, planning efficient links to global value chains, competitively producing products most suitable to their markets, and creating new regional or global brands from India. The value of design and the role played by small and medium enterprises (SMEs) using design as a basis for producing world-class products is evident from the experience of countries such as Germany[597] and Italy[598], and the emphasis given by China on promoting design activity.[599] "China seeks to lead at each point in the value chain. In semiconductors, for example, **China seeks to build a globally competitive industry in design**, operating systems, manufacturing, packaging, testing, equipment and materials."[600] (emphasis added)

Similarly, a study on "Globalization and Industrial Production Model"[601] states that: "German MNCs build up design and production competence in important, large foreign markets because they believe that is the best

[597] See https://www.bmwi.de/Redaktion/EN/Dossier/sme-policy.html and https://www.econstor.eu/bitstream/10419/189840/1/GLU-WP-No53.pdf.

[598] https://www.unido.org/sites/default/files/2008-05/the_italian_SME_experience_and_possible_LL_0.pdf ; http://www.iban.it/frontend/iban/public/file/ItalyReview_Opt.pdf and https://www.oecd.org/cfe/leed/Covid-19-Italian-regions-SME-policy-responses.pdf

[599] See for example, https://www.dezeen.com/2019/04/17/china-design-power-opinion-marcus-fairs/; https://www.institutmontaigne.org/en/blog/chinas-semiconductor-industry-autonomy-through-design and https://global.chinadaily.com.cn/a/202012/14/WS5fd6f7afa31024ad0ba9bb1e.html

[600] Page 1 of https://fas.org/sgp/crs/row/IF10964.pdf. Pages 1 and 2 summarize the Chinese Government's policy support measures in this context.

[601] https://link.springer.com/content/pdf/10.1007/s12651-014-0170-5.pdf

way to gain market share there. … The mix of local production and export is produced by strategic calculations within MNCs that involve **global considerations of cost, capacity and stakeholder interest**. … Localizing design and production operations, finally, are not only strategic responses to regulatory and market factors, they also create strategic advantages. Above all, **local design and production capacity facilitates local materials and components sourcing**."[602] (emphasis added)

One of the unexpected request from sunrise industries in India (like the mobile phone and engineering products) is to support a design eco-system so that design concepts and products can be synergistically developed for creating major value addition activities for companies in India, creating additional value addition and export opportunities.

This chapter explains in summary the concept of design, which is far more comprehensive in its scope than is commonly understood. A specific case of a successful aeronautical company is provided to give specific examples from a growth story that shows key factors that made the Indian form a world class enterprise. Key factors that need to be taken into account to promote design capabilities and growth are discussed next. The policy prescriptions from this discussion are summarised at the end of the chapter.

13.1 Design: Scope is larger than Conventionally Understood

Often, design is considered as similar to art. Design is needed to make any product or provide any service or to create a system. It is an intellectual property which is critical to original design manufacturing and brand creation, and is crucial for any country to have a competitive advantage. Design involves systematic application of knowledge of different overlapping fields like science, engineering, industrial design, sound design, art, architecture and marketing "to drive successful business results in a way that also impacts people's lives".[603] It is very different from the limited concepts of "prettification" or even "jugaad" as a process of innovation. The technique of design is to generate and explore numerous concepts and then methodologically narrowing down the best solution.[604] "Every type of design exists to solve problems. To see a problem and find a solution. So the toolset of the designer is based on research, not prettification. It's vital for design agencies to … always research their users, study their goals and pains."[605]

Design is needed to make any product or provide any service or to create a system. It is an intellectual property which is critical to original design manufacturing and brand creation. It combines three different forms of technology, namely hard technology (machinery, infrastructure), soft technology (knowledge base, cultural aspects, specific features of a product or market), and Org-ware, i.e. strategy and combination of hard and soft technology to achieve the most effective and efficient results.[606]

Design improves the possibility for a country to increase its competitive advantage, and efficient industrial production or brand building. Design takes account of efficiency of different parts and locations of the production process, using an understanding of global value chains and linked markets. In this process it also uses knowledge of the conditions in the market where the product is sold so that the user finds the product to be useful and attractive.

---

[602] Pages 137 and 139 of https://link.springer.com/content/pdf/10.1007/s12651-014-0170-5.pdf

[603] https://medium.com/google-design/the-meaning-of-design-44f1a82129a8

[604] https://uxdesign.cc/four-definitions-of-design-9e107fb057c5

[605] https://shakuro.com/blog/the-meaning-of-design-what-design-is-and-why-its-important

[606] See https://www.britannica.com/science/assistive-technology#ref1185944 and https://www.britannica.com/science/assistive-technology#ref1185944

13.2 Design – Using Multi-Disciplinary Training to Assess Linked or Overlapping Factors, to Develop a Problem Solving Approach for Achieving Short and Medium Term Goals

The difference between design and engineering/physics/mathematics is that in the case of the latter, the answer already exists which must be figured out, but in the case of design, there is no known answer. Hence, design thinking requires creativity and application of knowledge to make a product and its production process efficient and attractive.

This shows the need to create a vibrant eco-system for promoting and enabling design thinking at the national and societal level. This is facilitated in society if the education system encourages a problem solving approach, based on multi-disciplinary learning enabling different perspectives on an issue or a problem. Education system working in silos does not permit this, as it has happened in India. In comparison, the education system in the USA promotes a multi-disciplinary approach and considerable flexibility. Design is meant to solve societal problems and hence there is a deep connect of design with society.

Despite its importance, design was largely placed on the back burner in India compared to technology till the 1990s. The mindset was that you can get design from abroad. Trade fairs also promoted imported products. Industry did not invest in design as it seemed to be a cost, rather than investment. Without design, Indians were largely doing job work.

Though NID Ahmedabad was set up in the year 1961, it remained the only one till the year 2014. The Design Act came into place in 2000 but the penalty for infringement was only INR 25,000.

With the opening up of the economy in the 1990s, Indian industry realized that their technology was 20 years behind. The cars Scorpio and Indica were rare examples of Indian design. Though INR 2,000 crores were spent on designing the Indica car, Italian designers were hired to help in the same.

13.3 An Illustration – Dynamatic Technologies Ltd.

Dynamatic Technologies Limited (DTL) is a company that started in Bengaluru and today has its facilities in several cities of India, and in the UK and Germany.[607] Starting with the hydraulic pumps sector, it today operates in the aerodynamics, automotive, hydraulic and security sectors.[608] It is not only a part of global value chains, it developed its production strategy taking account of the most suitable conditions to invest in India and UK for a strong presence and control of key parts of the value chain. Its key management attributes its production, growth and investment strategy to thinking with a design perspective, identifying the synergies that would boost Indian presence in global markets while investing in parts of international markets as well. Thus, it has acquired firms in India and abroad with R&D and cutting edge technologies, and signed MOUs with several international companies, to both gain technical competence and widen its control over its international production chain as well as get better access to international markets. It established

[607] https://www.moneycontrol.com/company-facts/dynamatictechnologies/history/DT05

[608] Its production areas include, for example, Pumps, hydraulic, aircraft; Control valves, fluid power (hydraulic and pneumatic); Control valves, aircraft (hydraulic and pneumatic); Valves, hydraulic, aircraft; Pumps and pumping equipment; Valves, automatic control; Nonferrous die-castings except aluminium; Aerospace castings, aluminium; precision engineering products. See,
https://www.dnb.com/business-directory/company-profiles.dynamatic_technologies_limited.28c487cbddd6dce857e9f6e966f28a5c.html

certified training centres in India and incrementally raised Indian value addition based on medium term planning and nurturing of domestic strengths, working for both Indian firms such as Hindustan Aeronautics Limited (HAL), Boeing, Airbus, Bell Helicopters, and making specialized parts for Sukhoi aircraft.[609] Significantly, one of the main areas of emphasis by the company making Sukhoi aircraft in Russia is design.[610] One of the latest initiatives of DTL, working with AeroVironment Inc. and IIT Kanpur[611], is to develop a next-generation unmanned aircraft system (named as Cheel). The vision of its CEO and MD is similar to that of Atmanirbhar Bharat, when he says that "The next-generation Cheel will be a truly global system: make in India, serve the world."[612]

In any case, he has emphasized a vision and strategy of making synergistically in the world to make and grow in India. The growth pattern shows that for greater presence in global value chains and higher export momentum, the approach should not be limited to making in India but on the synergies that production in India can draw by working with and even producing in other parts of the world. A restrictive trade policy creates barriers to such an approach. A restrictive trade policy breaks the approach to consider the global value chain and focus more on a domestic value chain.

The key factors underlying growth and diversification of DTL according to senior management of the company are high competence in engineering and industrial design, and application of a design perspective that takes account of the whole global value chain for implementing investment, production and marketing initiatives. Value mapping showed the tasks that could be done in India and elsewhere. Within this framework, DTL identified parts of the value chain that could be performed in India and began by developing it within the country. DTL's value chain story is a story of Make in India and Make in UK. This was a result of design thinking.

DTL began with a specialized product (valve) for which it has a global patent. It is one of the leading producers in that area. It began with an initial supply to HAL and then diversified its area of operations. In this process, DTL focused on creating efficiency and synergies by identifying parts of the global value chain which would be most competitively produced in India and other countries, and then incrementally increase the scope and expertise within India to go up the value chain. It began with sales to the Indian market, but expansion and efficient production needed a larger, global market. For this DTL contacted some international firms and developed both commercial and technical partnerships. This possibility of exports allowed the scale of operations in India to increase based on an increase in imports and facilitation of value chain transactions. This was a classic example of international value chains which require international transactions (imports and exports) to create efficient domestic production.

With the help of its own "design-based focus" on strategy and the mutual commercial interests of DTL and other Indian as well as foreign companies, DTL has managed to competitively diversify its production base and product areas. It has developed an international reputation which makes it an institution of interest to both major companies and nations in planning their risk mitigation strategies during this difficult and uncertain time. Its strategy has thus also provided a stronger basis for economic, diplomatic and security related objectives of India and its partner countries.

---

[609] https://www.livemint.com/Companies/rocfSfuUBIcctGCDKVNy9K/Management-Case--Changing-dynamics-of-Dynamatic-Tech.html

[610] See, https://www.uacrussia.ru/en/corporation/company/sukhoy/#:~:text=PJSC%20Sukhoi%20Company%20is%20a,engineering%20to%20after%2Dsales%20support.

[611] https://www.iitk.ac.in/new/index.php/mou-between-dynamatics-and-institute

[612] See the last paragraph of the news report at https://www.livemint.com/Companies/rocfSfuUBIcctGCDKVNy9K/Management-Case--Changing-dynamics-of-Dynamatic-Tech.html

Many more such initiatives are possible and need to be supported: Companies in Germany are mid-size but they are world class. It would be useful to focus on the possibility of supporting growth of similarly dynamic companies in India.

One of the interesting points that emerged during discussions with DTL is that this approach could be applied on a wider scale. There are several knowledge-rich small companies that could be energized. These firms in India which have strong niche technology and products with market potential. Their strategy would need to use the coherent design-based approach that has been a major reason for the growth of DTL itself. This would require a process for supporting them, connecting them with larger global firms, and facilitating their operations. A beginning could be made by identifying a group of such firms in a specific location, such as Bangaluru, and expanding this circle with more experience and success.

13.4 Recommendations

Dealing with problems of skill and design is useful for improving both efficiency and quality of a product. For instance, proper design thinking is essential when we build infrastructure so that it fits the context and purpose and is of high quality. Education and skilling needs to promote design education as well as design thinking. Thus, the education curriculum itself should include this as a basis to develop an interactive and wide-ranging way of looking at specific issues.

Given the importance of design, core strategic significance should be given to at least certain activities in design. High priority focus areas could be identified, such as industrial design. Also, industry or Industry Associations should promote co-creation by multi-disciplinary teams sharing information and ideas. Individual heroes do not fit into this approach.

Coherence of policy is required between the Centre and States, and within the Ministries and Departments. For such consistency, misalignment between the Centre's and States' political priorities need to be addressed. Since conventionally the significance of design is not well understood, training should take place for those who will apply this knowledge to industry and infrastructure. In addition, an alliance of institutions should educate the political class and policy makers so that they also are able to see the value of such strengths.

Other policy interventions could include incentivizing the design activity through tax incentives.

Relevant important features of the production structures and markets should be kept in mind when determining policy. For instance, India is a leading producer of certain products in aerospace, but the market in India is small. Mostly, producers that add value for parts and components are in the West. A smooth flow of inputs is essential for the activities to grow and get established properly in the country. Restrictive policies result in breaking up or creating difficulties in such smooth operations of the value chains.

Design thinking needs to be applied to understand how global supply chains operate and how India can leverage its strength to take advantage of these chains. The value chain story of DTL is a very instructive story of Make in India based on an application of such design thinking. Value mapping showed DTL the tasks that could be done in India and elsewhere. It identified parts of the value chain that could be efficiently performed in India, where the value for India was possible and accordingly built up its manufacturing facilities in India and UK.

With some support, the approach of DTL could be applied on a wider scale. There are many knowledge-rich small companies that could be ‘fertigated’ to achieve similar results and scale up. Among institutional support, one possibility is for Exim to assess where there is value for India in this context, and promote focused initiatives in this regard. It could also consider schemes that provide cheaper finance.

Patenting in India is relatively easy while Global patenting and other IPRs are more difficult and expensive. Indian innovators often need a global market for their products which is possible only if they own IPR in different countries. Government should support Indian IPR holders in getting their IPR registered in other countries. This will enable Indian IPR holders to capture the proper value of their innovations.

For linked strategic sectors, a longer term approach is required, similar to that emphasized in major economies such as China and the EU. Qualified suppliers of key raw materials such as Titanium, Lithium etc are not available in India. The Government can support in creating such suppliers through appropriate policies and incentives. Titanium deposits are available in southern coastal States; rare earths in north-eastern States. A long term engagement is required to promote this as a medium to long term strength of India.

For small and medium enterprises, which could be a moving force in the above context, an important feedback is to improve the Labour Laws. One option is to examine a key difference for example between the Indian and UK laws. The Indian labour laws are the same as in the UK, except that exit and firing an employee is much more difficult in India. It is important to have a good exit policy. One possibility could be to increase the labour threshold, say from 100 to 1000.

► Chapter 14

Conclusions and Recommendations

Introduction

India's current policy reform is driven by the Atmanirbhar Bharat (AB) initiative announced by the Prime Minister (PM) in 2020. Trade and investment policies are prominent parts of the tools for achieving the objectives of AB. Though the objectives are not clearly specified as such, they could be inferred from the speeches of the PM and the Commerce and Industry Minister (CIM). The policy of Atmanirbharta **should** include improving India's domestic production levels and capabilities, raising employment, encouraging foreign direct investment (FDI), improving technological capabilities, increasing exports, and more substantive and larger links with global value chains (GVCs) based on a competitive domestic ecosystem. Since the background of this major initiative is the Covid-19 crisis, important objectives also include resilience of value chains, mitigation of risks, as well as building coalitions or economic partnerships with like-minded nations.

The growth of FDI and GVCs has resulted in the expansion of the scope of trade-related issues becoming a part of both bilateral/multilateral regional and international trade agreements. These initiatives cover a range of issues relating to trade and investment facilitation, sustainable and social standards, digital trade, and a re-orientation of national trade and investment policies. In this context and in response to Covid-19, states and firms have changed their approaches and strategies related to trade and investment policies, including through their bilateral, regional and multilateral initiatives. This was especially the case in the second quarter of 2020, when global merchandise exports declined by 21% compared to the previous year. According to WTO, global merchandise trade fell by 5.3% in 2020; it is likely to grow by 8% in 2021 and 4% in 2022. However, India's merchandise trade fell by 7.8%, a nearly 50% higher fall than the global average. The adverse impact on **global FDI** was even larger. In 2020, global FDI was down by 42% compared to the previous year, and the prospects for 2021 are weak. However India's FDI increased by 25.5%. This led to a re-orientation of government approaches including increasing trade restrictions in some cases and liberalising it in others (very few).

Globally, in Covid-19 times, Central banks and monetary authorities have intervened in financial markets and national governments have put in place a series of fiscal policy measures focused on supporting the health

sector, households and firms. Fiscal measures implemented include tax cuts and deferrals, wage and income supplements, expanding unemployment insurance, and direct payments to households and businesses. Monetary policy measures include interest rate cuts, preferential loans and loan guarantees, increased liquidity, new lending and financing programmes, asset purchases, foreign exchange swaps, and the easing of prudential regulations and capital buffers. However, the problem is so large that nations or firms cannot deal with it alone. A collective effort is required, with clarity of information, and actions taken by various countries through regional and multilateral institutions.

At the firm level, commercial strategies have been revised to focus on:

- Shorter and less fragmented value chains
- More concentrated value added
- More platform-driven and asset-light value chain governance
- A shift from global to regional and sub-regional value chains
- Downward pressure on global efficiency-seeking FDI in favour of regional market-seeking FDI
- Downward pressure on global trade in intermediate goods, less on trade in final products
- A shift in some industries from large-scale investment to smaller-scale distributed manufacturing
- Continued growth and fragmentation in services value chains
- Resilience and national security concerns as key drivers of GVC diversification

In this background, this report focuses on India's trade policy, investment policy, and the overlap between the two in the broad context of its economy. The same exercise is carried out at sectoral levels. Finally, on the basis of the analysis at both levels, some recommendations have been drawn.

14.1 India's Trade Policy

India's trade policy has focused on relatively high tariff and low non-tariff measures. Both tariffs and non-tariff measures have become more restrictive in recent years. These restrictive trade policies introduce inefficiency in domestic production, thus adversely affecting competitiveness (for a discussion, see below). This in turn, adversely affects exports, links to GVCs, and import competitiveness. This is evident from the evolution of India's export and import shares in global trade. India's global merchandise export shares have ranged between 1.6% to 1.7% from 2011-20, and import shares between 2.2% to 2.5% The sharp increase in export share in the previous decade of 2001-10 has not manifested itself in the decade of 2011-20. Any policy which reduces exports or export potential would in many cases limit the scale of operations, adversely affecting competitiveness in many sectors. Further, with a relatively high tariff regime, India would be at a disadvantage when entering into FTAs. Meanwhile, India's competitor countries are going ahead with their FTAs, creating an advantage for their exporters, and driving export market share away from India.

To the extent that tariffs are being used to encourage FDI and domestic investment, trade restrictive schemes must be recognised also as adversely affecting competitiveness. Competitiveness is at the heart of the ability to achieve and sustain several objectives of Atmanirbhar Bharat. This is evident from the experience of China and Vietnam compared to India. Both these countries managed to convert their trade deficits into surpluses over the last decade. India remains with a trade deficit which is a major area of concern for its policy-makers. Moreover, India's middle class will continue to grow in the future with its rising demand adding to import requirements unless met domestically by competitive production. Since tariffs are being justified on

the grounds of creating domestic investment and production opportunities, it is essential to realise that the attendant lack of competitiveness cannot be allowed to overwhelm short-term perceived benefit of higher domestic production. Therefore, if used, restrictive trade policies should be time-bound and temporary, so as to bring in competitive pressures to incentivise greater competitiveness.

Trade facilitation is a policy with beneficial effect for all objectives of Atmanirbhar Bharat, through its impact on competitiveness, enhancing the ability to create better capabilities for accessing both domestic and export markets, and to improve links with GVCs. Trade facilitation is an area of special focus for India, and the country is making steady progress in improving its operational conditions. However, to give more focus to these efforts, it is important to not only compare the country's performance on a global scale but also in terms of key comparator economies. India needs to improve in certain specific areas where it is in the last quartile of the smaller group of comparator economies.

14.2 Impact of Covid-19

The experience with Covid-19 has changed the policy orientation and risk-awareness in several economies. Efforts are being made to reduce reliance on single sources as the major provider of inputs, especially for strategic products. Moreover, greater scrutiny of investment has begun across nations in general, and within major economies in particular. Partnerships for diversification of sources for inputs and enhanced supply chain opportunities are seen as a new emphasis for increasing the resilience of supply chains. Thus, diplomacy and coalition-building is now an important part of the trade policy tool-box.

14.3 India's FDI Policy

India's FDI increased from relatively low levels in 2000 to over USD 60 billion in 2020. A significant part has come to services, telecommunications, and computer services and hardware. A comparison of investment policies in other countries shows that in addition to investment incentives and facilitation, what has gained prominence are security-related concerns, resilience of supply chains,[613] and strategic objectives that are leading to more inward-looking investment. These objectives are similar to those emphasised by India, though with some significant differences. India relies on trade restrictions much more than others. Further, it has only recently begun to focus more on global firms and specific priority sectors in a way that China and Vietnam have done for several years. Other nations are keener than India to create opportunities through FTAs and bilateral investment agreements. Vietnam is not as focused on producing key inputs or strategic products domestically as others including India; and China relies also on outward FDI while that is not the case for India.

It is important to learn from investment policy strategy of countries that have done comparatively well in terms of attracting FDI. Other countries such as China and Vietnam conduct a strategic evaluation and based on the priorities identified, a comprehensive approach is taken to improve operational conditions. Implementation is monitored to examine areas for improvement.

A major lesson from the experience of other countries is that support for effective implementation of policies is crucial. Feedback from Indian industry suggests that this is a particularly important area to address and improve. It also shows that not only is there an apparent conflict at times between trade and investment policies, but that the overall impact requires a consideration of whether or not the product of a protected

[613] See for example, https://www.whitehouse.gov/briefing-room/statements-releases/2021/02/24/fact-sheet-securing-americas-critical-supply-chains/

sector (e.g. electronics) is an important input into other sectors. For sectors whose products are linked to other sectors, the overall aggregate adverse effects can submerge any positive sectoral effects.

14.4 Improving Coordination between Trade and Investment Policy

India has initiated a structured subsidy programme in its Production Linked Incentive (PLI) schemes. This policy while encouraging investment is also meant to be trade promoting. So in a sense PLI is a bridge between trade and investment policy and is meant to promote both. However, there have been two problems with this policy. First, there appears to be a sentiment with the Government of 'One size fits all', namely, apply this policy with a similar approach to several sectors. However, this policy was designed for some products in the electronics sector for a few firms so that a system of checks and balances could be instituted. Applying it to other sectors with multiple players would be administratively difficult. Secondly, PLI was introduced in a Covid-19 year, which by no means was the best year to test its efficacy. While the PLI in the electronics sector met its targeted investment objectives, it failed to meet its output and export targets. Only one firm was able to meet all targets and even that firm has decided not to apply for PLI for some other products. Hence the rolling over of PLI or aggregating targets over some years would be required to both incentivise investment and trade over the long run. All policies do not work in a vacuum. They operate in the real world where situations like Covid-induced lockdowns do occur and adjustments have to be made accordingly.

In principle, while PLI is a better policy than tariffs, in some cases it can disincentivise an increase in productivity and competitiveness. To that extent, subsidies too should be time-bound and temporary. India's PLI scheme does incorporate such time limits for the subsidy support.

The impact of the PLI gets diluted with restrictive trade policies such as increasing tariffs. Tariff hikes will increase cost of inputs particularly if they are not manufactured in India. This will reduce India's competitiveness and hence its exports. It will also increase domestic prices of final products. Hence support being given through PLI will be effectively reduced through tariff hikes. In fact, some sectoral studies have shown that the current tariff hikes in 2020 and 2021 have led to the support provided by PLI to be reduced to near zero levels. Counter-intuitively, it may be cheaper to import battery chargers with a 20% tariff rather than procure them domestically as their inputs now have high tariffs. Policies which reduce incentives to improve competitiveness should not be adopted. Alternatively, if there is a need to use them, they should be temporary and phased out after a limited period of time.

Greater granularity and understanding of trade and investment policy conflicts and resolution can be obtained through sectoral studies. This report has studied seven sectors to understand these conflicts. These sectors range from traditional exports like textiles and clothing and leather products, to established industries like pharmaceuticals and automobiles, to emerging industries like medical devices, electronics and the solar sector. Before examining the interface of trade and investment policies, the challenges in each sector are first outlined. Next, the scope of government policy and its effects are enumerated. Lastly, the way forward and working towards consistent trade and investment policy is discussed. However, not all sectors are the same. For example, in traditional sectors such as leather and textiles and garments, India is slowly losing its competitive edge to other countries. Hence solutions are based on how India might regain its competitive edge. In pharma and automobiles, India is already an established presence. Hence to consolidate and take them further becomes a major concern. In the newly emerging sectors, India has yet to establish itself and so the learning from other countries becomes important.

Some general conclusions regarding consistency of trade and investment policies are that: trade policies of India are becoming restrictive while the focus of investment policies is to be more supportive; the positive

impact of support policies and ease of doing business is reduced by the restrictive trade policies. In most cases, trade restriction takes place through a rise is tariffs, while in some sectors with major export potential, significant restrictions are applied also through more restrictive implementation of non-tariff measures. Certain sectors such as pharmaceuticals and medical devices require a closer look at simplifying and facilitating the regulatory regimes, which become restrictions to both investment and trade. The positive impact of support policies is also reduced due to processes that are cumbersome, implementation being delayed, and limited co-ordination among implementing agencies.

In several sectors, competitiveness is changing or will change in the near future due to introduction of new technologies and improvement in design of products and processes. In certain sectors like automotive products, upgradation of technologies and design capabilities are relatively important factors to sustain competitiveness. A common feature to address across all sectors is that application of a design-oriented approach to value chains and production processes sustains competitiveness, is not given due importance in policy-making.

The main features of trade and investment policies across sectors are discussed below. This is followed by general conclusions and recommendations based on the assessment of the overall framework of analysis of trade and investment policies, an empirical evaluation of India's trade and investment policies compared to other countries, lessons from the experience of major competing economies and initiatives at the regional and multilateral institutions, and a detailed analysis of the situation across the many sectors covered by this report.

14.5 Sectoral Issues

14.5.1 Traditional sectors — Leather, Textiles and Garments

Leather

Challenges

This is a sector in which India has steadily been losing its export competitiveness with a year on year fall of an average of 5%. In terms of physical raw materials, the leather sector primarily requires an abundant supply of leather, chemicals for tanning, and easy availability of components and accessories required for shoes, leather goods and apparel. It has an average shortage of 2 billion square feet of leather. The shortage is made all the more acute because of recently imposed tariffs. The import duty on wet blue chrome tanned leather, crust leather, finished leather of all kinds, including splits and sides has been raised to 10%. These tariffs would make Indian export products more expensive as the price of leather accounts for roughly 60% of the cost of a leather product. It can be argued that exporters can always use the Advance Authorisation Scheme (AAS) route to source raw hides and skins from abroad. However, most exporters of shoes, apparel and leather goods do not have an in-house tannery. Moreover, for every kind of product, the Standard Input Output Norm (SION) laid down by the DGFT may not account for all the wastage involved in making the product, in which case an exporter has to get a specific SION fixed for his export product, which takes a lot of time.

While most chemicals are produced in India, some specialty chemicals (not produced in India) under ITC HS Chapter 32 (Heading 3201 and 3204) and Chapter 38 are imported from Italy, Germany, Spain, Peru, Chile, Argentina, Brazil etc. but the amounts involved are not large. The import tariffs on these chemicals is a uniform 10%. Further, the exemption of 5%, available for footwear components and embellishments for leather garments and leather goods, has been removed.

The lack of scale in operations, principally on account of disinclination to raise capital from the market, has proved to be an obstacle in servicing large orders from global brands and large chain stores. India's major exports are that of footwear. But it has hardly made a dent in the children's market and also lack of design capabilities has limited its foray in the garments area. Finally, the turnaround time for global orders has also shrunk from 90+ days to 60 days in most cases. Thus India's supply chain and logistics infrastructure have to be nimble and world class if we have to effect exports growth.

Government Policy and its effects

A Central sector scheme called the Indian Footwear, Leather & Accessories Development Programme (IFLADP) with an approved expenditure of INR 2600 crores,[614] has been under implementation since 2017-18. The IFLADP aims to develop infrastructure for the leather sector, address environmental concerns specific to the sector, facilitate additional investments, generate employment, increase production, and upgrade the design capabilities and skills of workers/trainers engaged in the sector. However, to date, only less than INR 1 crore has been disbursed to 48 eligible units/applications under the sub-scheme, after physical inspection and financial vetting by the implementing agency.

The Remission of Duties and Taxes on Exported Products (RoDTEP) would refund the embedded Central, State and local duties/taxes that were so far not being rebated/refunded and were, therefore, placing our exports at a disadvantage. However, it needs to be mentioned that the RoDTEP rates applicable from 1 January 2021, have been notified by the Government on 17th August 2021 ending a period of uncertainty for exporters.

Goods and Services Tax (GST) rates have been reduced, from 15 November 2017, for leather goods, leather garments, and leather chemicals from 28% to 18%, for finished leather from 12% to 5%, on job work from 18% to 5%, on effluent treatment plants from 18% to 12%, and on parts from 18% to 12%. This was expected to give a boost to the industry but exports have steadily fallen.

The Interest Equalisation Rate was enhanced from 3% to 5% for MSME units from 2 November 2018 on pre-shipment and post-shipment rupee export credit. Quarantine clearance for finished and crust leather was removed.

Despite these supportive policies, both exports and investment have been falling sharply in this sector since 2017.

Merging trade and investment policy for Leather

First of all the tariff policy in this sector needs to be changed. The tariff of 10% imposed for semi-finished leather in the budget 2021-22 needs to be withdrawn. The tariffs on chemicals used for the tanning industry, especially of plant origin and the others which are not being manufactured in India at present, need to be reduced to improve the competitiveness of our exports. The entitlement for imports of components and embellishments for footwear, leather garments and leather goods, under the Duty-Free Imports for Exporters Scheme, needs to be restored to pre 1.2.2021 levels. The imports of non-leather shoe components and embellishments needs to be liberalised to increase exports in this fast-growing segment of the global market, where India's presence is currently very small and stagnant.

Local manufacture of components, accessories and embellishments as well as non-leather footwear upper materials needs to be encouraged through appropriate policy incentives so as to reduce the turnaround time for exports and reduce dependence on China. PLI has not been granted to the leather sector.

[614] https://dipp.gov.in/sites/default/files/Brief_IFLADP.pdf

The Mega Cluster sub-scheme of IFLADP needs to be implemented quickly and more Leather Parks with common infrastructure, including a CETP, need to be set up near existing manufacturing clusters. Some of these projects could be linked up with the Sagarmala project so as to benefit from the proximity to ports. The export basket needs to be diversified to include casual and sports shoes for men, women and children, and give greater emphasis on increasing India's share of the global market in both women's and children's shoes. In leather garments, greater emphasis must be laid on the design element and collaboration with high fashion global brands so that we could move up the value chain and improve our value realisation. Attractive incentives, including Income Tax benefits, need to be given to individual enterprises, to improve their design capabilities. The Central Leather Research Institute and NIFT could jointly act as centres of excellence to this end. Both trade and investment policies need to be implemented together with neither contradicting the effects of the other.

Textiles Sector

Challenges and solutions

Trade-based challenges and solutions

The import tariff of 10% imposed recently on Extra Long Staple Cotton needs to be removed. The 3% duty-free import entitlement scheme, for import of trimmings and embellishments for made-ups and clothing, needs to be restored.

A level playing field needs to be provided with respect to MMF products and natural fibre products in terms of the tax structure. Also imports of MMF fibre and yarn need to be liberalised and recourse to frequent use of anti-dumping duties needs to be dispensed with in the near term. In the medium term, domestic capacity-building for MMF production needs to be encouraged through appropriate incentives.

The FTAs in most cases has eroded India's competitiveness by getting in cheaper imports into this sector. Hence, renegotiating the textile concessions in India's FTAs with ASEAN, Korea and Japan, and conclusion of the India-EU BTIA may lead to improvements in market access.

Investment-based challenges and solutions

It is imperative for the textile industry to modernise (especially weaving and processing), build up scale and leverage R&D to create innovative products to increase our penetration of foreign markets. For this, the Hank Yarn Obligation should be reduced from 30% to 15% and the reporting obligations on spinning mills should be reduced.

The setting up of large weaving units, and consolidation of several smaller weaving units into one to build up scale, need to be incentivised. The incentive could be given to organised large scale weaving units in the form of supply of electricity at the same concessional rates as powerloom units in a state.

The setting up of large Process Houses needs to be incentivised. One of the ways of doing it is to allow a longer payback period for bank loans in view of the fact that the life of a Process House is around 20 years.

There has to be dual emphasis on import substitution in technical textiles and greater export penetration under the National Technical Textiles Mission. This has to come through more focused R&D effort and building up successful public private partnerships.

The implementation of ATUFS needs to be streamlined significantly, inspections need to be outsourced to third parties, and disbursement of subsidies needs to be fast tracked.

14.5.2 The Established Sectors

Automobiles

Challenges

Lack of competitiveness in the automobile sector arises from the fact that the cost of importing auto-components from Asian countries into India is lower than local procurement. Around 27% of automotive parts are imported from China, including important components. Switching to alternate suppliers is a long-term process especially as India needs to prepare to meet BS6 standards. Lack of funding in R&D has meant dependence on low-technology Internal Combustion vehicles and transitioning into electronic or renewable resources has proven difficult. Making the right powertrain technology choices that will define the future of the automotive trade requires policy plus monetary support from the Government. On the services side, new forms of mobility require adequate infrastructure: for example, in mass transit, vehicle pick-up, vehicle drop-off, and in non-motorised transport which limits the adoption of cycle-sharing.

What has been done to address these challenges

Automobiles and auto components have a major share in the **PLI scheme of INR 57,042 crores**, followed by battery manufacturing at INR 18,100 crores. The **Voluntary Vehicle Fleet Modernisation Programme** offers tax benefits and discounts on replacing old vehicles with new ones. Ministry of Heavy Industry (MHI) constituted NATRIP Implementation Society for the execution of **NATRIP (National Automotive Testing and R&D Infrastructure Project) for setting up** state of the art **Automotive Test facilities at six locations** across India. The **NEMMP** (National Electric Mobility Mission Plan 2020) initiative encourages consistent, affordable and competent xEVs (hybrid and electric vehicles) for the faster adoption of EVs. The **Green Urban Transport Scheme** is being executed under a seven-year Mission through public private partnership. The MHI **has shortlisted 11 cities in the country for introduction of EVs** in their public transport systems under the FAME (Faster Adoption and Manufacturing of (Hybrid) and Electric Vehicles in India) scheme. The Government will also set up an incubation centre for startups working in the EVs space.

Effects of these policies

After GoI allowed 100% FDI in the automobile sector under the automatic route, investment increased. The Phased Manufacturing Programme for Cell & Battery is valid for five years (2019-24) to enable technology-driven sustainable and holistic mobility solutions to become more universal. Investments in Indian EVs grew by 170% in 2019, as compared to 2018. In the First Phase of the FAME Scheme, upto 31 March 2019, several thousand hybrid and electric vehicles were supported. Further, hybrid buses were sanctioned in several cities, and charging stations have been commissioned.

Merging trade and investment policy

In this sector as well, while the PLI scheme focuses on promoting products with great import substitution potential, especially with respect to auto components being imported from China, developing such capacity takes time. Hence, in the interim, tariffs on these components should be implemented only gradually. In other words, if a particular component or final product is eligible for a PLI, tariffs on its components should not be increased till domestic capacity is developed in India. Further, other domestic policies should support domestic production of products being granted PLI. For example, if GST on such products is very high, they should be reduced to a uniform 18%. In fact, to boost demand, GST rates on all automobiles and auto components should be reduced to a uniform 18%. Inverted GST structures can reduce the benefits of the PLI.

For boosting trade, investment policy, especially PLI, should focus on increasing the manufacturing capacity and exports in the commercial vehicles segment, where demand may increase because of expenditure on infrastructure, vehicle scrappage policy, and other growth drivers. To boost exports or substitute imports, regulation should provide a level playing field amongst different technologies, such as EV, xEV, ICE, and hydrogen fuel cell technology. Regulations should target outcomes, such as increased vehicular safety standards and reduced particulate matter emissions, and not what kind of vehicle is to be promoted. There should be an emphasis on promoting future-ready technologies like hydrogen fuel cells, through the private sector and the Government, by investing heavily in R&D activities geared towards the future. PLI should also target increased manufacturing of vehicles which are longer than 4 metres, as the demand for bigger cars is greater in the global automotive market. This would be a key step towards ensuring India becomes an export hub for the world.

Lastly, on the trade front, FTAs with key export markets should be explored. Further, export credit options with these markets should be a part of the FTA. FTAs should also provide for Investment facilitation, especially in the maintenance of vehicles.

The Pharmaceuticals Sector

Challenges and Solutions

There are large segments of the market which actually depend on the versatility of the sector in providing affordable and responsible healthcare products. India has a global responsibility in that sense, but it can discharge this responsibility only when it keeps up with developments at the world stage, and continues to produce the best at the least cost. This challenge when disaggregated, throws up many smaller ones in the areas of investment, fiscal management, industrial development, trade promotion, education, regulation and technology-related policies. Some of these challenges and the responses that need to be addressed are identified and addressed below.

Investment challenges and solutions

The restriction on 100% investment in the brownfield segment of the sector for foreign direct investment should be taken off as it does not stand to reason any more. Instead, the Government should link investment in pre-identified technologies, establishment of R&D, or products with fiscal incentives such as tax exemptions, IGST reimbursements, and other similar instruments.

Contract Manufacturing and Research has huge prospects for growth as the IPR remains with the owner and India's low-cost manufacturing and knowledge base provides appropriate incentives for such investment. Therefore, the Government must review relevant trade, regulatory and tax policies to align them with the objectives of growth in investment in this segment, and also promote investment by creating the right ecosystem for this segment.

While price control may have served the social objectives of the country, it has done equal harm in disincentivising innovation. Therefore, the Government should reduce the NLEM to only core products, keep control dosage form or Novel Drug Delivery systems out of price control, and leverage its own position as the largest bulk buyer to get optimum prices. In order to get competitive prices, several State Governments or the Central and willing State Governments could establish unified buying mechanisms. All government buying must shift to E-platforms such as GEM over a stipulated period of time.

The Government must bring in appropriate legislation, to regulate distribution margins and code of ethics among members of the distribution business and medical practitioners to optimise margins for them, and make available opportunities for investment in the industry.

Recognising the value involved in the size of operations as well as disadvantages inherent in the smaller size of some segments of business and its impact on areas such as compliance, quality, access to knowledge, and business practices, the Government may constitute a committee of experts to look into the merits and demerits of consolidation, and suggest policies which will help in optimisation of size to suit the objectives of different segments of the sector. This recommendation should not be construed to mean discouragement of smaller enterprises, but a means to bring in strategic insights into size, performance and nature of business.

The new paradigm of this sector can only be responded to by promoting investments in all aspects of R&D covering both innovations and drug discovery. Since private investments are constrained and in some areas because of the vastness of scope of required investments, there is complete justification for the Government to make adequate investments. The Government must establish a programme to set up Innovation Parks independently as well as in the Pharma Parks under development, on the lines recommended in the study carried out by the Department of Commerce and referred to, extensively, in the chapter on the pharma sector.

Trade policy related challenges and solutions

It is quite expensive to access highly regulated markets. Even after registering, there are distribution challenges. The relatively small size of the operators does not allow such investment, restricting their potential. Hence the scope of ongoing schemes such as Market Access Initiative and Market Development Assistance should be expanded in line with the recommendations made here.

The Government must avoid all pressures for increase of tariffs on any product stream as the sector is closely knit with global supply chains and any such increase is bound to initiate a ripple effect. In all existing FTAs and future FTAs, India must negotiate a regulatory and market access protocol with its preferential trade partners. Even without entering into FTAs, India must develop sector co-operation agreements with major countries of its interest to ease market access, particularly by securing commitments to regulatory processes and simplification of procedures to facilitate market access.

India's exports to the US constitute a large chunk of its export basket. While the US will remain a very prominent market for India, any adverse regulatory event can impact its industry. Hence market diversification is of critical interest, particularly to China, Japan, South East Asia, and Latin America. Targeted trade promotion programmes and bilateral or regional negotiations with these countries/blocks over a period of time can help improve India's market share in these countries.

There should be emphasis on time-bound adoption of WHO-GMP by all operators. A time-bound initiative to join PIC/S, as it will require systemic improvements, is required. Adoption of a uniform template for COPP will help facilitate exports.

Other institutional challenges and solutions

It lies in India's 'strategic interest' that API manufacturing is restored in India at the earliest. Therefore, timelines, as conceived in the schemes, are required to be maintained. A real-time monitoring mechanism must be institutionalised in the highest executive office, if not already done.

A National Action Plan on Biopharmaceuticals must be institutionalised immediately. The startup segment of biopharmaceuticals is evolving well and should begin to show results in due course, but commercial expansion is possible only when corresponding investment promotion and regulatory changes are made post

haste. Therefore, a national plan including elements suggested in this report and the Pharmaceuticals chapter of the Domestic Policy Constraints study of Exim Bank[615] must be put in place.

The regulatory organisations in the Centre and the States need harmonisation in terms of distribution of responsibilities based on their respective capacities and the gravity of these responsibilities. The central institution needs to harmonise interpretations and enforcement practices to create a regulatory environment for growth. The same holds true for other regulations such as environment and labour-related regulatory practices.

14.5.3 Newly Emerging Export Sectors

Electronics sector

Challenges

Basic raw materials and inputs still need to be imported from other countries on which there are high import and custom duties. Many tedious processes need to be followed to avail benefits under Customs Notification 25/99 (duty drawback for exports) on the inputs for the manufacture of components. The existing component manufacturing ecosystem in the country lacks global scale and capabilities, and thus remains uncompetitive. FTA with ASEAN and CEPAs with Korea and Japan also reduced the efficacy of BCD. Disbursement under M-SIPS was very low.[616] The approval process was tedious and only about 20% of the total projects were approved, and an even lower proportion of funds was disbursed. Despite supportive policies, the disability of the Indian industry vis-a-vis other countries, especially mobile phones still remains in double-digits. Tariff increase on key components and products reduces the effects of supportive policies such as PLI.

What has been done to address these challenges

To address these challenges in the past, initiatives like Make in India, Digital India and Startup, the Phased Manufacturing Programme (PMP), Modified Special Incentive Scheme (M-SIPS), and the National Policy on Electronics 2019 were instituted. For encouraging exports the MEIS was started with 2% incentive in 2016 which went up to 4% in 2017. In 2020, new policies such as PLI, SPECs and EMCs were introduced.

Effects of these policies on Electronics sector

India's production of electronics has increased from USD 29 billion in 2014 to USD 70 billion in 2019. It was nearly 100 billion in 2020-21. More than 268 units for mobile handsets have been set up in India since 2015, producing over 225 million mobile handsets and creating around 0.67 million jobs annually. PMPs helped create a local ecosystem for batteries, chargers and printed circuit board assembly, but not for manufacturing mechanics, camera modules, connectors and speakers. The tariff increase under PMP has been pushed to 2023. MEIS had a positive effect on exports. Exports increased to over USD 3 billion in 2020 from negligible levels in 2014. However, other key competitor countries have outperformed India in all electronic products, and even for mobile phones, India accounts for a very small share of the market. In comparison to other countries which have provided more supportive policies, India's effective disability in terms of cost disadvantages compared to major exporters still amounts up to 15%.

[615] https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/SpecialPublications/Report-on-Domestic-Constraints-on-Exports-of-Selected-Sectors-new.pdf

[616] See the chapter on electronics.

Merging trade and investment policies

The PLI, SPECS, and EMC schemes are the new generation of policies which merge trade and investment objectives. The PLI scheme is meant to benefit, inter alia, high-value phones which are mostly exported from India. SPECS and EMCs would also benefit both domestic producers and exporters. However, restrictive trade policy in terms of higher tariffs on components, sub-assemblies and final products would increase costs, making domestic electronics uncompetitive. This, in turn, would negate the effects of positive support policies such as PLI. Hence a rational approach to tariffs is required to maintain consistency between trade and investment policies in the electronics sector.

Solar Photovoltaic Sector

Challenges

While India's annual demand for solar cell manufacturing is 20 GW, its current average annual capacity is just 3 GW. India was one of the largest exporters of solar modules till 2011 but subsequently lost its competitive edge to China. Nearly 80% of India's demand for modules, cells and wafers are met by Chinese imports. By and large, the Indian solar industry has been dependent on imports of critical raw materials such as ethylene vinyl acetate (EVA), back-sheet, reflective glass, balance of system (BOS) for Solar Thermal and PV as also core machinery. Domestic PV suppliers contribute only 30%-35% share of all utility-scale solar installations. However, the situation is reversed in the commercial and industrial (C&I) and distributed segment of the market where domestic PV suppliers cater to nearly 60% of the market. But, utility scale solar accounts for 76% of the total market. Producing solar power using domestic modules costs between 10%-25% more than that using Chinese modules. Most of the jobs in the solar sector are in the downstream industry, i.e. connecting modules etc., as discussed in the chapter on the solar sector. **Hence there appears to be a trade-off between producing cheaper solar power and using domestically produced PV modules.**

Policies to address these problems

The National Solar Mission in 2010 urged bidders to use solar Photovoltaic (PV) modules manufactured domestically in their first ever solar tender of 150 megawatts (MW). The second tender of 350 MW further strengthened the stipulation requiring bidders to use only solar cells and modules produced domestically instead of modules produced using imported solar cells.

In 2012, the Modified Special Incentive Package Scheme (M-SIPS) was launched to provide financial aid for local players. In the following years, the Government announced the Domestic Content Requirement (DCR) and a safeguard duty (SGD) to dampen the influx of cheap foreign imports. Later on, schemes were launched to reserve 50% of the tender capacity for solar cells and modules manufactured domestically, while allowing the remaining 50% capacity to be set up using imported modules. But the process of reserving capacities in the tenders for solar cells and modules manufactured domestically was stopped in January 2018, due to the WTO ruling against India at the DSB.

Post 2018, Government provided a capital subsidy, tax breaks, custom duty exemption on imported capital goods and the machinery needed for manufacturing PVs, along with cheaper land parcels near port areas to be developed as manufacturing hubs. The Government approved exporter incentives at 2% under Remission of Duties and Taxes on Exported Products (RoDTEP). The industry however wants the incentive to be increased from the existing 2% to 8%-10%. Customs duty exemption was provided for import of capital equipment for manufacturing through an Export Promotion Capital Goods (EPCG) Licence. The Production Linked Incentive (PLI) Scheme of INR 4,500cr (USD 616 million) was allocated for the solar PV sector under the PLI.

Imposition of Safeguard Duty (SGD) on imports of PV Cells and Modules was introduced in July 2018, with a 25% duty imposed on solar cells and modules starting July 2018, then reduced to 20%, and later to 15%.

The Central Public Sector Undertaking (CPSU) scheme was to promote local content on power procured from projects under this scheme, that was only to be consumed by government organisations. MNRE implemented the Grid Connected Rooftop and Small Solar Power Plants Programme (Phase I) in 2015, for which a subsidy of up to 30% of the benchmark cost was provided for general category states, and up to 70% of the benchmark cost for special category states.

In government installations, achievement-linked incentives upto 25% of the benchmark cost in general category states/union territories (UTs), and up to 60% of the benchmark cost for special category states/UTs were provided.

Rooftop Phase II Programme, introduced in August 2019 for additional rooftop solar capacity of 4 GW for residential segment and 18 GW for commercial establishments was targeted through incentives for distribution companies (discoms). In addition, quality standards which discriminate against foreign producers of solar PVs was introduced in the form of ALMM.[617]

Effects of these policies on the solar PV sector

Most of these central government policies till 2019 did not catalyse a nation-wide move towards the indigenisation of the PV value chain in the desired manner.

In the wake of incentives to link installed capacity and use of Indian PVs, many Indian players including Adani, Renew, Azure, and Vikram Solar announced plans to expand their existing facilities or set up completely new integrated facilities. Even government entities like CIL were looking to set up an integrated wafer manufacturing facility. The first ever Project Development Tender with manufacturing capacity of solar panels and the associated generation capacity had fixed tariffs at INR 2.92/kWh which the discoms now consider too high, particularly in the light of the Covid-19 demand disruption over 2020.

Furthermore, with new record low tariffs reaching INR 1.99/ kWh in recent solar auctions, there is a likely chance of further delay and reluctance from discoms to buy solar power at earlier rates which were fixed at the time of the investment. Only two auctions have been conducted so far under the CPSU scheme. Despite setting a target of 40 GW of rooftop solar capacity to be achieved by 2022, the total rooftop solar capacity stood at only 5.9 GW as of June 2020. India is currently able to meet less than half the total demand for PV modules. Moreover, Chinese firms also have aggressive ongoing capacity expansion. There is a growing thrust towards technology advancement for the development of superior efficiency yet cost effective PV cells and modules.

Trade and investment policy reconciliation

In this sector as well, there is a clear conflict between generating solar power and investment and trade restrictive policies on solar PVs. Because it is more expensive to generate solar power with domestic modules, investment by utilities will not be encouraged if forced to use domestic modules.

Basic Custom Duties (BCD), on solar cells, modules and inverters, were introduced in 2021. But, it is possible that a 40% and 25% BCD on the import of solar modules and solar cells, respectively, may be levied in future. There is however an exemption of Custom Duties on Raw Material for Domestic Manufacturers.

In February 2020, MNRE requested that solar PV manufacturers provide a list of machinery/capital goods (required for setting up of units for the manufacture of solar PV modules, cells, polysilicon, wafers and ingots) that the manufacturers deem fit to be included in the BCD exemption list. This is an encouraging step and

[617] See Chapter on Solar.

may promote module manufacture, particularly because the current EPCG policy has to be phased out or changed, like MEIS, because of the WTO Panel ruling.

In order to merge investment and trade policies, government should formulate plans to support backward integration and plan initiatives to set up cell, wafer and ingot manufacturing facilities as well as module manufacturing. For this, all inputs should be kept duty free. Given the trade-off between deploying solar power and domestic solar modules, tariffs on modules should be kept low till domestic capacity covers at least 60% of demand. In any case increasing tariffs may be WTO incompatible as these are ITA 1 listed products.

State governments can intervene at these junctures by providing land, utilities, etc. at concessional rates and various regulatory approvals and permissions in a more timely and efficient manner to successfully compete against other nations such as China over the long term.

Further, sustained innovation should be the core of all the government's new plans. Government should focus on setting up new R&D facilities and institutes to support this high growth sector. The market is experiencing a huge shift to higher efficiency products and with global technological advancements in the PV manufacturing sector, India should also focus on spending more on R&D to build a long-term, sustainable segment.

Imposition of safeguard duties and basic custom duties can help the domestic players remain competitive with imported modules in the short run. However, this is only a partial solution that will only create demand in the local market, and that too at inefficient production costs. Moreover, China with its huge economies of scale can lower prices, neutralising the effects of SGD. This has been seen in the steel sector.

The planned initiatives should not be limited to boosting the domestic market. The focus should also be on helping players expand their horizons to be globally competitive. Hence India needs to leapfrog the current technologies and in its FDI plans include foreign collaborations and schemes for technology transfer. Schemes with other governments to develop collaborative ventures in next generation Solar PVs are needed. At the same time restrictive trade policy interventions should be time bound and limited in their scope.

Medical Devices

Challenges

The medical devices industry in India consists of large multinationals as well as small and medium enterprises (SMEs) growing at an unprecedented scale. The domestic industry is growing well at the lower end of the technology ladder and has achieved good market access abroad in a short span of time. While volumes will come from the lower end of consumables and disposables, the value will come out of implants, diagnostics, and electrical and electronic products. The MSME segment is unlikely to commercially propel the technology engine forward by themselves.

To get the right scale of investments, the inverted tariffs of this sector need to be corrected. There are **two types of products** as far as tariffs are concerned -- spares and components, and the final products. Most of the products in the first category are imported, and a few of the second category are made in India. The first should be duty free, and the second could entail duties. However, with the fall of nominal tariff rates for some components, some Indian players resort to the practice of importing Chinese products and then re-exporting them labelled as Indian medical devices. The reduction of tariffs to a minimum has resulted in almost complete import dependence in some cases. This is partly aggravated by the inertia to invest among Indian manufacturers given the option of cheaper imported components, completely avoiding the huge capital outlay. Support schemes discussed below create incentives for domestic investment and have begun to show

a positive result. Such a momentum needs to be maintained by limiting policies that reduce the positive impact.

Apart from tariffs, to attract investment it is important to create a legal and regulatory framework outside the Drug and Cosmetics Act, and set up a dedicated regulatory institutional framework for medical devices. The sector has enormous diversity and the covered products range from simple surgical gloves, thermometers and syringes to highly complex technology products coming out of physical sciences, biosciences and material sciences, and at the frontiers of the respective technologies. This diversity is further reflected in the **multitude of regulations** that the sector faces, including atomic energy regulations. The sector is regulated by **12 regulators** which means it is simply impossible to be regulated unless a **multidisciplinary regulatory architecture** is established. The human resource inadequacy with the drug regulator for this sector is glaring.

The importance of standards cannot be overemphasised. As the implementation of the new rules on standards unfolds overtime, **investments** in a sound **testing infrastructure** will be of great importance. Further, **conformity assessment procedures** through **third party certification** will become the imperative for a fast-moving sector in order to improve its credibility and therefore its **brand equity**, and also to provide consumer satisfaction.

India's e-procurement initiatives for the government do not include medical devices, and health insurance mechanisms are underdeveloped. The issue of price control may also discourage the industry. To develop the ecosystem of the industry, technology choices and collaboration are of vital importance. The registration of patents, and difficulties with the system, need to be addressed too. This would also encourage investment.

What the government has done

The most important initiative was the Recognition of Medical Devices as a "Sunshine Sector" in the Make in India campaign launched in 2014, which promoted and encouraged FDI and domestic investment in manufacturing of medical devices in India.

The Medical Devices Rule of 2017 was drafted to distinguish medical devices from pharmaceuticals for the purpose of regulation. In tune with the global practice, the 2017 Rules have introduced a risk-based classification system for regulation of medical devices. Under these Rules, single window clearance, manufacturing licence in perpetuity, and a risk-based classification based on international norms was adopted. In addition, infrastructural support was provided to R&D in allied sectors.

The Medical Devices Amendment Rules of 2020 introduced a new chapter for registration of medical devices by their respective manufacturers and importers, and exempted 37 categories of already regulated or notified medical devices from the requirement of registration.

A Production-Linked Incentives Scheme for Medical Devices, 2020 offers financial incentives to boost domestic manufacturing and attract large investment in medical devices segments such as cancer care devices, radiology and imaging devices, anaesthetics devices, implants etc. Production-Linked Incentives of upto INR 3,420 crores will be awarded in the scheme's tenure.

Promotion of Medical Devices Parks aims to strengthen the infrastructure base and develop a robust manufacturing ecosystem for medical devices in the domestic market. Grants under the Scheme include world-class standard testing and infrastructure facilities.

Effects of Government Policy

The current market size of the medical devices industry in India is estimated to be USD 11 billion. It is likely to grow to be a USD 65 billion industry by 2024. It is growing at 17% to 19% CAGR. Since April 2000,

India has received USD 2.1 billion FDI inflows. Out of this, USD 600 million was received in the last 5 years. Singapore, United States, Europe, and Japan are key investors in this sector. In the medical devices industry, Equipment & Instruments, Consumables and Implants have attracted the most FDI.

India has exported medical devices worth USD 2.8 billion during the year 2019 whereas its imports stood at around 7.2 billion in the same year. India has experienced a consistent rise (41%) in its imports over the past five years (2015-19), which constitute about 80% of the demand for high-value medical devices in the country, and about 70% of the low-value devices. India has gained competitiveness in the low-value products. It is still import dependent on high-value products.

The onset of the pandemic brought in developments in several areas such as Personal Protective Equipment for doctors and paramedics, ventilators for emergency care, and diagnostic test kits for RT PCR tests. Above all, it galvanised the Indian healthcare industry and the government into taking some long-awaited decisions such as the Production-Linked Incentive schemes and Industrial Park development for Pharmaceuticals and Medical devices.

India has developed some capacity and competitiveness at the lower end of the Medical devices sector but still lacks capacity at the higher end.

Merging trade and investment policies

While investment policies have been formulated to help the development of this industry, like in other sectors, trade policies, especially tariff policies, continue to be regressive. As far as investment policy is concerned, investments by the government itself, in institutions for technology development and promotion, is required. In addition, creation of fiscal instruments for promotion of R&D in the private sector should go hand in hand with government investment. The Departments of Science and Technology (DST) and Biotechnology (DBT) have created an effective mechanism for **growth of startups** and technology incubation involving reputed technical institutions such as the IITs. The results will be visible only after 5 to 10 years. **Foreign investments** are necessitated to keep up the present momentum, particularly in the higher technology segments of the sector. This will require two types of interventions, namely, facilitation in setting up businesses and providing regulatory frameworks in line with the best in the world, and adopting trade and industrial policy instruments which should expand market opportunities to sustain manufacturing in India at a global scale. The sector distinguishes itself from some other promising sectors in its **multi-faceted character**. On the one hand, existing products and technologies are simple and pervasive, but on the other hand, new complex technologies make manufacturing within the country difficult in the short run.

As far as tariff policy is concerned, the domestic industry would like to set up tariff walls for protection in a classical adoption of a phased manufacturing programme, but an indiscriminate tariff rise may neither be conducive to domestic needs of healthcare expansion in the short run, nor is it recommended by experts in the sector. As mentioned earlier, there are two types of products as far as tariffs are concerned. For the first category (spares and components), a tariff range of 0% to 2.5% appears reasonable depending upon the availability of production capacities within the country. In the second category (final products), a tariff range of 5% to 7.5% may be justified again depending upon the domestic production capacities. This will take away the possibility of inversion on some of the remaining product lines. Hence, a judicious mix of segment-by-segment and product-by-product **examination of value chains** is necessary to see that no inversions or unwarranted tariff walls are created lest the healthcare costs in the short run increase avoidably. Adoption of an internationally acceptable ecosystem comprising technical standards and conformity assessment procedures and institutions is also of great importance here in checking imports of substandard products.

A **growth strategy which combines** PLI (Production Linked Incentives) and PPO (Public Procurement Opportunities) with rational trade, particularly tariff policies, is required for this sector.

14.6 General Conclusions and Recommendations

14.6.1 The China Factor

India is heavily dependent on Chinese imports of components in a number of sectors as identified above. Geopolitical considerations may deter investment from China. Addressing China's large role In the Indian economy must include a strategic approach that includes trade and investment policy changes. In this context, there is a need to focus on strategic sectors and new technologies. Wherever inputs and investment in these sectors are needed and available mainly from China, some laxity in investment policies is required. If there is a possibility of producing these strategic products domestically – import substitution policies should be encouraged. Trade and investment policy should recognise that there would be security-related concerns regarding Chinese investment in India and these should be appropriately addressed through joint ventures and some stipulations on skill transfer. There should be an emphasis on coalition-building with other nations, which will, in turn, become a basis of international collaborative initiatives. However, these coalitions should not be anti-China, but rather seek opportunities for leapfrogging technologies in almost all sectors studied in this report. While US-China trade tensions are likely to continue, India's strategy for taking advantage of them should be one that is based on technology advancement. New US tariffs on China are likely to continue, but tariffs may also be applied to some Indian exports and hence India must prepare for that eventuality. New trade regulatory regimes are likely to develop through multilateral and regional initiatives, which may or may not exclude China. India must make efforts to be a part of these regimes.

14.6.2 Likely Situation in WTO and FTAs

(a) India is a part of or is closely following the WTO negotiations on Digital trade, Fisheries Subsidies, and Investment Facilitation. Work on Subsidies and State Enterprises is likely to develop, and India should prepare for that. The Appellate Body may become functional in the near term, and hence WTO-inconsistent policies should be avoided. To the extent that India takes a political decision of staying out of a negotiated agreement, it must nonetheless create its domestic policy and operational ecosystem to function under the new trade regulations agreed upon by a large number of countries, so as to remain an active part of the global value chains that reflect the new rules.

(b) In regard to FTAs, an important factor to realize is that global trade will be determined by recent FTAs or those currently under negotiations, e.g. AfCFTA, CPTPP, RCEP, EU-Vietnam, EU-Mexico, US-Kenya, US-UK, and EU-Australia. Significantly, existing FTAs like CPTPP are attracting new members. India should be prepared for these with a full analysis of the likely impact on Indian trade and investment of such agreements and policies that would limit the adverse impact if India is not a member of the more recent significant agreements.

In this background, India should review its approach to Regional Trade Agreements (RTAs). RTAs should be seen as instruments facilitating onboarding of global/regional value chains with a view to achieving global competitiveness and the desired market share of selected product/service areas within the region.

A number of policy suggestions have been made in the chapters on specific sectors. Some of the salient points, including those which are not commonly focused on but are given importance in the feedback from industry, are discussed below for trade and investment policy.

14.6.3 Recommendations on Trade Policy

A framework for analysing the consistency or lack of it between trade and investment policy is provided in chapter 1. It shows clear instances where policies consistently add to the positive impact of each other, or work against each other thus reducing their individual impact. It also shows that in some cases, a number of supplementary policies need to be part of a package to achieve the relevant objectives.

In this context, it has to be understood that **competitiveness is the only way to sustain achievement of the objectives of Atmanirbhar Bharat** over the medium term. **Restrictive trade policies**, such as an increase in tariffs and NTMs **reduce competitiveness**. The cost increase or operational constraint due to any policy that limits **scale of operations**, whether it is investment or trade policy reduces competitiveness. This may also reduce rather than increase the scope of value addition in the economy if the production of parts and components that are integrated in GVCs decreases, it will result in increase in costs or delay in supply. If a tariff is to be increased on inputs in a supply chain, it is important to make certain that the input could be produced domestically. Therefore, for tariff increase, a prior condition could be that some companies provide a plan of investment to produce the product in the near term. Only then should the tariff increase be implemented, for a temporary period. Moreover, a restrictive trade policy, if implemented, should have a time limit after which that policy should be withdrawn.

Timely implementation and support is crucial for maintaining competitiveness. For instance, RoDTEP should be implemented expeditiously and at rates where there is correct zero rating of exports, i.e. all indirect taxes are remitted or refunded.

Feedback from industry suggests that there are a number of concerns relating to operational conditions, such as uncertainty about classification or wrong classification and timely decisions and easy appeal processes linked to tariff increase should be addressed before raising tariffs. Two of the common examples in this regard include:

(a) Two different products could have the same nomenclature, e.g., different items under “connectors”, “microphones”, “camera”;

(b) Customs notifications should not be applied with retrospective effect.

A tariff increase on a final product such as solar PVs would have an unanticipated adverse effect on promoting the industry. Solar Panels are used as an input for the user industry (discoms). A tariff increase on solar panels raises the costs of production of solar power and the user industry would start shifting demand away from power produced from Solar technology. Hence, downstream effects on industries should be assessed before a tariff is imposed on upstream products. This applies to solar, automobiles, electronics, medical devices, and all other emerging industries.

Consistency and feasibility of regulation needs to be improved, and simple ground rules followed to create efficient regulations. For example, if a sale results in receipt of foreign currency payment for it, the GST on the sale should be refunded similar to exports (engineering products). Such a sale should be classified as deemed exports and given the benefits provided to these exports. At present, this is not done for example, for engineering products, and feedback from this sector indicates this practice to be an important factor affecting cost-competitiveness.

Similarly, in a number of industries, aggregators collect production from small producers and export them to various global markets. This activity requires consultants or agents placed abroad, who build trade relationships and develop business opportunities abroad. The GST on the payment to such consultants is not treated as exports, and thus is not zero rated. This seems to be the kind of policy which needs to be made

reasonable and less cumbersome, to achieve greater export momentum. In the area of quality-related NTMs, an attempt at solution-oriented sector-specific mechanisms could be established as standalone initiatives or in the context of FTAs. This should include MRAs and a process to address bilateral/regional market access obstacles created by NTMs. Such an initiative could develop a kind of system that is envisaged in Article 2.9.2 of the CPTPP to create larger trade opportunities. Experience also shows that there is a need for a robust Trade Promotion Agency, together with a practical target-oriented functional trade promotion programme.

14.6.4 Recommendations on Investment Policy

First of all, a flexible approach should be adopted for investments. Such an approach should take account of issues such as Covid-19 and global economic trends in policies such as PLI. Policy consistency across different Departments/ Ministries should be maintained. For example, if Covid-19 is treated as force majeur by one part of government, then all other government departments should treat it as such.

The timelines for disbursement of subsidies should be clearly established, e.g. in the Guidelines of PLI. Trade and investment facilitation rests on time-bound approvals. To create greater certainty in various schemes, including the PLI schemes, deemed approval processes should be established.

Policies under Ease of Doing Business such as the current drive by the Government to reduce the burden of regulatory compliances, are very welcome. These initiatives must be completed in a time-bound manner. Incentive policies should not be changed midway. Likewise, to give greater certainty of implementation, deemed approval should be more widely implemented, and verification and disbursement of funds under incentives should be handled by third parties to increase efficiency.

A Comprehensive Approach for Synchronising Trade and Investment Policies

A comprehensive strategic evaluation should be an integral part of preparing a policy response. For example, lessons from EU and US initiatives on reducing dependence on China, while maintaining policy/commercial engagement where necessary, should be the guiding approach.

Building coalitions should become a regular part of the trade and investment policy tool-box, particularly to address resilience of value chains and seeking additional markets (e.g., pharmaceuticals).

Removing duplication of agencies to provide clearance/approvals for the same issue (e.g., Trusted Electronics Value Chain). Clarifying conditions impacting operations, e.g., if a scheme has a penalty clause, the amount of penalty should be made clear (e.g., with reference to the plastic waste regulation).

There is a need to use a medium-term approach to capture need for technology adaptation to remain competitive in sectors where technology changes are imminent. Such technology changes are occurring in several sectors like Solar Panels, Pharmaceuticals, and Automobiles.

In the context of GVCs, the important issue is to work co-operatively with other countries to create mechanisms and approaches to support individual initiatives that build synergies between trade and investment policies. Some of these identified by multilateral and regional institutions include:

- **Ensuring transparency**: Ensuring transparency regarding trade-related measures associated with medical supplies, such as through sharing information with the WTO, can play an important role in maintaining confidence in global supply. This would be similar to AMIS, created in the wake of the food price crisis of 2007-08 for governments to share the relevant information in a timely manner. In this context, countries could explore a WTO initiative (including plurilateral) to remove tariffs on an agreed list of essential medical supplies.

- **Disciplines on export restrictions:** These could range from agreement to prohibit export bans for certain kinds of goods, or to codify strict conditions on their use, building on the current G20 agreement.[618]
- **Upfront investments in co-operative solutions**: The creation of stockpiles of essential medical supplies could include co-operative arrangements for creation of such stockpiles, including on a regional basis.
- **Addressing the needs of the most vulnerable countries**: Measures, for example, in relation to export restrictions and creation of regional stockpiles, could include specific exemptions or assistance to address the needs of the poorest countries.

Changes in Approach Required to Create Larger Positive Impact

The assessment of different sectors suggest that two different approaches are required, based on the sector being addressed. These are:

- **A Mission Approach** (e.g., Pharmaceuticals, Medical devices) with a comprehensive set of policies which help build a consistent support and incentive system for growth of the sector.
- An approach to address the **top five or six priority policy areas** that limit performance and create the largest constraints on producers/traders (most sectors). These priority policy areas need to be identified based on feedback from producers/exporters.

In addition:

- The Foreign Trade Policy of India should be adopted by the Cabinet, to give it a focus by the entire Government and not only by a single Ministry.
- Government should set up a National Mission for making Indian businesses competitive. All public policies and government/regulatory decisions should be judged on the criterion whether they are making businesses more competitive or less.
- National Mission on Quality: A time-bound programme (say, five years) should be launched to improve quality and make technical regulation coherent with standards in large markets.
- State Governments should establish a Department of Trade, to sensitise policy makers there about trade policy issues.

14.7 Suggestions for EXIM Bank

The Bank should create a permanent mechanism for feedback from Industry clients (say every 6 months) on concerns relating to exports, imports, domestic regulations and non-tariff barriers, which require government intervention. It should provide a feedback at regular intervals on such industry concerns to relevant Ministries. It should develop a programme to learn from success cases in India and to share experiences from such cases.

Since the pharmaceuticals industry has a long gestation period, a long-term funding programme is required. Exim Bank could help develop such a funding programme.

The Bank should initiate a study on how technological leapfrogging can restore India's competitiveness in selected sectors, especially vis-a-vis China.

---

[618] In particular the part which states that: "emergency measures designed to tackle Covid-19, if deemed necessary, must be targeted, proportionate, transparent and temporary, and that they do not create unnecessary barriers to trade or disruption to global supply chains, and are consistent with WTO rules". See paragraph 5 of https://www.wto.org/english/news_e/news20_e/dgra_30mar20_e.pdf

Bibliography

Acko, Difference between BSIV & BSVI Engine: BS4, BS6 Performance, Team Acko, June 18, 2021
https://www.acko.com/auto/difference-between-bsiv-bsvi-engine-bs4-bs6-performance/

ADB, Covid-19 (Coronavirus): ADB's Response, ADB is supporting its developing members in responding to the Covid-19 outbreak through finance, knowledge, and partnerships.
https://www.adb.org/what-we-do/covid19-coronavirus

Advisera, Certifying different legal entities under one certification scope in ISO 9001
https://advisera.com/9001academy/blog/2018/03/27/certifying-different-legal-entities-under-one-certification-scope-in-iso-9001/

AEPC, Covid-19 latest & Immediate Virtual Exchange, Policies in the Asia-Pacific for improving regions preparedness and rebuilding better after the Covid-19 pandemic
https://www.apec.org/Covid-19

Agreement between The European Union and Japan for an Economic partnership, EU/JP/en 1
https://trade.ec.europa.eu/doclib/docs/2018/august/tradoc_157228.pdf

Aiginger, K., Rodrik, D. Rebirth of Industrial Policy and an Agenda for the Twenty-First Century. J Ind Compet Trade 20, 189–207 (2020).
https://link.springer.com/article/10.1007/s10842-019-00322-3#citeas

Alternative Energy, The Latest in Solar Technology
https://www.altenergy.org/renewables/solar/latest-solar-technology.html

APEC, 2020 Leaders' Declaration, The 27th APEC Economic Leadership Meeting, Kuala Lumpur, Malaysia, 20 November 2020
https://www.apec.org/Meeting-Papers/Leaders-Declarations/2020/2020_aelm

APLF, China - CLIA outlines aid available to China's leather sector, April 08, 2020
http://www.aplf.com/en-US/leather-fashion-news-and-blog/news/44095/china-clia-outlines-aid-available-to-china-s-leather-

ARS Tannery, Italian Leather Research Institute, the ongoing research, March 18. 2018
https://tannerymagazine.com/italian-leather-research-institute-ongoing-research/

ASEAN Briefing, Medina A. F., Indonesia's New Tax Incentives: What it Means for Investors, August 26, 2019
https://www.aseanbriefing.com/news/indonesias-new-tax-incentives/

Asia-Pacific Trade and Investment Report 2019, Navigating None-Tariff Measures towards sustainable development, United Nations Economic and Social Commission for Asia and the Pacific, UNCTAD
https://www.unescap.org/sites/default/files/publications/APTIR2019-H%3DN.pdf

Asia-Pacific Research and Training Network on Trade, Impact of India-ASEAN Free Trade Agreement: A cross-country analysis using applied general equilibrium modelling, Sikdar, C. and B. Nag, By Working Paper Series, no. 107, November 2011
https://www.unescap.org/sites/default/files/AWP%20No.%20107.pdf

Australian Government, Australian Trade and Investment Commission, Do business with the world Austrade helps your business go further, faster
https://www.austrade.gov.au/

Bangladesh Economic Zones Authority, Incentive Package
https://www.beza.gov.bd/investing-in-zones/incentive-package/

BKPM, Press Release November 02, 2020, Tax Allowance Incentive Favorably Used by Investors. https://www.bkpm.go.id/images/uploads/file_siaran_pers/Press_Release_BKPM_02112020_Tax_Allowance_Incentive_Favorably_Used_by_Investors.pdf

Deloitte, Analysis, Survey of Global Investment and Innovation Incentives, Outlining innovation, investment, environmental sustainability and other incentives for 60 countries
https://www2.deloitte.com/global/en/pages/tax/articles/global-investment-and-innovation-incentives-survey.html

Bloomberg, India Is Showing Developing Countries How to Quickly Transition to Solar, Rathi A, April, 21, 2021
https://www.bloomberg.com/news/articles/2021-04-21/the-entrepreneur-leading-clean-solar-energy-in-india\

BMC, Merger mania: mergers and acquisitions Gagnon M. A. and Volesky K.D. (2017) in the generic drug sector from 1995 to 2016. Globalization and health, 13(1), 1-7.
https://globalizationandhealth.biomedcentral.com/articles/10.1186/s12992-017-0285-x

Brief on Indian Footwear, Leather & Accessories Development Programme (IFLADP) for 2017-20
https://dipp.gov.in/sites/default/files/Brief_IFLADP.pdf

Britannica, Assistive technology, Gray D.B. and Cook A.M., Encyclopaedia Britannica, May 12 2017
https://www.britannica.com/science/assistive-technology#ref1185944

Business Wire, Commercial Vehicles Market in India (2020 to 2024) - Featuring Ashok Leyland, Force Motors and Mahindra & Mahindra Among Others - ResearchAndMarkets.com, April 24, 2020
https://www.businesswire.com/news/home/20200424005188/en/Commercial-Vehicles-Market-in-India-2020-to-2024---Featuring-Ashok-Leyland-Force-Motors-and-Mahindra-Mahindra-Among-Others---ResearchAndMarkets.com

Business Today, India levies 11.6% tariff on medical product imports against average of 4.8%: WTO study, Mathew J.C., April 04, 2020
https://www.businesstoday.in/industry/pharma/story/india-levies-116-tariff-on-medical-product-imports-against-wto-average-of-48-says-study-253935-2020-04-04

Cabinet approves Promotion of domestic manufacturing of critical Key Starting Materials/Drug Intermediates and Active Pharmaceutical Ingredients in the country, March 21 2020, PIB
https://pib.gov.in/PressReleasePage.aspx?PRID=1607483

Cabinet approves the proposal of National Policy on Electronics 2019, Feb 19, 2019. PIB Delhi, Release ID: 1565285
https://pib.gov.in/PressReleasePage.aspx?PRID=1565285

Cabinet approves Production Linked Incentive Scheme for IT Hardware, Feb 24, 2021, PIB Delhi, Release ID: 1700431
https://pib.gov.in/PressReleasePage.aspx?PRID=1700431

Cabinet approves the proposal of National Policy on Electronics 2019, Feb 19, 2019, PIB Delhi, Release ID: 1565285
https://pib.gov.in/PressReleasePage.aspx?PRID=1565285

Cambridge University Press, Economic Statecraft in the 21st Century: Implications for the Future of the Global Trade Regime, Aggarwal V. K and Reddie A.W, February 11, 2021
https://www.cambridge.org/core/journals/world-trade-review/article/abs/economic-statecraft-in-the-21st-century-implications-for-the-future-of-the-global-trade-regime/164195A90AF9FC352E82117CA4531EA0

CEEW, Scaling up Solar Manufacturing in India to Enhance India's Energy Security
https://cef.ceew.in/solutions-factory/publications/scaling-up-solar-manufacturing-to-enhance-india-energy-security

Central Pollution Control Board, Directions under 18 (1)(b) of the water (Prevention and control of Pollution) Act, 1974 – Tannery units in Kanpur
https://cpcb.nic.in/openpdffile-direction.php?id=UHVibGljYXRpb25GaWxlLzMxMTlfMTU1NzgzNzA0Ml9tZWRpYXBob3RvMTMxMjEucGRm

Centre for Monitoring Indian Economy (CMIE) (2020); Industry outlook report by CMIE
https://industryoutlook.cmie.com/

Centre for WTO Studies, IIFT, Republic of Korea and its Growing FTA Network, Working Paper No. 54, Seshadri, V.S, 2019
http://wtocentre.iift.ac.in/workingpaper/WorkingPaper54.pdf

China Briefing, Investing in Suzhou Industrial Park: A Brief Profile, Zhang Z, March 9, 2021
https://www.china-briefing.com/news/investing-in-suzhou-industrial-park-a-brief-profile/

China Briefing, Where to Invest in China: A Primer on its Economic Development Zones, Zhang Z, April, 17, 2020
https://www.china-briefing.com/news/chinas-economic-development-zones-types-incentives/

China Briefing, China Expands Encouraged Catalogue, Improves Foreign Investor Access, Zhang Z, January 05, 2021
https://www.china-briefing.com/news/china-2020-fi-encouraged-catalogue-effect-january-27-2021/

China Daily, Global Edition, China's IC design industry maintains fast growth: expert, Xinhua, December 14, 2020
https://global.chinadaily.com.cn/a/202012/14/WS5fd6f7afa31024ad0ba9bb1e.html

China's Solar PV Manufacturing and Subsidies from the Perspective of State Capitalism by CHEN GANG, *https://rauli.cbs.dk/index.php/cjas/article/view/4813/5239*

CITI, CITI Global Textile Conclave, 2018, THE FIBRE STORY – Opportunities and Challenges (MMF), November 28, 2018, Kishore A
https://citiindia.org/gtc2018/pdf/Pres_2_CITI_CONCLAVE_2018_Shri_Anant_Kishore.pdf

Clean Max, Solar Net Metering Concept
https://www.cleanmax.com/solar-net-metering.php

CLC Tanners Association, A brief history of the leather industry in Kolkata
http://calcuttaleathercomplex.in/new_website/about/

Comprehensive Economic and Trade Agreement (CETA) between Canada, of the one part, and the European Union and its Member States
http://trade.ec.europa.eu/doclib/docs/2014/september/tradoc_152806.pdf

Compare your country, Trade Facilitation Indicators
http://www.compareyourcountry.org/trade-facilitation

Council for Leather Exports, Industry at a Glance
https://leatherindia.org/industry-at-a-glance/

Council for Leather Exports, Membership Strength, The Region-Wise Membership Strength As On 30.06.2021
https://leatherindia.org/membership-strength/

Council for Leather Exports, Raw Material Sourcing Meet, Feb 01, 2019
http://leatherindia.org/raw-material-sourcing-meet-feb-01-2019/

Council for Leather Exports, Changes in Union Budget 2021-22 – Duty Free Import Scheme, No. CLE-HO/POL/CIRCULAR/2021, March 31, 2021
http://leatherindia.org/changes-in-union-budget-2021-22-duty-free-import-scheme/

Customs (Administration of Rules of Origin under Trade Agreements) Rules, 2020 (CAROTAR, 2020), September 21, 2020
https://www.cbic.gov.in/resources//htdocs-cbec/customs/CarotarBrochure_8thOct2020.pdf

Department of Pharmaceuticals, Scheme for Development of Pharmaceuticals Industry
https://pharmaceuticals.gov.in/sites/default/files/Scheme%20for%20Development%20of%20Pharmaceutical%20Industry%20updated.pdf

Department of Pharmaceuticals, The Gazette of India, CG-DL-E-03032021-225603, Part 1, Section 1, New Delhi, March 03, 2021
https://pharmaceuticals.gov.in/sites/default/files/Gazette%20Notification%20of%20PLI%20scheme%20for%20Pharmaceuticals_0.pdf

dezeen, China is fast becoming the world's creative superpower, Fairs M, April 17, 2019
https://www.dezeen.com/2019/04/17/china-design-power-opinion-marcus-fairs/

DIPP, Government of India, Brief on Indian Footwear, Leather and accessories development programme (IFLADP) FOR 2017-20
https://dipp.gov.in/sites/default/files/Brief_IFLADP.pdf

DIIP, GOI, Fact Sheet on Foreign Direct Investment (FDI), from April 2000 to June 2020
https://dipp.gov.in/sites/default/files/FDI_Factsheet_June20_20October2020.pdf

Dun & Bradstreet, D&B Business Directory, Dynamitic Technologies Limited
https://www.dnb.com/business-directory/company-profiles.dynamatic_technologies_limited.28c487cbddd6dce857e9f6e966f28a5c.html

ECONSTOR, Global Labour University, The role of small and medium-sized enterprises in development: What can be learned from the German experience? Herr, Hansjörg; Nettekoven, Zeynep Mualla, Working Paper No. 53, July 2018
https://www.econstor.eu/bitstream/10419/189840/1/GLU-WP-No53.pdf

EDB Singapore, SG, Gains Through Growth
https://www.edb.gov.sg/en/how-we-help/incentives-and-schemes.html

Electronic B2B.com, Experts Consider New-age Technologies Important for Industry 4.0, October 29, 2018
https://www.electronicsb2b.com/industry-buzz/experts-consider-new-age-technologies-important-for-industry-4-0/

ELP, Public Procurement Policies: Are they WTO Complaint? June 13, 2020
https://elplaw.in/wp-content/uploads/2020/06/Public-Procurement-Policies-Are-they-WTO-compliant.pdf

ENGLISH.GOV.CN, Work urged to further stabilize foreign trade, investment, August 12, 2020
http://english.www.gov.cn/policies/latestreleases/202008/12/content_WS5f33e19bc6d029c1c2637a2d.html

Equity Master, Pharmaceuticals Sector Analysis Report December 29, 2020
https://www.equitymaster.com/research-it/sector-info/pharma/Pharmaceuticals-Sector-Analysis-Report.asp

Ernst & Young, Covid-19: How are governments responding to the call for stimulus? Koch C, March 15, 2021
https://www.ey.com/en_gl/tax/how-Covid-19-is-causing-governments-to-adopt-economic-stimulus--

Ernst & Young, Renewable Energy Country Attractiveness Index (RECAI)
https://www.ey.com/en_in/recai

ET, Auto.com, The Society of Indian Automobile Manufacturers
https://auto.economictimes.indiatimes.com/tag/the+society+of+indian+automobile+manufacturers

ET, Auto.com, Another pan-India lockdown will hit auto sector; affect workforce, capex plans: CARE Ratings, PTI July 16, 2020
https://auto.economictimes.indiatimes.com/news/industry/another-pan-india-lockdown-will-hit-auto-sector-affect-workforce-capex-plans-care-ratings/76996632

ET, Energyworld.com
https://energy.economictimes.indiatimes.com/news/renewable/coronavirus-solar-power-prices-expected-to-rise-in-india-industry-demands-projects-review/74218646

ET, Energy World, Solar equipment imports from China may attract higher 20 per cent duty, June 24, 2020
https://energy.economictimes.indiatimes.com/news/renewable/solar-gear-imports-from-china-may-attract-higher-20-per-cent-duty/76530976

ET, Energy world, Renewable
https://energy.economictimes.indiatimes.com/news/Renewable/

ET, Energy World, MNRE asks stakeholders for strict compliance of ALMM Order for solar PV modules, cells, April 21, 2020
https://energy.economictimes.indiatimes.com/news/renewable/mnre-asks-stakeholders-for-strict-compliance-of-almm-order-for-solar-pv-modules-cells/75274107

EU and China Comprehensive Agreement on Investment
https://trade.ec.europa.eu/doclib/docs/2020/december/tradoc_159239.pdf

EU-Central Africa (Cameroon) Economic Partnership Agreement Creating opportunities for EU and African business, October 2020
https://trade.ec.europa.eu/doclib/docs/2020/october/tradoc_158984.pdf

European Commission, Negotiations and agreements Implementing EU agreements, November 2020
https://ec.europa.eu/trade/policy/countries-and-regions/negotiations-and-agreements/

Examples of Health-Related Compulsory Licenses
http://www.cptech.org/ip/health/cl/recent-examples.html
Exim Bank, Domestic Policy Constraints for Exports in Select Sectors - Main
https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/SpecialPublications/Report-on-Domestic-Constraints-on-Exports-of-Selected-Sectors-new.pdf

Exim Bank of India, Relooking India's Tariff Framework, Main Report
https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/SpecialPublications/Main-Report-Relooking-Indias-Tariff-Framework-120121.pdf

Exim Bank of India, Domestic Policy Constraints for Exports in Select Sectors - Main Report
https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/SpecialPublications/Report-on-Domestic-Constraints-on-Exports-of-Selected-Sectors-new.pdf

Exim Bank of India, Domestic Policy Constraints in Select Sectors – Report Hubs
https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/SpecialPublications/Report-on-Export-Hubs.pdf

Exim Mitra, state level schemes
https://eximmitra.in/en/information-data-on-exports/policies-and-schemes/state-level-schemes

Export Promotion Council for EOUs and SEZs.
http://texmin.nic.in/sites/default/files/Report_SITP_26Dec2016.pdf

Fact Sheet on Foreign Direct Investment from April 2000 to September 2020
https://dipp.gov.in/sites/default/files/FDI_Fact_sheet_September_20.pdf

Federal Ministry for Economic Affairs and Energy, SME Policy, The German Mittelstand as a model for success, January 27, 2020
https://www.bmwi.de/Redaktion/EN/Dossier/sme-policy.html

FERDI, Non-Tariff Measures: Data and Quantitative tools of analysis, Melo J and Nicita A, Working Paper 218, March 2018
https://ferdi.fr/dl/df-pwFsQKwSBf2Djde77ELncfwt/ferdi-p218-non-tariff-measures-data-and-quantitative-tools-of-analysis.pdf

FDI India, Textiles and Garments, FDI In Textiles & Garments
https://www.fdi.finance/sectors/textiles-and-garments

FICCI, Solar Energy Task Force Report on Securing the Supply Chain for Solar in India by FICCI Subgroup on Securing Solar Supply Chain
https://ficci.in/spdocument/20294/Supply-Chain-paper.pdf

Financial Express, Union Budget 2021: Leather products to get costlier after 10% customs duty, say manufacturers, PTI, February 01, 2021
https://www.financialexpress.com/budget/union-budget-2021-leather-products-to-get-costlier-after-10-customs-duty-say-manufacturers/2184942/

Geely Auto, Geely Global Media Centre, Geely Auto Goes Full Contactless with New Car Keys Being Delivered by Drone, March 23, 2020
http://global.geely.com/media-center/news/geely-auto-goes-full-contactless-with-new-car-keys-being-delivered-by-drone/

Gise.in
http://www.gise.in/uploads/downloads/1490881948_site-selection.pdf

Global Solutions, The World Policy Forum, Policy Responses to Covid-19 What can the G20 do to stabilise the world economy in times of the Covid-19 pandemic?
https://www.global-solutions-initiative.org/global-table/Covid-19-stabilizing-the-world-economy/

Globalization and the German industrial production model, Herrigel G, Published online: 29 October 2014, Institut für Arbeitsmarkt- und Berufsforschung 2014
https://link.springer.com/content/pdf/10.1007/s12651-014-0170-5.pdf

Google Design, The Meaning of Design, Adapted from opening keynote presentation @ Toronto Tech Summit, Nov. 2016, Merchant R, Feb 24, 2018
https://medium.com/google-design/the-meaning-of-design-44f1a82129a8

Government of Canada, About tariff elimination under the CPTPP
https://www.international.gc.ca/trade-commerce/trade-agreements-accords-commerciaux/agr-acc/cptpp-ptpgp/tariff-elimination-droits_de_douane.aspx?lang=eng

Government of India, Ministry of Finance, Department of Revenue, (Central Board of Indirect Taxes & Customs), Circular No.40/2020-Customs, September 04, 2020
https://www.cbic.gov.in/resources/htdocs-cbec/customs/cs-circulars/cs-circulars-2020/Circular-No-40-2020.pdf

Government of India, Ministry of Commerce and Industry, Department for Promotion of Industry and Internal Trade, India Investment Grid, National Infrastructure Pipeline
https://indiainvestmentgrid.gov.in/national-infrastructure-pipeline

Government of India, Ministry of Commerce & Industry, Department for Promotion of Industry and Internal Trade, Consolidated FDI Policy Circular of 2020, October 15, 2020
https://dipp.gov.in/sites/default/files/FDI-PolicyCircular-2020-29October2020_0.pdf

Government of India, Ministry of Commerce and Industry, Department for Promotion of Industry & Internal Trade, Annual Report 2020-21
https://dipp.gov.in/sites/default/files/annualReport-English2020-21.pdf

Government of India, Ministry of Commerce and Industry, Department for Promotion of Industry & Internal Trade, FDI Statistics Archives
https://dipp.gov.in/publications/fdi-statistics/archives

Government of India, Invest India, Agnii
https://www.agnii.gov.in/

Government of India, Ministry of Commerce & Industry, Government amends the extant FDI policy for curbing opportunistic takeovers/acquisitions of Indian companies due to the current Covid-19 pandemic, PIB, April 18, 2020
https://pib.gov.in/PressReleasePage.aspx?PRID=1615711

Government of India, Ministry of Electronics & Information and Technology
https://www.meity.gov.in/esdm/SPECS

Government of India, MEITY (IPHW Division), File No. W-18/30/2019-IPHW, SPECS-Guidelines-01062020
https://www.meity.gov.in/writereaddata/files/SPECS-Guidelines-01062020.pdf

Groww, An Overview of the Pharma Industry in India, Team Groww, Oct 26, 2020
https://groww.in/blog/overview-of-pharma-industry-in-india/

GTAD, Bangladesh leather service centre for export development II
http://gtad.wto.org/project.aspx?prjCode=BGD%2f37%2f19A

Gulf Times, Toxic poultry feed threatens Bangladesh's poor, June 30 2014
https://www.gulf-times.com/story/398475/Toxic-poultry-feed-threatens-Bangladesh-s-poor

G20 Trade and Investment, Ministerial Statement, March 30, 2020
https://www.wto.org/english/news_e/news20_e/dgra_30mar20_e.pdf

G20 Research Group, G20 Information Centre, G 20 Leaders' Declaration , Riyadh Summit, November 21, 2020
http://www.g20.utoronto.ca/2020/2020-g20-leaders-declaration-1121.html

G20 Research Group, G20 Information Centre, Extraordinary G20 Leaders' Summit: Statement on Covid-19, Riyadh, Saudi Arabia, March 26, 2020
http://www.g20.utoronto.ca/2020/2020-g20-statement-0326.html

G20 Research Group, University of Toronto, Extraordinary G20 Leaders' Summit: Statement on Covid-19, Riyadh, Saudi Arabia, March 26, 2020
http://www.g20.utoronto.ca/2020/2020-g20-statement-0326.html

G20, G20 Trade and Investment, Ministerial Statement, March 30, 2020
https://www.wto.org/english/news_e/news20_e/dgra_30mar20_e.pdf

IBEF, Brand India, Industry, Automobile Industry in India, June 30, 2021
https://www.ibef.org/industry/india-automobiles.aspx

IBEF, India Pharmaceutical Industry Report, April, 2020
https://www.ibef.org/industry/pharmaceutical-india.aspx

ICEA, Making India a Global Hub for Handset Manufacturing, A study on Disabilities and Smart Policy Measures Including Replacement of Merchandise Export Incentive (MEIS), IKDHVAJ Team
https://icea.org.in/wp-content/uploads/2021/02/DisabilityReport.pdf

ICRIER, Working Paper 386 India's GVC integration: An analysis of upgrading efforts and facilitation of lead firms, Ray S and Miglani S, February 2020
https://icrier.org/pdf/Working_Paper_386.pdf

IFC, Utility-Scale Solar Photovoltaic Power Plants In partnership with A Project Developer's Guide
https://www.ifc.org/wps/wcm/connect/a1b3dbd3-983e-4ee3-a67b-cdc29ef900cb/IFC+Solar+Report_Web+_08+05.pdf?MOD=AJPERES&CVID=kZePDPG

IIT Kanpur, Challenges faced by Leather Industry in Kanpur, A Project Report Submitted In Partial Fulfilment of the Requirements For the course ECO 332 – Development theory, April 2007
http://home.iitk.ac.in/~sgupta/tannery_report.pdf

IIT Kanpur, IIT Kanpur to Partner with Dynamatic Technologies for joint indigenous development of innovative Unmanned Aerial Systems
https://www.iitk.ac.in/new/index.php/mou-between-dynamatics-and-institute

IMF, THE IMF AND Covid-19 (CORONAVIRUS), A New Commitment for Vaccine Equity and Defeating the Pandemic, June, 01, 2021
https://www.imf.org/en/Topics/imf-and-covid19

Implementation of Trade Facilitation Agreement, National Trade Facilitation Action Plan, 2020-2023, National Committee on Trade Facilitation
https://www.cbic.gov.in/resources//htdocs-cbec/implmntin-trade-facilitation/NTFAP2020-23jk.pdf;jsessionid=EED42D752742D71A8FF8992FC5343FD1

India Briefing, India's Pharmaceutical Industry – Foreign Investment Opportunities, Incentives, Cyrill M, April 13, 2021
https://www.india-briefing.com/news/indias-pharmaceutical-industry-investment-trends-opportunities-incentives-18300.html/

India Filings, Industrial Information System (IIS)
https://www.indiafilings.com/learn/industrial-information-system-iis/

India.gov.in
https://www.india.gov.in/website-export-promotion-council-eous-and-sezs

India National Trade Facilitation Action Plan 2017-2020
https://www.cbic.gov.in/resources/htdocs-cbec/implmntin-trade-facilitation/national-trade-facilitation.pdf;jsessionid=1EA0894380D27C332BFDA8B88FD81053

Indian Power Sector.com, 'Statutory nods barrier for Indian power sector'
http://indianpowersector.com/home/tag/power-shortage/

INDIA-JAPAN CEPA AN APPRAISAL, AIC and RIS, Seshadri V.S.
http://www.ris.org.in/sites/default/files/India-Japan%20CEPA%20Report_2016.pdf

Indian Express, FDI in pharma and related implications of Covid-19, EP News Bureau, July 14, 2020
https://www.expresspharma.in/fdi-in-pharma-and-related-implications-of-Covid-19/

Industrial policy, productive transformation and jobs: Theory, history and practice José M. Salazar-Xirinachs J.M. S, Irmgard Nübler I and Kozul-Wright R
https://www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_315664.pdf

Institut Montaigne, China's Semiconductor Industry: Autonomy Through Design? Harold S.W. and Hodiak J, September 25, 2020
https://www.institutmontaigne.org/en/blog/chinas-semiconductor-industry-autonomy-through-design

Insolvency and Bankruptcy Board of India
https://www.ibbi.gov.in/

International Trade Administration, 2016 Top Markets Report Technical Textiles Country Case Study
https://legacy.trade.gov/topmarkets/pdf/Textiles_India.pdf

International Trade Centre and DIE, An Inventory of Concrete Measures to Facilitate the Flow of Sustainable FDI: What? Why? How?, Sauvant K P, Stephenson M, Hamdani K and Kagan Y, November 26, 2020
https://www.intracen.org/uploadedFiles/intracenorg/Content/Redesign/Events/IFD%20Inventory%20as%20of%2026%20Nov.%2020%20rev.pdf

Invest India, Automobile, Running in the top gear, Bajwa N
https://www.investindia.gov.in/sector/automobile

Invest India, Fostering innovation for improved health, Bajaj Akriti, June 28, 2021
https://www.investindia.gov.in/sector/medical-devices

Invest India, Schemes for Medical Devices Manufacturing
https://www.investindia.gov.in/schemes-for-medical-devices-manufacturing

Invest India, Snapshot Indian pharmaceuticals - a formula for success, Srividhya (2020)
https://www.investindia.gov.in/sector/pharmaceuticals

Invest India, World's tannery, Sagar R
https://www.investindia.gov.in/sector/leather/

Invest India, Strategic Investment Research Unit, Technical Textiles: The Future of Textiles, Sharma A., Lakshmanan R. & Nayyar M., August 19, 2020
https://www.investindia.gov.in/siru/technical-textiles-future-textiles

Invest India, Team India Blogs, Back to Growth: Technical textile sector profile and interview with Dr. Sundararaman, Chairman, Indian Technical Textile Association (ITTA),Nayyar M., Janurary 28, 2021
https://www.investindia.gov.in/team-india-blogs/back-growth-technical-textile-sector-profile-and-interview-dr-sundararaman

Investment Opportunities in India's Healthcare Sector, NITI Aayog, March 2021
https://niti.gov.in/sites/default/files/2021-03/InvestmentOpportunities_HealthcareSector_0.pdf

Ministry of Commerce and Industry, GOI, Export Products (Pharmaceuticals)
https://commerce.gov.in/about-us/divisions/export-products-division/export-products-pharmaceuticals/

ITC, Trade Map, Trade statistics for international business development
https://www.trademap.org/Index.aspx

Kenya Revenue Authority, Investing in Kenya, Incentives for Investors
https://www.kra.go.ke/en/ngos/incentives-investors-certificate/investing-in-kenya/incentives-investors

Kementerain Investas BKPM, Incentives
https://www5.investindonesia.go.id/en/how-we-can-help/incentives

KPMG, Auto Sales post Covid-19, Jacob J
https://home.kpmg/in/en/home/insights/2020/06/auto-sales-post-Covid-19-the-road-to-recovery.html

KPMG, Government Response – Global landscape , An overview of government and institution measures around the world in response to Covid-19.
https://home.kpmg/xx/en/home/insights/2020/04/government-response-global-landscape.html

KPMG, R&D in the automotive sector, March 21, . 2018
https://home.kpmg/pl/en/home/insights/2018/03/r-and-d-in-the-automotive-sector.html

Let's Save Electricity, Best Solar Panels in India 2020
https://letsavelectricity.com/best-solar-panels-in-india-in-2020/

Made in India, Automobile
https://www.makeinindia.com/sector/automobiles

Maier+Vidorno, Automotive Sector Overview 2020
https://www.maiervidorno.com/industry-expertise/automotive-industry-in-india/

MAINE, Medical Devices Industry Opportunities in Japan & China, June 2015
http://www.mitc.com/wp-content/uploads/2015/04/2015-Medical-Devices-Resource-Guide-Japan-and-China.pdf?29e721

Malaysian Investment Development Authority i-incentives, Investment Incentives Portal
https://investmalaysia.mida.gov.my/incentives/Login.Login.aspx

Mazumdar, M. (2012). Performance of pharmaceutical companies in India: a critical analysis of industrial structure, firm specific resources, and emerging strategies. Springer Science & Business Media.
https://books.google.co.in/books?hl=en&lr=&id=JpOG5ztR0nMC&oi=fnd&pg=PR3&dq=Mazumdar+et+al.+(2012)+indian+pharmaceutical&ots=0CxJc6c7f5&sig=5p333Gx57U-vQS-U21tO8y31EFI#v=onepage&q=Mazumdar%20et%20al.%20(2012)%20indian%20pharmaceutical&f=false

Mercom India, MNRE Issues Requirements for Compulsory Registration of Solar Manufacturers, October 25, 2018
https://mercomindia.com/mnre-issues-requirements-solar-manufacturing/

Mckinsey & Company, Shaping the new normal, India's auto component industry, September 2020
https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/India/Shaping%20the%20new%20normal/Shaping%20the%20new%20normal_report.pdf

Mickinsey and Company, Covid-19: Implications for business, Executive Briefing No.57, June 2, 2021
https://www.mckinsey.com/business-functions/risk/our-insights/Covid-19-implications-for-business?cid=other-eml-alt-mip-mck&hdpid=ac2c2468-0a78-4bb6-9ecf-721f9f654493&hctky=3164146&hlkid=32b83c6fb778468c900b47755c8089e0#

Ministry of Commerce and Industry, Department of Commerce, Government of India, Aatmanirbhar Bharat is about opening India's doors wider so that India engages with the world from a position of strength, on equal, fair & reciprocal terms, Goyal P., November 28, 2020
https://commerce.gov.in/press-releases/aatmanirbhar-bharat-is-about-opening-indias-doors-wider-so-that-india-engages-with-the-world-from-a-position-of-strength-on-equal-fair-reciprocal-terms-shri-piyush-goyal/?hilite=%27TMANIRBHAR%27%2C%27BHARAT%27

Ministry of Electronics and Information Technology, GOI, Capacity Building, May 24, 2018
https://www.meity.gov.in/content/capacity-building-2

Ministry of Electronics & Information Technology (MeitY). Government of India, Annual Report 2019-2020
https://www.meity.gov.in/writereaddata/files/Annual_Report_2019%E2%80%9320.pdf

Ministry of Commerce and Industry, Department of Commerce, Directorate General of Foreign Trade, GOI, Trade Notice: 03/ 2020-21, April 15, 2020
http://www.eepcindia.org/download/200610224418.pdf

Ministry of Electronics & Information Technology, Production Linked Incentive Scheme (PLI) for Large Scale Electronics Manufacturing
https://www.meity.gov.in/esdm/pli

Ministry of Electronic & Information Technology, GOI, Expression of Interest for Conducting study on Methods suitable for manufacturing of Electronics goods covered under ITA agreement
https://www.meity.gov.in/writereaddata/files/tender_upload/Published-EOI%20ITA_26%283%29201916072020.pdf

Ministry of Electronics & Information Technology, Electronic Manufacturing Clusters (EMC)
https://www.meity.gov.in/esdm/clusters

Ministry of Electronics & Information Technology, Modified Electronics Manufacturing Clusters (EMC 2.0) Scheme
https://www.meity.gov.in/esdm/emc2.0

Ministry of Electronics & Information Technology, Scheme for Promotion of Manufacturing of Electronic Components and Semiconductors (SPECS)
https://www.meity.gov.in/esdm/SPECS#:~:text=The%20vision%20of%20National%20Policy,environment%20for%20the%20industry%20to

Ministry of Finance, GOI, Constitution RoDTEP Committee
https://www.cbic.gov.in/resources/htdocs-cbec/Constitution-RoDTEP-Committee.pdf

Ministry of Finance, Government of India, Union Budget 2018-19, Budget Speech by Hon'ble Finance Minister
https://www.indiabudget.gov.in/budget2018-2019/bspeecha.asp

Ministry of Finance, Government of India, Union Budget 2020-21, Budget Speech
https://www.indiabudget.gov.in/budgetspeech.php

Ministry of Finance, Government of India, Union Budget 2019-20, Budget Speech
https://www.indiabudget.gov.in/budget2019-20/budgetspeech.php

Ministry of New and Renewable Energy
https://mnre.gov.in/

Ministry of Textiles website.
http://texmin.nic.in/

Ministry of Textile, Annual Report 2019-20
http://texmin.nic.in/sites/default/files/AR_MoT_2019-20_English.pdf

Ministry of Textile, Final report of sub-committee, September 18, 2013
http://texmin.nic.in/sites/default/files/Final%20report%20of%20sub-committee%2018-9-13.pdf

Ministry of Textile, Final Report on Trends in Production, Distribution & Demand for Hank Yarn & Issues related thereto, M/s. Technopak
http://texmin.nic.in/sites/default/files/HankYarnStudyReport.pdf

Ministry of Textile, GOI, Press Information Bureau, Scheme for Powerloom Sector, February 12, 20201
https://pib.gov.in/Pressreleaseshare.aspx?PRID=1697402

Ministry of Textile, GOI, Press Information Bureau, Year End Review 2020, December 30, 2020
https://pib.gov.in/Pressreleaseshare.aspx?PRID=1684735

Ministry of Textiles, GOI, Press Information Bureau, National Technical Textiles Mission, September 18, 2020
https://pib.gov.in/PressReleasePage.aspx?PRID=1656237

Ministry of Textiles, GOI, Press Information Bureau, Synthetic Yarn, March 19, 2021
https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1706033

Ministry of Textile, Indian manmade fibre Textile Industry
http://texmin.nic.in/sites/default/files/Indian%20Manmade%20fibre%20textile%20industry_0.pdf

Ministry of Textile, Note on technical textiles
http://texmin.nic.in/sites/default/files/note_technical_textiles_ammt_0.pdf

Mint, Government move to increase truck axle load raises concerns, July 17, 2018
https://www.livemint.com/Politics/412913vGo6i4RPyiucEn3J/Government-move-to-increase-truck-axle-load-raises-concerns.html

Mint, India's auto industry braces for a hit on import of parts Kamat V, February 23, 2020
https://www.livemint.com/market/mark-to-market/india-s-auto-industry-braces-for-a-hit-on-import-of-parts-11582481191524.html

Mint, 6 ways to reignite India's auto industry, Chhibber B and Dhawan R, December 02 2019
https://www.livemint.com/industry/manufacturing/6-ways-to-reignite-india-s-auto-industry-11571157981126.html

Mint, Management Case | Changing dynamics of Dynamatic Tech, Sanjai P.R., March 10, 2015
https://www.livemint.com/Companies/rocfSfuUBIcctGCDKVNy9K/Management-Case--Changing-dynamics-of-Dynamatic-Tech.html

mondag, India: The Sunshine Sector In "Make In India" – Medical Device Industry Shines As Never Before, Ganju, Ritika, October 18, 2018
https://www.mondaq.com/india/inward-foreign-investment/745722/the-sunshine-sector-in-make-in-india-medical-device-industry-shines-as-never-before

mondag, India: "Compulsory Licensing" – Every Request For Compulsory License Will Not Be Granted And Special Powers Of The Government In Exceptional Circumstances, Sharma A, March 14, 2017
https://www.mondaq.com/india/patent/576540/compulsory-licensing-every-request-for-compulsory-license-will-not-be-granted-and-special-powers-of-the-government-in-exceptional-circumstances

Money Control, Dynamitic Technologies Ltd
https://www.moneycontrol.com/company-facts/dynamatictechnologies/history/DT05

Motoring, Secret German auto subsidies exposed, May 24, 2017
https://www.motoring.com.au/secret-german-auto-subsidies-exposed-107275/

National Treatment and Market Access for Goods, Definitions and Scope
https://www.mfat.govt.nz/assets/Trade-agreements/TPP/Text-ENGLISH/2.-National-Treatment-and-Market-Access-for-Goods.pdf

NITI Aayog, Weaving The Way For Indian Textile Industry, Gupta U.K., January 29, 2020
http://niti.gov.in/weaving-way-indian-textile-industry

NS Energy, Profiling the top five states for solar power production in India, March 26, 2021
https://www.nsenergybusiness.com/news/top-states-solar-power-production-india/

OECD, Checklist for Foreign Direct Investment Incentive Policies
https://www.oecd.org/daf/inv/investment-policy/2506900.pdf

OECD Library, OECD Trade Policy Papers, Micro-Evidence on Corporate Relationships in Global Value Chains, Andrenelli A, Lejárraga I, Miroudot S and Montinar L April 25, 2019
https://www.oecd-ilibrary.org/trade/micro-evidence-on-corporate-relationships-in-global-value-chains_f6225ffb-en

OECD Trade Policy Papers, Micro-Evidence on Corporate Relationships in Global Value Chains
https://www.oecd-ilibrary.org/trade/micro-evidence-on-corporate-relationships-in-global-value-chains_f6225ffb-en

OECD, OECD Studies o SMEs and Entrepreneurship, Italy Key Issues and Polices
http://www.iban.it/frontend/iban/public/file/ItalyReview_Opt.pdf

OECD, Tackling Coronavirus (Covid-19), Italian regional SME policy responses, April 08, 2020
https://www.oecd.org/cfe/leed/Covid-19-Italian-regions-SME-policy-responses.pdf

OECD, Multinational enterprises in the global economy, Heavily debated but hardly measured, May 2018
https://www.oecd.org/industry/ind/MNEs-in-the-global-economy-policy-note.pdf

OECD, OECD Policy Responses to Coronavirus (Covid-19),Trade interdependencies in Covid-19 goods, May 05, 2020
https://www.oecd.org/coronavirus/policy-responses/trade-interdependencies-in-Covid-19-goods-79aaa1d6/

OECD, Tackling Coronavirus (Covid 19): Contributing to a global effort, Covid-19 and Global Value Chains: Policy Options to Build More Resilient Production Networks, June 03, 2020
https://read.oecd-ilibrary.org/view/?ref=134_134302-ocsbti4mh1&title=Covid-19-and-Global-Value-Chains-Chains-Policy-Options-to-Build-More-Resilient-Production-Networks

OECD, OECD Policy Responses to Coronavirus (Covid-19) Covid-19 and international trade: Issues and actions, June 12, 2020
https://www.oecd.org/coronavirus/policy-responses/Covid-19-and-international-trade-issues-and-actions-494da2fa/

Office of the United States Trade Representative, Executive office of the President, United States-Kenya Negotiations, Summary of Specific Negotiating Objectives, May 2020
https://ustr.gov/sites/default/files/Summary_of_U.S.-Kenya_Negotiating_Objectives.pdf

Office of Industries U.S. International Trade Commission, India's Textile and Apparel Industry: The views expressed in this staff study are those of the Office of Industries, March 2001, Publication 3401
https://www.usitc.gov/publications/332/PUB3401.pdf

Open Knowledge Repository, World Development Report 2020 : Trading for Development in the Age of Global Value Chains
https://openknowledge.worldbank.org/handle/10986/32437

ORF, Can Aatmanirbhar Bharat Abhiyaan help India's solar manufacturing sector? Roy, A, June 05, 2020
https://www.orfonline.org/expert-speak/why-india-needs-to-nudge-domestic-manufacturing-for-solar-industry-67388

Pharmexcil, q6th Annual Report, 2019-2020
https://pharmexcil.com/uploads/files/16thAnnualReport.pdf

PIB, GOI, CCEA, Cabinet approves scheme for "Remission of Duties and Taxes on Exported Products (RoDTEP)" to boost exports Scheme for enhancing Exports to International Markets, March 13, 2020
https://pib.gov.in/PressReleseDetail.aspx?PRID=1606281

PM addresses seminar on Atmanirbhar Bharat in Defence manufacturing, August 20, 2020
https://www.pmindia.gov.in/en/news_updates/pm-addresses-seminar-on-atmanirbhar-bharat-in-defence-manufacturing/

Proposed Kenya-United States of America, Free Trade Area Agreement, Negotiation Principles, Objectives and Scope, Ministry of Industrialization, Trade and Enterprise Development, Republic of Kenya, June 22 2020
https://www.tralac.org/documents/resources/external-relations/us-agoa/3787-proposed-kenya-us-fta-agreement-negotiating-principles-objectives-and-scope-22-june-2020/file.html

Press Information Bureau, Government of India, English Rendering of Prime Minister Shri Narendra Modi's Address to the Nation, May 12. 2020
https://pib.gov.in/PressReleseDetail.aspx?PRID=1623418

Press Information Bureau, GOI, FDI policy further liberalized in key sectors, Cabinet approves amendments in FDI policy, January 10, 2018
https://pib.gov.in/PressReleseDetail.aspx?PRID=1516115

PTI, Government of India, Prime Minister's Office, PM gives a clarion call for Atmanirbhar Bharat, May 12, 2020
https://www.pmindia.gov.in/en/news_updates/pm-addresses-seminar-on-atmanirbhar-bharat-in-defence-manufacturing/

PRS Legislative Research, The Companies (Amendment) Bill, 2016, Ministry: Corporate Affairs
https://prsindia.org/billtrack/the-companies-amendment-bill-2016

PWC and SIAM, Indian automotive sector: Creating future-ready organisations, May 2019
https://www.pwc.in/assets/pdfs/industries/automotive/indian-automotive-sector.pdf

PWC, Worldwide Trade, China, People's Republic of, Corporate - Tax credits and incentives, January 05, 2021
https://taxsummaries.pwc.com/peoples-republic-of-china/corporate/tax-credits-and-incentives

PWC, Worldwide Trade, China, People's Republic of, Corporate – Deductions, January 05, 2021
https://taxsummaries.pwc.com/peoples-republic-of-china/corporate/deductions

PWC, Worldwide Trade, Vietnam Corporate - Tax credits and incentives, January 25, 2021
https://taxsummaries.pwc.com/vietnam/corporate/tax-credits-and-incentive

PWC, Worldwide Tax, Malaysia, Corporate - Tax credits and incentives, December 16, 2020
https://taxsummaries.pwc.com/malaysia/corporate/tax-credits-and-incentives

PWC, Worldwide Tax, Thailand Corporate - Tax credits and incentives, January 17 2021
https://taxsummaries.pwc.com/thailand/corporate/tax-credits-and-incentives

PWC Worldwide tax summaries, Indonesia Corporate - Tax credits and incentives, December 29 2020
https://taxsummaries.pwc.com/indonesia/corporate/tax-credits-and-incentives

PWC, Vietnam Corporate - Tax credits and incentives, January 25, 2021
https://taxsummaries.pwc.com/vietnam/corporate/tax-credits-and-incentives

Quarterly Fact Sheet, Fact Sheet on Foreign Direct Investment (FDI, April 2000 to March 2021
https://dipp.gov.in/sites/default/files/FDI_Factsheet_March%2C21.pdf

RANITEC, Best Practice – Zero Liquid Discharge System in Tannery CETP in Tamil Nadu
https://tnpcb.gov.in/pdf_2019/TanneryCETP_ZLD15519.pdf

ResearchGate, Export Competitiveness of India's Textiles and Clothing Sector in the United States, Institute of Indian Studies, Hankuk University of Foreign Studies, Seoul, Kim M., 2019
https://www.researchgate.net/publication/333179468_Export_Competitiveness_of_India's_Textiles_and_Clothing_Sector_in_the_United_States

ResearchGate, Industrial policy, productive transformation and jobs: Theory, history and practice, April 2014
https://www.researchgate.net/publication/262857559_Industrial_policy_productive_transformation_and_jobs_Theory_history_and_practice

RIS, India-Japan CEPA, An Appraisal, Seshadri V.S., 2016
https://www.ris.org.in/india-japan-cepa-appraisal

RIS, India-Korea CEPA-An Appraisal of Progress, V. S. Seshadri, V.S., 2015
https://www.ris.org.in/india-korea-cepa-appraisal-progress

RIS, Medical Devices Industry in India, Local Manufacturing and Trade, T. C. James T.C., and Jaiswal A
http://www.ris.org.in/sites/default/files/Medical%20Devices_Report.pdf

Saur Energy International, Top 10 Solar PV Module Suppliers in India for 2019, Verma V July 08, 2020
https://www.saurenergy.com/solar-energy-blog/top-10-solar-pv-module-suppliers-in-india-for-2019

Saur Energy International, Top 10 Solar PV Module Suppliers in India for 2019 Verma , July 08, 2020
https://www.saurenergy.com/solar-energy-blog/top-10-solar-pv-module-suppliers-in-india-for-2019

Science Direct, Autonomous, connected, electric shared vehicles (ACES) and public finance: An explorative analysis, Transportation Research Interdisciplinary Perspectives, Volume 2, September 2019
https://www.sciencedirect.com/science/article/pii/S2590198219300387

Science Direct, Techno-economic analysis of solar photovoltaic power plant for garment zone of Jaipur city Chandel M, Agrawal G.D., Mathur S. and Mathur A, Case Studies in Thermal Engineering Volume 2, March 2014,
https://www.sciencedirect.com/science/article/pii/S2214157X13000117#!

Scientific American, Why China Is Dominating the Solar Industry, Fialka F, December 19, 2016
https://www.scientificamerican.com/article/why-china-is-dominating-the-solar-industry/

Shakuro, The Meaning of Design: What Design Is and Why It's Important
https://shakuro.com/blog/the-meaning-of-design-what-design-is-and-why-its-important

SIAM, Automobile Domestic Sales Trends
https://www.siam.in/statistics.aspx?mpgid=8&pgidtrail=14

Solar Mango, Why do Indian Solar Panels Cost a Lot More Than Chinese Panels?
http://www.solarmango.com/2016/08/07/indian-solar-panels-cost-lot-chinese-panels/

Solar Mango, Area Required for Solar PV Power Plants
http://www.solarmango.com/scp/area-required-for-solar-pv-power-plants/

Solar Mango, Top 5 States for Solar Energy Investments in India
http://www.solarmango.com/ask/2016/02/10/top-5-states-solar-energy-investments-india/

TEXPROCIL, Ministry of Textiles,
https://texprocil.org/index.php

Thailand Board Investment, Thailand BOI Urges Investors to Focus on Business Upgrades Ahead of 2021 Recovery
https://www.boi.go.th/index.php?page=press_releases_detail&topic_id=125600

Thailand Board of Investment, Incentives Under the Investment Promotion Act
https://www.boi.go.th/index.php?page=incentive

The Economic Times, Passenger vehicle exports tumble 58 per cent in H1FY21 as Covid-19 disruptions take toll, PTI, Oct 18, 2020
https://economictimes.indiatimes.com/industry/auto/auto-news/passenger-vehicle-exports-tumble-58-per-cent-in-h1fy21-as-Covid-19-disruptions-take-toll/articleshow/78729818.cms?utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

The Economic Times, Govt considering proposal to cut export duty on hides, skins of bovine, PTI, June 07, 2020
https://economictimes.indiatimes.com/news/economy/foreign-trade/govt-considering-proposal-to-cut-export-duty-on-hides-skins-of-bovine/articleshow/76245379.cms

The Economic Times, Mega FDI plan to focus on faster pharma approvals, Suneja K, May 10, 2020
https://economictimes.indiatimes.com/industry/healthcare/biotech/pharmaceuticals/mega-fdi-plan-to-focus-on-faster-pharma-approvals/articleshow/75664593.cms?from=mdr

The Economic Times, MNRE, July 14, 2021
https://economictimes.indiatimes.com/topic/MNRE

The Gazette of India, scheme for promotion of manufacturing of electronic components and semi, CG-DL-E-01042020-218992, No.85, April 01, 2020
https://www.meity.gov.in/writereaddata/files/scheme_for_promotion_of_manufacturing_of_electronic_components_and_semiconductors.pdf

The Hindu, Business Line, Faceless schemes of direct taxes creating more problems than resolutions, Sinha S, December 29, 2020
https://www.thehindubusinessline.com/news/national/faceless-schemes-of-direct-taxes-creating-more-problems-than-resolutions/article33445675.ece

The Hindu, Business Line, Pharma sector to create 58,000 more jobs by 2025, feel experts Ahmedabad Bureau, January 27, 2018
https://www.thehindubusinessline.com/companies/pharma-sector-to-create-58000-more-jobs-by-2025-feel-experts/article9564251.ece

The Hindu, Business Line, Scrap import duty on cotton as it hurts garment exports, trade body tells Centre, June 28, 2021
https://www.thehindubusinessline.com/markets/commodities/scrap-import-duty-on-cotton-as-it-hurts-garment-exports-trade-body-tells-centre/article35024115.ece

The Hindu, Industry, Nitin Gadkari urges auto component manufacturers to increase localisation to 100%., PTI, February 25, 2021
https://www.thehindu.com/business/Industry/nitin-gadkari-urges-auto-component-manufacturers-to-increase-localisation-to-100/article33930277.ece

The Hindu, Why is the auto industry facing trouble? Bhargava Y, August 18, 2019
https://www.thehindu.com/business/Industry/why-is-the-auto-industry-facing-trouble/article29121023.ece

The Hindu, India's leather exports decline 28.3% to $3.3 billion in 2020-21, Special Correspondent April 23, 2021
https://www.thehindu.com/news/national/tamil-nadu/indias-leather-exports-decline-283-to-33-billion-in-2020-21/article34388740.ece

The Hindu, SIMA urges freeing viscose fibre from anti-dumping duty, Preetha M.S., November 25, 2020
https://www.thehindu.com/business/sima-urges-freeing-viscose-fibre-from-anti-dumping-duty/article33178877.ece

The Indian Express, Explained: What is fuelling the auto sector recovery in India? Singh S, July 2, 2020
https://indianexpress.com/article/explained/explained-what-is-fuelling-the-auto-sector-recovery-in-india-6486873/

The Textile Magazine, India's weaving Industry – A need to become globally competitive
February 27, 2021
https://www.indiantextilemagazine.in/indias-weaving-industry-a-need-to-become-globally-competitive/

The Times of India, Union budget 2021-22: '10% customs duty to hit UP's leather goods export, Chauhan A, February 1, 2021
https://timesofindia.indiatimes.com/city/kanpur/union-budget-2021-22-10-customs-duty-to-hit-ups-leather-goods-export/articleshow/80637047.cms

The Synthetic and Rayon Textiles Export Promotion Council (SRTEPC)
http://www.srtepc.org/

The Week, EBG Federation releases 18th Annual position paper, PTI December 02, 2020
https://www.theweek.in/wire-updates/business/2020/12/02/pwr11-ebg-federation.html

The Week, Solar companies' dependence on China may prove to be a challenge, Singh A, June 25, 2020
https://www.theweek.in/news/biz-tech/2020/06/25/solar-companies-dependence-on-china-may-prove-to-be-a-challenge.html

The White House, Securing America's Critical Supply Chains Statement and Releases, February 24, 2021
https://www.whitehouse.gov/briefing-room/statements-releases/2021/02/24/fact-sheet-securing-americas-critical-supply-chains/

The White House, Briefing Room, FACT SHEET: Securing America's Critical Supply Chains February 24, 2021, STATEMENTS AND RELEASES
https://www.whitehouse.gov/briefing-room/statements-releases/2021/02/24/fact-sheet-securing-americas-critical-supply-chains/

The White House, BRIEFING ROOM, Fact Sheet: Quad Summit, March 12, 2021, STATEMENTS AND RELEASES
https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/12/fact-sheet-quad-summit/

The White House, BRIEFING ROOM, Press Briefing by Press Secretary Jen Psaki and National Security Advisor Jake Sullivan, March 12, 2021, PRESS BRIEFINGS
https://www.whitehouse.gov/briefing-room/press-briefings/2021/03/12/press-briefing-by-press-secretary-jen-psaki-march-12-2021/

The White House, Briefing Room, FACT SHEET: Securing America's Critical Supply Chains, February 24, 2021
https://www.whitehouse.gov/briefing-room/statements-releases/2021/02/24/fact-sheet-securing-americas-critical-supply-chains/#content

This industry was crippled by the coronavirus -- here's how it's fighting back', World Economic Forum, 25 Feb. 2020
https://www.weforum.org/agenda/2020/02/coronavirus-china-automotive-industry/

UAC, JSC "Aviation Holding Company "Sukhoi"
https://www.uacrussia.ru/en/corporation/company/sukhoy/

UK Collective, Four Definitions of Design, Porter S.S., March 25, 2020
https://uxdesign.cc/four-definitions-of-design-9e107fb057c5

UNCTAD, Impact of Covid-19, Pandemic on Trade and Development, Transitioning to a new normal
https://unctad.org/system/files/official-document/osg2020d1_en.pdf

UNCTAD, World Investment Report 2020, International Production Beyond the Pandemic, Key message and Overview.
https://unctad.org/system/files/official-document/wir2020_overview_en.pdf

UNIDO, The Italian SME Experience and Possible Lessons for Emerging Countries, Bianchi P, Lee M. Miller, Bertini S, March 1997
https://www.unido.org/sites/default/files/2008-05/the_italian_SME_experience_and_possible_LL_0.pdf

United Nations and ESCAP, ESCAP Policy Brief Beyond the Covid-19 pandemic: Coping with the 'new normal' in supply chains, Anukoonwattaka W and Mikic M
https://www.unescap.org/sites/default/d8files/knowledge-products/Policy_brief_supply_chain.pdf

UNCTAD, Investment Trends and Monitor, Global FDI Flows down 42% I 2020, Further weakness expected in2021, risking sustain table recovery, Issue 38, January 2021
https://unctad.org/system/files/official-document/diaeiainf2021d1_en.pdf

UNCTAD, Impact of the Pandemic on Trade and Development, Transitioning to a New Normal
https://unctad.org/system/files/official-document/osg2020d1_en.pdf

UNCTAD, WORLD INVESTMENT REPORT2020, INTERNATIONAL PRODUCTION BEYOND THE PANDEMIC
https://unctad.org/system/files/official-document/wir2020_en.pdf

UNCTAD, Prosperity for all, Covid-19 response
https://unctad.org/programme/Covid-19-response

United Nations and PAGE, Policy Response to Covid 19, POLICY MEASURES IMPLEMENTED IN PAGE COUNTRIES AS A RESPONSE TO Covid-19
https://www.un-page.org/Policy%20Responses

United Nations Economic and Social Commission for Asia and the Pacific and United Nations Conference on Trade and Development, Asia-Pacific Trade and Investment Report 2019, Navigating Non-Tariff Measures towards Sustainable Development
https://www.unescap.org/sites/default/d8files/knowledge-products/APTIR2019-H%3DN.pdf

United Nations, United Nations Comprehensive Response to Covid-19 Saving Lives, Protecting Societies, Recovering Better, September 2020
https://www.un.org/sites/un2.un.org/files/un-comprehensive-response-to-Covid-19.pdf

United States International Trade Commission, Covid-19 Related Goods: The U.S. Industry, Market, Trade, and Supply Chain Challenges. December 2020, Publication Number: 5145, Investigation Number: 332-580
https://www.usitc.gov/publications/332/pub5145.pdf

UNCTAD, Investment Policy Monitor No. 24, February, 2021
https://unctad.org/system/files/official-document/diaepcbinf2021d2_en.pdf

UNCTAD, Investment Policy Hub, Shanghai introduces support policies to encourage foreign R&D centers, November 24, 2020
https://investmentpolicy.unctad.org/investment-policy-monitor/measures/3620/china-shanghai-introduces-support-policies-to-encourage-foreign-r-d-centers

UNCTAD, World Investment Report 2018 - Investment and New Industrial Policies
https://unctad.org/system/files/official-document/wir2018_en.pdf

UNCTAD, World Investment Report 2013: Global Value Chains: Investment and Trade for Development
https://unctad.org/system/files/official-document/wir2013_en.pdf

UNCTAD/PRESS/PR/2018/016, WIR-Adoption of new industrial policies accelerates in response to economic shift, United Nations reports
https://unctad.org/press-material/wir-adoption-new-industrial-policies-accelerates-response-economic-shift-united

United Nations Conference Trade and Employment, Final Act and Related Document, Interim Commission for the International Trade Organization, New York, April 1948
https://www.wto.org/english/docs_e/legal_e/havana_e.pdf

United Nations, Design and Assessment of Tax Incentives in Development Countries Selected issues and a country 2018
https://www.un.org/esa/ffd/wp-content/uploads/2018/02/tax-incentives_eng.pdf

USB, Chief Investment Office, Regional outlook Insights and financial research across key regions including Asia, the Americas and Europe.
https://www.ubs.com/global/en/wealth-management/chief-investment-office/market-insights/regional-outlook.html

Vanderbilt University, Department of Economics, Compulsory licensing, price controls, and access to patented foreign products, April 2012, Bondy E and Sagg K
https://www.wipo.int/edocs/mdocs/mdocs/en/wipo_ip_econ_ge_4_12/wipo_ip_econ_ge_4_12_ref_saggi.pdf

VCCI, USAID and PCI, 2019 PCI Full Report, March 15, 2021
https://pcivietnam.vn/en/publications/2019-pci-full-report-ct174

VCCI, USAID and PCI, Assessing the Impact of Climate Change on Vietnamese Businesses, September 16, 2020
https://pcivietnam.vn/en/publications/assessing-the-impact-of-climate-change-on-vietnamese-businesses-ct181

VCCI, USAID and PCI. 2019 PCI Full Report, May 5, 2020
https://pcivietnam.vn/en/publications/2019-pci-full-report-ct174

Vietnam Briefing, Bac Giang: An Emerging Investment Destination, Nguyen T, March 16, 2021
https://www.vietnam-briefing.com/news/bac-giang-emerging-investment-destination.html/

Vietnam Briefing, Vietnam's Industrial Zones – How to Pick a Location for Your Business, Dezan Shira & Associates, April 24, 2019
https://www.vietnam-briefing.com/news/vietnam-industrial-zones-how-to-pick-location-for-your-business.html/

Vietnam Briefing, Vietnam Issues Investment Incentives for SMEs, Dezan Shira & Associates, April 29, 2020
www.vietnam-briefing.com/news/vietnam-issues-investment-incentives-smes.html/

Vietnam News, Companies in supporting industry to be provided with interest rate subsidy next year, December, 07, 2020
https://vietnamnews.vn/economy/822039/companies-in-supporting-industry-to-be-provided-with-interest-rate-subsidy-next-year.html

Yingli Solar
http://www.yinglisolar.com/en/

VOX EU, Global value chain transformation to 2030: Overall direction and policy implications, Zhan J, Bolwijn R, Casella B, Santos-Paulino A.U ,13 August 13, 2020
https://voxeu.org/article/global-value-chain-transformation-decade-ahead

VOX EU, Global value chain transformation to 2030: Overall direction and policy implications, Zhan J, Bolwijn R, Casella B, Santos-Paulino A.U ,13 August 13, 2020
https://voxeu.org/article/global-value-chain-transformation-decade-ahead

VOX EU, New eBook: Covid-19 and Trade Policy: Why Turning Inward Won't Work, Baldwin R, Evenett S, April 29, 2020
https://voxeu.org/article/new-ebook-Covid-19-and-trade-policy-why-turning-inward-wont-work

VOC EU, Global value chain transformation to 2030: Overall direction and policy implications, Zhan J, Bolwijn R, Casella B, Santos-Paulino A.U, August 13,2020
https://voxeu.org/article/global-value-chain-transformation-decade-ahead

VOX EU, Trade policy responses to the Covid-19 pandemic: Evidence from a new dataset Simon S, Fiorini M, Fritz J, Hoekman B, Lukaszuk P, Rocha N, Ruta M, Santi F , Shingal A, December 11, 2020
https://voxeu.org/article/trade-policy-responses-Covid-19-pandemic-new-dataset

VOX EU, Trade and the Covid-19 crisis in developing countries, Espitia A, Rocha N, Ruta M, April 09, 2020
https://voxeu.org/article/trade-and-Covid-19-crisis-developing-countries

VOV EU, Trade and the Covid-19 crisis in developing countries Espitia A, Rocha N, Ruta M April 09, https://voxeu.org/article/trade-and-Covid-19-crisis-developing-countries2020

World Bank, Doing Business, Measuring Business Regulations, Trading across Borders
https://www.doingbusiness.org/en/data/exploretopics/trading-across-borders

WITS, Korea, Rep. Textiles and Clothing Imports by country and region in US$ Thousand 2018
https://wits.worldbank.org/CountryProfile/en/Country/KOR/Year/2018/TradeFlow/Import/Partner/all/Product/50-63_TextCloth

World Bank, Saving Lives, Scaling-up Impact and Getting Back on Track, World Bank Group Covid-19 Crisis Response Approach Paper, June 2020
https://documents1.worldbank.org/curated/en/136631594937150795/pdf/World-Bank-Group-Covid-19-Crisis-Response-Approach-Paper-Saving-Lives-Scaling-up-Impact-and-Getting-Back-on-Track.pdf

World Bank, Global Economic Prospects, A Strong but Uneven Recovery
https://www.worldbank.org/en/publication/global-economic-prospects

World Bank, 2020 Year in Review: The impact of Covid-19 in 12 charts BLAKE P I Wadhwa DECEMBER 14, 2020
https://blogs.worldbank.org/voices/2020-year-review-impact-Covid-19-12-charts

World Bank, The World Bank Group's Response to the Covid-19 (coronavirus) Pandemic
https://www.worldbank.org/en/who-we-are/news/coronavirus-covid19

World Bank Group, INVESTMENT POLICY AND REGULATORY REVIEW, Vietnam 2019
https://documents1.worldbank.org/curated/en/400351586323809041/pdf/Vietnam-2019-Investment-Policy-and-Regulatory-Review.pdf

World Bank, Working for a World Free of Poverty, International LPI
https://lpi.worldbank.org/international/global

World Economic Forum, This industry was crippled by the coronavirus - here's how it's fighting back, He P and Huang Z, February 25, 2020
https://www.weforum.org/agenda/authors/zili-huang

World Health Organization (2017), Report on Indian Policies to Promote Local Production of Pharmaceutical Products and Protect Public Health
https://frederickabbott.com/content/indian-policies-promote-local-production-pharmaceutical-products-and-protect-public-health

World Investment Report 2018 - Investment and New Industrial Policies, UNCTAD
https://unctad.org/system/files/official-document/wir2018_en.pdf

World Investment Report 2019 - Special Economic Zones,
https://unctad.org/system/files/official-document/WIR2019_CH1.pdf

WSBI and ESBG, Covid-19: Worldwide policy responses, initiatives
https://www.wsbi-esbg.org/Covid-19/Pages/Worldwide-Policy-Responses.aspx

WTO Analytical Index, SCM Agreement – Article 3 (Jurisprudence)
https://www.wto.org/english/res_e/publications_e/ai17_e/subsidies_art3_jur.pdf

WTO Centre VCCI, WTO-FTA International Economic Integration, EU-Vietnam Trade and Investment Agreements, June 19 2019
https://wtocenter.vn/chuyen-de/12778-eu-vietnam-trade-and-investment-agreements

WTO, Covid-19 AND WORLD TRADE, Covid-19: Support measures, June 02, 2021
https://www.wto.org/english/tratop_e/covid19_e/trade_related_support_measures_e.htm

WTO, India – Export Related Measures, Report on Panel, WT/DS541/R, October 31, 2019
https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/DS/541R.pdf&Open=True

WTO, Trade Topics, Covid-19 and world trade
https://www.wto.org/english/tratop_e/covid19_e/covid19_e.htm

WTO, WTO reports on COVID-19 and world trade The WTO reports on COVID-19 and world trade provide detailed information on the impact of the pandemic on global trade.
https://www.wto.org/english/tratop_e/covid19_e/covid_reports_e.htm

WTO, WT/COMTD/AFT/W/81/Rev.1, (20-4731), July 9 2020
https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/COMTD/AFTW81R1.pdf&Open=True

WTO, WT/TPR/OV/22,19-8208, OVERVIEW OF DEVELOPMENTS IN THE INTERNATIONAL TRADING ENVIRONMENT, November 29, 2019
https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV22.pdf&Open=True

WTO, WT/TPR/OV/23, OVERVIEW OF DEVELOPMENTS IN THE INTERNATIONAL TRADING ENVIRON MENT, November 30, 2020
https://docs.wto.org/dol2fe/Pages/SS/directdoc.aspx?filename=q:/WT/TPR/OV23.pdf&Open=True

WTO, OMC, Fourth Quarter 2020 Merchandise Trade Value
https://www.wto.org/english/res_e/statis_e/daily_update_e/merch_value_latest.pdf

WTO, Press/876 Press Release, World trade primed for strong but uneven recovery after COVID-19 pandemic shock
https://www.wto.org/english/news_e/pres21_e/pr876_e.htm

WTO, Trade in Medical Goods in the Context of Tackling Covid-19, April 03, 2020
https://www.wto.org/english/news_e/news20_e/rese_03apr20_e.pdf

WTO, Telecommunications Services: Reference Paper, Negotiating group on basic telecommunications, April 24, l 1996
https://www.wto.org/english/tratop_e/serv_e/telecom_e/tel23_e.htm

WTO, Understanding the WTO basics, The GATT years: from Havana to Marrakesh
https://www.wto.org/english/thewto_e/whatis_e/tif_e/fact4_e.htm

2020/2021 Malaysian Tax Booklet, Tax Incentives
https://www.pwc.com/my/en/publications/mtb/tax-incentives.html

EXPORT-IMPORT BANK OF INDIA

HEAD OFFICE

Centre One Building, 21st Floor, World Trade Centre Complex, Cuffe Parade, Mumbai 400 005.
Phone: (91 22) 22172600 Fax : (91 22) 22182572
E-mail : ccg@eximbankindia.in Website: www.eximbankindia.in

LONDON BRANCH

5th Floor, 35 King Street, London EC2V 888 United Kingdom
Phone : (0044) 20 77969040 Fax : (0044) 20 76000936 E-Mail : eximlondon@eximbankindia.in

DOMESTIC OFFICES

Ahmedabad
Sakar II, 1st Floor,
Next to Ellisbridge Shopping Centre,
Ellisbridge P. O., Ahmedabad 380 006
Phone : (91 79) 26576843
Fax : (91 79) 26577696
E-mail : eximahro@eximbankindia.in

Bengaluru
Ramanashree Arcade, 4th Floor,
18, M. G. Road,
Bengaluru 560 001
Phone : (91 80) 25585755
Fax : (91 80) 25589107
E-mail : eximbro@eximbankindia.in

Chandigarh
C- 213, Elante offices, Plot No. 178-178A,
Industrial Area phase 1,
Chandigarh 160 002
Phone : (91 172) 4629171
Fax : (91 172) 4629175
E-mail : eximcro@eximbankindia.in

Chennai
Overseas Towers, 4th and 5th Floor,
756-L, Anna Salai, Chennai 600 002
Phone : (91 44) 28522830/31
Fax : (91 44) 28522832
E-mail : eximchro@eximbankindia.in

Guwahati
NEDFi House, 4th Floor, GS Road,
Dispur, Guwahati 781 006
Phone : (91 361) 2237607 /609
Fax : (91 361) 2237701
E-mail : eximgro@eximbankindia.in

Hyderabad
Golden Edifice, 2nd Floor,
6-3-639/640, Raj Bhavan Road,
Khairatabad Circle, Hyderabad 500 004
Phone : (91 40) 23307816
Fax : (91 40) 23317843
E-mail : eximhro@eximbankindia.in

Kolkata
Vanijya Bhawan, 4th Floor,
(International Trade Facilitation Centre),
1/1 Wood Street, Kolkata 700 016
Phone : (91 33) 68261301
Fax : (91 33) 68261302
E-mail : eximkro@eximbankindia.in

Mumbai
8th Floor, Maker Chamber IV,
Nariman Point,
Mumbai 400 021
Phone : (91 22) 22861300
Fax : (91 22) 22182572
E-mail : eximmro@eximbankindia.in

New Delhi
Office Block, Tower 1, 7th Floor,
Adjacent Ring Road, Kidwai Nagar (E)
New Delhi - 110 023
Phone : (91 11) 61242600 / 24607700
Fax : (91 11) 20815029
E-mail : eximndo@eximbankindia.in

Pune
No. 402 & 402(B), 4th floor, Signature Building,
Bhamburda, Bhandarkar Rd.,
Shivajinagar, Pune - 411 004
Phone : (91 20) 26403000
Fax : (91 20) 25648846
E-mail : eximpro@eximbankindia.in

OVERSEAS OFFICES

Abidjan
5th Floor,
Azur Building,
18-Docteur Crozet Road,
Plateau,
Abidjan,
Côte d'Ivoi re
Phone : (225) 27 20 24 29 51
Fax : (225) 27 20 24 29 50
Email : eximabidjan@eximbankindia.in

Addis Ababa
House No. 46,
JakRose Estate Compound,
Woreda 07,
Bole Sub-city,
Addis Ababa,
Ethiopia.
Phone : (251 118) 222296
Fax : (251 116) 610170
Email : aaro@eximbankindia.in

Dhaka
Madhumita Plaza, 12th Floor,
Plot No. 11, Road No. 11, Block G,
Banani, Dhaka, Bangladesh - 1213.
Phone : (88) 01708520444
E-mail : eximdhaka@eximbankindia.in

Dubai
Level 5, Tenancy lB, Gate Precinct Building No. 3,
Dubai International Financial Centre,
PO Box No. 506541, Dubai, UAE.
Phone : (971 4) 3637462
Fax : (971 4) 3637461
E-mail : eximdubai@eximbankindia.in

Johannesburg
2nd Floor, Sandton City Twin Towers East,
Sandhurst Ext. 3, Sandton 2196,
Johannesburg, South Africa.
Phone : (27) 113265103
Fax : (27 11) 7844511
E-mail : eximjro@eximbankindia.in

Singapore
20, Collyer Quay, #10-02,
Tung Centre, Singapore 049319.
Phone : (65) 65326464
Fax : (65) 65352131
E-mail : eximsingapore@eximbankindia.in

Washington D.C.
1750 Pennsylvania Avenue NW,
Suite 1202, Washington D.C. 20006,
United States of America.
Phone : (1 202) 223 3238
Fax : (1 202) 785 8487
E-mail : eximwashington@eximbankindia.in

Yangon
House No. 54/A, Ground Floor,
Boyarnyunt Street, Dagon Township,
Yangon, Myanmar
Phone : (95) 1389520
E-mail : eximyangon@eximbankindia.in

India Exim Bank

Centre One Building, 21st Floor, World Trade Centre Complex, Cuffe Parade, Mumbai - 400005
Ph.: (91 22) 22172600 | Fax: (91 22) 22182572
E-mail: ccg@eximbankindia.in | Website: www.eximbankindia.in, www.eximmitra.in
Follow us on