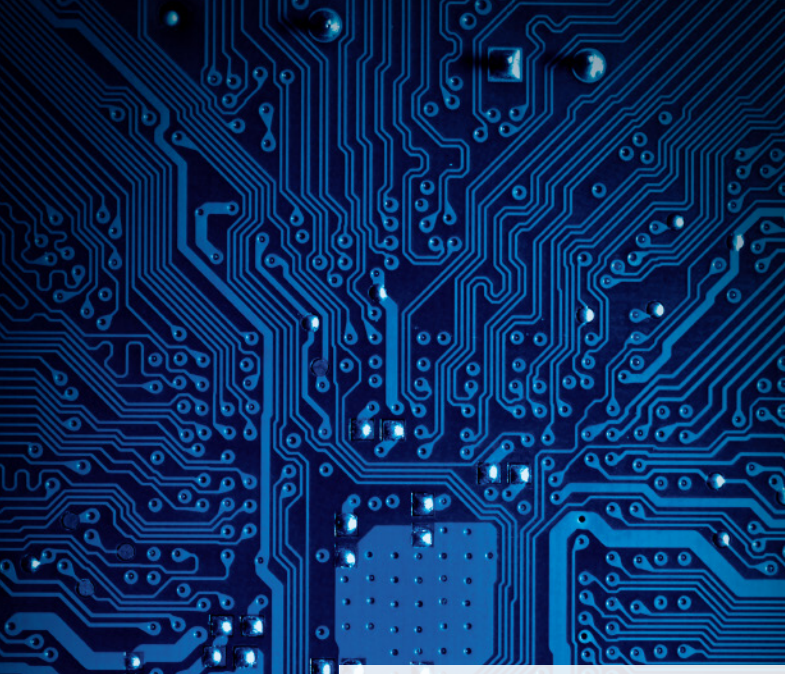
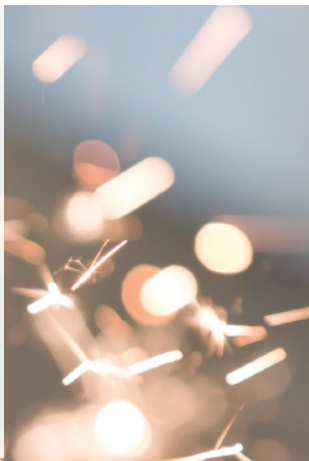
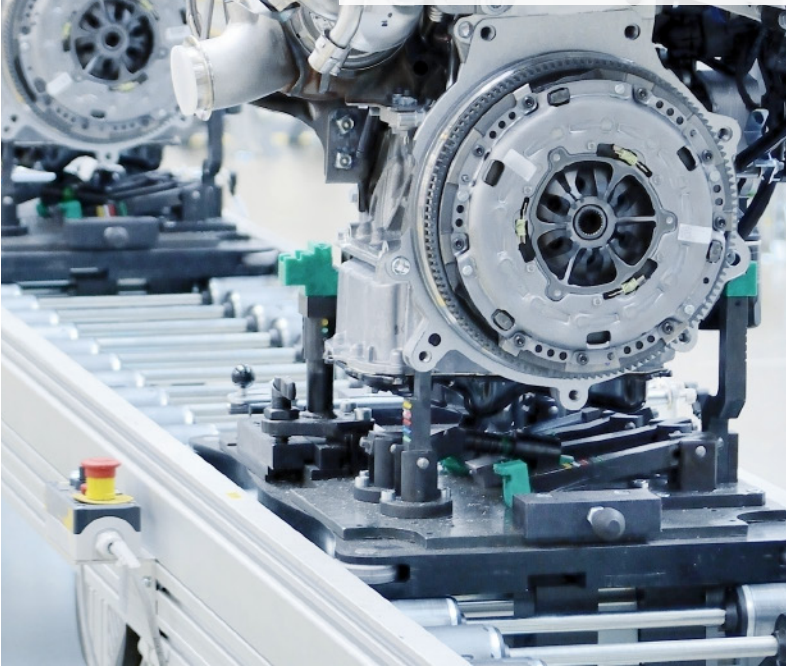



The Pakistan Business Council
FOSTERING ECONOMIC GROWTH

Value Addition in Manufacturing: Study of High Potential Products for Local Manufacturing and Export Diversification


Value Addition in Manufacturing: Study of High Potential Products for Local Manufacturing and Export Diversification

December, 2018

ACKNOWLEDGEMENTS

In keeping with PBC's raison d'être, this report aims to add knowledge which would provide a new momentum to industrialization in Pakistan. The leading business minds of the country have given their insights in compilation of this report, which when pieced together has produced a directional roadmap to implement PBC's "Make in Pakistan" programme.

The authors of this report thank the business leaders, policy-practitioners and researchers, who gave their time and shared their perspectives to enable completing the study.

The study was conceived and executed by Saud Bangash and Jawad Rehman, who in addition to being PBC's staff members are ardent believers that should the right policy approaches be adopted, Pakistan can become the next factory of the world.

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LIST OF ACRONYMS

ADP	Auto Development Policy
BMR	Balancing, Modernization and Replacement
BECO	Batala Engineering Company
CPEC	China-Pakistan Economic Corridor
CRC	Cold Rolled Coil
CBU	Complete Built-up Unit
CKD	Completely Knocked Down
CPO	Crude Palm Oil
EDP	Electronics Development Policy
ED	Export Duty
FDI	Foreign Direct Investment
FTA	Free Trade Agreement
GoP	Government of Pakistan
GDP	Gross Domestic Product
HS	Harmonized System
HVA	High Value Agricultural
HDGC	Hot Dipped Galvanized Coil
HRC	Hot Rolled Coil
HR	Human Resources
ITT	Industrial, Trade and Technology
IT	Information Technology
IC	Integrated Circuit
ITC	International Trade Centre
JV	Joint Venture
LSM	Large Scale Manufacturing
LCV	Light Commercial Vehicles
LCPL	Lotte Chemical Pakistan Limited
MRL	Maximum Residue Level
MT	Metric Ton
NTC	National Tariff Commission

LIST OF ACRONYMS

NIC	Newly Industrialized Countries
OGDC	Oil and Gas Development Company
OCAC	Oil Companies Advisory Committee
OEM	Original Equipment Manufacturers
PAC	Pakistan Aeronautical Complex
PAI	Pakistan Automotive Institute
PAMA	Pakistan Automotive Manufacturers Association
PBC	Pakistan Business Council
PECO	Pakistan Engineering Company Limited
PICIC	Pakistan Industrial Credit and Investment Corporation
PIDC	Pakistan Industrial Development Corporation
PMTF	Pakistan Machine Tool Factory
PPGI	Pre-Painted Galvanized Iron
PPL	Pakistan Petroleum Limited
PSF	Plastic Scintillating Fibers
PSM	Pakistan Steel Mills
PX	Paraxylene
PET	Polyethylene Terephthalate
PTA	Preferential Trade Agreement
PTA	Purified Terephthalate Acid
REER	Real Effective Exchange Rate
RD	Regulatory Duties
R&D	Research and Development
SPS	Sanitary and Phyto-Sanitary
SEZ	Special Economic Zone
SOE	State-Owned Enterprise
STPF	Strategic Trade Policy Framework
TRR	Technically Recoverable Resources
TKM	Tons' Kilometer
WTO	World Trade Organization

PREFACE

The Pakistan Business Council (PBC) is spearheading the agenda for "Make in Pakistan", which proposes policy steps to enhance local manufacturing and advocates affirmative action for increasing Pakistan's exports, substituting imports and creating 'real sector' jobs. The real sector of an economy pertains to industry & manufacturing, agricultural production, and the information & technology and non-financial services which support industry and agriculture.

Pakistan's economic growth is driven by the services sector, particularly the retail sector fueling consumption of imported intermediary and finished goods. This has resulted in a host of problems for economic planners, particularly a widening negative trade balance, punitive pressure on local manufacturers due to cheap imports, and an unstable macroeconomic environment.

In the last five years, exports have declined from roughly 25 billion dollars to an estimated 22 billion dollars – a decline of around 13 percent in nominal value. A narrow export base, whereby 200 out of about 5,000 tariff lines[1] represent 90% of Pakistan's global exports, highlights the urgent need to reform Pakistan's economic policy towards favoring industrial growth, productivity, and competitiveness.[2] There is an over-reliance on export of low value-added textiles, primarily cotton based products, concentrated in narrow export markets of the United States and European Union. Pakistan should aim for increasing its range of high value added products manufactured locally.

Pakistan's limited and unsophisticated export basket has been a concern for policymakers since decades. Despite the gravity of the issue, Pakistan has yet to adopt a consistent approach to progressively diversify its exports beyond existing products (increasing its "Product Space"). This study identifies high-potential industries and products, which if indigenized will provide Pakistan's economy a chance to enter new global value chains and capture greater market share abroad. Based on international experiences, private sector insights, Pakistan's demographic potential, and existing industrial base, this report has envisaged a ten-year roadmap to propel exports from Pakistan. Leveraging PBC's access to the largest industrial conglomerates in Pakistan, this research brings to the fore insights from the industry and strengthens the roadmap for "Make in Pakistan".

[1] Based on 6-digit HS level codes

[2] Figures retrieved from ITC Trade Map. Accessed 15-10-2018

EXECUTIVE SUMMARY

Industry plays a central role in delivering broad based economic growth by creating jobs, balancing the external account and generating tax revenues for investment in social development. Pakistan needs to create up to two million jobs each year to absorb new entrants to its young workforce. This can only be achieved by increasing contribution of industry to GDP, which can provide skilled and better paying jobs to the youth of the country. In Pakistan, there is a chronic problem of underemployment, which can be solved by industrial growth and helping the workforce graduate into skilled jobs.

Pakistan's future industrial growth is predicated upon improving the industry's export competitiveness driven by expanding Pakistan's 'Product Space' of locally manufactured goods. Pakistan currently manufactures a limited array of products, and exports even fewer items. In order for Pakistan to make economic progress, it needs to diversify its exports, and enter new global value chains. In order to do so, the Government has to play a proactive role by improving the regulatory regime, the tax and tariff structures, and address the ease and cost of doing business.

This report identifies key products in industrial sectors that Pakistan should prioritize for localization. These industries include higher value-added manufacturing in the Automobile, Electronics, Machine Tools, and Food Processing industries. Investments in these industries will broaden the range of products manufactured in Pakistan, and with appropriate incentives and technology, achieve competitiveness for increasing exports. The raw materials utilized in manufacturing of these products should also be localized to the best extent possible. Local raw materials such as iron, steel, and petro-chemicals will not only help improve competitiveness, but also reduce the burden of imports on Pakistan's external account and provide employment opportunities.

A 10-year framework is presented in this report for increasing indigenization of industrial manufacturing in Pakistan. Divided into three phases, the framework aims to provide a planned approach to encourage domestic manufacturing in and export orientation of new industries. In the first phase spread over two years, the Government should reform the regulatory regime as proposed under PBC's "Make in Pakistan" thrust,[3] while providing special incentives to investments in the priority sectors identified in this report. At the same time, a joint effort should be made by the Government and Industry to make an outreach to international companies in the identified sectors for inviting them to establish factories in Pakistan. In the following five years of the 10-year framework, the aim should be for new industry to establish manufacturing units in Pakistan, whereas the last phase spread over three years should prioritize expansion in exports.

For diversifying exports, the strategy proposed in this report applies a three-pronged approach; incentivizing investments in export enhancing sectors, import substituting raw materials, and complementing industrial growth by productivity enhancing measures.

Generating exports from the automobile industry is one of the key focus of this strategy. Building upon the existing base, negotiating licenses to enable local production of technologically advanced components such as engines, transmissions and other sophisticated components of vehicles will

[3] The complete report on "Make in Pakistan" thrust is accessible through the PBC website through the web link: https://www.pbc.org.pk/research/make-in-pakistan-thrust/

increase complexity in the automobile industry by adding local content and improving export competitiveness. By producing half a million units of commercial vehicles and passenger cars, Pakistan can achieve the scale required for exporting vehicles. Securing export rights from global automobile partners will be critical. Furthermore, local technological capabilities in automotive designing can be enhanced by establishing a Pakistan Automotive Institute.

Electronics manufacturing is the second identified sector for export diversification. Formulation of an Electronics Development Policy (EDP) will help secure investments into the electronics industry in Pakistan. Inviting global leaders of handheld sets and laptops to establish production facilities in Pakistan, will create domestic capabilities and a vendor base for electronics manufacturing. To build local expertise in electronics, the Government should invest in setting up technological institutes such as an Institute of Electronics. Incentives offered through a future EDP coupled with the existing domestic demand for electronics, will provide the electronics industry space to mature and grow.

To build local engineering capabilities, the private sector should be given incentives to establish a machine tool factory in collaboration with leading global manufacturers. Furthermore, the private sector can explore opportunities to manufacture components for the Pakistan Air Force in the upcoming Aviation City (SEZ).

Pakistan should aim to become a food processing hub and start exporting processed food. Pakistan should reduce reliance on exporting primary agricultural commodities such as rice. Higher value added products, especially packaged fruits, vegetables and meat can be exported by inviting international food companies to enter Pakistan. Furthermore, the private sector should be invited to modernize the food wholesale markets, warehousing facilities and logistics to international standards, which will enable exports of perishable food items.

Localizing production of raw material for industrial development will improve Pakistan's export competitiveness. **Through import substituting measures,** the availability of raw materials can be made reliable and cheaper to source. Steel and petrochemicals' production should be localized as they are the primary raw materials for the identified export oriented industries. The steel sector should be allowed to lease the remaining working facilities of Pakistan Steel Mills (PSM) and to invest in modern equipment which could include processing large volumes of iron ore. Concomitantly, extraction of Iron-ore within Pakistan and sourcing from regional reserves should be made a priority.

Petrochemicals as raw material for the industry should also be localized as much as possible. A modern large scale Oil Refinery with a Naphtha Cracker should be installed in Pakistan to produce refined Oil and Naphtha for production of plastics and synthetic rubber and textile inputs. Pakistan's endowment in large reserves of local shale oil and gas should be extracted with oil exploration companies. The Government will have to commit to tariff, taxation and energy pricing support for both steel and petrochemical industries for a 10 to 20-year period.

The domestic production of edible oil should be given high priority in the short run, along with policies to encourage production of soybean and rapeseed for animal feed – both placing a heavy import burden on the economy.

Industrial output can be enhanced manifold by taking measures to improve productivity through

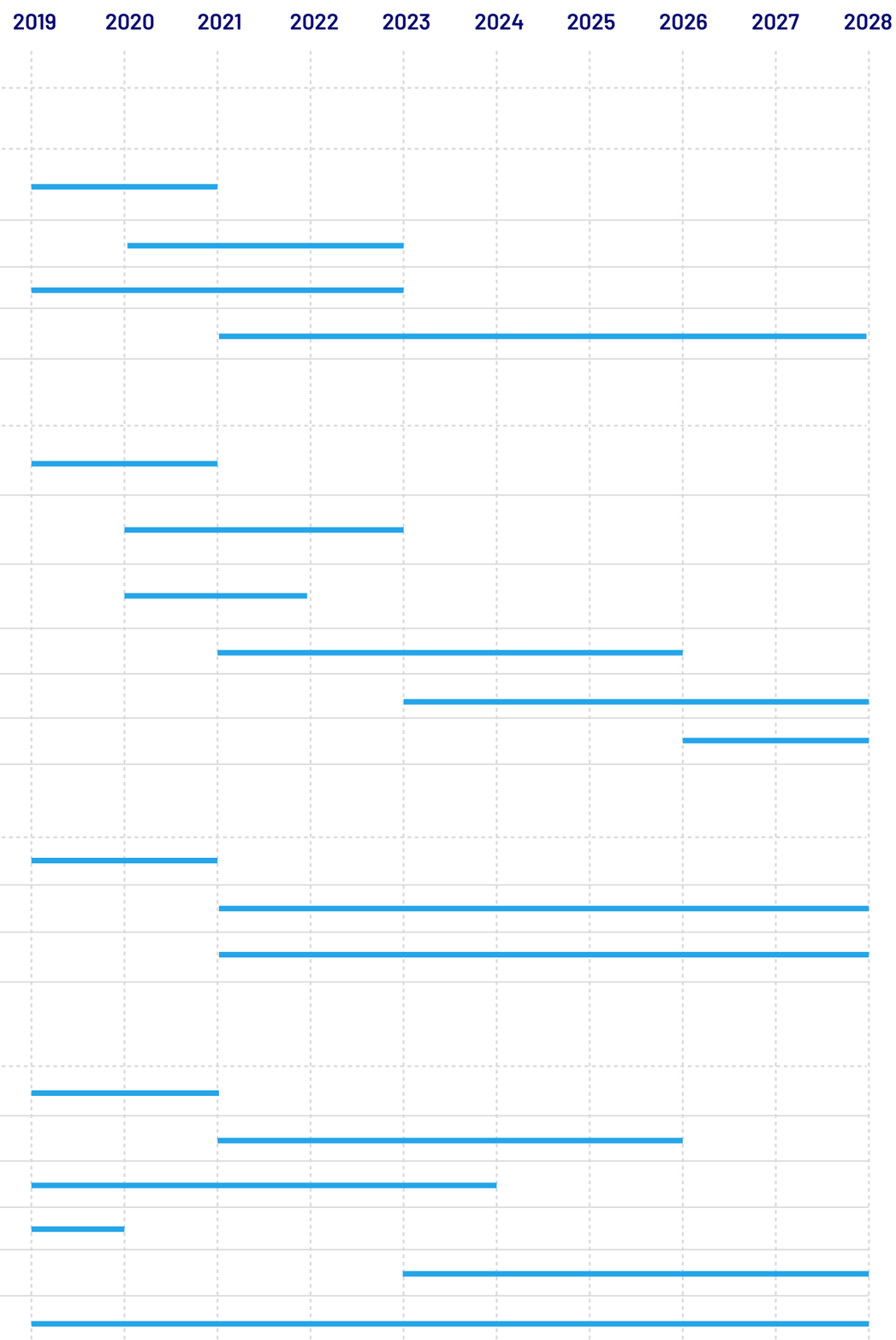
appropriate skills training and local technology innovation for the industry. By linking the National Incubation Centers with industry, local innovation can be spurred. The link between the industry and technological hubs will create indigenous solutions to Pakistan's industrial needs. Additionally, transportation and logistics systems need upgradation. In particular, railway management and infrastructure needs to be prioritized as a primary medium of freight transportation. Pakistan will also benefit from modern cargo handling and warehousing facilities for airfreight. These terminals should be established at Karachi and Islamabad airports.

Reducing the cost of energy, and providing a macroeconomic environment which ensures price stability is critical for achieving export competitiveness. Governments, irrespective of the political party, need to ensure policy continuity and macroeconomic stability. In the absence of macroeconomic stability, the investment returns remain uncertain, thus discouraging potential investors.

Pakistan should approach industrialization in a planned manner, by expanding its product range for pursuing export diversification. This report is an effort to provide strategic insights for Pakistan's future industrial landscape.

RECOMMENDATIONS

EXPORT ENHANCING



Automobile

- Negotiate licenses to enable local production of engines, transmissions, and other technology intensive components for Cars, Buses and Trucks
- Establish a Pakistan Automotive Institute through joint collaboration of GoP and Auto-Manufacturers
- Locally Manufacture 500,000 vehicles per annum
- Add variants of motor-bikes/tractors for sale in East Asian/ African markets

Electronics

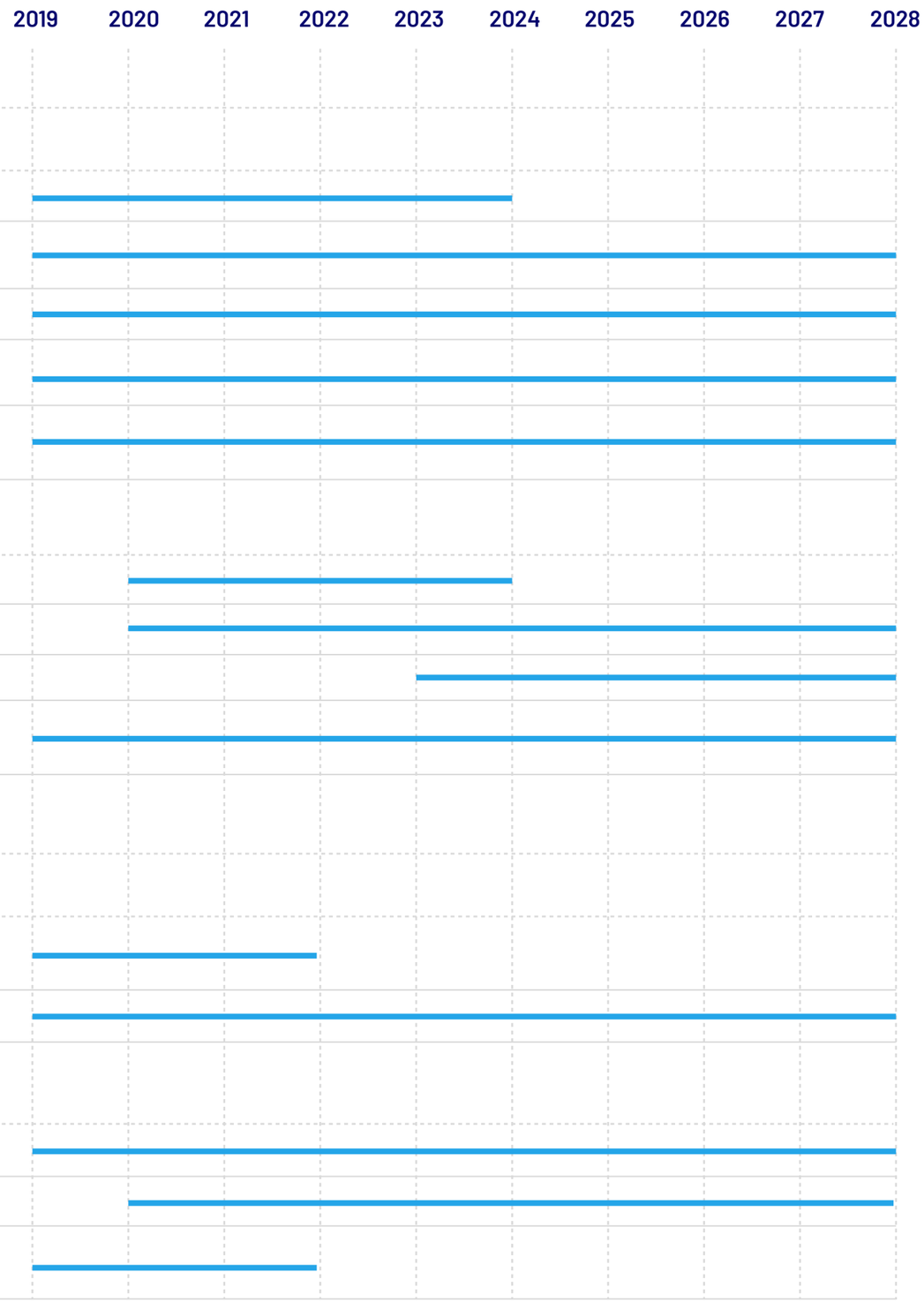
- Formulate an Electronics Development Policy, with a particular focus on localizing manufacturing of handheld sets, laptops, and white goods
- Establish an Institute of Electronics to support the industry and introduce chip design and production in Pakistan
- PBC/GoP invite global handheld phone/laptop manufacturers to install manufacturing facilities in Pakistan
- Target two global manufacturers of handheld phones / laptops to enter Pakistan
- Expand / improve the gamut of electronic devices manufactured in Pakistan
- Target export of electronic devices from Pakistan

Engineering

- Establish a specialized institute of electrical and mechanical engineers to design machines (GoP)
- Invite industry to produce aircraft components in the Aviation City (SEZ) established by PAF
- Establish a Machine Tool Factory under a joint venture with a large international manufacturer

Food Processing

- PBC/GoP invite 4-5 leading global food brands to establish manufacturing facilities in Pakistan
- Target at least two new global food brands to enter Pakistan for production, based out of SEZs
- Establish export oriented food wholesale markets (Ref: SAFAL model explained in the report)
- Harmonize food standards across the country
- Global food companies operating in SEZs to export packaged food products
- Prioritize strategy to replace imported edible oil with local oils and ghee



IMPORT SUBSTITUTING

Steel/Iron

- Lease PSM land to publically listed companies to establish Steel Mills based on latest technology
- Zero rate coke (coal) and iron ore imports and bring them under the special taxation regime for the steel sector to encourage investments into steel from iron ore
- Extract and source Iron-ore from national and regional reserves
- Provide protection and maintain existing taxation and tariff regime to the steel industry to utilize existing installed capacity and encourage further local investments in expansion
- Strengthen NTC to impose safeguard and anti-dumping duties on steel imports expeditiously, when the need arises.

Petrochemicals

- Establish a modern large scale Oil Refinery and Naphtha Cracker Complex.
- Invite oil exploration companies to frack shale gas and oil from local reserves with local partners
- Develop upstream and downstream industries for plastic and rubber goods
- Lock-in a tariff protection regime plastics (including PTA) for a 10 year period to enable local manufacturers to expand/install capacity.

PRODUCTIVITY ENHANCING

Technology and Innovation

- Develop a strategy for establishing linkages b/w National Incubation Centers and Industry for efficiency enhancement
- Create an enabling environment for private equity to fund innovation in industry

Transport, Logistics, and Warehousing

- Improve railway management and infrastructure to increase rail cargo freight (GoP)
- Develop and market financial products for purchasing trucks
- Develop modern cargo handling and warehousing facilities terminal at the Islamabad and Karachi Airports

SECTION 01

Creating an Enabling Environment for Industrialization: PBC's Targets and Enablers for Industrial Policy

This report provides an action framework to establish future industries in Pakistan with the aim to diversify exports, and substitute expensive imports. The approach to future industrialization proposed in this report is predicated on PBC's policy recommendations for reforming the taxation system, restructuring the tariff regime, and reducing the cost of doing business. Below is a summary of recommendations to provide an enabling environment for industrialization in Pakistan.

Five Year targets of a new Industrial Policy

The PBC has proposed the following five-year targets of a new industrial policy:

- To take the percentage contribution of manufacturing to GDP up to 25% from the current 13.5%
- Manufactured goods to represent over 85% of exports from the current 77%, thus adding value to commodities
- Annual rate of growth of manufacturing to be more than 10%
- Investment to represent 30% of GDP from the current 16%
- Pakistan's share of world exports to grow from 0.13% to 0.25% i.e. to greater than USD 40 billion
- Export of goods and services to amount to 12.5% of GDP from the current 8.2%
- Import content in exports to double as a result of cascading import tariffs.

To create a level playing field for the formal manufacturing sector and to give it space to consolidate financially and develop scale, it is vital that:

- The tax base is broadened by the inclusion of the retail, wholesale and agricultural sectors, which together represent 40% of the formal economy but contribute less than 2% to taxes
- Leakage of wealth into the real estate sector and overseas is stemmed
- The government resolves to make this the last time that Pakistan has to go to the IMF (or friendly nations) for help. Structural reforms need to be undertaken diligently and implemented rigorously.

THE GENERAL POLICY ENABLERS

The main policies that need alignment to support industry are: **trade, fiscal, energy, agriculture, labour and the capital markets.** Additionally, the **fragmentation** between the federation and the provinces and interprovincial conflicts need to be resolved.

Amongst all the policies needing alignment, the most crucial are the **trade and taxation policies** to promote industrialization. Hitherto, these ministries have operated in silos.

Cascading import duty on raw materials not available locally, low duty on intermediate items not made domestically and higher duty on finished goods would allow Pakistan to maximize its positon in the global value chain. However, exceptions will need to be made when locally produced finished goods for one industry, represent raw and intermediate materials for another. Irrespective of this, industry should not be allowed to be held hostage by inefficient domestic suppliers. The Duty & Tax Remission (DTRE) policy should be simplified to allow more Small and Medium Enterprises (SMEs) to avail duty exemptions on imported material used to generate exports. In short, the aim of the tariff policy should be to promote growth of industry rather than merely to generate revenue.

The National Tariff Commission should remain functional and effective, which has not always been the case. Domestic industry must swiftly be protected from dumping. Laws that impede this currently need to be reviewed.

Trade agreements need to ensure preferential access to partner countries of value-added items, not just of commodities or intermediate inputs. In the past Pakistan has primarily exported cotton and yarn, allowing others to convert it into apparel, which competes with Pakistan's exports to the USA and the EU. Concessions on imports under Free Trade Agreements (FTAs) should be limited to raw materials and intermediate items not produced locally so that value-addition in the country is encouraged. Over the medium term, the impact on tax revenues of import concessions should be offset by tax on profit of local manufacturing businesses. Another important benchmark is impact of FTAs on jobs in the country.

The FTA with China needs to be renegotiated to secure parity access for Pakistani goods with the best tariffs made available by China to any other country. ASEAN, Bangladesh, Australia and New Zealand presently enjoy more attractive market access into China than Pakistan. Pakistan should additionally reach out to countries like Canada and Japan for tariff parity with Bangladesh.

Further agreements with countries like Thailand and Turkey should only be pursued if they stand the test of incremental value-added exports, job creation and medium term tax revenue equalization. Presently, FTAs with neither Thailand, nor Turkey meet this criterion. The Ministry of Commerce needs to develop capacity for holistic analysis of the impact of trade agreements. Pending this, there should be a moratorium on new arrangements.

The fiscal policy should be based on equitable distribution of the taxation burden through a broader tax base. 58% of the taxation burden cannot be carried by manufacturing which represents 13.5% of GDP. The policy should also promote capital formation and consolidation to facilitate scale, competitiveness and investment. There should be no penalty on retention of profit for future investment. Tax on new projects should only be levied when they become profitable and they should

be allowed to avail capital allowances and to carry forward losses from the early years. Group taxation and tax on inter-corporate dividends should revert back to the basis of the Finance Act 2007.

Fiscal policy making should be separated from tax collection. The latter should be infused with technology and talent to broaden the tax base. The former should strive to create sustainable bases for growth through adoption of long-term policies which infuse investor confidence.

Taxation processes should be simplified and made more transparent to curb harassment of tax payers. The primary indicator to judge the performance of Federal Board of Revenue (FBR) should be incremental tax revenue from new tax payers. Secondly, taxes recovered in advance of due dates and tax refunds due to business should be excluded from deficit and target evaluation of the FBR. Indeed, tax should not be sought in advance of due dates and processes should be simplified, such as by zero-rating export sectors to avoid the build-up of tax refunds.

Tax rates need to be brought down to be regionally competitive. In particular, the general sales tax rate should be revised downward to ensure a level playing field between the formal and the informal sector, given the poor state of documentation of the economy. The number of taxes need to be reduced and a national tax authority created to unify filing of returns and settlement of liabilities. Tax returns should be simplified. Tax audits should be conducted independent of the taxation authorities. Currently the FBR is both the judge and the jury. Tax notices are issued liberally to exert pressure on tax payers. There should be accountability in terms of how many of these are upheld in court.

Income tax should be levied on profit assessed on the basis of returns that everyone engaged in taxable activity should be made to file. Tax evasion should be a crime. Presumptive taxes on turnover should be converted to advance tax adjustable against final liability. The Final Tax Regime (FTR) scheme should be phased out entirely.

Under-invoicing should be curbed through the exchange of data with trading partners. Realistic Import Trade Price (ITP) should be determined for items prone to under-invoicing. Evasion through misdeclaration of imports, misuse of the Afghan Transit Treaty and of the inland clearing facilities can be controlled through improved coordination between Customs and the Ministry of Commerce. One example of such coordination would be regular reconciliation of output, such as of motor cycles, with key inputs such as imported engines. Further, the blatant sale of smuggled consumer products should be stopped through raids on shops and markets selling these and by insisting on Urdu language labels.

Energy should be provided to industry at a cost that allows it to be competitive globally. Whilst the primary focus of this needs to be on export sectors, it is important to recognize that a dollar saved from imports is worth the same as a dollar generated from exports and that import substitution yields greater tax revenue.

Fragmentation between the federal and provincial authorities and inter-provincial conflicts need to be resolved speedily to make it easier to do business. Multiple taxes, varying rates, inability to offset input sales tax with output sales tax, disputes on jurisdiction, currently differing product and environmental standards etc., all create complexity and make it difficult to do business. They also

thwart scale and competitiveness in the global markets.

The Foreign Direct Investment policy should focus on import substitution, exports, technology acquisition, capital and risk-intensive sectors rather than on short payback, domestic consumption oriented industries that reap the demographic dividend of Pakistan's large and growing middle class. Terms for exporting products must be built into future contracts of foreign investments. The federal Board of Investment should be sector focused to target such investment, instead of conducting general road shows. It should also be empowered by the provinces to act as a one-window facilitator, rather than merely as a promoter of investment.

Diversify exports through a planned approach by locally manufacturing high value-added products in three to four global value chains. Transfer of technology will be critical to achieve localization and should be made part of licensing agreements. Ensuring a minimum share of local ownership in greenfield projects is also required for transferring technology. Industries which have high potential of export earnings, given the right mix of incentives, include Man-made Fibers, Automobiles, Electronics, and Food processing. Furthermore, export diversification will be complemented by localizing production of cheap raw-materials including Steel and Petrochemicals. The plan for indigenizing manufacturing will also need to encourage better linkages of Technology & Innovation, Logistics & Warehousing, Research & Development, and Financial Services with the local industry.

Capital markets for both equity and debt need to be developed to support investment in industry. Some of the key measures are: lower corporate tax rate on companies to provide incentive to seek and remain listed; development of a secondary listing platform for smaller companies and start-ups that don't meet the criterion of a full listing; exemption of inter-corporate dividends from cascading taxes to promote consolidation and scale; restoration of group loss relief as per the Finance Act 2007; ability to carry forward capital losses on listed stocks for up to three years; reduction in government's reliance on the banking sector for funding its deficits together with a regulatory framework to promote lending to the private sector; credit guarantee scheme to encourage greater exposure to SMEs; long-term credit institutions to support mortgage and infrastructure funding; reform in regulations for private equity investment; and the development of tax-friendly rules for Real Estate Investment Trust (REITS).

Corporatization should be promoted to improve the standards of governance and accountability. Companies should not be taxed at rates higher than unincorporated concerns. The corporate sector should not be encumbered by unreasonable reporting requirements such as the impractical definition of related parties and the provisions designed to cover the inefficiency of fiscal and other authorities with respect to foreign shareholdings. The anomalies in the Companies Act 2017 should be removed urgently.

The **Housing** industry will benefit from the removal of opaqueness in property titles, weak foreclosure laws and absence of long term mortgages. Housing construction is a major growth opportunity which would stimulate multiple sectors of the economy, create millions of jobs and address a significant social gap.

Exchange rates, albeit currently managed, should ensure sustained competitiveness of exports and provide a check on the growth of imports. Reliance on the U.S. dollar as the medium of trade should

be reduced. Pakistan should consider the Chinese Yuan as a medium of exchange, at least for trade with China.

Ease of Doing Business Ranking of Pakistan though up by 11 points to 136 leaves substantial room for improvement. A large number of actions lie in the provincial domain and the commitment of provinces to reform is vital. Simplification, unification and digitization with one-window facilities offer significant avenues of potential to address the measures in which Pakistan ranks worse than the best. Equally important is communicating the reforms effectively to SME businesses that compose the Ease of Doing Business (EODB) survey sample to ensure that their response is objective and positive. Pakistan needs to specially focus on streamlining taxes and taxation processes, which are also a hindrance to broadening the tax base.

Land: Currently zoning laws mainly cover residential and commercial areas. Industrial zones should be prescribed in all towns above a population size of 100,000. Many industrial estates in larger cities are now surrounded by residential areas. They are also congested, lack adequate infrastructure, besides being exorbitant in cost. Provision of land at reasonable cost with permission to construct vertically to house light engineering and apparel will accelerate industrialization.

Productivity, Quality, Innovation and Image: Pakistan's business needs to substantially improve quality and variety of its offerings, add sophistication to marketing through brand and image building and to widen its sales targeting beyond the traditional markets. The government initiatives should focus on the SME sector, as well as on non-traditional exports.

Skills need to be developed through public-private initiatives. Businesses must be allowed to retain and invest the Workers' Profit Participation Fund (WPPF) balance (after distribution to labour) to focus on upgrading skills. Investment from China, particularly in the more value-added apparel sector should target skill development, as much as exports.

Labour is a devolved subject with provinces responsible for setting their own minimum wages. Yet a uniform wage rate applies in the country, resulting in the informal sector evading it. The minimum wage paid by the formal sector impacts its competitiveness in the global markets against countries like Bangladesh. Furthermore, the uniformity of minimum wages across the country reduces the incentive to locate industry in less developed areas of Pakistan where jobs are needed most. It is not practical to propose differentiated labour rates. However, wage subsidies would accelerate the industrialization of rural areas and help to make exports sourced from there, more competitive. Other factors that inflate the cost of employment, such as overtime need to be brought in line through a comprehensive benchmarking with the region.

The Small and Medium Enterprises (SMEs) are the engine of growth for employment, whereas larger businesses are more capital intensive. Nevertheless, the latter can do more to integrate SMEs into their value-chains through outsourcing. The transaction costs involved in embedding SMEs in value chains of the export industry needs to be addressed. The banking sector needs to be less risk-averse to SMEs and ways should be found to make export credit available to SMEs supplying larger exporters. The SME sector would be a major beneficiary of initiatives to make it easier to do business. It should be involved in suggesting ways to take Pakistan into the top 100 countries in ease of doing business.

SEZs: Special Economic Zones could be an opportunity to relocate industry from congested areas and to establish new ventures through global partnerships. SEZs should provide "Plug and Play" industrial areas with adequate utilities, good transportation links and on-site housing for labour. Incentives to industry located in SEZs should be allowed based on the criterion of expanding the gamut of locally manufactured products and meeting export targets. Tax holidays and other concessions that potentially risk undermining existing industry outside such zones should be discouraged.

CPEC: To make CPEC a game changer for employment, exports and import substitution, Chinese investment needs to be attracted in more labour intensive industries, in the short to medium-term, due to the rising labour cost in China. This and a fairer free trade agreement should be pitched in exchange for the geo-political and world market access advantages that China would derive from CPEC. Care should be taken to ensure that industry relocated to Pakistan is not equipped with old and obsolete technology. As the Chinese government is known to direct its private sector, securing its support will help the Pakistan private sector to pursue Joint Ventures (JVs) in preference to other global alternatives available to the Chinese.

Standards: National product standards will permit industries to leverage the national scale, whilst robust implementation of harmonized standards by provincial authorities will ensure consumer safety. This should also extend to imported products, especially packaged foods, for which Urdu language labels/ingredient lists should be a requirement. The Pakistan Standards and Quality Control Authority (PSQCA) should be strengthened to help industry meet global standards. Equally, its upgraded testing capability will help verify quality and conformance of imports, stemming the entry and sale of sub-standard and about-to-expire products, which are dumped into the country, impacting local industry.

Sustainability through responsible environmental practices should be a goal of the industrial policy. Conservation of energy and water; recovery, recycling and reuse of materials, especially plastics should be incentivized. Greater inclusion of women in the workforce will unleash a significantly under-utilized resource. These are also embodied in the United Nations Sustainable Development Goals to which Pakistan Government is a signatory and in which industry can play a role.

Perspectives in developing manufacturing capabilities

Manufacturing sector establishes the structural foundation on which most economies rely for economic growth and prosperity. Industrial growth provides opportunity for countries to move up the technology curve, provide a base for exports, and employ high skilled labor. During the process of industrialization, all major world economies have supported development of their indigenous production capabilities. Evidence suggests that targeted Industrial, Trade and Technology (ITT) related policies were utilized to support domestic manufacturing by respective Governments, including the United States, United Kingdom, and Spain. More recently, East Asian Countries termed the Newly Industrialized Countries (NICs) such as Taiwan, South Korea, Japan and Hong Kong have followed suit to develop their manufacturing base. Technological transfer and skills development have been the key thrusts for strengthening their manufacturing base along with other facilitative policies provided by their governments. Recent academic research on developing the "Product Space" has highlighted how advanced economies are clustered around high valued technological goods at the core of product space. Developing countries produce unsophisticated goods and continue to do so until an impetus is provided to their manufacturing sector to shift production into other clusters of high value added products. Pakistan's economic structure and subsequent policies have kept its manufacturing volumes low and unsophisticated. Firms have not been encouraged to produce technologically advanced products. In order to advance towards the core of the Product Space, Pakistan would require ITT policies to encourage production and manufacturing of sophisticated products.

Advantages of Value-Added Local Manufacturing

Focus on industrialization has been a common factor in the developmental discourse and practice in all major world economies striving to reduce dependency on natural resources for earnings. As an engine of growth, manufacturing provides the economy productivity growth by increasing output per worker that is considerably higher than in the agricultural sector and other resource based sectors. The industrial sector also has a significantly higher potential for growth since technology transfer and learning outcomes provide greater returns on investment, and have a multiplier effect. It is easier for firms to scale through investments due to easier access into international markets via exports and for firms to branch out into differentiated products. Furthermore, manufacturing helps develop upstream and downstream industries, therefore enabling broad-based growth.[4] Labor becomes more productive through training and experience allowing workers to attain better earning and quality of life. Overall, competitiveness in manufacturing also creates avenues that have helped drive large populations out of poverty.[5]

[4] Weiss, J., and Jalilian, H., Routledge Handbook of Industry and development: Manufacturing as an engine of growth. New York. Routledge. 2016.

[5] Nixson, F., Routledge Handbook of Industry and development: Import substituting industrialization. Can or should we divorce industrialization and trade strategies? New York. Routledge. 2016.

Developing industrial capacity requires intensive training in technical skills, information technology and management techniques, while building robust linkages between markets, and regulatory and research institutions. The learning process is gradual, time and resource consuming. In order to scale and become efficient, the process requires utilizing existing technological components in the most productive manner. Firms and institutions need to work hand-in-hand to leverage know-how and technologies to maximize productivity.[6]

Strategies Adopted for Industrialization

Advanced economics have subscribed to Industrial, Trade and Technology (ITT) policies in the past. With only a few exceptions, all large economies have matured their industrial core before making economic progress. It is interesting to note that all advanced countries have utilized ITT policies to promote industrial development. Governments have provided their firms enough space to develop an industrial infrastructure geared to be internationally competitive. All advanced countries have from time to time protected their industry from predatory competition. Historic evidence shows that there has been significant state intervention propelling industrial advancement. Trade liberalization was adopted after developing a strong industrial base.

Industrial support was provided through various policy measures by Governments in the past. Tariff protection was used across the board by all the advanced economies. United Kingdom had tariffs as high as 45-55% in the 1820's; United States had tariff protection in the range of 40-50% from 1820 - 1930; Spain had its tariffs between 40-60% by 1910 – 1930s'; Germany had tariff in the range of 20 – 25% in the same time period. Nuanced read into the development of all these countries shows a similar pattern of protection and development. The manufacturing sector was promoted through subsidies and duty drawback on input products. Governments provided industrial sector direct support through technological acquisition. This involved a number of measures undertaken such as Research and Development (R&D), training, financing study tours, or through acquisition of industrial machinery and highly skilled labor. In certain countries, the public sector invested in production with the private sector and created mechanisms to develop industrial base. These interventions included joint ventures with the private sector and through investment into natural monopolies, followed by divestment and opening up the sector to private investment.[7] One may argue that it is only for the private sector to efficiently allocate resources for production, and the public sector should limit its role to regulating the private sector, however there is little doubt that facilitative government policies which protect local industry to become technologically advanced is a critical step which every advanced economy has taken.

The East Asian Countries – also called the 'Miracles' or 'Tigers' – also utilized ITT policies to attain industrialization. These economies undertook significant structural transformations to develop their industrial base. In a very short time, their employment and output structure were overhauled from agriculture to a technology driven industrial sector. The Tigers diversified their production to a sophisticated basket of goods. These countries adopted policies which supported domestic manufacturing through protection. By actively deploying ITT policies, the Newly Industrialized Countries (NICs) such as Taiwan, Korea, Japan initially and now China, Vietnam, Cambodia, and

[6] Lall, S., and Weiss, J., Industrial Competitiveness: The Challenge for Pakistan. Background paper for the Asian Development Bank Institute. November 2003.

[7] Ibid.

Thailand show that sate support is critical in supporting diversification of locally produced products. These countries have followed, what can be described as a standard approach to obtain growth, quite similar in nature to the Western economies. In order to develop a thriving manufacturing sector, these counties fine-tuned their industrial and trade policies with a single purpose, which was to develop local manufacturing in the shortest timeframe. On the trade front, they provided tariff rebates for imported raw materials and machinery. To incentivize production, consumption of luxury goods was curtailed, and reinvestment of retained earnings was encouraged through tax incentives. **Countries managed their exchange rates effectively to keep them competitive and stable against the basket of currencies of their trading partners, to avoid macroeconomic disruptions leading to uncertainty for investors.**

Firms in the Tiger economies were also provided export promotion packages in the form of subsidized loans for exporters and tariff rebates against inputs for exported products. They developed systematic method for government investments, such as Special Purpose Vehicles and Wealth Funds. They also provided their manufacturing sector with incentives for technological upgradation.[8] It is pertinent to mention here that protection in these economies was targeted. Protection was provided only to industries that promised potential to grow and performed well. Such protection was applied only in the dynamic and sophisticated sectors of the economy such as electronics and automobiles.[9] The governments also tied protection with achievement of targets by firms. This was done to incentivize efficiency in production of firms. In addition to sunset clauses for the special incentives given, the states' support to a factory was measured by its performance in exports. Associated discipline in production, and reinvestment into technology is what made firms successful in the East Asian Economies.

Determining the Product Space of a Country

The structure of an economy plays a crucial part in determining introduction of new products into its manufacturing sector, ceteris paribus. Recent research into product development and sophistication has yielded insights into the evolution of the production structure of an economy. For instance, if a country produces garments, it will be easier for it to produce leather products since both sectors require similar production capabilities, infrastructure, regulation, markets, and workforce. But it will be significantly harder for the same economy to start producing electronic goods since it does not have the machinery and associated expertise needed to develop such goods.

The universe of products has been mapped out in what is called the "Product Space". The center-core of the Product Space is dense, packed with many products, while it is thin at the periphery. There are more sophisticated goods in the core of the Product Space, and less sophisticated goods at the periphery. The Product Space can be seen in Figure 1 below. If a country produces less sophisticated goods, it will find it easier to diversify into similar types of goods. It will have to slowly build its capacity to move towards the dense core. [10] Concerted efforts are required to

[8] Chang, H.J., The East Asian Development Experience: The Miracle, The Crisis and the Future. New York. Zeb Books Ltd. 2006.

[9] Dany, R., Industrial development: Some stylized facts and policy directions. Department of Economic and Social Affairs, United Nations. 2007.

[10] Ibid

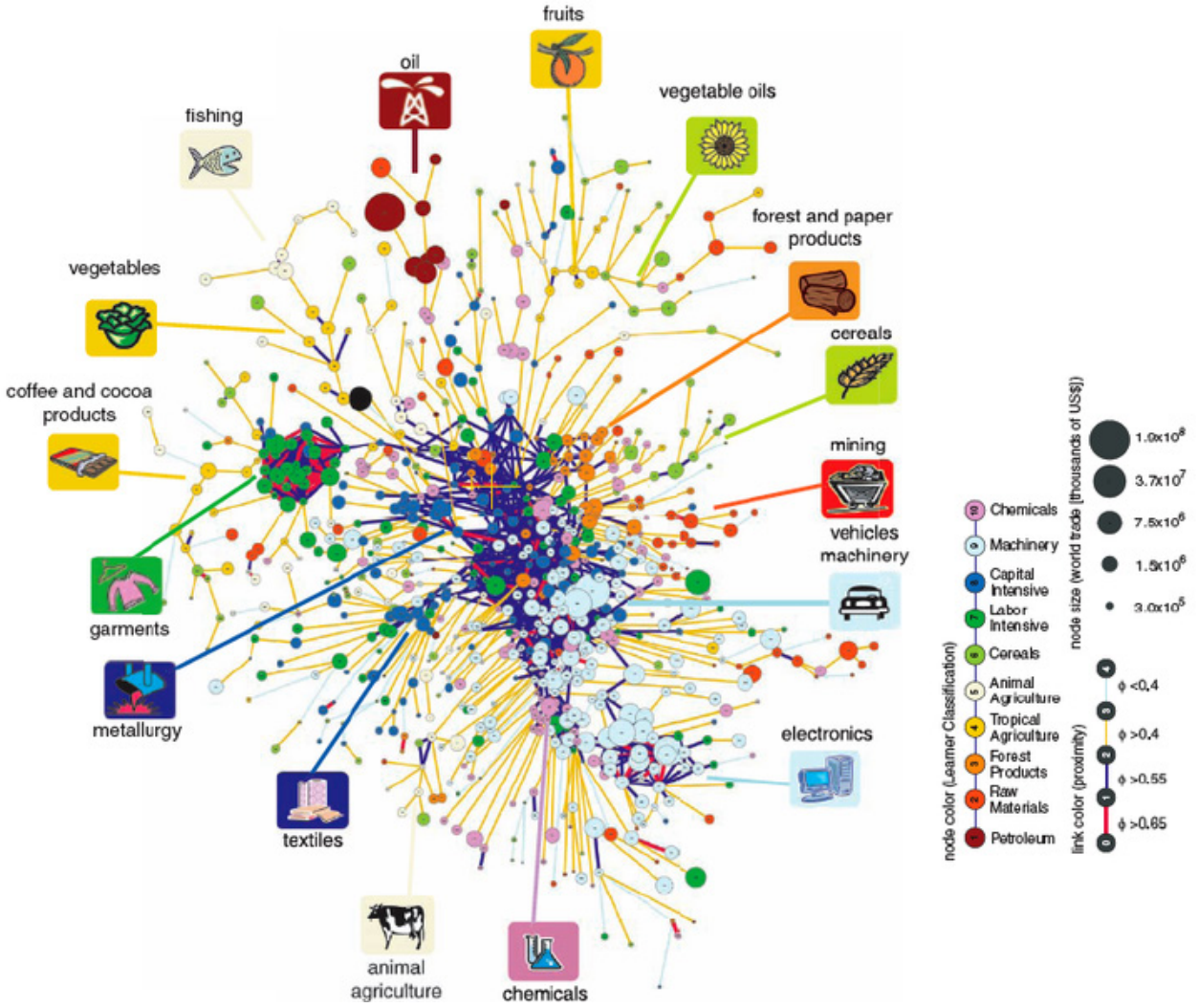


Figure 1-The Product Space and its Classification
Based on the seminal work by Cesar A. Hidalgo, 2007

propel the industry towards the core of the Product Space, which typically does not occur organically.[11]

Utilizing export data based on Harmonized System (H.S.) Codes, the theory provides an analytical outlook of the embedded knowledge and capabilities of an economy.[12] The exports of a country highlight the sophistication of knowledge that individuals and firms have. The type of exports from a country imply two things. Firstly, whether the economy is able to cater to the domestic market for that particular good. Secondly, whether the goods being exported over the years are competitive in the international markets. **Moving up the export sophistication ladder and entering the global value chains in automobiles, machinery, electronics, and chemicals allow economies to diversify their export baskets and produce more intricate products.**

[11] Hidalgo, C.A., Klinger, B., Barabasi, L., Hausmann, R. The product space conditions the development of nations. Center for International Development, Kennedy School of Government, Harvard University, Cambridge. 2007

[12] Hausmann, R., Hidalgo, C.A., Bustos, S., Coscia, M., Simoes, A., Yildrim, M.A., The Atlas of Economic Complexity: Mapping paths to prosperity. Massachusetts Institute of Technology and Center for International Development, Harvard University. 2013.

PAKISTAN'S TRADE AND INDUSTRIAL POLICIES

Pakistan is de-industrializing prematurely. This is so due to government policies that have curtailed industrial development. This was not always the case. Pakistan had a vibrant industrial setup in the 1960's with the support of state institutions such as Pakistan Industrial Development Corporation (PIDC). Nationalization halted and derailed the industrialization progress to a large extent. The subsequent privatization in the 1980's-1990's re-invigorated industrial output. Trade liberalization since the late 1990's has negatively impacted the manufacturing sector. The industry share to GDP in Pakistan has remained low, and currently at 17.9 percent[13], it is one the lowest in all regional economies. Revitalization of manufacturing for export should be the top priority of the Government in order to achieve sustainable economic growth.

The growth in the manufacturing sector of Pakistan has been slow. The manufacturing growth rate hovered at 10% in the 1960's, and fell to 4.8% in the 1990's. The state played an important role in facilitating the development of industry in Pakistan in the 1960's. One of the most crucial organization's in this context was PIDC. The Ministry of Industries & Production established PIDC in 1952. Until 1988, the organization established several industrial units under joint ownership with the private sector. Financial support and credit lending for industrial units was catered to by Pakistan Industrial Credit and Investment Corporation (PICIC). Both PIDC and PICIC lost momentum after the nationalization process and separation of East Pakistan. The industry has hardly shown signs of recovery since, and its growth rate has remained anemic between the range of 2-6% (with an alarming fall of -4.2% in 2008-09).[14] The manufacturing sector's contribution to the economy has remained limited. Its share has always remained less than 20% of the GDP. Figure 2 shows that Pakistan has been unable to increase manufacturing's percentage share of GDP above the peak level of 18%.

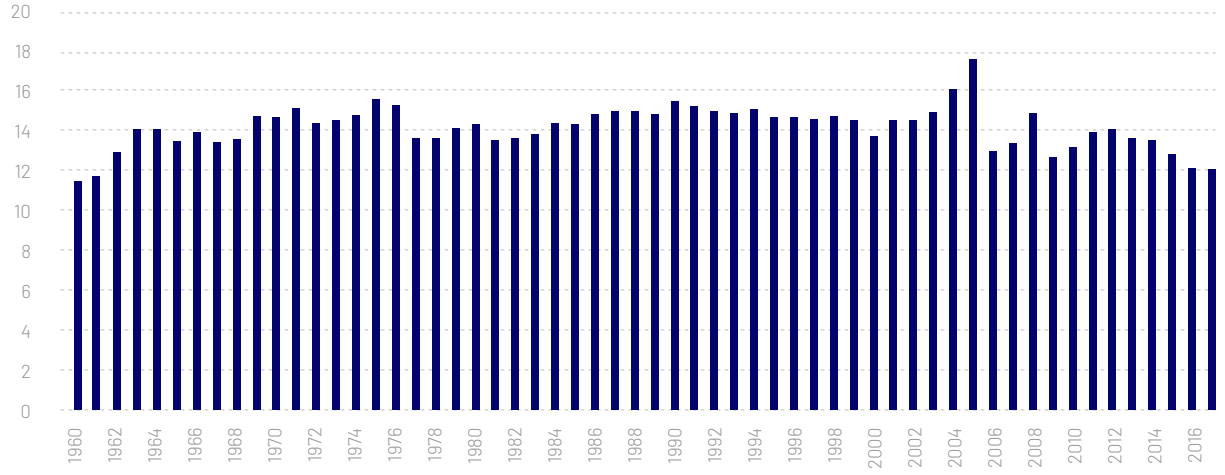


Figure 2 - Pakistan's share of manufacturing as % of GDP
Source: World Development Indicators, World Bank

[13] Source: World Development Indicators. This figure is different from Manufacturing as a percentage of GDP, which is also reported in this report from the same source.

[14] Statistical Appendix: Pakistan Economic Survey, 2017/18. Ministry of Finance.

More alarmingly, the current levels of manufacturing output are the lowest since 1960's. To put this into context, none of the NICs has had an average share of manufacturing less than 20% of GDP in the last couple of decades as evident from Table 1 below.

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Pakistan	16.0	17.5	13.0	13.3	14.8	12.7	13.1	13.8	14.0	13.6	13.5	12.8	12.1
Bangladesh	14.4	14.7	15.3	15.9	16.1	16.5	16.1	16.0	15.9	16.4	16.6	16.8	17.0
China	32.0	32.1	32.5	32.4	32.1	31.5	31.5	32.0	31.4	30.6	30.4	29.4	28.8
India	16.4	16.6	17.4	17.3	17.1	16.7	16.2	16.1	15.8	15.3	15.1	15.4	15.3
Japan	21.3	21.6	21.6	22.1	21.4	19.1	20.8	19.7	19.7	19.4	19.7	20.7	21.0
S. Korea	25.7	25.5	25.1	25.5	25.8	26.1	27.8	28.5	28.2	28.2	27.5	27.1	26.8
Thailand	29.6	29.8	30.3	30.7	30.7	29.6	31.1	29.1	28.1	27.7	27.7	27.5	27.4
Vietnam	20.3	18.8	19.4	19.4	18.6	18.3	12.9	13.4	13.3	13.3	13.2	13.7	14.3

Table 1- Manufacturing's share in GDP - Selected Countries
Source: World Development Indicators, World Bank

The Table 1 highlights the significance that NICs place on manufacturing. Pakistan has the lowest manufacturing share in GDP of all countries mentioned above. China and Thailand lead the pack with manufacturing contribution in their economies nearly at 30%, while S. Korea hovers at 25% and Japan at 20%. Other comparator regional economies such as Bangladesh and India are maintaining their manufacturing share of GDP over 15% while Pakistan is displaying a declining trend.

During their course of development, advanced economies have matured into knowledge economies, and have progressively relocated their manufacturing to countries with lower cost of production, while their services sector grew. Advanced economies have implemented robust patenting regimes to ensure that their intellectual property is safeguarded.

Pakistan experienced three periods of economic growth spurts with distinct peaks. A growth rate of 18% in 1961, 13% in 1980, and of 16% in 2005 was recorded in the Large Scale Manufacturing (LSM). Each peak of GDP growth rate coincided with a high manufacturing growth rate. Trends in growth rates of the industry mirror GDP growth, almost correspondingly. The Figure below shows the correlation of growth rates of the GDP and manufacturing in Pakistan.

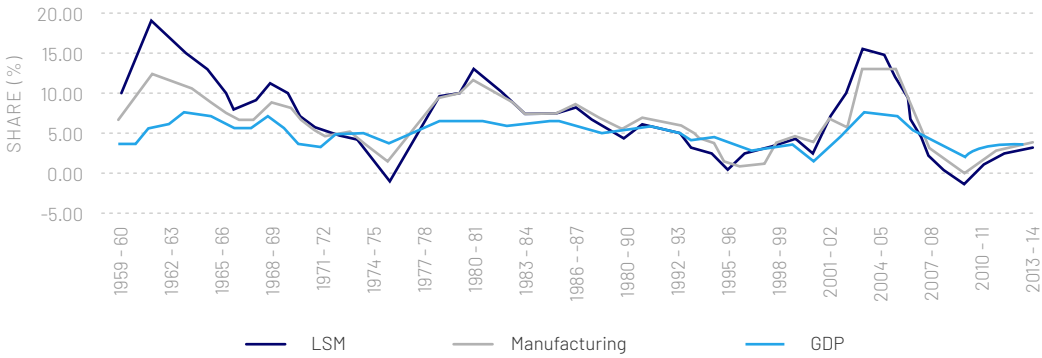


Figure 3: Historic growth rates of GDP, Manufacturing and LSM in Pakistan
Source: Hamid, N., Khan, M. September, 2015. Pakistan: A case of premature deindustrialization? The Lahore Journal of Economics

Pakistan had high applied tariff rates which provided its industries an opportunity to develop in its nascence. These tariff rates have dwindled significantly. The applied tariff rates have shrunk from around 80% in 1985, and 56% in 1995. After joining World Trade Organization (WTO), Pakistan has been lowering its trade barriers and increasing competition from international markets at home. It has also entered into a number of Free Trade Agreements (FTA) and Preferential Trade Agreements (PTA) with a few of its trading partners. The applied tariff rates in Pakistan are often below the bound rates that are committed to WTO. The average tariff rates for Pakistan fell to a maximum of 25% in 2002.[15] The current range of tariffs lie between 3% to 20% (except for sensitive list items) and suggestions by the Ministry of Commerce under the Strategic Trade Policy Framework (STPF) are that the tariff rates should be further reduced.

Trade liberalization, shortage and high cost of energy, uncompetitive exchange rate, and till recently, insecure operating environment, have all contributed to the decline of exports (as a percentage of GDP). In fact, Pakistan's exports as percentage of GDP peaked out in 1992 as visible from Figure 4 below. The country has witnessed stagnant and declining exports since. It is around the same time period that Pakistan liberalized its trade structure and abandoned an active industrial policy. The underdeveloped manufacturing sector has been unable to compete with cheaper imported goods in the local market and unable to adequately compete in global markets to increase exports.[16]

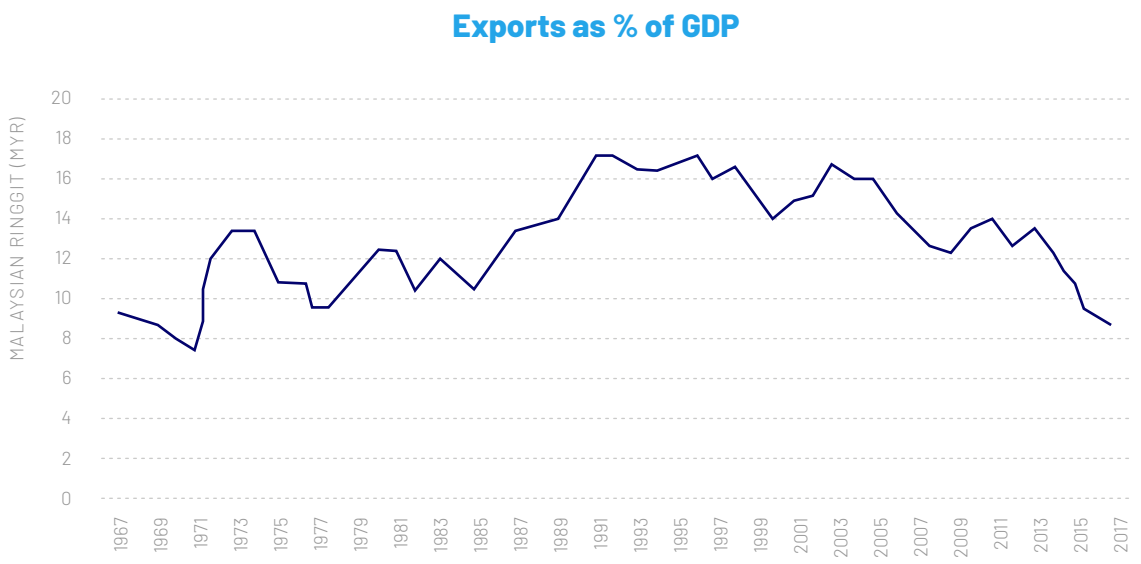


Figure 4: Pakistan's Export as a percentage of GDP
Source: World Development Indictors

[15] Lall, S., and Weiss, J., Industrial Competitiveness: The Challenge for Pakistan. Background paper for the Asian Development Bank Institute. November 2003.

[16] Hamid, N., and Khan, M., Pakistan: A case of premature deindustrialization? Lahore Journal of Economics, 20: Special Edition. September 2015.

Brief Analysis of Trade Structure

TRADE COMPOSITION OF PAKISTAN

Pakistan's exports have remained low technology and concentrated to a limited number of goods. Textiles followed by leather products and some agricultural commodities make up most of the exports. Over the last decade, exports have increased in value from USD 20.3 billion to USD 21.9 billion. However, currently at 8.2% of GDP, exports are at their lowest since 1970.[17] At the same time, imports have increased from USD 42.3 billion to USD 57.4 billion widening the trade deficit from USD 22 billion to USD 35.5 billion. Amongst the largest contributors to the import bill are Mineral Fuels & Oils, Industrial Machinery, and Electrical Machinery. A little less than half of all the imports in Pakistan constitute of fuel and machinery, which are necessary for increasing economic activity and production.

EXPORT STRUCTURE OF REGIONAL COMPETITORS

A number of regional comparators had an export mix similar to Pakistan in the 1970s. During that decade, emerging economies were exporting textile products in addition to primary commodities and raw material. South Korea's export mix resembled Pakistan's, and China & Thailand were focused on agro based commodities. The Figure below traces the change over time in the export composition of China, Pakistan, Thailand and South Korea. Pakistan's export composition in the bottom right quadrant shows a relatively modest transition from fabrics to garments exports. Other countries have pursued industrialization vigorously and added machinery and electronics to their mix of exports.

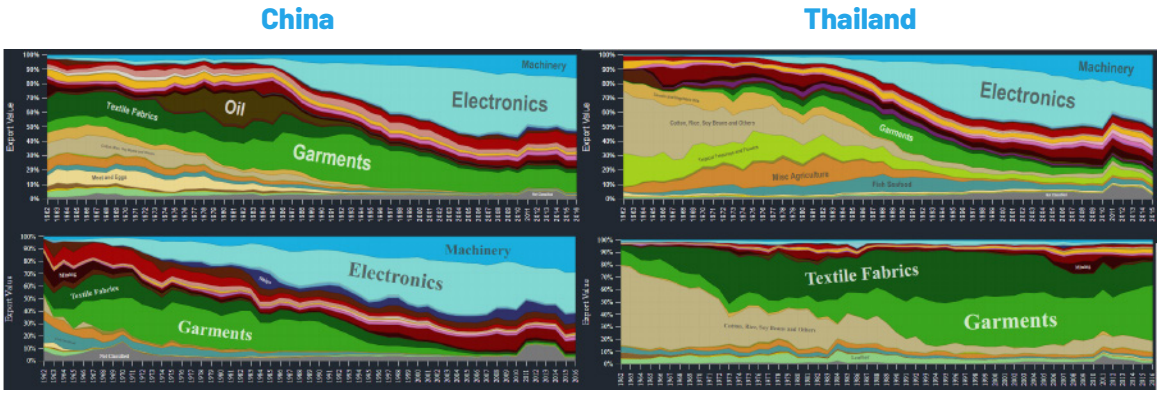


Figure 5: Time series comparison of Exports Thailand, China, South Korea and Pakistan
Source: AJG Simoes, CA Hidalgo. (2011). The Economic Complexity Observatory: An Analytical Tool for Understanding the Dynamics of Economic Development. Online database accessed on 10-07-2018.

[17] World Development Indicators Database, World Bank Group, 2017. Accessed 19-10-2018.

It is important for Pakistan to restructure its economy on similar lines to these countries in order for it to enhance its productive capabilities and exports. Without diversifying production into other sectors of the economy, Pakistan will continue to face economic challenges. Regional examples of more economically diverse countries, that were initially similar to Pakistan, highlights the need to actively pursue policies that will incentivize production in a wider range of goods.

Structuring the New Industry

Diversifying Pakistan's Product Space is critical to achieve long term economic success. Sustained growth of the economy is concomitant with increased levels of manufacturing as evidenced by the strong correlation between GDP growth and industrial growth in the past. Maintaining sustained periods of industrial growth will require diversification in manufacturing. The private sector will not be able to mobilize and channel its resources in isolation from the state. It will need appropriate policies, incentives, and facilities in order to venture into creating new products. With the right incentives in place for the manufacturing sector, Pakistan should be able to broaden its production base, strengthen exports, and improve macroeconomic stability.

Leveraging PBC's platform to gather insights from eminent business and industrial leaders of Pakistan, this study has identified key sectors and products that should be developed in Pakistan to reshape its industrial structure and reduce its reliance on a limited set of export goods. Textile and leather products have been Pakistan's primary exports for decades and there has been almost no diversification. This study has explored additional sectors that Pakistan needs to focus on, in order for it to build its productive capacity to become an export driven economy. As a result, the study has identified key industries (Figure 6) that Pakistan should indigenize for manufacturing.[18] As the Figure outlines, the four industries that can enhance exports significantly are Automobiles, Electronics, Engineering, and Food-processing. These four industries are at varied stages of development in Pakistan, but with the right incentives and policy measures, they can be propelled to become export driven. Apart from these key sectors, the overall industrial product space would benefit from indigenization of raw materials such as steel and petro-chemicals. Output from both these sectors make up the essential inputs needed by industrial complexes. Indigenizing these sectors through import substituting efforts in the short run while encouraging domestic competition, will allow firms to become competitive over a period of time. There is considerable demand for all of these products within Pakistan; enough for firms to be able to expand production and achieve scale over time. In addition, it will be important to develop support services for industrial manufacturing. Services from the I.T sector and new technological innovations from research centers should feed into the manufacturing sector, and these should be encouraged to provide efficient solutions to the industry. Furthermore, logistics and transportation infrastructure needs gradual upgradation and modernization in order to keep pace with additional freight demand and specialized handling of goods. The Government will have to make efforts to ensure that it remains consistent in its policies, prioritize price stability, and provide adequate protection to new technology acquiring export oriented industries.

Pakistan already manufactures a few products within the dense (sophisticated) core of the Product Space for domestic consumption, localized to a limited extent. An ideal entry point for Pakistan to extend itself into the dense core of the product space would be through further localization of its existing industry, making products competitive enough for export through technology acquisition,

[18] Conventional industry such as textile, footwear, crockery, fans, utensils, surgical instruments etc. need continued support, but are not included in the scope of this study as it explores diversification into core areas of the Product Space.

and by bringing international manufacturers of sophisticated products to Pakistan through joint ventures.

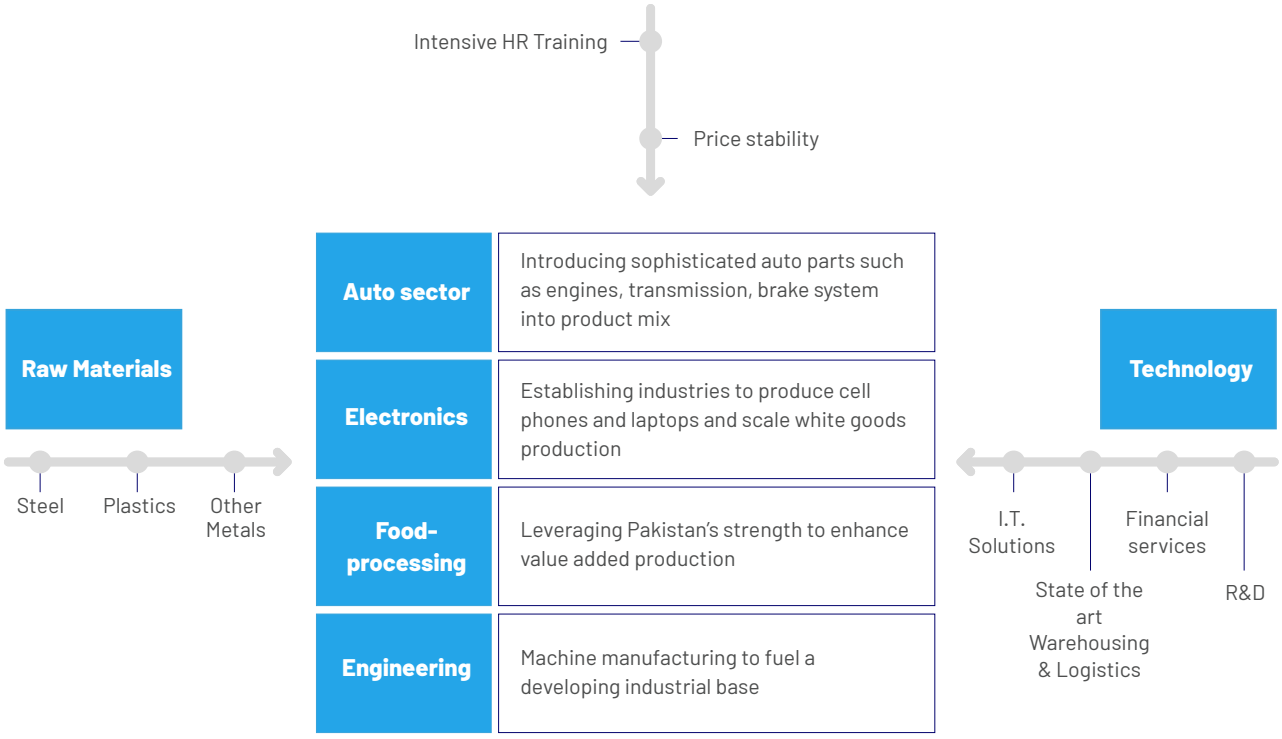


Figure 6 - Key Industries and inputs needed to structure the New Industry

Becoming export capable in sophisticated goods would require capability to produce parts/components of these products locally. The automobile sector is the leading industry in this category. It has localized to a large degree and some of its upstream vendors are also starting to mature. Further localization of this industry would involve indigenizing the powertrain of vehicles, which includes the engine and transmission, along with other sophisticated components. The powertrain is amongst the high-value added components of a vehicle and producing it should be the next target for the industry.

In addition to the automobile industry, Pakistan is also producing relatively less sophisticated electronic products, referred to as the white goods or light-engineering goods. Electronics have achieved only a limited level of localization, primarily due to lack of scale and appropriate policy support. There will be growing demand for white goods in the future and Pakistan should develop capability to further localize these products. Within electronics, there is immense local demand for handheld phone sets and computers. A local firm has initiated assembling of these products, a first step to further localization. Large international manufacturers should be encouraged to establish manufacturing facilities in partnership with local manufacturers. Pakistan should devise an Electronics Development Policy to promote manufacturing of electronic products locally through joint ventures.

As an important component of enhancing production capabilities in the long run, Pakistan needs to establish its machine tool manufacturing capabilities. The private sector should be given incentives with appropriate government support to establish a machine tool factory in Pakistan. A joint venture

with a leading global manufacturer to service the domestic demand for machines will initiate this process. Having a local machine tools industry will be beneficial in providing readily available industrial equipment within Pakistan which is critical for competitiveness and innovation.

Given its natural endowments in agriculture, Pakistan should also focus on improving agricultural yield and developing its food processing industry for export. Local farmers and producers are provided incentives for production (mainly for wheat and sugar-cane), but they lack expertise in modern methods of handling and processing High Value Agricultural (HVA) commodities. Inviting and establishing ventures with global large scale food industries will help upgrade the food value chain and agricultural practices in Pakistan. Such global companies should be invited to establish manufacturing units in Pakistan, primarily for export. This will build domestic suppliers' capability to modernize as well. A well-crafted and harmonized Standards regime should be implemented to ensure highest quality standards in the production and safety of food products.

Indigenizing production of raw materials should be an important component of promoting industrialization in Pakistan. Localizing extraction and conversion of raw materials, where possible, will provide a cheaper and reliable supply of inputs for the industry, while substituting imports. These include steel, petro-chemical, cotton, and edible oil. Steel is required in all forms of production and construction. Pakistan should produce the full range of steel products locally from scrap and potentially from local and regional reserves of Iron-ore.

Apart from steel as an input to industry, Pakistan should also increase its capacity to refine crude oil, to reduce reliance on imports and to encourage exploration of local shale oil. Naphtha, a byproduct of crude oil, is the hydro-carbon that is used in creating plastic and synthetic rubber. Establishing a "naphtha cracking" facility to process petroleum crude oil distillates would allow production of plastics and rubber locally. Both of these products have significant and increasing domestic demand, and their production should be localized as much as possible. Furthermore, Pakistan should also develop facilities to utilize local alternatives to palm oil, such as sunflower seed and rice bran to make edible oil.

Investments are needed in technology, research and innovation to enhance Pakistan's industrial capabilities. Human Resources (HR) of Pakistan need to be trained and absorbed in medium – high skilled jobs. Furthermore, industry linked R&D centers need to be established in collaboration with the respective industries. Linkages between research hubs and the industry will enable Pakistan to excel in industrial design and production.

Ensuring policy continuity and price stability will build investor confidence and encourage industrial growth. Fluctuations in business conditions have unintended consequences on plans and feasibilities, which has severely hindered Pakistan's industrial growth in the past. Inconsistent policies and changing incentives create uncertainties in business operations and discourage future investments. Exchange rate volatility also affects businesses by triggering speculations and disrupting business cycles.

In order for export enhancing industries to take root, scale manufacturing, and expand, a minimum 10-year timeframe should to be envisaged. Establishment of industries, their vendors, and industrial clusters require an incubation period. This timeframe can be broken down into three phases, as shown in Figure 7.

Figure 7- 10 Year Industrial Plan

The first phase in PBC's proposed "Make in Pakistan" programme, spread over the next two years, requires targeted policies for each priority industry to be developed. At the same time, the regulatory environment for each identified sector needs to be reviewed and improved. In parallel, outreach to international manufacturers will be initiated for inviting their production facilities to be established within Pakistan, ideally in the Special Economic Zones (SEZs) to avail immediate benefits and become export oriented over time. These efforts should be undertaken in close coordination by the Government and industry.

The following five years, depending on the level of progress made by the industry, will be the incubation period during which newly established industries will be required to consolidate their foothold in the local economy and generate scale. Firms will establish distribution channels, market their products, and expand their outputs during this period to achieve scale.

In the last three years of the plan, new industries would be required to export their products with incentives closely tied to their export performance.

SECTION 05

Export Enhancing Sectors

AUTOMOBILE

Pakistan has developed its automobile industry by providing adequate incentives to it during the last four decades. With the support of Government policies, the automobile industry has localized manufacturing to a considerable extent. It goes on to show that with appropriate incentive structures, Pakistan has the capability to manufacture products in the dense core of the Product Space. Yet, the automobile industry needs further technological upgradation to develop the powertrain and other sophisticated components of vehicles. The powertrain of a vehicle comprises the engine and transmission. Engines for tractors and motorcycles have been indigenized in Pakistan, but they are relatively unsophisticated as compared to cars. With increased scale of production, and the right policy mix, the ability to manufacture the powertrain and other sophisticated components of vehicles will be possible. Under the Auto Development Policy 2016-21 (ADP), new entrants are starting production in Pakistan which will increase competition as well as the scale of operations for new and existing firms. The Government can further facilitate auto development by establishing an automotive R&D center for designing, testing and certifying raw materials, and manufactured parts in addition to specialized training in new technologies.

Indigenization in the Automobile Industry

The footprint of the automobile industry in Pakistan's economy is substantial. It generates direct employment for 400,000 skilled labor, and by an estimation, 2 million people are employed by it indirectly. It is the second largest revenue generating sector for the Government. Exports from the sector amounted to USD 400 million comprising of auto parts, motorcycles, and tractors.[19] The industry has achieved significant localization in various categories. In terms of local content, cars have achieved 70%, tractors 90%, motor cycles 92%, and three wheelers 78% localization. The automobile industry has developed gradually and targeted state policies have yielded results. Higher levels of indigenization in tractor and motorcycle manufacturing have made Pakistan's production competitive in the global market. Engines of motorcycles and tractors are now being locally manufactured as they are relatively less sophisticated, their copyrights are available, and licensing arrangements by global manufacturers are flexible. While both of these products are relatively less sophisticated to produce, localization has reduced imports of these goods into Pakistan and helped achieve scale to become competitive for export. Apart from exporting auto components, Pakistan produced 2 million motor cycles and around 72,000 tractors in 2017, and exported approximately 200,000 and 1,000 of these products respectively.[20] Motorcycle production has grown by 200% in the last decade as shown in Figure 8. These figures are promising, yet there is space for further localization and increasing production in both these categories, on the back of Government supported policies. The industry should also aim to increase its exports of motorcycles/tractors to the East Asian & African countries by adding product variants.

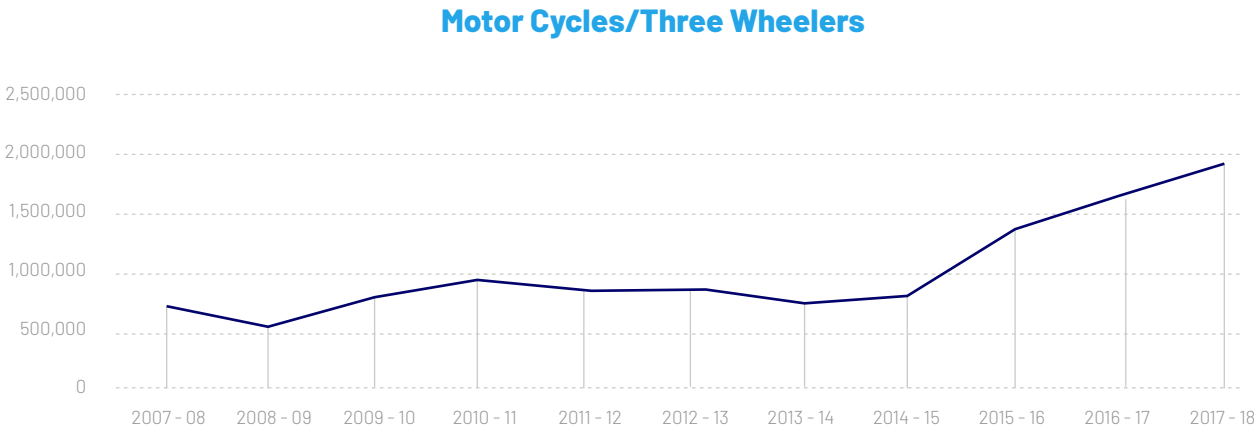


Figure 8- Motor-cycle, Three-Wheeler production In Pakistan
Source: PAMA

The development of the automobile industry in Pakistan provides a directional roadmap for indigenizing production and promoting local manufacturing. The indigenization in the local industry was made possible due to proactive policies by the Government. While relying on tariff based measures, the policies have encouraged Original Equipment Manufacturers (OEM) to localize. It is much more cost-effective for manufacturers to source parts locally than import them, however for parts which are not manufactured locally, there is no choice but to import under the Completely

[19] Pakistan Association of Automobile Parts & Accessories Manufacturers (PAAPAM), different from reported figures on the ITC Trade Map database.

[20] Figures shared by representatives of PAAPAM and Millat Tractors respectively.

Knocked Down (CKD) category of imports. Despite initial hesitation by the OEMs to purchase components domestically, they eventually chose to order components from local vendors. This has flourished the domestic auto parts manufacturing segment, which have increased to over 350 medium and large size Tier-1 firms. The auto parts industry has become globally competitive to obtain export orders.

Enhancing Export Capability of the Automobile Industry

Local production of over 215,000 passenger cars per annum has enabled the auto sector to achieve a degree of scale. Per the industry's perspective, production of 500,000 vehicles will make Pakistan capable to export passenger cars and light commercial vehicles. With the ADP in place, the industry has the opportunity to expand its production. The ADP has recently attracted 2 Korean companies, 1 French company, and 6 Chinese companies to form new JVs in Pakistan's auto sector.[21] An estimated investment of USD 820 million is expected to arrive in the auto sector and about 190,000 additional vehicles will be manufactured in the passenger cars and light commercial vehicles (LCV) categories annually.[22] The current production of around 270,000 light and heavy vehicles and a likely 190,000 additional units produced by the end of 2021 will place Pakistan amongst the top 25 global producers.[23]

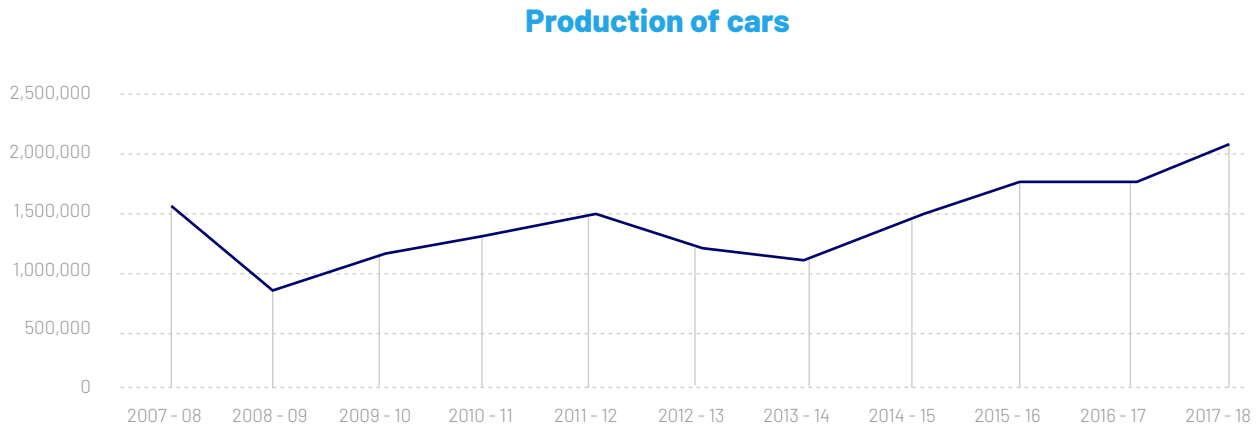


Figure 9- Production of cars in Pakistan
Source: PAMA

While car manufacturing has increased by 32% in the last decade, Pakistan's market penetration for cars is low. Only 13 out of 1,000 people in Pakistan own a car. This is significantly lower than 79 out of 1,000 people owning cars in Indonesia, and 259 out of 1,000 in Brazil.[24] The increased sale of motorcycles/three-wheelers is indicative of expected growth in local demand for cars in the future. With the right business environment and policy regime in place, Pakistan should be capable to export significant volumes of vehicles and parts in the future.

[21] Kia Lucky Motors, Hyundai Nishat Motors, Renault, United Motors, Regal Automobiles, Khalid Mushtaq Motors, Foton JW Auto Park, Sazgar Engineering, and Master Motors.

[22] Hussain, B., September, 2018. Incentives for new entrants may hinder auto parts sector. Express Tribune. Retrieved from: https://tribune.com.pk/story/1809087/2-incentives-new-entrants-may-hinder-auto-parts-sector/

[23] International Organization of Motor Vehicles Manufacturers online database, accessed September, 2018. Pakistan's position on global rankings will also depend on how much production is increased by other countries as well.

[24] Shared by representatives of PAPAAM

Pakistan needs to encourage the OEMs to develop the powertrain and other sophisticated components of vehicles in Pakistan. The Government needs to further incentivize local manufacturers to produce these parts, in an effort to improve domestic manufacturing capabilities. With an expected increase in domestic demand and a parallel growth in production, Pakistan is poised to provide a captive market for such high technology components within the country. Only with further deletion in the passenger car and LCV category can Pakistan achieve a competitive edge to become export oriented in the auto sector. Perhaps with Suzuki discontinuing its Mehran passenger car variant, which has a significant existing market share due to its price economy, utility, and an established vendor base, local investors may consider leveraging the opportunity to introduce a family car for the local market with similar specifications. Development of further upgrades could then be pursued. Chinese manufacturers are eyeing this market opportunity by introducing CBUs such as Bravo by United.

Increasing the production capacity of base materials such as steel, aluminum, plastic and rubber will help reduce costs and provide and an edge over competitors from China, India and Thailand. The recent interest shown by Korean, French and Chinese auto manufacturers, installing greenfield projects in Pakistan, provides an ideal opportunity to indigenize manufacturing of powertrains. Under the ambit of the ADP, the Government should pursue localization of powertrains by existing OEMs as greenfield investments.

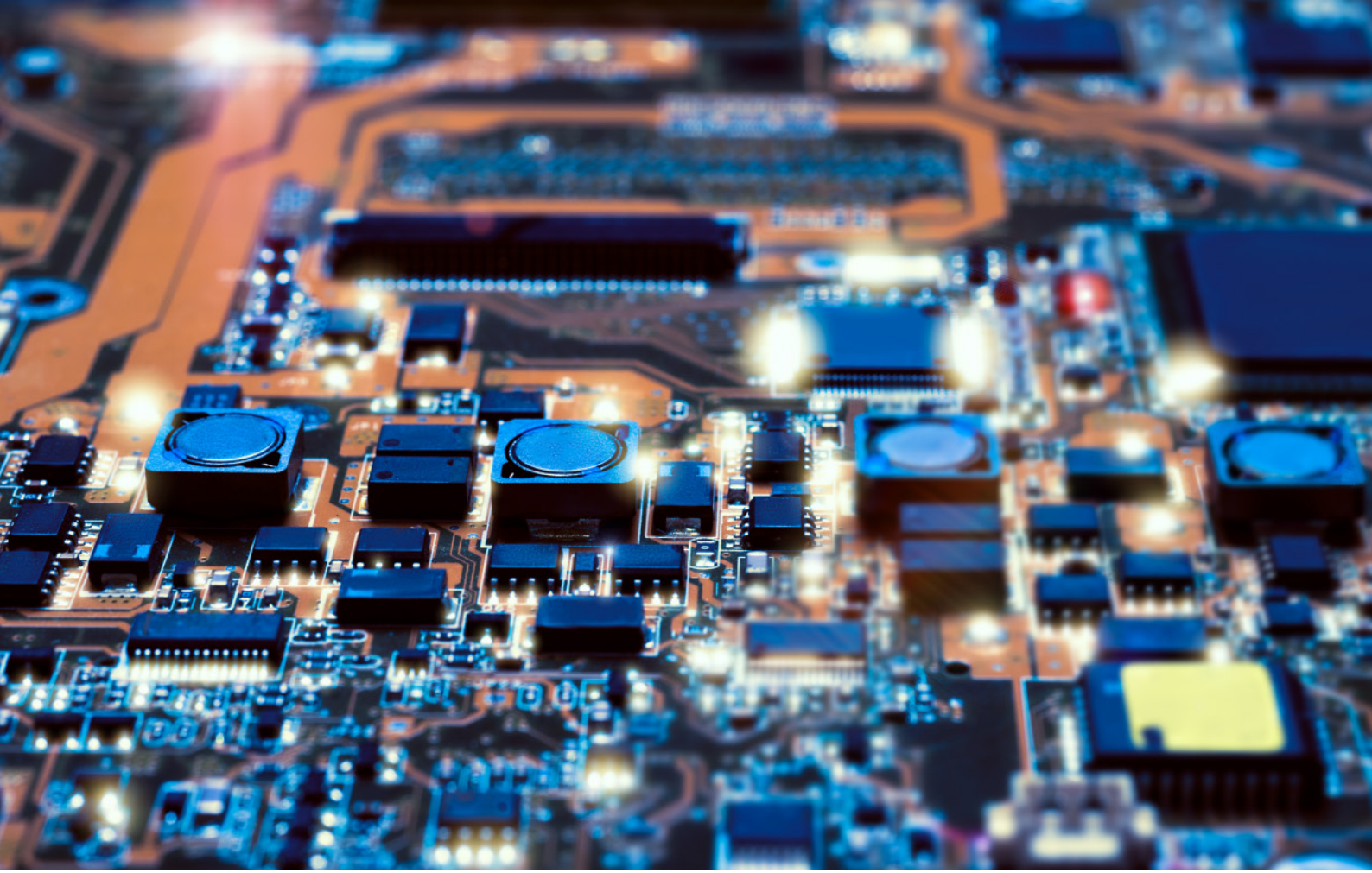
For improving export competitiveness of the auto parts segment and to build local capacity in automobile design, testing and providing certifications for raw material and auto parts, concerted efforts are required to improve R&D facilities. The ADP envisages creating a Pakistan Automotive Institute (PAI). The PAI should be established on priority basis to support the development of local skills and talent needed in the industry. PBC supported by its members can provide advice in the establishment of PAI and in its programme development.

Regional Countries Exporting Automobiles

Countries in the region that have had significant exports in the auto sector include South Korea (USD 61.9 billion, 11% of its total exports), Turkey (USD 23.8 billion, 15% of its total exports), Thailand (USD 28.5 billion, 12% of its total exports), China (USD 67.2 billion, 3% of its total exports), and India (USD 16.2 billion, 5% of its total exports). All of these countries have implemented policies that have helped develop their local manufacturing capabilities and made them globally competitive.[25] It is interesting to note that with the production of around 200,000 vehicles, South Africa became a car exporting nation. South Africa also supported its indigenous vehicle manufacturing sector from 1950 with high levels of protection and an inward orientation.[26]

[25] Export figures extracted from ITC Trade Map at the HS-87 two-digit level.

[26] Barnes, J., Black, A., May 2013. The Motor Industry Development Programme 1995-2012: What have we learned. International Conference on Manufacturing-led Growth for Employment and Equality.



ELECTRONICS

Pakistan has limited electronics production capabilities which need to be enhanced in order for it to move up the technology curve and to diversify its export basket. Electronic products are situated in the dense and most sophisticated part of the Product Space, where Pakistan should aim to create its capabilities. Pakistan is currently producing a number of white goods such as air conditioners, washing machines, microwaves, refrigerators, etc. but has achieved a modest level of diversification in manufactured electronic products; primarily due to the lack of scale and appropriate policy support. Pakistan should aim to develop its capabilities to further localize production in white goods and introduce manufacturing for a new range of electronic products. In order to do so, the industry would require support from the Government to build its capacity, as was done in the case of the auto sector.

Given the high demand for handheld phone sets and computers, the Government should encourage local production of these products. This does not only include assembly plants for electronic equipment but also manufacturing of related components. While developed electronics industries in countries like Japan, Germany, and South Korea are focusing on Research and Development, they are looking to shift production facilities to countries which offer cheap and skilled labor and intellectual property protection. With attractive incentives and a conducive business environment, large scale global manufacturers of electronics can be invited to establish plants in Pakistan. Local companies should seek JVs to manufacture electronic products with leading global manufacturers. Pakistan requires a dedicated policy for establishing an indigenous electronics industry.

White Goods in Pakistan

Pakistan is producing a limited set of electronic goods, under the white goods category, which are relatively unsophisticated. The industry contributes to about 1% of GDP. An estimated 70,000 workers are employed directly by the white goods industry and around 350,000 workers are employed by it indirectly.[27] The growth of this industry has allowed Pakistan to enter manufacturing in the light engineering sector, which provides a good inroad to diversifying production to other electronic products. With a large and burgeoning middle class, the demand for these such products is increasing.[28] Pakistan provides a captive market for firms to establish local manufacturing of electronic products. With progressive localization in the Electronics industry, manufacturers will gradually become globally competitive for export. The Government should introduce policy measures to encourage localization and product diversification in electronic products manufacturing.

It is pertinent to mention here that the existing white goods industry in Pakistan has optimized the level of localization to the size of the domestic consumer market. For instance, a compressor of an air conditioner, accounting for about 20% of the product cost, cannot be produced locally since the minimum viable production capacity for a plant to produce compressors is 100 million units annually, whereas the overall market size in Pakistan is below 12 million units. Nonetheless, new investments should be encouraged to improve competitiveness and discourage imports. With the right incentives, companies will be able to generate scale and cater for export markets. Further incentives should also be offered to help develop a vendor industry for white goods.

New Electronic Products – Handheld Phones and Computers

For "latecomer" economies like Pakistan, setting up assembling facilities through JVs seems to be an ideal entry point into manufacturing handheld phones and computers. A number of global companies have shown interest in setting up manufacturing units for these products. Pakistan should capitalize on the interest and provide adequate incentives to these global companies for cellphone manufacturing, starting with installing assembly plants locally.

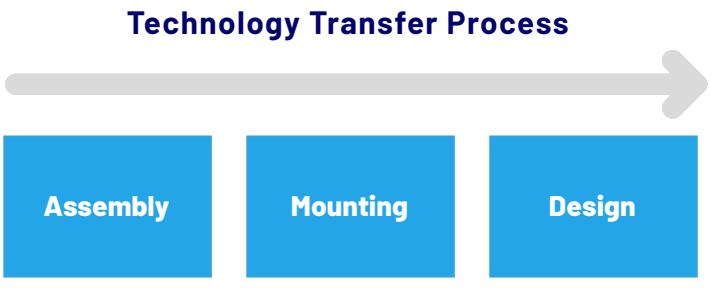


Figure 10 - Electronics development process

[27] As reported by Pakistan Electronics Manufacturing Association.

[28] Two largest local manufactures in white goods in Pakistan are PEL and Dawlence, each with 29% and 50% share in home appliances respectively. Retrieved from: https://epaper.brecorder.com/2018/09/27/19-page/741186-news.html

Assembling electronic products locally will initiate the process of ultimately manufacturing electronic components within the country. In the second phase, mounting of these goods should be indigenized. Manufacturing of ceramic and electronic components used in cellphones and computers, should be localized creating a complete value chain. In the last phase, the design process of these goods should also be localized once electronic product manufacturing achieves sufficient scale.

With adequate protection, global manufacturers and their local partners will develop assembling capabilities in Pakistan. This policy approach will also help establish a local vendor industry for electronic products, which will further strengthen the manufacturing base for the industry (see box 1). Haier Pakistan has started assembling laptops and cellphones in Pakistan since 2015 in joint collaboration with its Chinese principle. Pakistan should ideally aim to attract the current market leaders such as Mitsui, Panasonic and Sony of Japan, Samsung of South Korea, Siemens of Germany and Huawei of China to establish their manufacturing facilities in Pakistan. It should also attract Chinese manufacturers such as Oppo and Xiaomi to set up assembling units of handheld phones locally. Samsung has established one of the world's largest smart phone manufacturing units in India, to increase manufacturing capacity within India to 120 million smart phones annually.[29] While Huawei may have initially expressed interest in establishing a manufacturing base in Pakistan, infrastructure constraints and a cumbersome regulatory environment tapered its interest at the time.

The high demand of handheld phone sets in Pakistan, provides an opportunity for Pakistan to enter into this segment of the electronics manufacturing. In the last decade, cellphone coverage and utilization has increased significantly in Pakistan. Each year Pakistan imports over half a billion dollars' worth of cell phones and parts as highlighted in the figure below. In 2017, the import value peaked at USD 845 million. This import value quantifies into 11.5 million handheld sets, and 8.4 million of these were imported from China. These are only the recorded official estimates. There is anecdotal evidence that a significant number of cell phones are imported into the country through illegal channels.[30]

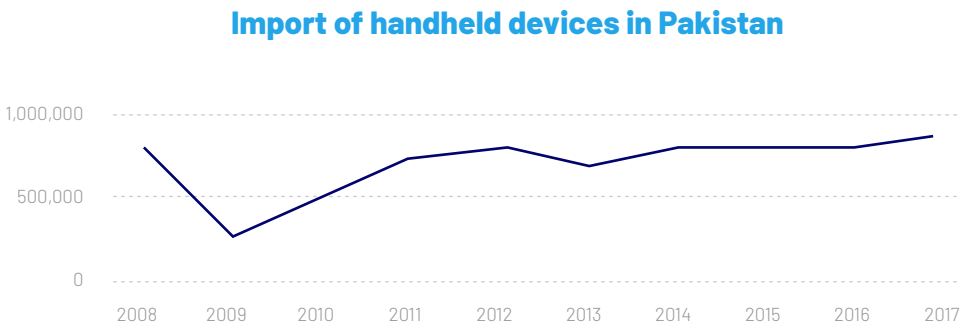


Figure 11 – Imports of cellular and handheld devices in Pakistan
Source: ITC Trade Map Database

[29] Iyengar, R. July 2018. Samsung goes big in India with world's largest mobile factory. Retrieved from https://money.cnn.com/2018/07/09/technology/samsung-india-biggest-factory-noida-smartphone/index.html

[30] Huda,T., Hasan, M., Hasan, S. May, 2015. Ascertain the Market Demand of Goods Prone to Smuggling – Establishing the Volume of Smuggling, MCC Preventive, Karachi.

With a significantly large domestic market, Pakistan has the potential to manufacture cellphones locally to meet the domestic demand. The significant demand for these electronic products in the domestic market makes Pakistan a viable destination for establishing manufacturing facilities.

akistan should explore the option of manufacturing computers locally as well. Pakistan imported over USD 300 million worth of computers in 2017. This is three times of what it imported in 2013, showing the growing demand for this category of products. Similar to cell phones, Pakistan should seek to attract a leading global manufacturer of computers to establish its facilities in Pakistan and aim to develop a local semi-conductor manufacturing industry.

Government Support in Electronics Manufacturing

The Government should develop an Electronics Development Policy. This policy should be formulated in consultation with the existing electronic products manufacturers. As with the auto industry, the right set of incentives will encourage manufacturing in the electronics category as well. Apart from incentives offered to further localize white goods, incentives should also be structured to start assembling and manufacturing electronic products such as handheld sets and computers.

The development of a robust local electronics industry was envisioned in Pakistan previously, but it has yet to be realized. A National Institute of Electronics was planned under an Ordinance in 1979. The functions of the Institute were to design and fabricate electronic components such as Integrated Circuits (ICs), and assist in augmenting local production for the local industry. It has not been successful in implementation since the electronic industry never took root in Pakistan as envisioned. The Government should aim to revive design and research capabilities in collaboration with the private sector. Since efforts undertaken by the public sector alone have not succeeded, collaborative efforts with industry and academia will help develop human capital and provide industrial solutions.

With an aim to develop a robust electronics sector, the Government should partner the industry to establish a new Institute of Electronics. The engineers from the Institute will be trained and will work in close liaison with the industry. The Institute will become viable once it starts receiving orders and demand for research from the Electronics industry inside and outside of Pakistan. The Institute will help Pakistan progress from the Mounting to the Design phase in electronics manufacturing.

The East Asian Electronics Industry Development

The newly industrializing economies (NIEs) of East Asia, namely South Korea, Taiwan, Singapore, and Hong Kong have developed their indigenous electronic industrial agglomerates. These economies are touted as "latecomers" and followed a "catch-up" cycle. None of these economies had a history of electronic component development prior to the 1960's. The electronics industry in these economies took root in four stages.

Phase 1: Start-up Industry. The startup-phase was initiated by foreign companies starting Joint Ventures (JVs) or utilizing production facilities to capitalize on cheap labor. In the process, they transferred technical and management skills to their local partners. Initially they started assembling basic semiconductors and consumer goods. Matsuhita and Sanyo provided technical assistance to South Korean firms Samsung and Goldstar to manufacture transistor radio sets. The Japanese used these firms as a point of entry for domestic markets. US firms, on the other hand, invested in wholly owned subsidiaries for manufacturing simple components. Samsung Electronics began as a JV with Sanyo in 1969 with 106 Japanese employees who trained S. Korean counterparts in the production of radios, television sets and simple components. Taiwan, Singapore and Hong Kong entered the electronics market through assembly of simple consumer goods like radios and television sets, and semiconductors.

Phase 2: Industry Take-off. Firms in these countries started purchasing necessary inputs for producing specialist parts. Cheaper price of goods increased their market share in the local economy. Production line in these firms grew to include digital watches, telephones, and video games. During 1970's, Samsung and Goldstar acquired additional technology through licensing with Japanese firms. R&D investments to reverse engineer products were made by these companies. Samsung got its first international order from GE from US for production of microwave ovens.

Phase 3: Sophistication. In the 1980's these countries started producing computers, computer peripherals and telecom equipment. With increased local manufacturing, domestic companies started gaining greater share of design and production of lower end goods. A number of principal investors started reducing their footprint in these countries. Most notably, Sanyo withdrew its JV with Samsung in 1983 and NEC pulled out from its JV with Goldstar Electric. Japanese firms withdrew from South Korea because of specific government measures that reduced special tax benefits to international investors.

Phase 4: Innovation. Larger firms in the NIEs invested heavily in R&D, but they lagged significantly behind Japanese and US firms in terms of technology. A large number of firms had to import machinery and capital goods from Japan. In 1990, USD 57 billion worth of capital goods were imported by these four countries. Many were still reliant on OEM for a large proportion of their sales, but they were still able to innovate in some aspects of electronics manufacturing.

Box 1 - The East Asian Electronics Development
Source: Hobday, M., 1995. East Asian Latecomer Firms: Learning the technology of electronics. University of Sussex, U.K. World Development, Vol. 23, No. 7

ENGINEERING (MACHINE TOOLING)

Developing an engineering base allows an economy to flourish its industry and facilitates its entry into the sophisticated part of the Product Space. Pakistan has an underdeveloped engineering base which does not support industrial manufacturing. In order for Pakistan to diversify its exports it should develop its capabilities in engineering. Being able to manufacture machine tooling capabilities would supplement Pakistan's technological capabilities and make it easier for firms to establish production units. Reliance on imported machinery increases the cost of doing business. The opportunity cost of time delays in receiving international shipments of machinery due to freight time, damage, custom clearances, etc. for machines along with hurdles in repair & maintenance of imported machines justifies strengthening local engineering capabilities. The private sector should be given adequate incentives to establish a machine tooling industry in partnership with leading global manufacturers of machines.

The Government can play a pivotal role in encouraging this process by sourcing defense production to local industry. The leading defense industries around the world are driven by the private sector. Pakistan's defense industry should also ideally outsource its production to the private sector. Under the right conditions, it will also provide local industry the opportunity to develop commercial products. Furthermore, the private sector will be well-poised to help increase defense equipment exports.

Reviving Machine Tooling

Machine tooling is the base industry for promoting industrialization. Investments in this industry creates self-reliance, develops skilled workforce, and enables the economy to produce a wide range of industrial components. The public sector needs to provide the private sector an opportunity to enter the engineering space and produce machines. The Pakistan Machine Tool Factory (PMTF) was a public sector initiative to develop engineering in Pakistan in the 1960's, but it failed to develop its capacity, primarily due to Government intervention in its operations. India established a similar

venture which has grown since. Other engineering ventures which were successful eventually discontinued due to nationalization and have not recovered (see Box 2).

In order to re-establish machine tooling in Pakistan, the Government needs to provide the private sector adequate incentives to invest in this sector. By encouraging the private sector to form joint ventures with leading global machine tool manufacturers to produce industrial components, especially for the automobile and textile sectors, the machine tooling industry can be established in Pakistan. In addition, the Government needs to establish a state of the art institute of electrical and mechanical engineering in order to train a cadre of engineers who can design machines. Such an institute will thus aim to provide the requisite human resources to the local machine tooling industry.

Private Sector Defense Manufacturing

The Defense industry in countries around the world have outsourced production to the private sector. An example is Embraer of Brazil, which now produces commercial light aircrafts. Pakistan Aeronautical Complex (PAC) provides an opportunity for establishing a value chain in the private sector, to produce components for the Mishak light aircraft and the JF-17 Thunder aircraft. A SEZ is planned adjoining PAC. The engineering companies of Pakistan can be given special incentives to start producing aircraft components and also to market them internationally. With improved contractual mechanisms between the private sector and the defense industries, there is a possibility to develop arms production capabilities locally and enhance the overall engineering capabilities in Pakistan.

Machine Tooling History in Pakistan

There have been two major ventures into developing machine tooling in Pakistan undertaken in the 1950-60's. Batala Engineering Company (BECO) was incorporated in 1950 and became the leader of light engineering products such as machine tools, pumps, power looms, concrete mixers, cranes, power presses, electric motors, etc. It was nationalized into Pakistan Engineering Company Limited (PECO) in 1972 and has been unable to find its footing since. It was privatized and up to 67% of its shares are held privately but it discontinued production of its standard line to machine tools in the last decade. Similarly, the Pakistan Machine Tool Factory (PMTF) was setup for enabling the production of machine tooling in Pakistan through PIDC in 1968 under a regional programme under the Economic Cooperation for Development. Oerlikon Buhrle & Co. was the principal Swiss company that provided the technical design and technological transfer arrangements. But like other SOE's it has deteriorated and has not been able to capitalize on its potential and lies primarily dormant. At a similar time, in around 1952, the same Swiss company had helped establish Hindustan Machine Tools Ltd. in India which flourished. It has now set up industrial machine tooling plants in six different regions of India and provides a range of industrial machines.

Box 2- History of local Machine Tool Manufacturing
Source: Stagnant machine tools industry, Dec. 2007. Daily Dawn. Retrieved from: https://www.dawn.com/news/280602;
Matthews, R., (Oct, 1988). Development of India's Machine Tool Industry. Economic and Political Weekly, Vol. 23, No. 40

FOOD PROCESSING

A large proportion of Pakistan's economy revolves around agricultural production and its downstream industries, yet exports from this sector have been limited. While this sector employs 42.3% of the labor force it only contributes to 18.9% of the GDP.[31] Exports from this sector are primarily limited to rice and few other goods. Produce from agro-based industries is utilized for domestic consumption and there is limited export orientation within the sector. In order for Pakistan to increase exports from agro-based commodities, it needs to invest in High Value Agricultural (HVA) commodities and modernize its food processing capabilities.

Despite continued support from Government through various programmes, the sector has been unable to adopt modern technologies. Improving productivity, augmenting manufacturing and upgrading the supply chain technologies is required for exporting food products. Pakistan should invite global food processing companies to establish their manufacturing facilities in Pakistan for export.

Furthermore, Pakistan has the basic inputs needed for food processing, but lacks modernized methods of food handling, distribution and packaging. New entrants can facilitate upstream improvements in food processing, logistics and agricultural productivity.

Furthermore, better farm-to-market infrastructure is required to reduce farm gate losses, create sophisticated storage facilities, improve distribution and network channels, increase farmer incomes and prices through bypassing the middlemen. Establishing a cool chain, especially

[31] Pakistan Economic Survey, Ministry of Finance, 2017-18

warehouses for exporting food articles is also required particularly at airports.
At the same time, Pakistan needs to strengthen its quality infrastructure by harmonizing its food quality standards in line with the international standards, in order for it to conform to and meet global export requirements in food quality and phytosanitary standards.

In addition, Pakistan should substitute the import of palm oil by replacing it with indigenously produced edible oil. This will save Pakistan's precious foreign reserves that reduce the trade deficit.

Improving the Food Value Chain through Downstream Investments

Making Pakistan an export oriented country in food processing would require large capital investments from firms which specialize in this sector. While the Government should aim to develop the local food based industries, the demand side effect of large international firms would encourage standardization and provide scale through market access, which is required to produce globally competitive products. Further development of the food industry in Pakistan and exporting food products hinges on new global firms entering Pakistan's market.

A competitive downstream industry in food processing will drive Pakistan's upstream productivity in agriculture. Pakistan has already witnessed such investments improving productivity in its dairy industry (see Box 3). Food companies such as Del Monte, Heinz, Kraft, Danone, etc. should be invited to install production facilities in Pakistan. As part of their licensing arrangements they should be incentivized to utilize the local infrastructure and produce with special concessions as long as the companies maintain a minimum export percentage of the total local production.

Consolidation in the Dairy Sector

Nestle Pakistan and Engro Foods have improved dairy production, collection and outputs in Pakistan. These firms have been able to develop network of milk collection centers, testing and cold storage solutions, packaging and transportation facilities throughout Sindh and Punjab and have streamlined the milk value chain. Milk is then also used as an input in value added products such as development of butter, cream and yoghurt. These firms have built distribution, retailing, and marketing systems to make products available nationally. Despite their wide reach outreach, these firms have only captured 5% market of the total dairy production in Pakistan, allaying fears of market monopoly in basic food commodities. Without concentrated efforts from these Large Scale Manufacturing (LSM) firms, development and consolidation in this sector would not have been possible.

Box 3: Development of dairy collection and processing mechanism in Pakistan
Source: Zia, U., Mahmood T., and Ali, M.R. Dairy Development in Pakistan. Food and Agriculture Organization of the United Nations. 2011

Modernizing Agricultural Collection and Distribution Channels

The horticulture production, distribution, and transportation mechanism in Pakistan is antiquated and there is a need to establish enterprises in Pakistan where market operators are able to directly reach farmers and their associated networks. The food supply chain is currently inefficient and is dominated by intermediaries; from the farm, the produce is bought by *beopari* (merchant), *aarti* (middlemen), *pharia* (distributor), retailer and eventually sold to the consumer. During transport, an estimated 30-35% produce is wasted and translates into higher price to the consumer. The produce is not sorted, graded nor packaged; neither is there is a cool chain for transporting perishable food. In addition, transactions are informal and undocumented. The market information system is weak and the trading volumes on the Pakistan Mercantile Exchange are small.

A similar low quality infrastructure for food distribution is prevalent in India. However, as an example, in 2003 India introduced Safal Fruit and Vegetables Auction Market in Bangalore in an effort to modernize its farm to market operations. The facility has a capacity to handle 1,600 tons of produce per day and has installed modern facilities such as temperature and humidity controlled storage halls, fruit ripening facilities, cold storage chambers, auction halls, distribution centers for institutional buyers and wholesale shops. The market is operated by a farmer cooperative, and has also established retail stores. Pakistan should envision establishing similar facilities to upgrade its horticulture production, collection, and food retailing system.

Enterprises and cooperatives that are able to connect farmers directly to the retail market will empower both producers and consumers. Driven by downstream food processing companies, higher value addition through sorting, grading, packaging and better logistics will help bypass the archaic mode of market operations and also enable exports of food products from Pakistan.

Food Quality Standards for Export Competitiveness

Pakistan's food quality infrastructure needs to be upgraded to harmonize it with the world. This is essential to help augment exports of processed fruits, vegetables, meat and milk products. In order to export products to another country, a number of stringent food safety standards need to be adhered to. These include conformity to Sanitary and Phyto-Sanitary (SPS) measures countries set for food safety, the standards set by Codex Alimentarius Commission on Food Import and Export Inspection, and the Maximum Residue Level (MRL) of pesticides amongst others. Without being able to conform to international standards for food production and packaging, it is difficult for any country to become export capable in the food industry.

Utilizing Domestic Capability to Produce Edible Oil

Pakistan should be proactively developing its capacity to produce edible oil. It is amongst the top five most imported items in value, and its imports will continue to increase in the future unless local capacity to produce edible oil is developed. In the year 2017, Pakistan imported around USD 3 billion worth of edible oil.[32] The domestic production of oil has been decreasing in the last few years while import has been gradually increasing. Palm oil and soybean account for larger proportion of imported oils. Only 12% of oil was produced locally in 2017 as evident from Table 2.[33]

[32] The figure for all types of animal/vegetable oil imported under HS 15 amounts to USD 2.3 billion as reported on ITC Trade map, different from MoF figures.

	Local Production (tons)	Imported Oil (tons)	Total Availability (tons)	Import Value (Million USD)
2017	431	3,192	3,623	3,063
2016	462	3,264	3,726	2,710
2015	556	2,967	3,523	2,633
2014	573	2,627	3,200	2,500
2013	567	2,502	3,069	2,500

Table 2: Production and Import of Oil
Source: Pakistan Economic Survey, 2017/18

There are 150 units processing Ghee/Cooking Oil in Pakistan dependent upon imported raw material. There is a need to increase localization and reduce dependence on imported edible oil. While treating palm oil as a non-discretionary import good, the Government needs to enhance its policy to promote indigenous production of oilseed crops in Pakistan. It should also encourage other methods of oil production such as extraction from rice bran[34] and locally available seeds such as sunflower and mustard.

Pakistan imports almost all of its palm oil from either Indonesia or Malaysia. While Pakistan has a Free Trade Agreement (FTA) with these countries, they have added an Export Duty (ED) on Crude Palm Oil (CPO) which has increased the cost of production for firms to refine oil in Pakistan. The ED puts a crippling burden of price on raw material for refineries. With lack of available CPO, refineries in Pakistan are unable to produce, as evident from decreasing local production. While it is critical for Pakistan to produce oil from local varieties of seeds, it would be advisable for the Government to interact with Malaysian and Indonesian counterparts to lower their EDs in the short run.[34]

The poultry and livestock feed industry utilizes soybeans and rapeseed for their high protein content. In particular, soybean has a universal acceptability as animal feed due its nutritional value and availability all year round.[36] Soybean imports have skyrocketed in Pakistan from just USD 2,000 in 2013 to USD 745 million in 2017, showing its high demand in the animal feed industry. In addition, Pakistan imported USD 475 million worth of rape/colza seeds in 2017 up from USD 322 million in 2013.[37] Given the soaring demand of these commodities in Pakistan, local production of these food commodities should be given high priority in Government's agricultural development plans to enable import substitution.

[33] Pakistan Economic Survey, Ministry of Finance, Government of Pakistan. Various issues.

[34] Hanmoungjai, P., Pyle, D.L., Niranjan, K. August 2001. Enzymatic Process of Extracting Oil and Protein from Rice Bran, School of Food Biosciences, The University of Reading, United Kingdom.

[35] Janmohammed, M., An overview of edible oil industry in Pakistan, Business Recorder. Retrieved on 2nd September, 2018 from: https://fp.brecorder.com/2018/01/20180120337192/

[36] H., K., Dei., 2011. Soybean as a Feed Ingredient for Livestock and Poultry. Recent Trends for Enhancing the Diversity and Quality of Soybean Products. Department of Animal Science, Faculty of Agriculture, University of Development Studies, Tamale, Ghana

[37] ITC Trade Map

SECTION 06

Raw Material and Support Industries

Steel Production

Developing and indigenizing steel production in Pakistan is an important component in supporting its industrial growth. Steel is the raw material needed in engineering and export oriented goods identified in this study. Improving manufacturing capability in this sector would support all industries in the long run and provide them access to cheap and plentiful raw material. Steel sector is also an important component in the building & construction, automotive, energy & water transmission industries, and in laying transport infrastructure. It is also a crucial ingredient required for creating an export oriented Pakistan.

Pakistan established the Pakistan Steel Mill (PSM) in the late 1970s. At present PSM is defunct due to ballooning losses. In the meantime, local private sector companies have increased capacity for production of steel products. But the industry faces stiff competition from China and needs policies in place to protect it from dumping practices. Most of all, the Steel industry requires a consistent tariff in order to justify investments in expanding production capacity.

Furthermore, a consortium of public-private enterprises should be encouraged to extract and process local & regional iron ore reserves. In the absence of PSM, Pakistan is not processing any iron ore, which should be encouraged through the private sector. In order to increase exports in industries such as automobiles, electronics and machinery, value added finished items from steel should be the priority for Pakistan. This is only possible with cheap and ready access to various types of locally produced steel.

Steel Production from Iron Ore in Pakistan

PSM is the only facility in Pakistan that can produce steel from iron ore, although its technology is outdated and its capacity is limited. Under full scale operational capability, the PSM can produce up to 1.1 million tons of steel per annum while the domestic demand in 2017 was 9 million tons. Since PSM is not operational anymore, the import of iron ore has dropped to negligible levels (See Box 4). Therefore, while domestic demand for steel has kept increasing, the capacity to produce steel products from iron ore has dwindled. This is also a consequence of growing global recycling of scrap. Steel is perhaps the most recycled material in the world and hence the most sustainable. Any strategy on steel must therefore factor both iron-ore and recycled steel. The demand for steel is expected to increase by 3 million tons in the next couple of years. Table 3 shows the production capacity and market size of steel products in Pakistan and Table 4 highlights the growth in imports of steel products in Pakistan.

Steel products in Pakistan can be categorized into three broad groups; Flat Products, Long Products, and Tubes & Pipes. The table below shows the existing market size and range of products in Pakistan:

Category	Product Range	Market Size (MT)	Share	Sufficient Production Capacity
Flat Products	Hot Rolled Coil (HRC)	1,500,000	32%	No
	Cold Rolled Coil (CRC)	700,000		Yes
	Hot Dipped Galvanized Coil (HDGC) / Pre-Painted Galvanized Iron Coils	700,000		Yes
Long Products	Rebar	5,000,000	56%	Yes
	Sections / Structural			Yes
	Wire Rod/ Bar			Yes
Tubes & Pipes	Longitudinal ERW Tubes & Pipes, diameter ≤ 16"	750,000	10%	Yes
	Spiral welded pipe, diameter > 16"	Project based		No
	Seamless pipes	150,000		No
Other	Misc.	200,000	2%	No
Total		**9,000,000**	**100%**	

Table 3: Current Market Size and Product Range
Source: ITC Trade Map/ Industry Sources

Long Products are in greater demand in developing economies as they are utilized in infrastructure and construction activities, whereas Flat Products are geared towards industrial manufacturing and the development of various value added products. As such, the multiplier effect of one metric ton (MT) of Flat Products is much higher than that of long products such as rebar. Therefore, although there is significantly greater demand for long products in Pakistan at its current stage of development, the demand for flat products should increase over time and its capacity development should be encouraged. It is worth noting that many existing local steel plants are operating below their installed capacities as significant quantities of commercial steel are still being imported, which local manufactures have the capacity to produce.

Type of Product / Year	Iron Ore	Ferrous Scrap	Flat Rolled Products	Pig Iron	Directly Reduced Iron Ore	Tubes and Pipes	All other products	Total Imports
2008	2,692,445	1,871,037	1,243,519	17,755	32	352,669	436,454	6,613,911
2009	573,640	2,254,182	1,376,813	23,676	4	314,167	353,360	4,895,842
2010	110,952	1,771,139	1,389,246	24,399	218	179,095	314,512	3,789,561
2011	271,596	1,583,931	1,298,734	17,081	823	126,821	193,770	3,492,756
2012	143,019	1,772,885	1,427,084	14,830	47,261	217,197	190,740	3,813,016
2013	277,685	1,781,177	1,501,218	12,005	2,228	278,543	189,386	4,042,242
2014	139,869	2,482,543	1,675,029	12,952	3,804	303,693	292,884	4,910,774
2015	100,205	3,256,950	1,988,935	21,976	-	308,843	348,989	6,025,898
2016	-	4,024,792	2,551,832	26,538	6	327,159	407,932	7,338,259
2017	78	5,278,414	2,661,700	39,611	1	322,439	410,730	8,712,973

Table 4: Imports of Steel Products (tons)
Source: ITC Trade Map

The table above indicates that there is significant installed capacity for producing flat-rolled steel products and Tubes & Pipes. The main raw material for these products is Pig Iron and Ferrous Scrap (about 60% of global steel is produced through recycling steel products).

Extracting and Processing Local and Regional Iron Ore

Pakistan should explore options for processing locally and regionally sourced iron ore to improve its cost-competitiveness and spur industrialization. There are around 430 million tons of iron ore reserves in Pakistan and reportedly about 1.8 billion tons of iron reserves in Afghanistan.

The ferrous content of the iron-ore in Pakistan reportedly about 46%, as compared to about 62% in Afghanistan. Only half a million tons of iron ore was mined in Pakistan in 2017. There are reportedly fairly rich but small size ores in Chagai district,[38] and anecdotal evidence suggests that Kalabagh has fairly high quality reserves of iron ore as well. Hajigak, which is located around 100 kilometers West from Kabul, has estimated high quality iron ore reserves of 1.8 billion tons, of which 110 million tons are proven reserves. Pakistan should benefit from sourcing iron ore reserves from within the region. Since Afghanistan will not be able to extract and process this ore in the foreseeable future, Pakistan should consider options to develop indigenous iron ore processing facilities. Engaging international mining companies to extract iron ore, setting up multilateral financing and institutional arrangements, and formation of a local conglomerate to set up a private sector steel mill should be explored to harness regional potential in the steel sector. Such a venture will reduce cost of importing steel inputs and will help Pakistan in achieving self-sufficiency in iron-ore availability.

As an immediate step to encourage investments into developing iron ore processing plants, the Government needs to provide zero rated tariff on import of iron ore and coke (coal) as raw material; as is currently the case with scrap steel. Furthermore, the conversion of iron ore should be brought under the special procedures of sales tax regime as applied on steel scrap. The former will be essential to incentivize installation of iron ore and coke based conversion plants. These measures will have two advantages. It will encourage iron ore over scrap as the preferred raw material in Steel production. Secondly, it will drive iron ore extraction from local mines.

Production from the PSM

PSM has limited capacity and outdated technology to produce steel products; under its maximum production capacity and optimum conditions it can only produce less than 10% of the domestic demand. With limited fiscal space, the Government will gain to benefit from leasing PSM land and established infrastructure to the publically listed companies (in various sizes/allocations) through a competitive bidding process. It would reduce pressure on the national budget and transform PSM into a revenue generating entity for the Government. These companies can be supported in generating captive power and installing desalination plants for steel making. With appropriate policy support companies can be encouraged to install capacity to process iron ore in line with the national demand.

[38] Economic Survey of Pakistan 2017-18.

Anti-Dumping Duties in the Steel Sector

Pakistan's private sector is exporting finished flat products (CRC and HDGC) and pipes & tubes to the United States and Canada, however manufacturers are facing anti-dumping duties imposed on them by both these countries. It is pertinent to note that steel is increasingly becoming a political commodity with countries imposing duties and non-tariff barriers in order to protect their indigenous steel industries.

The Chinese steel industry, which comprises half the world's steel production, exerts a great deal of pressure on the domestic steel industry. The China Pakistan Free Trade Agreement has proven to be a major obstacle in the growth and development of PSM and large scale private sector steel manufacturers. Pakistan needs to protect and develop its indigenous industrial development and thwart dumping of steel into Pakistan from countries such as China, Russia, and Ukraine, all of which have excess steel production capacity. The National Tariff Commission (NTC) has imposed anti-dumping duty on import of CRC, HDGC, and PPGI and should continue to further escalate these duties. Under this suggested framework, there should be continuity of the tariff and tax structure in the steel sector. Providing sufficient tariff protection along with continuing the Regulatory Duties (RDs) will allow the steel industry to utilize installed capacity and increase its production.

The Pakistan Steel Mill – A Brief

Pakistan envisioned development of indigenous steel production in its first Five Year Plan (1955-1960). The public sector undertook the development of steel industry by formation of Pakistan Steel Mills Corporation as a private listed company in the public sector in 1968. Pakistan signed an agreement with the USSR in 1971 on the basis of a feasibility report. USSR agreed to provide financial and technical assistance in the establishment of a steel mill in Karachi. With support from Soviet expertise, the construction for the PSM was underway in 1973 and the project was eventually completed in 1985. The PSM has a capacity of producing 1.1 million tons of flat steel products and billets per annum. While the foundation of steel industry in Pakistan was laid by the public sector, it has become completely dormant in the last couple of years and the private sector has taken over domestic production of steel goods. The debilitation of the public sector enterprise is accentuated by accumulated losses of USD 3.5 billion by the PSM and it has not been operational since June 2015. Regulatory Duties on HRC and Alloy HRC were imposed in 2014-15 to revive the PSM and a Rs. 18 billion bailout package was granted during the same period. However, declining international steel prices from October 2014 to Jan 2016, operational inefficiencies, and a massive backlog of investment in balancing, modernization and replacement (BMR) ultimately led to the failure of the bailout package. The revival of PSM seems highly unlikely at this juncture since there hasn't been any upgradation in its machinery and technology, while cheaper imports and private sector production have rendered it uncompetitive. The products being produced at PSM are not in line with current industrial requirements. For instance, the hot rolling and cold rolling mills are only able to produce only 15-ton coil as opposed to the average size of 25-ton coil, which limits throughput and hence productivity. Furthermore, PSM is unable to produce HRC in cold-rolling/galvanizing quality which is required to fulfill the bulk of Pakistan's HRC requirement.

Box 4: A brief on state of PSM

Sources: Pakistan Steel Mills, Our History. Retrieved from http://www.paksteel.com.pk/organ_our_history.html; and Information provided by representatives of the steel sector

PETROCHEMICALS

Petroleum based products serve as fuel and raw material for many industries, and indigenizing the production of petrochemicals will benefit Pakistan's industry by providing stable, secure, and cheaper inputs for production.

In addition to being used as a fuel, derivatives of crude oil also form the raw material to create synthetic products such as rubber and plastic, both of which form base materials needed in export oriented industries suggested in this study. Furthermore, man-made fibers are a derivative of petrochemicals, and localization of this industry will support diversification in the textiles sector as well.

Localizing petrochemicals requires installation of a modern large scale oil refinery in Pakistan, since the existing refineries have very limited capacity to process sufficient volume of crude oil, and are based on obsolete technology. The refinery complex should be setup in conjunction with a "Naphtha Cracker". The cracker uses naphtha, a byproduct of crude oil as its raw material to further distill out hydrocarbons used in producing synthetic materials such as plastic and rubber. Since the demand for petro-based products is increasing with changing consumer preferences for synthetic products, localizing them will help lower the pressure on Pakistan's external account. Pakistan is exporting a small volume of plastic goods and with further localization, such exports have the potential to grow. More importantly, localization of plastics and rubber will support development of high value added and sophisticated goods outlined in this study.

Increasing Local Production of Petroleum Products

Increasing Local Refining Capacity

Increasing capacity to refine crude oil will help meet the domestic demand for petroleum products and in process, it will help reduce the import burden. Petroleum products were the second largest item on Pakistan's import bill in 2017, equivalent to USD 10.5 billion dollars and about 25 million tons of petroleum products were imported.[39] According to Oil Companies Advisory Committee (OCAC), Pakistan's crude oil processing capacity is about 10.5 million tons.[40] The refineries in Pakistan on average process 30 million barrels of local and roughly 65 million barrels of imported crude oil annually.

	Crude Oil Imports (000 barrels)	Local Crude Extraction (000 barrels)
2007-2008	64,912	25,603
2008-2009	62,115	24,033
2009-2010	53,081	23,706
2010-2011	51,306	24,041
2011-2012	47,104	24,573
2012-2013	57,037	27,841
2013-2014	61,933	31,585
2014-2015	64,208	34,490
2015-2016	66,855	31,652
2016-2017	66,737	32,369

Table 5: Crude Oil Import and Local extraction
Source: Pakistan Economic Survey 2017/18

Since the bulk of Pakistan's imported oil (about 14.5 million tons) is unrefined, it justifies the establishment of a large scale oil refinery complex in Pakistan. There are bilateral discussions underway with foreign governments to establish a refinery complex in Gwadar port city. Establishment of such a complex will bolster local production capabilities and help reduce pressure on the current account.

[39] ITC Trade Map database. This does not include gaseous products.

[40] Retrieved from Oil Companies Advisory Council (OCAC). The conversion of tons to barrels varies due to a number of factors and we can presume that the refineries in Pakistan are operating at a high capacity.

Exploring Opportunities to Extract Local Shale Gas/Oil

In addition to local oil reserves, Pakistan has substantial amounts of shale gas /oil reserves that it should prioritize for extraction. The US Energy Information Assessment placed Pakistan's shale oil reserves at 105 trillion cubic feet of wet shale technically recoverable resources (TRR) in 2013. The TRR of shale account for 1.5% of the total global estimated reserves.[41] There has been some progress made in oil exploration and reportedly ExxonMobil has acquired 25% shareholding in offshore drilling within Pakistan, along with 25% shareholding each of Oil and Gas Development Company (OGDC), Pakistan Petroleum Limited (PPL), and ENI (an Italian energy firm). [42] Since hydraulic fracking, a process through which shale oil is extracted, is a very costly process – shale oil extraction is only feasible when the international oil prices are high. Since global oil prices are gradually recovering after the oil market crash in 2014, extraction of local shale will be viable and beneficial for Pakistan's economy.

It is interesting to note that Guar gum, one of the raw materials used in extraction of shale gas & oil is indigenous to the sub-continent. Pakistan produces around 10% of total Guar grown in the world, and at its peak in 2013, Pakistan exported around USD 120 million worth of Guar/Guar gum. Its use in shale production caused a surge in its price from PKR 13/kg in 2008 to PKR 450/kg in 2011.[43] 80% of guar in the world is grown by India; it exported USD 3 billion worth of the Guar/Guar gum in 2013.[44]

[41] Technically Recoverable Shale Oil and Shale Gas Resources: An assessment of 137 shale formations in 41 countries out of the United States, U.S Energy Information Administration. June 2013.

[42] https://tribune.com.pk/story/1721191/2-exxonmobil-acquires-25-stake-offshore-drilling-pakistan/

[43] Abbasi, A. H. 2014. Shale Oil and Gas: Lifeline for Pakistan. Sustainable Development Policy Institute.

[44] Some sources have attributed exports to USD 5 billion. The USD 3 billion is extracted from ITC Trade map HS Code: 130232

Localizing Naphtha

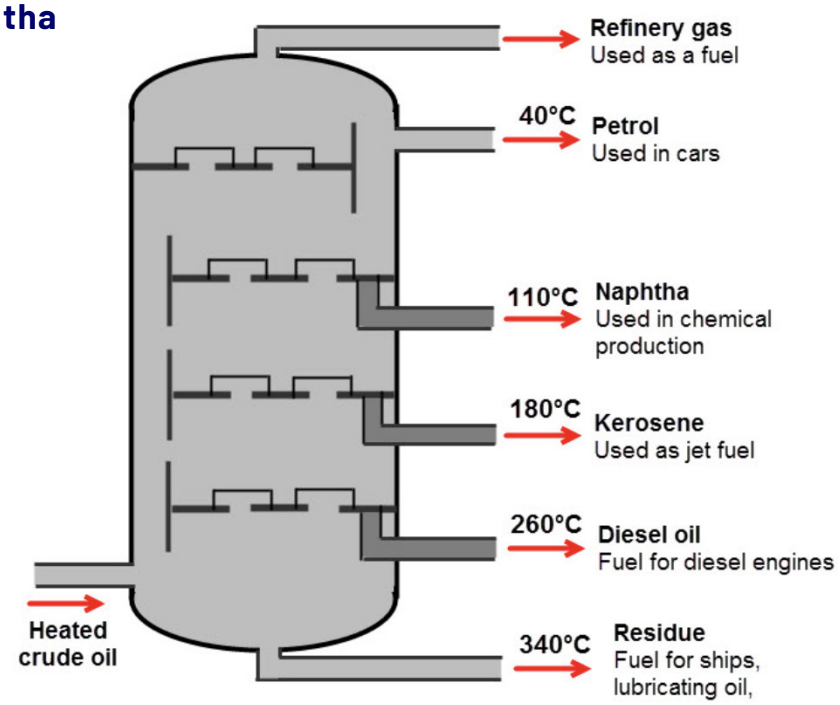


Figure 12: Distillates of Crude Oil

Naphtha is the raw material for production of plastics and rubber and it is one of the byproducts of crude oil (see Figure 12). Pakistan should install a naphtha cracker alongside the proposed refinery. The Cracker would be able to produce condensates that can be utilized to provide raw material for the plastic and rubber industry in Pakistan (see Figure 13 and 14). It is worth mentioning here, that considerations for installing a naphtha cracker have been previously made, and it requires massive capital investment. It becomes more viable alongside a petroleum refinery complex. The Government, in partnership with the private sector should seek international investment opportunities to develop this complex. Since Pakistan does not have naphtha cracking capabilities, naphtha condensates from local crude are being exported. On average, a barrel of crude oil produces 43% petrol, 23% diesel, 9% kerosene, 5% coke, etc. and only 1% of other products including naphtha.[45] With production and access to condensates of local naphtha, it is likely that Pakistan will witness a surge of vendor industries, particularly in plastics industry. This will create a number of employment opportunities as well. In the long run, this investment will help expand the product space through provision of sustained cheaper product range of localized goods.

Catering to Local Demand for Plastics

Production of plastics in Pakistan will be very beneficial to the economy, both as a source of cheap raw material for the industry and for reducing burden on the national exchequer. Articles of plastic are classified into seven categories, and there is a market and demand for all such products in Pakistan. In addition to its utilization in consumer goods, plastic is an important product in industrial manufacturing processes such as packaging, electronics, auto, and textile sector, all of which would benefit from local production.

[45] https://energyeducation.ca/encyclopedia/In_a_barrel_of_oil. Naphtha and gas oil refinery outputs also depend on the composition of the feed of crude oil which may vary from where it is extracted.

Opportunity to Expand Production – Lotte Chemicals

Lotte Chemical Pakistan Limited (LCPL) is the only PTA manufacturer in Pakistan and has a capacity to produce 500,000 MT annually. This PTA plant located at Port Qasim was set up by ICI in 1998 and was the largest FDI of that time. The PTA Plant has since then supplied a major raw material to local textile and packaging industries, which has subsequently assisted in enhancing investments and exports in these sectors. While the country has significantly benefited from this investment, unfortunately, this plant kept incurring losses due to high infrastructure costs and lower tariff protection compared to the region. In 2008 when the previous Government reduced the import duty on PTA from 15% to 7.5%, ICI decided to divest from the PTA Business and it was purchase by LOTTE.

Since the acquisition LOTTE has invested over $70 million in LCPL to improve the efficiency and operational costs with the desire to turn around this business into a profitable venture. However, unfortunately, the government further slashed the PTA tariff to mere 3% in 2010 making production of PTA one of the least protected sectors of the economy. Since then LCPL has been fighting for a level playing field with the region and finally the tariff protection was adjusted to 5% in 2016.

Even after 20 years since its startup LCPL remains the only PTA producer in Pakistan while in China and India the PTA capacities have grown by manifolds due to clear and long-term policies followed by their governments. Other key industries in Pakistan like PSF and PET are faced with similar situation which has impeded their growth.

Box 5: PTA Production in Pakistan
Source: CEO – Lotte Chemicals Pakistan

In 2017, Pakistan imported almost USD 2.3 billion worth of plastic polymers - primarily polyethylene, polypropylene – and other plastic goods weighing around 1.1 million metric tons. The demand for plastics is forecasted to increase at an estimated average of 7-9% in the next few years. [46] In addition, Pakistan imported USD 350 million worth of cyclic hydrocarbons which are used in manufacturing of plastic resin. These imports largely composed of paraxylene (PX) - used to manufacture purified terephthalate acid (PTA) – and styrene. PTA is further treated to form PET and polyester, and styrene is used in manufacturing of polystyrene. Pakistan produces about 10% of its total plastic raw materials (in the form of PVC resin, PET resin, and Polystyrene). A couple of companies are exporting limited amount of PET and Polystyrene materials including Gatronova and Diamond Polystyrene.[47] Further localization will help reduce high imports of plastic products and cyclic hydrocarbons and promote development of downstream industries of plastics and related goods.

[46] PAKPLAS Annual Report, 2018.

[47] Ibid.

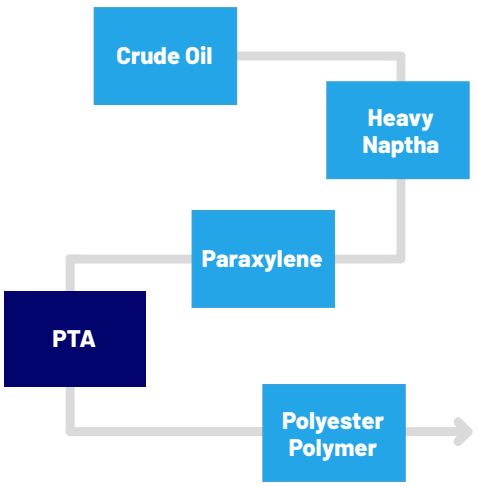


Figure 13: Plastic Production
Source: LOTTE Chemical website

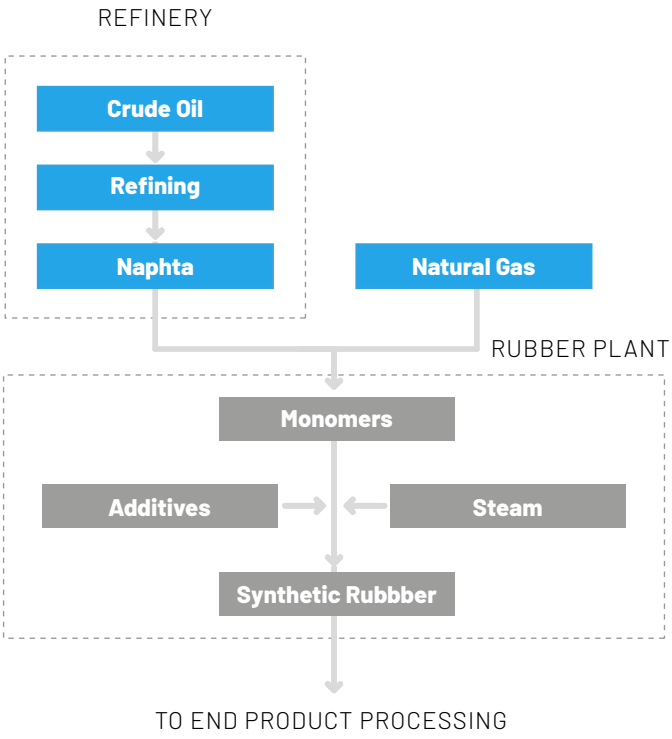


Figure 14: Synthetic Rubber Production
Source: Production of Synthetic rubber, Siemens AG. 2013

Catering for Local Demand for Rubber

Pakistan does not have the capability to produce synthetic rubber which is an important industrial input in certain goods. Pakistan primarily utilizes rubber in the form of tires & tubes. With the surge in demand of automobiles in Pakistan, import of rubber is witnessing a growing demand. The total import of rubber based products in 2017 was around half a billion dollars, out of which USD 350 million were contributed by tyres. Use of rubber in conveyor and transmission belts is also increasing. Additionally, rubber is the raw material in hoses, shoes, belts, matting, flooring, medical gloves, etc.

Type of product	2013	2014	2015	2016	2017
New pneumatic tyres, of rubber	202,581,000	232,783,000	289,866,000	327,631,000	351,175,000
Synthetic rubber and factice derived from oils, in primary forms or in plates, sheets or strip	79,695,000	85,424,000	93,516,000	77,906,000	102,078,000
Conveyor or transmission belts or belting, of vulcanised rubber	13,123,000	17,207,000	16,497,000	17,556,000	20,844,000
Inner tubes, of rubber	2,703,000	2,622	2,836,000	3,167,000	5,976,000
Total	298,102,000	338,036,000	402,715,000	426,260,000	480,073,000

Table 6: Import of Rubber Products (USD)
Source: ITC Trade Map Database

With a naphtha cracking facility in place, Pakistan should aim to produce its own rubber and capacity to produce high quality tyres. In order to be export oriented in the auto sector, producing high quality tyres and rubber will make the auto sector more competitive. There is only one large scale manufacturer of tyres catering to passenger tyres, tractors, trucks and buses, while seven vendors are making tyres for two and three wheelers. Pakistan needs to be able to produce its own tyres, since most of its tyres are imported (many through illegal channels).

Kumho Tyres, a South Korean company, has announced a joint venture with Century, under which production facilities of one million tyres per annum will be established in 2018. Other such initiatives should be encouraged to develop local rubber manufacturing.

TRANSPORTATION AND LOGISTICS

The transportation infrastructure in Pakistan is weak and needs significant upgradation in order for it to provide impetus for sustained industrial growth. The channels of transportation in Pakistan include rail, road, air, ports, and inland waterways. The physical infrastructure in most of these modes is either weak, non-existent, or has capacity constraints to ship high volumes of freight. The new road infrastructure being developed under the China-Pakistan Economic Corridor (CPEC) project has added significant new capacity for freight haulage by road. Greater industrial production and output will require significant improvements in transport of freight within and out of the country.

Railway networks are an efficient and primary form of freight transportation in many parts of the world, but it is underutilized in Pakistan. Pakistan's railway network is spread over 7,791 kilometers and connected with all major industrial hubs. Railways is considered a cheap and effective mode of transportation for freight in many advanced economies. Unfortunately, Pakistan has witnessed deterioration in freight transportation through rail. Only about 2% of total cargo in Pakistan is transported through this mode, which is significantly lower than in many advanced economies. As a comparison, France utilizes its rail network for around 40% of its inland cargo transportation. Deployment of goods through the rail network is not only cost efficient for the industry, but it also reduces the stress on existing road networks which already have substantial pressure from commercial and passenger transportation. The dilapidated state of the railway network is primarily due to low investments in the rail infrastructure, operations and human capital. The Government needs to address issues related to railway operations and make it a viable and convenient method to ship goods across the country. [48]

[48] National Transport Policy of Pakistan (2017)

The current freight volume in Pakistan is around 180 billion tons' kilometer (tkm) and most of it is transmitted through the road network. Projected growth in vehicle and freight demand will put additional pressure on this channel of transportation, and congestion on roads in the future is likely. Trucks are currently the primary mode of freight transportation. Despite the growing demand of goods across the country, the fleet of trucks in Pakistan is limited. One of the major contributing factor to this is the high cost of purchasing trucks. The leasing cost for these vehicles is high, at a 15 percent markup. Apart from the high upfront capital needed for down payment, leasing requires a collateral that many buyers of trucks don't have available, creating an informal leasing market. The informal sector charges around 40% markup which makes it a very risky investment, creating a high cost of entry in the transportation sector. Providing loan products for purchasing trucks could be considered for providing a boost to the transportation sector.

Air freight is in its nascence in Pakistan. Low volumes of air travel and the lack of adequate number of aviation companies in Pakistan makes it very costly to ship goods, especially perishable items. The industry should be able to ship goods in and out of the country in an expedient manner and cargo terminals should be upgraded at major airports of the country. The newly established Islamabad International Airport provides an ideal location for establishment of a modern cargo terminal and modern warehouse facility, due to the availability of land in its vicinity, along with Karachi Airport due to the large production facilities located in the city. In collaboration with shipping companies, warehousing facilities can be established. These would include cold storage units for perishables food, open warehouses, loading and unloading docks, and an expedient clearing system for inbound & outgoing cargo. Investment and installation capacity at these terminals can be calibrated according to the annual throughput of the cargo facility. [49]

An option worth considering to reduce pressure on the road infrastructure and cargo vehicles in the future is to transport petroleum products through pipelines. Currently, 37 percent of petroleum products are transported through pipelines and 61 percent are carried by road. This would also contribute in reducing road hazards through oil spills and accidents.[50]

The inland waterway operations in Pakistan are almost non-existent and can be developed as a mode of transportation. They can provide an cost effective mechanism for goods to be ferried across waterway systems between rural regions for agricultural and industrial produce. One constraint in developing such a network is the seasonal flow of water and the dry periods. Regardless, there are a number of water ways which can be utilized to ferry goods inland and reduce pressure on other modes of transportation. As an ongoing initiative in Punjab, a pilot project is being undertaken to carry out inland waterway transportation between Attock and Daud Khel. With the right form of incentives, the Government can develop this mode of transportation as well. [51]

[49] Air Freight: A market study with implications for Landlocked Countries. Transport Papers. World Bank Group. 2009

[50] Ibid.

[51] Ibid.

TECHNOLOGY AND INNOVATION

Growth of manufacturing industry in the long term will have to be assisted with supporting technology services. While the Information Technology sector is performing well in providing services for enterprise software development, marketing, financial services, and retail amongst other things, there is little synergy between the industrial development and technology innovation in Pakistan. To graduate beyond existing manufacturing processes and to achieve scale, developing local capacity for innovating industry focused technology is important. Such capacity would involve creating linkages between the industry and technology centers, establishing specialized industry led Research and Development (R&D) centers, and training technical human resources. Research institutes and the industry should be encouraged to work in tandem to provide education and training to develop a workforce that has the potential to be absorbed readily into the industrial complexes of Pakistan. The Government should support the establishment of R&D facilities by giving tax breaks on R&D expenses by the industry.

Advancements in technological standards do not evolve in isolation. Dedicated plans and support structures have to be developed to acquire industrial technology. All the advancing economies have invested heavily in R&D, and Pakistan should aim to do so as well. The new industrial wave will take over the world in the near future – it will be disruptive with significantly higher automation. In formulating it strategies, Pakistan should gear itself to harness its technological research toward innovations in Pakistan's industry.

With China amongst other advanced industrial economies looking to implement the new wave of industrial development, Pakistan should seek to integrate mid-tier technology in its manufacturing capabilities such as designing chips and embedded software. It may be noted that India's IT ministry

has prepared its Electronics Policy of 2012, highlighting the integral role of this sector in building higher electronic and technology content into industrial organization and future products. There are opportunities for integration of Technology and Innovative services in all the aforementioned sectors of automobiles, food processing, electronics, and warehousing. All these sectors can benefit from a closed loop recycling manufacturing, metallic 3D printing technologies, bio-based plastics and advanced green materials and packaging.[52]

Beyond its scope in industrial outlook, further development of the IT sector will help create and sustain a highly skilled workforce and nurture an ecosystem of innovation. IT and IT Enabled Services (IT-ES) are vital for positioning Pakistan in the digitally-enabled global economy. Besides boosting productivity, reducing costs and making it easier to do business, provided further incentives to export, the sector can generate up to four-times the current level of exports.

[52] For further reading, refer to World Economic Forum's White Paper: Driving the Sustainability of Production Systems with Fourth Industrial Revolution, January 2018.

Shifting Government Policy Towards Industrialization

In order to encourage industrialization in Pakistan, concentrated efforts are required by both the private and the public sector. In order for Pakistan to achieve manufacturing levels similar to its neighboring economies, it would require a breadth of reforms and cognizance of its importance from all facets of the economy and dedicated planning. Localization and technological development cannot take place in isolation. Lessons learnt from all the NIEs in Asia are a testament to the directional approach needed to facilitate industrial growth from an inward looking economy, towards propelling exports over an envisioned course of time. While it may be argued that Pakistan's industry received high level of protection and Government patronage in the past, it must be taken into consideration that the industry collapsed after nationalization and has not recovered in the post-nationalization era. There is immense room and potential for the industry to grow and mature; most of it is predicated upon having policy alignment in promoting indigenization and growth in exports.

Apart from the support needed to improve manufacturing in the identified sectors, and to enable product development, the Government should also commit to the following:

CONSISTENCY IN POLICY

Industries need to be given a consistent policy framework to operate in, with set parameters to measure performance and an assurance to continuity in policy. Policies should not be revised. Inconsistent policy environment reduces investor confidence, and thwarts chances of future investments. Change in policies and tariff structures in an ad-hoc manner disrupts feasibility of operations and investment decisions.

TARIFF RESTRUCTURING

The Strategic Trade Policy Framework of Pakistan 2018-2023, under consideration of the Ministry of Commerce envisions reduction of custom duty for a wide range of products. Reduction of tariffs endangers the production capabilities in Pakistan and encourages imports at the cost of local production. PBC has advocated a cascading structure for tariff duties which are critical to promote localization. In order to further indigenize local production, at the very least, all locally produced goods should have tariff structure similar to regional competitors. The tariff rates for Pakistan under the World Trade Organization (WTO) fall under three major categories: Bounded, Unbounded, Preferential. The bounded rates fall within the range of 5 – 100% for a large majority of items.[53]

[53] Only 67 out of 5200 tariff lines are unbounded (without a maximum defined tariff rate). 15 tariff lines have 150%, and 1 line has 200% upper limit.

Pakistan can strategically place cascading tariffs whilst providing adequate cover to its industry. Although, various FTAs and PTAs may lower the efficacy of such policy provisions, it will still provide space for new industries to mature. Besides, where possible, trade agreements should be renegotiated to promote indigenous production.

REIMAGINING THE FOREIGN DIRECT INVESTMENT (FDI) REGIME

SEZ's in Pakistan should be promoted to become the centers for local and foreign direct investment in the industrialization process. The Government should play a proactive role in ensuring that SEZ's physical infrastructure is high quality and the regulatory framework meets the needs of investors. Physical infrastructure in existing Economic Zones and the future SEZ's should be upgraded on a "plug and play" model, making it easy to establish industrial production facilities. The regulatory environment should be made easy for industry to operate in and comply with, reducing the cost of doing business. Furthermore, the incentives given for industry operating in SEZs should not undermine the existing industry operating out of the limits of SEZs.

Investors should be encouraged to export by providing them targeted incentives for achieving predetermined performance targets. These targets should be tied to the percentage share of production exported and the jobs created by a manufacturer. The investors should be allowed flexible tax holiday incentives (up to 15 years) for setting up manufacturing facilities for new product lines, not being manufactured previously in the country. Duty-free import of capital goods should be allowed for these manufacturers. Furthermore, manufacturing facilities established in SEZs should be mandated to have 49% local ownership, to encourage technology transfer to domestic industry.

SECTION 08

Conclusion

An industrialized Pakistan should be the thrust of the Government's future economic planning and vision. All economies that have made rapid progress have established a vibrant industrial base and continue to further bolster their technological capabilities. While Pakistan had a significant manufacturing base in 1960's, it now has to rediscover its path to industrialization.
Revisiting some of Pakistan's historical accomplishments in industrialization date back to the 1960's when it established its nascent industrial complexes, many of them through state sponsorship by PIDC and other State backed financial institutions. The nationalization and separation of East Pakistan was a major setback to the industrialization process of Pakistan. Revival of the industry in 1990's was again hampered by subsequent trade liberalization. Pakistan now needs to realign its economic policy to promote local manufacturing and indigenization.

Pakistan is de-industrializing, and unless amends are made, Pakistan will be unable to produce sufficient jobs to reduce poverty. It is imperative for Pakistan to shift its focus to developing local capabilities in a number of industrial sectors. In order to do so, Pakistan needs to pursue an industrial framework which provides industry an opportunity to flourish. The eventual goal of such a framework should be to promote diversification in exported products. This research has highlighted industrial sectors and specific products that Pakistan needs to target in order to expand its Product Space and become an export led economy.

This report has identified four industries that, if developed, will enhance Pakistan's competitiveness and help diversify its exports. These include Automobiles, Electronics, Food Processing, and Machine Tool Manufacturing. With the appropriate industrial policies in place, starting with implementing PBC's "Make-in-Pakistan" thrust, growth in high value exports can be achieved. The industrialization process will also benefit from localizing the production of raw materials, in particular steel and petro-chemicals.

Introducing technology, innovation and research in industry is also an important element in improving long term productivity, which can be achieved by creating linkages between the industry, technology companies and specialized research centers. Increasing industrial output and exports also require improving transportation infrastructure and making modern warehousing facilities available in the country.

Manufacturers need to grow exports through an export based incentive regime, which would reward firms exporting high value-added locally manufactured products. In addition to providing targeted and customized incentives to manufacturers, the Government should revise the duty tariff structure to prioritize development of new industries that expand Pakistan's Product Space.

Policy consistency is critical for firms to deploy their investment plans. Disruptions in policies result in decreased production and discourage future investments from wary investors. Price stability should be encouraged, to help form long term expectations and allow a steady environment for decision making for investments and exports.

ABOUT PBC

The PBC is a private sector business policy advocacy forum composed of Pakistan's largest businesses / groups including multinationals that have a significant investment in and a long-term commitment to the growth of Pakistan. Members turnover represents every ninth Rupee of Pakistan's GDP and together the members contribute %25 of the annual tax revenues and exports. More information about the PBC, its members and its activities can be found on our website **www.pbc.org.pk**

The PBC's Member Companies

Abbott
AkzoNobel
Allied Bank
Amreli Steels
Artistic Milliners
Mayfair
Bank Alfalah
Cherat Cement Company Limited
Coca-Cola
Colgate-Palmolive
Central Depository Company
Dalda
Dawood Hercules
Descon
efu General
Engro Corp
Engro Foods
Faysal Bank
Ferozsons Laboratories Limited
Gatron
Getz Pharma
GlaxoSmithKline
Gul Ahmed Textile Mills Limited
HBL
Hascol
Hubco
ICI Pakistan Ltd.
Interloop
International Industries Ltd.


INDUS
GROUP
INDUS GROUP
of companies


TOYOTA
INDUS MOTOR COMPANY LTD.


JDW
JDW Group


JS BANK


Jubilee
GENERAL INSURANCE


KE


K&Ns


LOTTE


LUCKY
CEMENT


Martin Dow


MAHMOOD GROUP


MEGA
MEGA CONGLOMERATE


MFL
MILLAT TRACTORS LIMITED


National
FOODS
SINCE 1970


NAVEENA
GROUP


Nestlé


NISHAT MILLS LTD


ORIX


PACKAGES Limited


pakarab
FERTILIZERS LIMITED


PSL
PAKISTAN SERVICES LTD.


ptcl


PAKISTAN TOBACCO
COMPANY


PHILIP MORRIS
INTERNATIONAL


Qarshi


SAIF GROUP


Sapphire


Shan


SICPA


SIEMENS


Soneri Bank


SOORTY


HUTCHISON PORTS
PAKISTAN


Standard
Chartered


SPEL


TAPAL


TCS


telenor


Tetra Pak


TPLHoldings
Tomorrow Delivered Today


Tufail
Chemical Industries Ltd.


UBL
where you come first


Unilever

The PBC Members by Sector

PBC currently has 76 members, whose businesses cover nearly all sectors of the formal economy. The sector wise representation (in alphabetical order) is detailed below:

Sector	Member Companies
Large-Scale Manufacturing	
Agro Industries	1
Cement	2
Chemicals / Fertilizer	8
Energy	2
Engineering	7
Fast Moving Consumer Goods	15
Packaging Material	2
Pharmaceuticals and Healthcare	6
Textiles	9
Total Members in Large-Scale Manufacturing	**52**
Services	
Financial service	11
Hospitality	1
Insurance	2
Logistics / Courier	2
Telecommunication	2
Utilities	1
Total Members in the Services Sector	**19**
Conglomerates	**5**

28 MNC's from 13 Countries

USA

Abbott

Coca-Cola

COLGATE-PALMOLIVE

PHILIP MORRIS INTERNATIONAL

UK

gsk GlaxoSmithKline

PAKISTAN TOBACCO COMPANY

gsk GlaxoSmithKline Consumer Healthcare

Standard Chartered

Unilever

rb

UBL where you come first

UAE

Bank Alfalah

KE Energy That Moves Life

ptcl

Switzerland

Nestlé

SICPA

Japan

TOYOTA INDUS MOTOR COMPANY LTD.

ORIX

Netherlands

AkzoNobel

engro foods

France

HBL

Bahrain

faysalbank

South Korea

LOTTE

Norway

telenor

Hong Kong

HUTCHISON PORTS PAKISTAN

Germany

SIEMENS

Sweden

PROTECTS WHAT'S GOOD™ Tetra Pak

ANNEX 1 – INTERVIEWS FOR RESEARCH

Sector	Institute	Interviewee & Designation
Automotive	Synthetic Products Enterprises Limited	Mr. Almas Hyder – Chief Executive Officer
	Millat Tractors Limited	Mr. Sikandar Mustafa Khan – Chairman
	Atlas Honda	Mr. Saquib H. Shirazi – Chief Executive Officer
	Pakistan Association Of Automotive Parts & Accessories Manufacturers	Mr. Muhammad Ashraf Shaikh - Chairman
Electronics	Pak Elektron Limited	Mr. Naseem Saigol – Chairman
	Huawei Pakistan	Mr. Ahmed Bilal Masud – Deputy Chief Executive Officer
I.T.	Ignite – National Technology Fund	Mr. Yusuf Hussain – Chief Executive Officer
Petrochemicals	Yunus Brothers Group	Mr. Mohammad Ali Tabba – Chief Executive
	ICI Pakistan Limited	Mr. Asif Jooma – Chief Executive Officer
	Lotte Chemical Pakistan Limited	Mr. Humair Ijaz – Chief Executive Officer
Food Processing	Nestle Pakistan Limited	Syed Yawar Ali - Chairman
Steel	International Steels Limited	Mr. Riyaz Chinoy – Chief Executive Officer
	Amreli Steels Limited	Mr. Hadi Akberali – Chief Operating Officer (Strategy)
Engineering	Rastgar Engineering Company (Pvt) Ltd.	Mr. Imtiaz Rastgar - Chairman
	Engineering Development Board	Mr. Asim Ayaz – Deputy General Manager
Logistics and Warehousing	Transfreight Corporation	Mr. Babar Badat – Director
	E2E Supply Chain Management Limited	Mr. Abid Butt – Chief Executive Officer
Policy Practitioners	Ex- Finance Minister	Dr. Salman Shah
Researchers	N/A	Dr. Iza Aftab, Information Technology University
		Mr. Nazeef Ishtiaq, Information Technology University
		Mr. Ahmed Chaudhry, Punjab Economic Research Institution

The Pakistan Business Council
FOSTERING ECONOMIC GROWTH
(A Company set up under Section 42 of the Companies Ordinance 1984)

8th Floor, Dawood Center
M.T. Khan Road,
Karachi, Pakistan

T: +92 21 3563 0528 - 29
F: +92 21 3563 0530

Ground Floor, Unit No. 7, Block 3001,
Rehmat Plaza, Blue Area,
Islamabad, Pakistan

T: 051-8444008
T: 051-8444009

www.pbc.org.pk