



Enhancing the Competitiveness of Pakistan's Domestic Fan Industry

A Joint Study By

The Pakistan Business Council (PBC)

The Engineering Development Board (EDB)

Pakistan Electric Fan Manufacturers Association (PEFMA)

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The Pakistan Business Council

Overview

The Pakistan Business Council (PBC) is a business policy advocacy platform, established in 2005 by 14 (now 87) of Pakistan's largest private-sector businesses and conglomerates, including multinationals. PBC businesses cover nearly all sectors of the formal economy. It is a professionally-run organization headed by a full-time chief executive officer.

The PBC is a not-for-profit entity, registered under Section 42 of the Companies Ordinance 1984. Though it is not required under the law to do so, the PBC follows to the greatest extent possible, the Code of Corporate Governance as applicable to listed companies.

The PBC is a pan-industry advocacy group. It is not a trade body nor does it advocate for any specific business sector. Rather, its key advocacy thrust is on easing barriers to allow Pakistani businesses to compete in regional and global arenas. The PBC conducts research and holds conferences and seminars to facilitate the flow of relevant information to all stakeholders in order to help create an informed view on the major issues faced by Pakistan.

The PBC works closely with relevant government departments, ministries, regulators and institutions, as well as other stakeholders including professional bodies, to develop consensus on major issues which impact the conduct of business in and from Pakistan. The PBC has submitted key position papers and recommendations to the government on legislation and other government policies affecting businesses. It also serves on various taskforces and committees of the Government of Pakistan as well as those of the State Bank, the SECP and other regulators with the objective to provide policy assistance on new initiatives and reforms.

The PBC's Founding Objectives

- To provide for the formation and exchange of views on any question connected with the conduct of business in and from Pakistan.
- To conduct, organize, set up, administer and manage campaigns, surveys, focus groups, workshops, seminars and fieldwork for carrying out research and raising awareness in regard to matters affecting businesses in Pakistan.
- To acquire, collect, compile, analyze, publish and provide statistics, data analysis and other information relating to businesses of any kind, nature or description and on opportunities for such businesses within and outside Pakistan.
- To promote and facilitate the integration of businesses in Pakistan into the World economy and to encourage in the development and growth of Pakistani multinationals.
- To interact with governments in the economic development of Pakistan and to facilitate, foster and further the economic, social and human resource development of Pakistan.

The PBC's Member Companies





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Acronyms

ADB	Asian Development Bank
ACD	Additional Customs Duty
ATL	Active Taxpayers List
AUP	Average Unit Price
CAGR	Compound Annual Growth Rate
CE	Conformité Européenne
CD	Customs Duty
DB	Doing Business
EDB	Engineering Development Board
EMC	Electromagnetic Compatibility
EMTL	Electrical Measurement & Test Laboratory
FATF	Financial Action Task Force
FBR	Federal Board of Revenue
FDI	Foreign Direct Investment
FOB	Free on Board
FTA	Free Trade Agreement
FY	Fiscal Year
GCI	Global Competitiveness Index
GDP	Gross Domestic Product
HS	Harmonized System
IOCO	Input Output Coefficient Organization
ITC	International Trade Center
JV	Joint Venture
LC	Letter of Credit
LPI	Logistic Performance Index
LTFF	Long Term Financing Facility
MoC	Ministry of Commerce, Pakistan
MoF	Ministry of Finance, Pakistan
MoST	Ministry of Science & Technology, Pakistan
NEECA	National Energy Efficiency & Conservation Authority
NTC	National Tariff Commission
PBC	Pakistan Business Council
PCSIR	Pakistan Council of Scientific and Industrial Research
PEFMA	Pakistan Electric Fan Manufacturers Association
PKR	Pakistani Rupee

PRAL	Pakistan Revenue Automation Limited
RCA	Revealed Comparative Advantage
RD	Regulatory Duty
RoHS	Restriction of Hazardous Substance Directive
RTA	Relative Trade Advantage
SBP	State Bank of Pakistan
SDPI	Sustainable Development Policy Institute
SEZ	Special Economic Zone
SECP	Securities and Exchange Commission of Pakistan
SME	Small and Medium Enterprise
SMEDA	Small and Medium Enterprises Development Authority
ST	Sales Tax
TDAP	Trade Development Authority of Pakistan
TERF	Temporary Economic Refinance Facility
TT	Telegraphic Transfer
TUF	Technology Upgradation Fund
US\$	United States Dollar
WEF	World Economic Forum
WHT	Withholding Tax
WTO	World Trade Organization

Executive Summary

Manufacturing has traditionally played a key role in the economic growth of countries, it also has a multiplier impact on growth through value addition. Pakistan has been witnessing premature deindustrialization with the share of manufacturing having declined from 13.6 percent in 2011 to 12.8 percent of GDP in 2021. Although large-scale manufacturing posted an increase of 9.0 percent, manufacturing in the engineering sector contracted by 25.5 percent between July 2020 & March 2021¹.

To better understand the challenges faced by the manufacturing sector, and to arrest the steady decline in manufacturing's contribution to GDP, the PBC has initiated a series of sectoral studies under its Make-in-Pakistan initiative with an aim to enhance the competitiveness of sectors in which Pakistan has some competitive advantage. As part of this objective, the PBC has signed a Memorandum of Understanding (MOU) with the Engineering Development Board (EDB). The EDB is an apex policy and decision making autonomous body for all aspects concerning the Engineering Industry as per its terms of reference. The primary mandate of the EDB is policy formulation and implementation for facilitating and encouraging development & growth of the Engineering Industry of the country. This report titled "Enhancing the Competitiveness of Pakistan's Domestic Fan Industry" is a joint effort of The Pakistan Business Council (PBC) the Engineering Development Board² (EDB) and the Pakistan Electric Fan Manufacturers Association (PEFMA). This Report is the first in a series of studies for which the PBC and the EDB are collaborating with various sector associations to formulate a set of policy recommendations aimed at enhancing the competitiveness of the particular engineering sub-sector.

Global Domestic Fan Industry

The domestic/household fan generally includes ceiling fans, table fans, pedestal fans, exhaust fans, and wall fans. According to international standards, a fan having a wattage below 125W is categorized as a 'domestic fan'. The global domestic fan industry comprises mainly of ceiling fans, pedestal fans, exhaust fans, and wall fans. Increased electrification, especially in rural areas has contributed to a growth in demand of the domestic fan market globally. A rise in disposable incomes along with global climate change has also boosted demand for domestic fans. Disposable fans made out of plastic are popular mostly in regions where the ambient temperature remains low such as Europe, however, durable fans made mostly from metal are more popular in hotter regions such as Asia, Africa and the Middle East.

The global household³ fan market has been expanding with domestic fans worth US\$ 6.1 billion sold in 2020. The industry has posted a compound annual growth rate (CAGR) of 11.3 percent between 2016 and 2020 and sales are expected to touch US\$ 7.7 billion by 2023. China is the dominant domestic fan supplier with a global export share of 77.6 percent in terms of value. China is followed by Malaysia (2.9%), Taipei; Chinese (2.1%), Germany (1.6%), and others. The top domestic fan importers in 2020 included the USA (35.3%), Japan (5.3%), Germany (4.0%), France (3.1%), Korea (2.9%), among others.

Pakistan's Domestic Fan Industry

Pakistan's domestic fan industry is primarily concentrated in the Gujrat and Gujranwala regions of Punjab and both these regions account for nearly 90.0 percent of the domestic fans' manufacturing capacity. The overwhelming concentration of the industry and its vendors in these two clusters has rendered setting up manufacturing facilities in other parts of the country unviable – in short, location has become a major entry barrier to the industry. The structure of the industry is sharply fragmented with the six largest companies accounting for around 40 percent of the total annual production.

The source of dominance of the larger companies can be attributed to better technology, efficient management systems, branding, a strong distribution network and a skilled and experienced workforce. The industry has a

¹ Pakistan Economic Survey, 2020-21

² The Engineering Development Board is an apex government body under Ministry of Industries & Production entrusted to strengthen the engineering base in Pakistan.

³ The terms household and domestic for fans have been used interchangeably in this report

production capacity of around 8-10 million units per annum and currently employs around 190,000 workers. Urban population growth, improvements in access to electricity, housing sector growth, climate change, and the introduction of solar as well as DC inverter fans are the major growth drivers for the domestic fan industry in Pakistan.

The total value of exports of the domestic fan industry was USD 24.9 million in 2020. Major export destinations for Pakistan's domestic fans included Iraq (21.1%), Bangladesh (16.7%), Oman (14.5%), UAE (14.3%), Yemen (9.6%), and others in 2020. Exports in Financial 2021 amounted to USD 32.0 million.

Value Chain Analysis

From sheet cutting to final testing and packaging, the production of a domestic fan requires around ten distinct steps once the raw material is procured. Most of the raw material requirements of the industry are met through local vendors, who also in most cases import the primary raw materials. Quality checks include power consumption tests, revolutions per minute, electric current flow, and air delivery. The industry, on average, adds value of between 35 to 40 percent as mentioned by industry participants.

Potential Export Markets for Domestic Fans

For the purposes of this Study, the potential export markets have been first sorted based on their regional similarities and then further bifurcated into those having intensive or extensive margins⁴. The European markets have remained largely untapped for domestic fan exports from Pakistan. Although domestic fans from Pakistan face zero tariffs, non-tariff barriers are stringent, and difficult to comply with for exports to the EU market for which the estimated export potential⁵ is US\$ 928.0 million. Other top potential markets include countries in Africa, Asia, and the Middle East that have export potentials of US\$ 122.8 million, US\$ 618.8 million, and US\$ 262.0 million respectively. Opportunities are also available under existing trade agreements, domestic fans from Pakistan can be exported under preferential tariffs to China, Malaysia, and Indonesia.

Demand-Supply Analysis

The demand for electric fans has mainly been fueled by the housing sector growth, access to electricity, increase in GDP per capita, the rate of inflation, and urban population growth. The notable supply-side factors include exchange rate, unit wage change, productivity growth rate, and loans to consumer electronics manufacturers. Equilibrium analysis allows examining how demand and supply-side factors are correlated.

Measuring Competitiveness

This study uses a blended approach for measuring competitiveness at the industry level. Interviews of individual domestic fan manufacturers were conducted and this input was used for making inferences about the industry as a whole – this is called a bottom-up approach to measuring competitiveness. The bottom-up approach was supplemented in the second part of the study by comparing global competitiveness indicators to provide estimates for industry-level competitiveness, the second approach is called a top-down approach. The responses of market participants have been systematically structured into the modified Porter's Diamond Model for competitiveness. This is summarized below:

Factor Conditions

Absence of domestic raw materials. Domestic fan manufacturers use 50-60 percent imported raw materials. Electric steel sheets, plastic, copper, aluminum, and printed circuit boards (PCBs) are major raw

⁴ The intensive margin of exports is defined as the opportunities for growth of exports in markets where products are already being exported whereas the extensive margin of exports is the opportunities for growth in new markets.

⁵ The export potential identified is the maximum possible potential for exports into that market and does not reflect consumer preferences as well as the ability of Pakistani manufacturers to meet this demand.

materials imported by the domestic fan industry.

Cost components of domestic fan industry. The cost breakup for the domestic fan industry depending on firm-level efficiencies ranges from: (1) Raw materials ~ 70-80 percent (2) Utilities ~ 2-3 percent (3) Labor ~ 5-7 percent (4) Overheads ~ 10-12 percent.

Absence of skilled labor. There is an acute shortage of skilled labor. Seasonal employment opportunities limit the industry's ability to retain skilled labor.

Demand Conditions

Domestic markets and seasonal business of the industry. The annual demand for domestic fans in Pakistan is estimated to be between 8-10 million units.

Seasonal production of domestic fans peaks between January and July each year.

Market dynamics. The market is segmented into household and institutional consumers.

Consumer preferences. High-end consumers are primarily brand-conscious whereas others are price-conscious. Solar fans are however targeted towards the rural population.

Demand for imported fans. Small quantities of DC fans, plastic fans, battery-operated fans, and decorative fancy fans are currently being imported.

Local market penetration. The penetration rate of the domestic fan is above 95 percent whereas the annual replacement rate is between 2 to 3 percent. It is estimated that, on average, people replace fans every 3 to 5 years.

Related and Supporting Industries

Local vendor industry. The vendor industry is the backbone of the domestic fan industry. Components that are mainly outsourced through vendors include capacitors, guards, blades, body, rotor & stator, ball-bearings, canopies, and others.

Fan Development Institute. . It was established in 2005 with an aim to improve the skill set of workers. However, the facilities and curriculum needs to be upgraded/ updated in consultation with industry.

Local universities and R&D. Industry suffers from a lack of institutional linkages for R&D support for domestic fan industry.

Pakistan Council of Scientific & Industrial Research (PCSIR). The PCSIR complements the domestic fan industry and fulfils some of the testing requirements. However, upgradation is required in order to facilitate EMC and RoHS tests which are mandatory for obtaining CE mark.

Firm, Strategy, Structure, and Rivalry

Domestic fan industry structure. The industry is mainly clustered around small, medium, and large manufacturers. Economies of scale, export orientation, in-house production capacity, and access to import quota for raw materials are distinguishing features of the small, medium, and large-scale manufacturers.

Underutilized production capacity. The average production capacity utilization rate is between 70-80 percent for the domestic fan industry.

Domestic market concentration. Around 40 percent of sales in the domestic market are catered to by the six large manufacturers.

Barriers to entry. There exists high barriers to entry specially for setting up manufacturing units outside Gujranwala and Gujrat as vendors and suppliers of raw materials are mostly located in these two cities.

Government

Unprotected local fan industry. There exists no protection on raw materials exports. There is no restriction on exports of recycled aluminum & copper and this has caused a shortage of these raw materials for domestic manufacturers.

Customs tariffs anomalies. Some of the imported inputs are not rightly classified and are hence subject to high tariffs. Moreover, inclusion of the domestic fan industry in the third schedule of the Sales Tax Act is creating difficulties.

International Factors

Potential export markets. Top potential markets include those in the Middle East, Africa and Europe.

International competitiveness. It is claimed by the domestic manufacturers that Pakistani fans are more durable and competitive in terms of quality than those from India and China. However, they also admit that Chinese fans are priced competitively.

Implications of Pakistan's placement in the FATF grey list. Third-party payment mechanism – i.e., remittances through informal channels has become more difficult. Also, commercial banks require a detailed profile of importers in high-risk countries.

Risks in international businesses. International business exposure has further heightened the business risk. The major sources of risk are counterparty credit risk and exchange rate risk, especially when exporting to high-risk countries.

Barriers to Trade

This section in the study highlights the tariff and non-tariff barriers for exporting domestic fans to identified potential markets. Major non-tariff barrier is certification requirements. The 'CE Marking' for the EU and 'UL Marking' for the US require compliance with stringent testing requirements.

Government Policies and Initiatives

This study also, briefly discusses government policies that are applicable to the domestic fan industry. Except for a few, these policies are not specific to the domestic fan industry but are available for the engineering sector as a whole. The list of relevant SROs and policies are as follows:

- Duty Drawback for Electric Fans (S.R.O. 859(I)/2020)
- Duty and Tax Remission for Exports (DTRE) (S.R.O. 450(I)/2001)
- Drawback on Local Taxes and Levies (DLTL) (S.R.O. 711(I)/2018)
- Electric Sheet Import Quota (S.R.O. 565(I)/2006 & 2014)

- Export Finance Scheme
- Long Term Financing Facility (LTFF)
- Refinancing Facility for Modernization of SMEs
- SME Bank Loan Regime

Strategies followed by Competitor Countries

This section in the study compares the competitive strategies adopted by regional peers i.e., India and China. Generous duty drawback rates under MEIS⁶ and production-linked incentive schemes favor the domestic fan industry in India. Chinese domestic fan industry enjoys a lower cost structure due to economies of scale, availability of raw materials, and domestic testing facilities.

SWOT Analysis

Strengths. The core strength of Pakistan's domestic fan industry includes the industry's capacity to manufacture high-quality durable electric fans which match the demand requirements of consumers in hotter regions. Industry's readiness to adopt technological trends is the other major strength of the domestic fan industry.

Weaknesses. Overcollateralization for loans, high dependency on imported raw materials, unskilled labor, small firm size and lack of marketing and branding are limiting the industry's potential for growth.

Opportunities. The domestic market is growing due to increase in population, urban migration and increasing incomes. Export opportunities for the EU, Africa, and the Middle East as well as penetration of DC and solar fans into the domestic market provide scope for further expansion of the market to cater to increased demand. Global climate change and competitive exchange rates are favorable factors to enter into international markets.

Threats. Volatile raw material prices, export of recycled raw materials, inconsistent tariff regime, and cumbersome tax requirements have all negatively impacted the business environment and are posing a continuous threat to the industry's survival.

Major Findings

- Reportedly, domestic fans manufactured in Pakistan are more competitive than those of India and China in terms of quality. However, Pakistani exporters are not able to offer competitive prices due to the high cost of production and heavy reliance on imported raw materials.
- Major supply-side disruption in the domestic fan industry is being seen due to a shortage of raw materials, especially recycled metals. Scrap from the world is being imported, recycled into aluminum and copper ingots, and then being reexported to China amid a ban on recycling activities in China for environmental reasons.
- Recycled copper, steel, and aluminum are being exported at prices higher than domestic market prices. Exporters are however under-invoicing their shipments, their listed export prices are closer to those that prevail in the domestic markets. Large manufacturers are of the opinion that linking copper and aluminum export prices with London Metal Exchange (LME) could mitigate the problem whereas SMEs suggest a ban on raw material exports to allow them to remain competitive.

⁶ MEIS – Merchandise Exports from India Scheme

- Pakistan's current exports of domestic fans in 2020 were US\$ 24.9 million. There exists an export potential worth US\$ 1,931.6 million (or US\$ 1.93 billion) to the top domestic fan importing countries in the world.
- The local domestic fan industry has successfully substituted imports of direct current (DC) fans as well as solar fans and is now self-sufficient and able to cater to the needs of the domestic market besides catering to exports. Over the last three years, the industry first localized manufacturing of DC fans whereas only a Brushless DC (BLDC) electric motor and Printed Circuit Board (PCB) kit needed to be imported. Now, only PCB kits are being imported for which industry participants are also striving for localization.
- Pakistan's domestic fan industry operates on a seasonal manufacturing cycle and this results in a semi-specialized labor force and unutilized capacity. Access to international markets could potentially help utilize production capacity better.
- Pakistani fans are efficient even in regions where the ambient temperature reaches 50-55°C. Due to such high efficiencies and better revolutions per minute, these fans are more competitive than those of India and China in markets where the climate is relatively hot.

CHAPTER 01

The Global Domestic Fan Industry

1.1. The Domestic Fan – Definition

The term domestic/household fan is generally used to describe ceiling fans, table fans, pedestal fans, exhaust fans, and wall fans. A fan is an electrical device that consumes power to create a circular air motion to generate a flow within the air. An electric fan consists of various parts such as an electric motor, blades, flywheels, rotors, and mechanisms for mounting the fan such as a ball-and-socket system.

According to international standards, a fan having a wattage below 125W is categorized as a 'domestic fan' whereas fans are in the 'industrial fans' classification if the wattage is equal to or greater than 125W.

1.2. Overview of the Global Domestic Fan Market

The global domestic fan market was worth US\$ 6.1 billion in 2020. The market is projected to grow at a compound annual growth rate (CAGR) of 3.93 percent and is expected to be worth US\$ 7.7 billion by 2023⁷.

The global domestic fan market can be segmented by product type, by distribution channel, by end-user, and by geography. On the basis of product type, the ceiling fan segment is expected to continue to dominate in the global market owing to the increasing adoption of ceiling electric fans in the commercial sector across the globe.

Based on distribution channel, the retail segment is expected to dominate the global electric fan market due to increasing bulk demand for electric fans from various sectors. Other distribution channels include multi-brand stores, exclusive stores, and online sales.

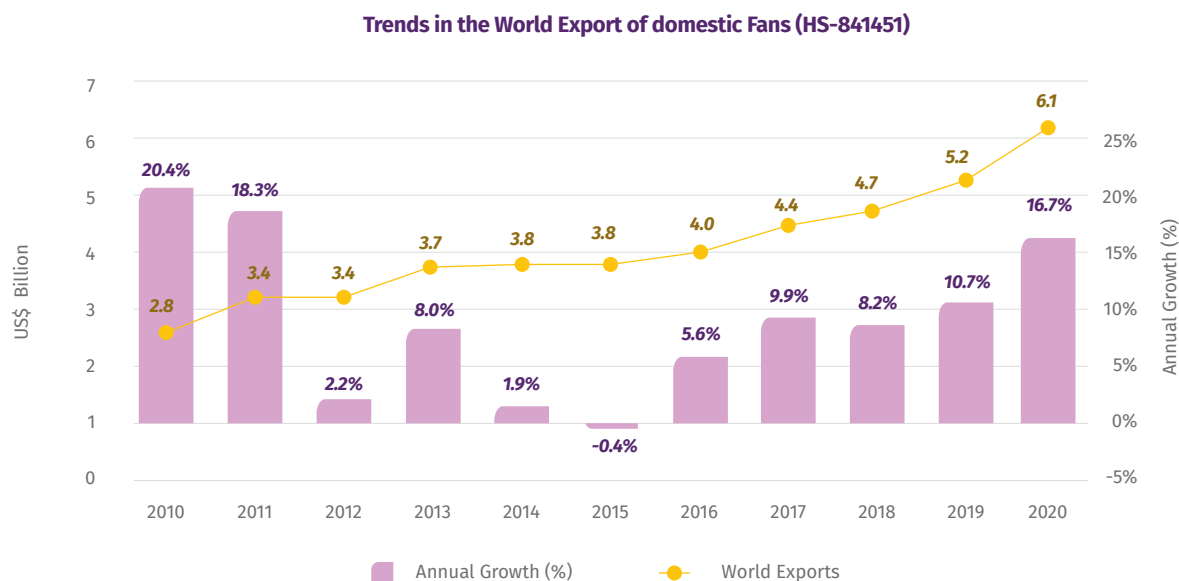
Classification on the basis of end-user demand shows that the household segment is expected to dominate as compared to the commercial segment in the wake of increasing construction activities in emerging markets. In terms of geography, the Middle East and Africa are likely to demand more domestic fans because of the relatively hot climate in both regions and an increase in purchasing power, especially in the case of African consumers. Also, more durable fans as opposed to plastic-made disposable fans are expected to become popular in the European markets as a result of global climate change.

1.3. Trends in World Exports of Domestic Fans

The world's exports of Domestic Fans (HS-841451) have been increasing since 2010 and reached US\$ 6.1 billion in 2020. During the last decade, the highest annual growth in global exports of domestic fans was observed in 2010 with an increase of 20.0 percent. A robust increase in global domestic fan exports was witnessed in 2020 with a growth rate of 16.7 percent despite the COVID-19 pandemic. This seems to indicate that, unlike other home appliances, domestic fans can be considered as consumer essentials.

⁷ <https://apnews.com/press-release/pr-businesswire/6f300641d1e543828a535750dfe9426c>

Figure 1:

Trend in World Exports of Domestic Fans (HS-841451)**1.4. The Top Global Domestic Fan Exporters**

The following table lists the top 15 global exporters of domestic fans (HS-841451) and Pakistan's rank in 2020. China ranked first with an export share of about 77.6 percent followed by Malaysia (2.9 percent), Taipei; Chinese (2.1 percent), Germany (1.6 percent), and the USA (1.6 percent). Pakistan ranked at the 17th position in terms of global exporters of domestic fans with a market share of 0.4 percent with a decrease of 13.6 percent in 2020 as compared to 2019.

Table 1:

Top 15 Global Domestic Fan Exporters

Ranks	Exporters	Export Values in US\$ million			Change 2019-20 (%)	Export Share 2020 (%)	CAGR 2016-20 (%)	Average Unit Price (US\$)
		2018	2019	2020				
	World	4,735.7	5,241.4	6,118.6	16.74		11.3	
1	China	3,405.4	3,830.8	4,745.0	23.9	77.6	12.7	39.6
2	Malaysia	146.0	126.9	175.9	38.7	2.9	11.5	42.0
3	Taipei, Chinese	98.7	122.5	127.4	4.0	2.1	8.6	34.8
4	Germany	90.8	99.1	100.3	1.3	1.6	2.2	102.2
5	USA	106.8	106.4	96.5	-9.3	1.6	0.9	42.0
6	Netherlands	53.1	61.2	86.4	41.2	1.4	32.5	50.5
7	Spain	79.8	77.2	84.0	8.8	1.4	7.9	96.5
8	Thailand	72.6	79.2	73.9	-6.7	1.2	2.2	-
9	Belgium	39.9	52.7	62.4	18.4	1.0	25.6	50.0
10	Mexico	48.2	60.0	57.8	-3.6	0.9	56.0	112.7
11	India	54.4	59.7	57.2	-4.1	0.9	3.9	112.7
12	Hong Kong, China	73.1	64.3	52.7	-18.1	0.9	-11.0	106.2

Table 1:

Top 15 Global Domestic Fan Exporters

Ranks	Exporters	Export Values in US\$ million			Change 2019-20 (%)	Export Share 2020 (%)	CAGR 2016-20 (%)	Average Unit Price (US\$)
		2018	2019	2020				
13	Viet Nam	20.3	26.3	46.5	76.9	0.8	28.1	-
14	Ukraine	36.1	36.7	39.5	7.6	0.6	6.5	80.8
15	Italy	29.4	34.8	33.4	-4.0	0.5	9.6	104.8
17	Pakistan	26.7	28.8	24.9	-13.6	0.4	-1.0	116.2

Source: ITC Trade Map

The stacked area chart below illustrates the trend across the top exporters of domestic fans. A sharp rise in Chinese exports of domestic fans is visible which is followed by those of Malaysia, Taipei Chinese, Germany, and the US. Hong Kong's share has reduced whereas Malaysia has significantly increased its share in global exports over the period 2009-2020.

Figure 2 :

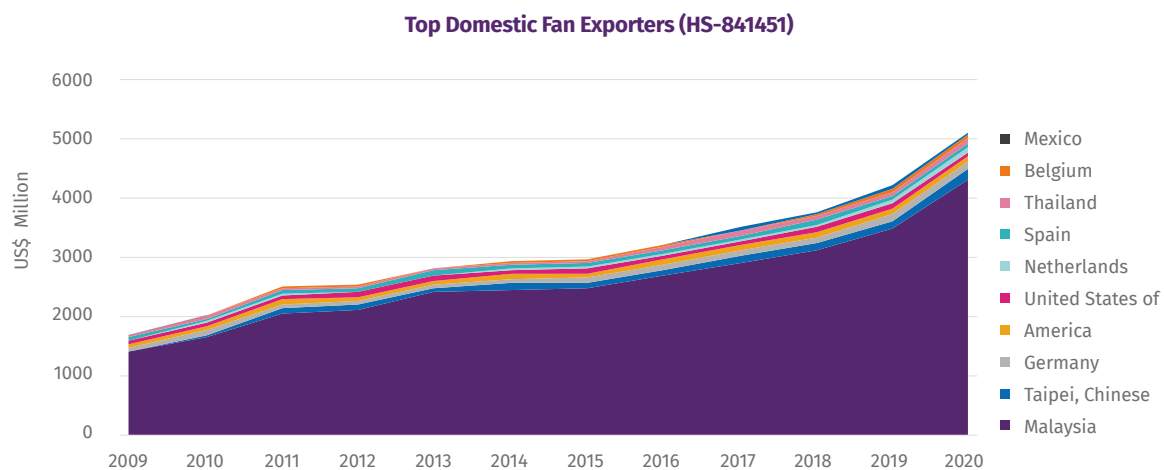
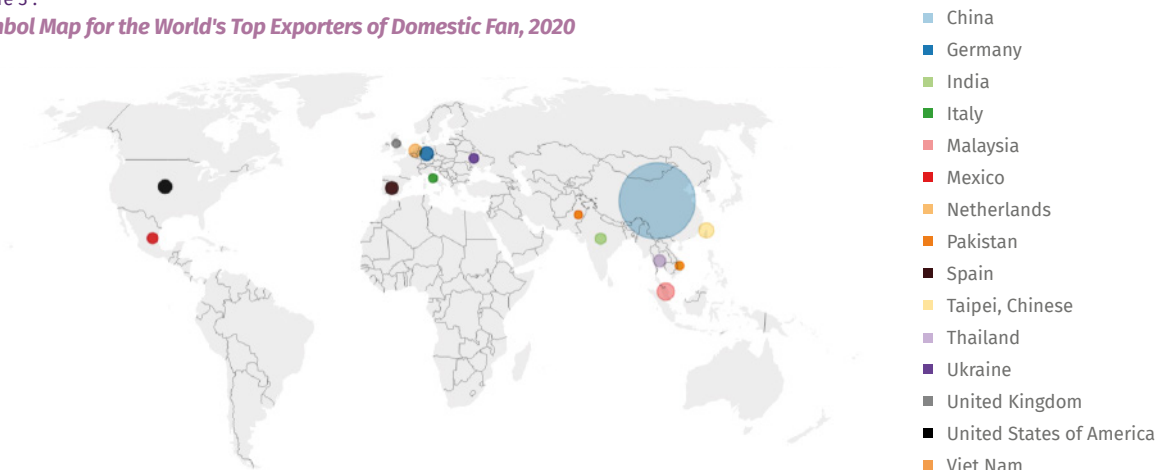
Top Domestic Fan Exporters - Stacked Area Chart

Figure 3 shows the major exporters of domestic fans. The size of the circles on the map is proportionate to the value of exports. A cursory look shows that China is the largest exporter of domestic fans whereas other notable exporters include Malaysia; Taipei, Chinese; Germany, and the US.

Figure 3 :

Symbol Map for the World's Top Exporters of Domestic Fan, 2020

1.5. The Top Global Domestic Fan Importers

The table below lists the top 15 global domestic fan importers along with Pakistan's ranking. The USA accounted for 35.3 percent of global imports of domestic fans in 2020 followed by Japan (5.3 percent), Germany (4.0 percent), France (3.1 percent), and Korea (2.9 percent).

Pakistan ranked at 90th position as a global importer and has been witnessing a decline since 2016 with an average growth rate of -24.5 percent per annum. A decline in imports can be attributed to import substitution and the domestic industry's adaptability to changing trends.

Table 2:

Top 15 Domestic Fan Importers in the World

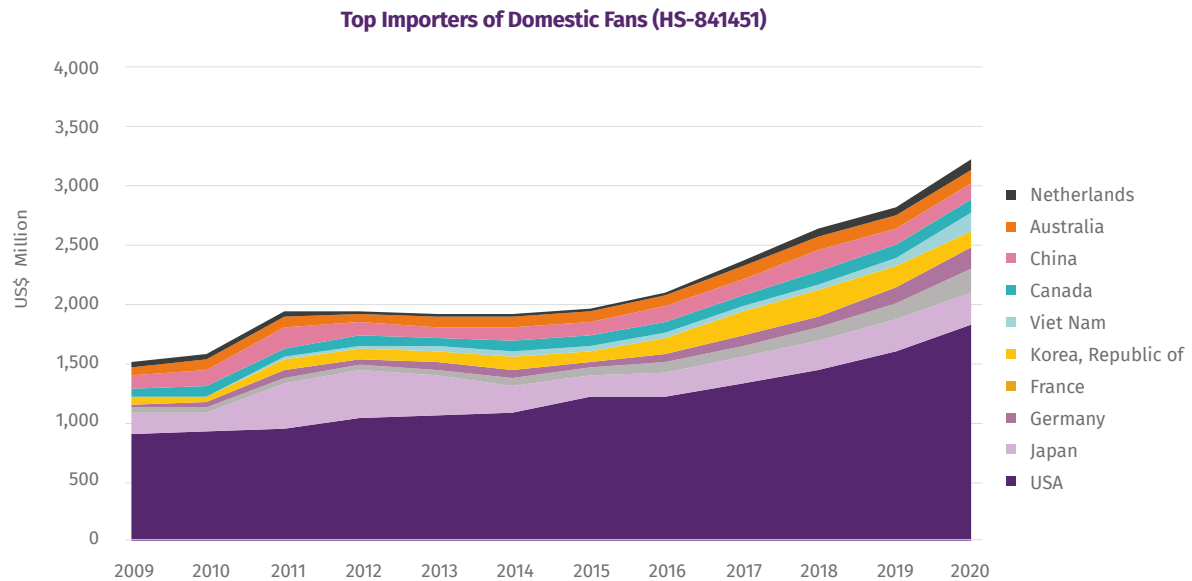
Ranks	Exporters	Export Values in US\$ million			Change 2019-20 (%)	Export Share 2020 (%)	CAGR 2016-20 (%)	Average Unit Price (US\$)
		2018	2019	2020				
	World	4,826.4	5,134.2	5,678.8	10.6	8.9	-	-
1	USA	1,589.3	1,746.1	2,002.2	14.7	10.6	35.3	26.0
2	Japan	271.1	300.6	303.7	1.0	8.2	5.3	66.8
3	Germany	119.3	167.1	226.7	35.7	23.4	4.0	46.0
4	France	108.3	130.5	178.1	36.5	21.3	3.1	46.8
5	Korea	227.5	206.7	166.0	-19.7	5.3	2.9	47.1
6	Canada	126.9	129.9	136.2	4.9	6.6	2.4	24.0
7	China	195.8	154.1	134.0	-13.0	0.1	2.4	281.3
8	Australia	130.6	122.1	126.9	3.9	5.8	2.2	20.0
9	Netherlands	59.3	76.0	117.1	54.2	33.1	2.1	44.2
10	Spain	96.3	89.2	115.6	29.5	12.4	2.0	42.7
11	Mexico	115.3	117.7	108.0	-8.2	3.8	1.9	15.0
12	United Kingdom	99.5	127.4	103.2	-19.0	13.2	1.8	45.2
13	UAE	78.1	68.7	82.8	20.5	15.4	1.5	-
14	Saudi Arabia	20.6	41.7	82.2	97.2	14.9	1.4	38.0
15	India	102.1	114.2	80.2	-29.7	3.5	1.4	75.2
90	Pakistan	15.7	6.2	4.7	-24.5	-36.4	0.1	35.0

Source: ITC Trade Map

The stacked area chart shown below portrays the trend across the world's importers of domestic fans over the period 2009-2020. The United States of America remained a major import destination and has posted a steady growth since 2009. Import substitution and export orientation of domestic fans are evident in the case of China.

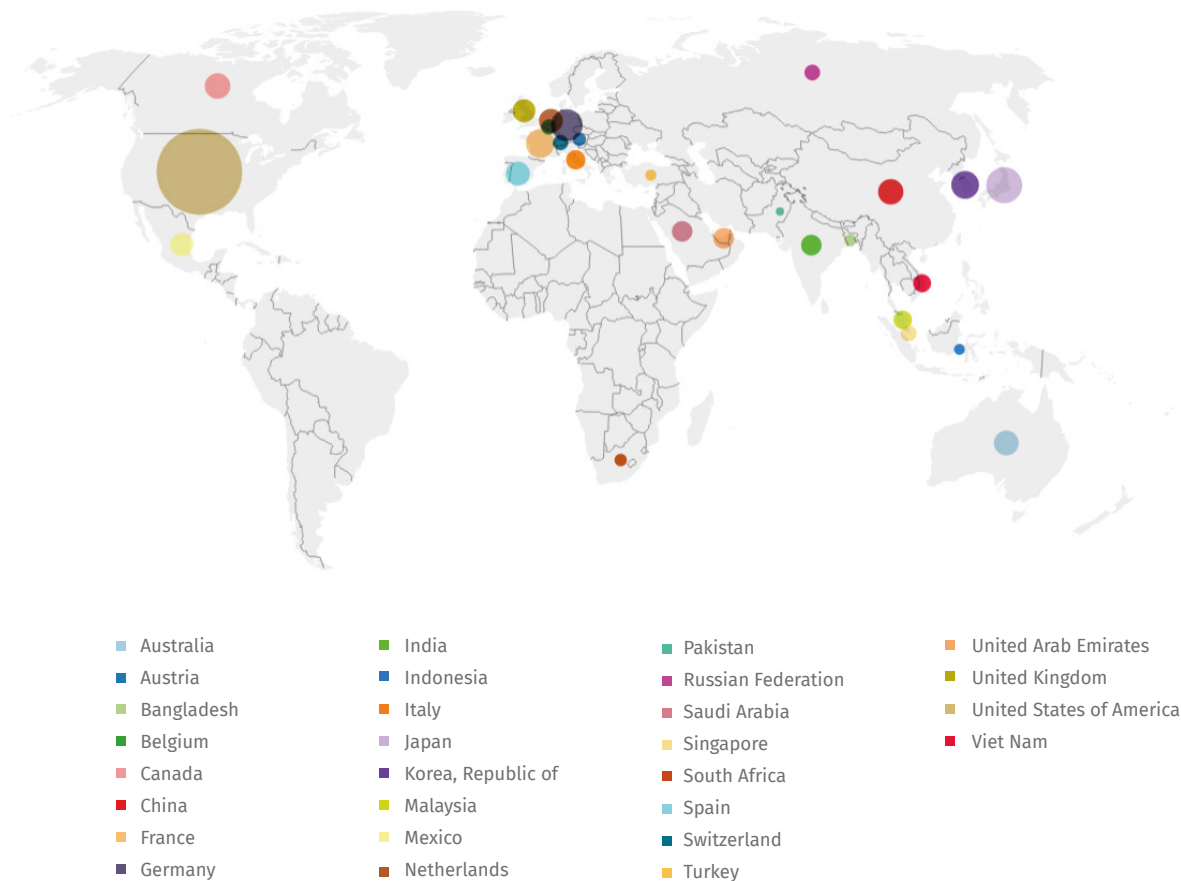
Figure 4 portrays the trend across the world's importers of domestic fans over the period 2009-2020. The United States of America remained a major import destination and has posted a steady growth since 2009. Import substitution and export orientation of domestic fans are evident in the case of China.

Figure 4 :

Top Domestic Fan Importers - Stacked Area Chart

The figure below shows the major importers of domestic fans in 2020. A larger circle for the US reflects a bigger import share relative to other countries. Other major importers include Japan, Germany, France, and Korea among others.

Figure 5 :

Symbol Map for the World's Top Domestic Fan Importers, 2020

CHAPTER 02

Pakistan's Domestic Fan Industry



2.1. Overview of Pakistan's Domestic Fan Industry

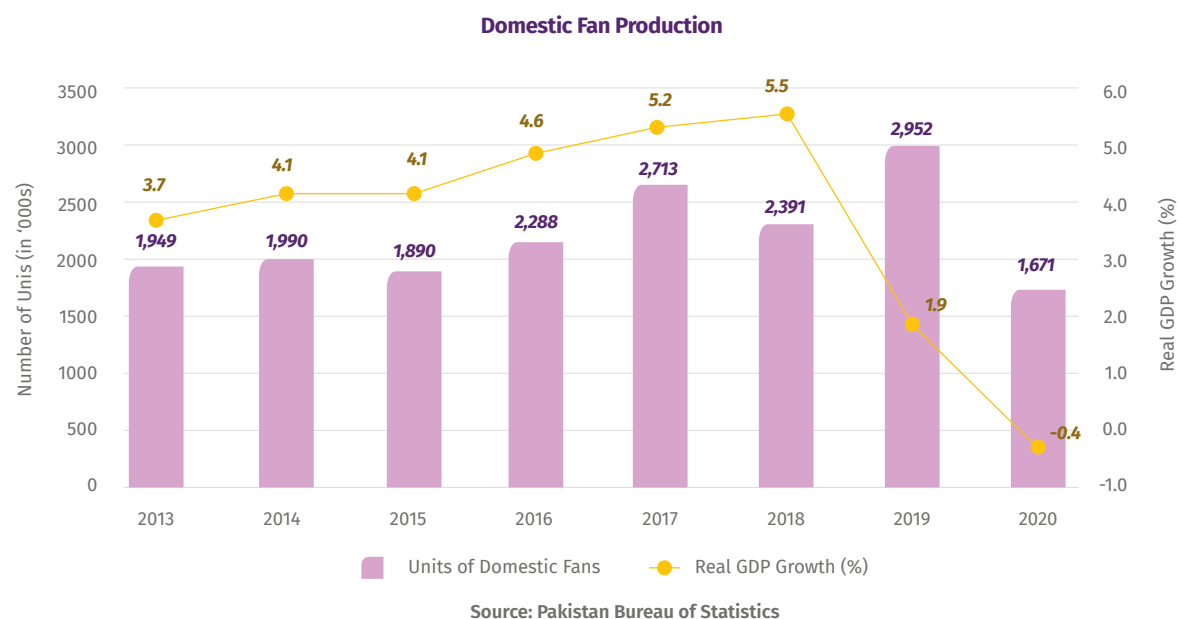
Fan manufacturing is a part of the light engineering sector and is among one of the oldest industries of Pakistan. The fan industry in Pakistan has its origins before partition and has existed since 1942. The fan industry is mainly clustered in four major cities namely Gujrat, Gujranwala, Lahore and Karachi. However, 90 percent of the country's domestic fan production is centered in Gujrat and Gujranwala. Due to the development of vibrant clusters around these two cities over the years, firms operating in these clusters have been benefiting from external economies such as easy access to raw materials with over 700 vendors operating within the area. Vendors mainly supply a range of components such as castings, blades, guards, down rods; accessories including plastic, rubber, electric parts, and sub-assemblies including electric motors to fan manufacturers in Gujrat and Gujranwala. Around 300-350 domestic fan manufacturing units are currently operating in Pakistan (270 units are registered with PEFMA) and which contribute 0.3 percent to the national GDP and 0.15 percent to exports. The industry provides direct employment to around 40,000 and indirectly to another 150,000 workers.

Industry Snapshot	
Number of Units	300-350 (approx.)
Direct Employment	40,000
Indirect Employment	150,000
Production Capacity	8-10 million units
Penetration Rate	95-98 %
Replacement Purchase	8-10 %
Labour to Capital Ratio	4 workers per US\$ 20,000
Contribution to GDP	0.3%
Exports (2020)	24.86 million US\$
Share in Pakistan Exports	0.15%

Over the last decade, the fan cluster in Pakistan has shown robust growth which is mainly driven by an increase in demand as a result of rapid rural-urban migration, electrification of villages, improvements in living conditions, and climate change.

Figure 6 shows the trend in domestic fan production as well as the real GDP growth rate. The total production of domestic fans stood at 1.6 million units in the year 2020 – the lowest in a decade. Both real GDP growth and the manufacturing of domestic fan series appear co-related, a recovery in real GDP growth is likely to increase domestic fan production in a post-COVID scenario.

Figure 6:
Domestic Fan Production, 2013-2020



2.2. Product Mix

Ceiling Fans represent 65% of the total fan production in Pakistan while pedestal fans account for another 25%. The remaining 10% include table fans, table-cum-pedestal fans, wall bracket fans, and exhaust fans.

Product Mix by Category

- Ceiling Fan
- Pedestal Fan
- Table Fan
- Table-cum-Pedestal Fan
- Circumatic Fan
- Wall bracket
- Exhaust Fan

Product Range

For each of the product categories, domestic fans are available in different sizes. The table below shows the size range for each category as provided by the Pakistan Electric Fan Manufacturers Association (PEFMA).

Table 3:
Product Range (by size)

Products	Size (inches)
Ceiling Fan	36" 48" 56" 60"
Pedestal Fan	18" 24" 30"
Wall Bracket Fan	12" 14" 16" 18" 24"
Table Fan	12" 14" 16" 18"
Louver Stand Fan	14"
Louver Wall Fan	14"
Plastic Exhaust Fan	8" 10" 12"
Metal Exhaust Fan	8" 10" 12" 16" 18" 20" 24"

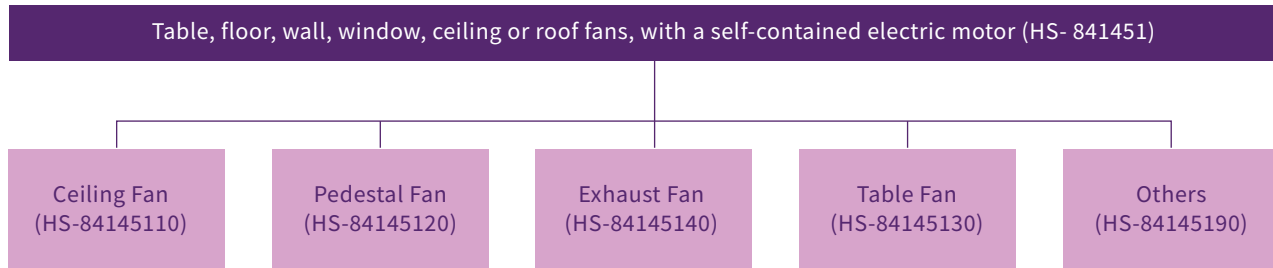
Source: Pakistan Electric Fan Manufacturers Association (PEFMA)

Break-up by HS-Codes

Under Harmonised System (HS) for international trade, HS-code designated for domestic fans is HS-841451 with product description 'Table, floor, wall, window, ceiling or roof fans, with a self-contained electric motor'. At the country level, national tariff lines (or HS-08 digits) for domestic fans include Ceiling Fan (HS-84145110), Pedestal Fan (HS-84145120), Exhaust Fan (HS-84145140), Table Fan (HS-84145130), and Others (HS-84145190).

Figure 7:

HS-Codes for Domestic Fans at HS-08-Digit



2.3. Characteristics and Growth Drivers for Pakistan's Domestic Fan Industry

Nature of the Industry. The domestic fan industry has a seasonal manufacturing & sales cycle and hence relies mostly on contractual labor. Sales from the Gujrat and Gujranwala manufacturing cluster are mostly destined for the local market with up to 80 percent production sold within the country. Demand is overwhelmingly concentrated in the January to early July period. The replacement sales and production of domestic fans are also linked with the business cycles within Pakistan.

Climate Change. Pakistan's climate has changed markedly. During the last 100 years, the average temperature in Pakistan has increased by 0.6°C whereas the projected average rise in Pakistan's temperature, by the end of the current century, is estimated to be between 3-5°C higher compared to the global average (ADB, 2017). Demand for domestic fans is linked with temperature and climate conditions.

Monopolistic Competition. The market follows monopolistic competition as there are large number of manufacturers offering similar products that can only be differentiated based on brand, quality, and prices. Pakistan's domestic fans are reportedly more competitive than those of India and China in terms of quality, however, they are not competitively priced in international markets.

Market Penetration of DC and Solar Fans.

Solar Domestic Fans: Domestic fans that utilize solar energy are popular in areas with limited or no access to grid electricity. Solar fans have become increasingly popular in Pakistan's rural areas in the last three to five years.

DC Inverter Domestic Fans: Direct current domestic fans were previously imported into Pakistan. However, the domestic fan industry has localized its production recently and now only Printed Circuit Boards (PCBs) for inverters need to be imported. DC inverter domestic fans are far more efficient than traditional fans.

A DC fan is one of the types of fan which consume lower electricity as compared to a normal AC fan. It's also called a energy saving fan and it is claimed that it consumers 50-70% less energy as compared to AC fans. Moreover, hybrid solutions for domestic fans are also becoming popular in the market due to both AC and DC ecologies working in parallel.

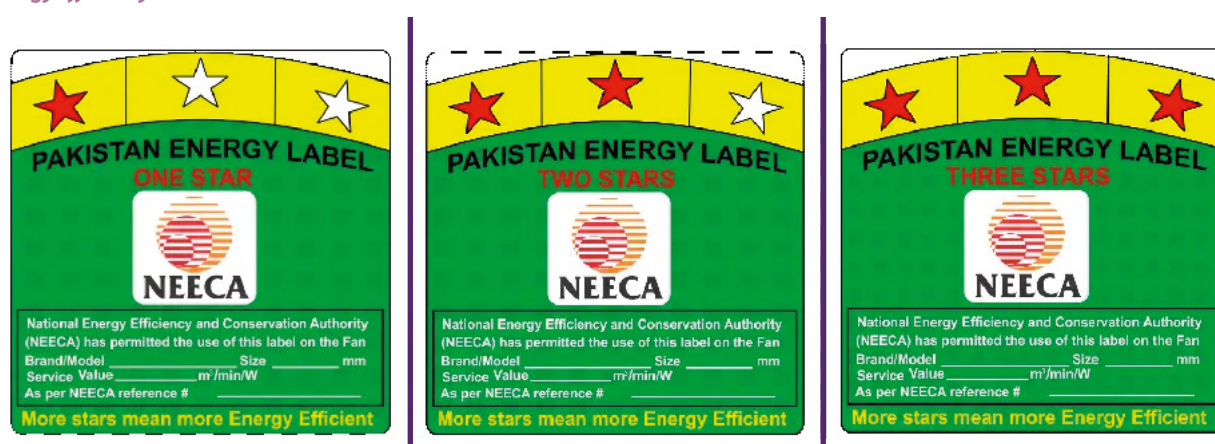
Currently, the following types of DC and hybrid AC/DC fans are produced in Pakistan:

- Simple 12V DC fans.
- DC inverter fans.
- Hybrid AC/DC input fans and battery-integrated solar AC/DC fans. Hybrid AC/DC solar fans utilize solar energy and are popular in areas with limited or no access to grid electricity. Solar fans have become increasingly popular in Pakistan's rural areas in the last three to five years.

Energy Efficiency. National Energy Efficiency & Conservation Authority (NEECA) launched the first energy labeling scheme in the country in July 2016. This was done in order to bring higher quality energy-efficient products to the market leading to a reduction in energy consumption. Currently, sixteen fan manufacturers with a total of 27 models have qualified for 3 – Star Pakistan Energy Labels.

Figure 8:

Energy Efficiency Stickers

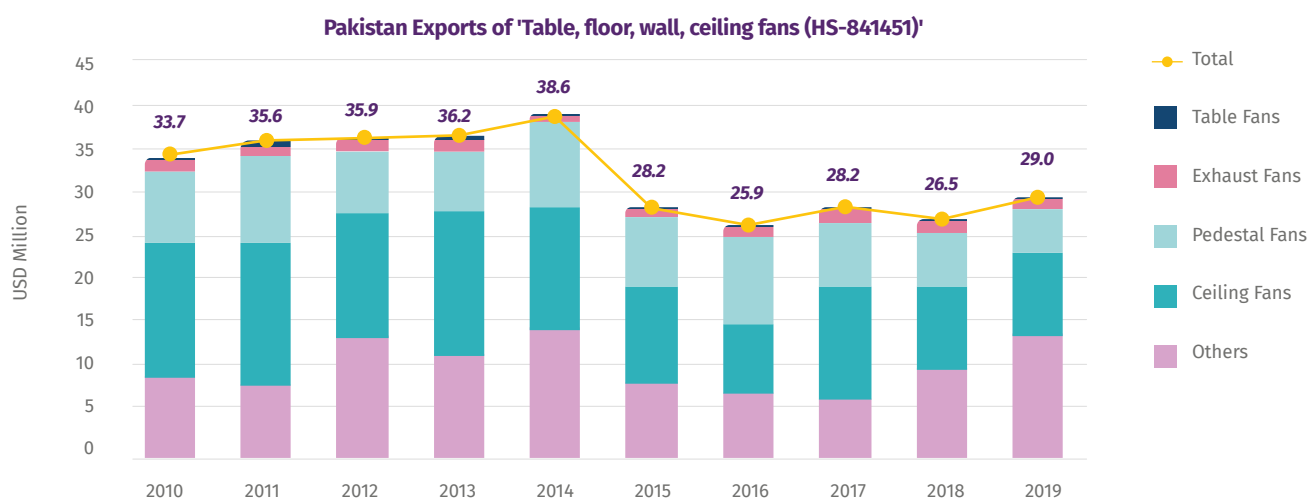


2.4. Pakistan's Exports of Domestic Fans (HS-841451)

During 2010-2014, Pakistan's exports of domestic fans showed strong growth, however, a substantial decline was observed in 2015. Exports fluctuated in the range of US\$ 25-28 million over the 2015-2018 period before reaching US\$ 29.0 million in 2019. The figure below shows the overall mixed trends in exports of domestic fans from Pakistan over the 2010-2019 period. Exports of 'Ceiling Fans' contributed the most to Pakistan's overall exports of domestic fans till 2018 whereas 'Other Fans' dominated the export basket in 2019.

Figure 9:

Pakistan Exports of Domestic Fans (HS-841451)



Source: ITC Trade Map

The table below shows the destination-wise export statistics for Pakistan's domestic fans. In 2020, exports were US\$ 24.9 million which posted a decline of 13.6 percent as compared to 2019. Exports were primarily directed towards Iraq (21.1%), Bangladesh (16.1%), Oman (14.5%), UAE (14.3%), and Yemen (9.6%) in 2020.

Table 4:

Pakistan's Exports of Domestic Fan (HS-841451) to the World

	Countries	Pakistan's Exports (US\$ million)			Share in Pakistan's Fan Exports (%)	Unit value (US\$/unit)	Growth in 2018-19 (%)	CAGR (2016-20)	Average tariff faced by Pakistan (%)
		2018	2019	2020					
	World	26.7	28.8	24.9	100.0	-	-13.6	-1.0	-
1	Iraq	3.9	4.1	5.2	21.1	16.0	29.6	14.3	-
2	Bangladesh	7.9	8.3	4.2	16.7	14.0	-50.2	-1.5	25
3	Oman	3.4	4.0	3.6	14.5	16.0	-9.1	88.9	5
4	UAE	2.7	4.0	3.6	14.3	19.0	-10.5	-2.4	5
5	Yemen	2.7	3.0	2.4	9.6	18.0	-19.5	-5.7	5
6	Afghanistan	1.9	1.6	2.2	8.7	18.0	38.5	-1.2	5
7	Saudi Arabia	1.2	1.9	1.8	7.2	22.0	-5.4	-13.8	5
8	Djibouti	0.6	0.3	0.6	2.2	18.0	92.7	5.3	19.5
9	Sudan	0.4	0.6	0.5	2.1	16.0	-15.6	-	-
10	South Africa	0.1	0.3	0.2	0.8	25.0	-31.9	11.6	5
11	Qatar	0.5	0.3	0.2	0.6	34.0	-46.8	-31.1	5
12	Sri Lanka	0.1	0.1	0.1	0.6	20.0	69.0	-20.0	0
13	Italy	0.0	0.1	0.1	0.3	20.0	21.1	-	0
14	Kuwait	0.1	0.0	0.1	0.3	30.0	103.0	-22.8	5
15	Mozambique	0.0	0.1	0.1	0.3	24.0	30.0	28.3	20

Source: ITC Trade Map

2.5. Trends in Pakistan's Exports of Fan – Product Category and Destination

This section provides category and destination export trends for Pakistan's domestic fan industry.

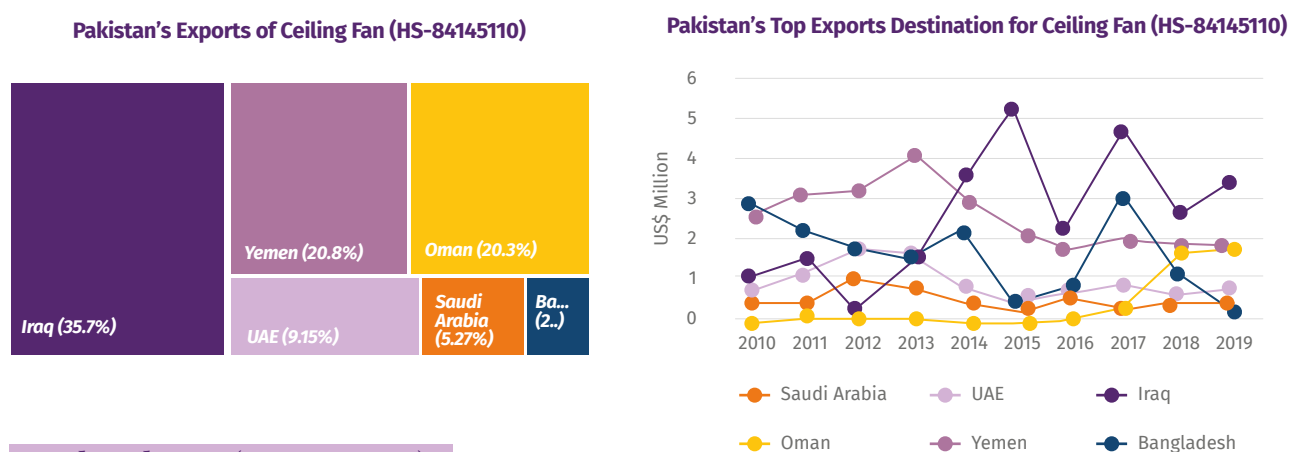
Ceiling Fans (HS-84145110)

Till 2018, Ceiling Fan (HS-84145110) accounted for the largest share in overall domestic fan manufacturing and exports from Pakistan. The left panel of the figure below shows that Iraq (share in Pakistan's Ceiling Fan exports (35.7%), Yemen (20.8%), Oman (20.3%), UAE (9.2%), Saudi Arabia (5.3%), and Bangladesh (2.9%) were the major export destinations for ceiling fans in 2019.

The right panel of the figure below illustrates an overall increasing trend in exports of ceiling fans from Pakistan to Iraq and Oman whereas a decreasing trend is evident for exports to Yemen and Bangladesh. Exports to Saudi Arabia and UAE appear steady over the period 2010-2019.

Figure 10:

Pakistan's Exports of Ceiling Fan (HS-84145110)



Pedestal Fans (HS-84145120)

Pedestal Fan (HS-84145120) exports from Pakistan were mainly directed towards Bangladesh (33.5%), the UAE (28.9%), Saudi Arabia (14%), Oman (4.6%), and South Africa (4.5%) in 2019 as shown in the left panel of the figure below.

Exports of pedestal fans from Pakistan to Bangladesh and Saudi Arabia were quite volatile while reflecting an overall increasing trend. Although there is an overall decreasing trend in Pakistan's exports of pedestal fans to the UAE, however, there was some pick up in pedestal fan exports in 2019 to the UAE as well as to South Africa and Oman.

Figure 11:

Pakistan's Exports of Pedestal Fans (HS-84145120)

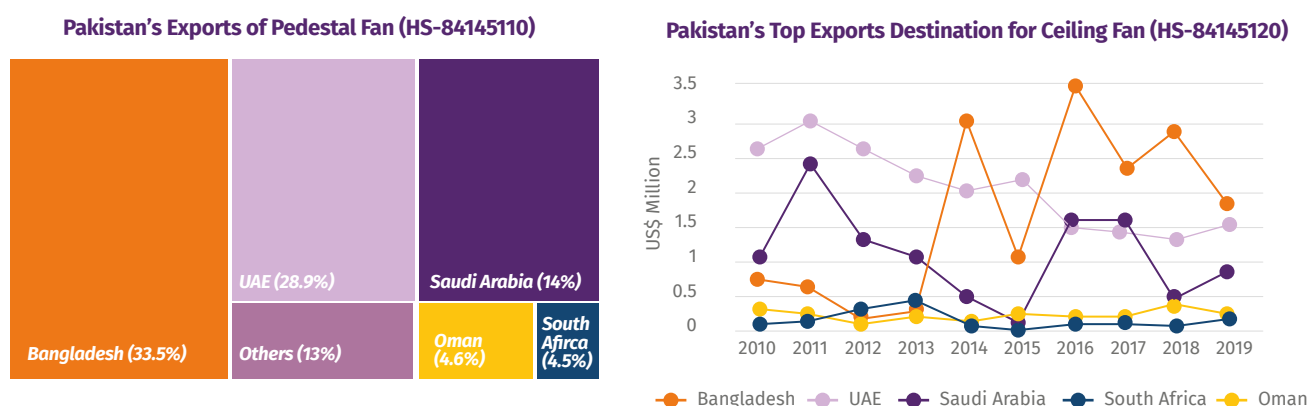
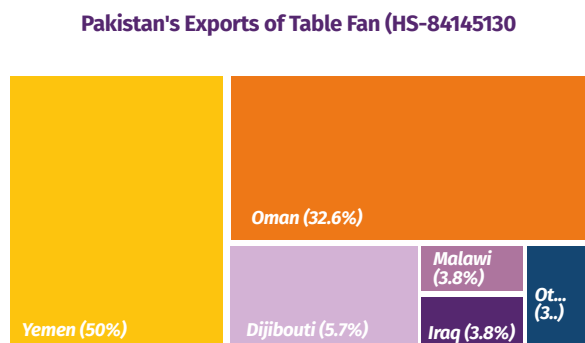


Table Fans (HS-84145130)

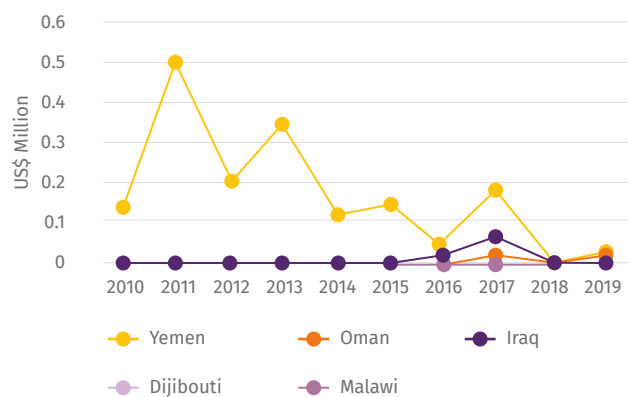
With overall US\$ 0.05 million exports of Table Fans (HS-84145130) to the world, this was an increase of 126 percent in 2019 as compared to 2018. Pakistan's exports of 'Table Fan (HS-84145130)' have been mostly directed towards Yemen since 2010, however it has been showing a downward trend as shown in the right panel of the figure below. The left panel of the figure below shows that Yemen accounts for 50.0% of Pakistan's exports of Table Fans. The other major destinations are Oman (32.6%), Djibouti (5.7%), and Iraq (3.8%).

Figure 12:

Pakistan's Exports of Table Fan (HS-84145130)



Pakistan's Top Exports Destination for Table Fan (HS-84145130)

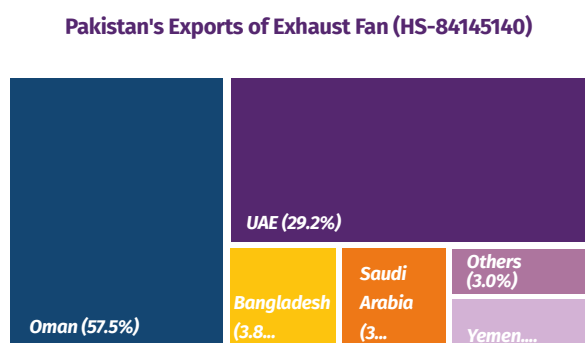


Exhaust Fans (HS-84145140)

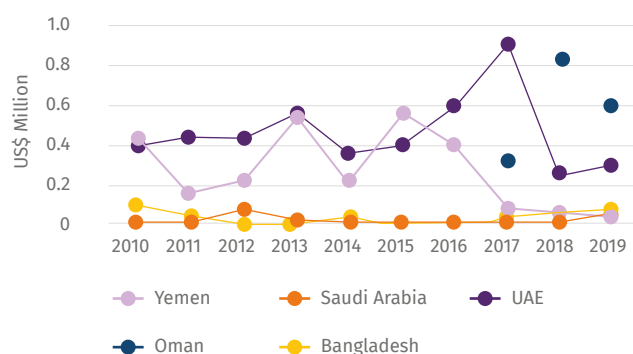
Pakistan's exports of 'Exhaust Fans (HS-84145140)' to the world fell by 15.2 percent in 2019 relative to 2018. Exports were mostly directed towards the Middle Eastern markets and Bangladesh. Around 57.0 percent of total Exhaust Fans' exports from Pakistan were destined for Oman which is followed by the UAE (29.2%), Bangladesh (3.8%), Saudi Arabia (3.4%), Yemen (2.8%) and others.

Figure 13:

Pakistan's Exports of Exhaust Fan (HS-84145140)



Pakistan's Top Exports Destination for Exhaust Fan (HS-84145140)

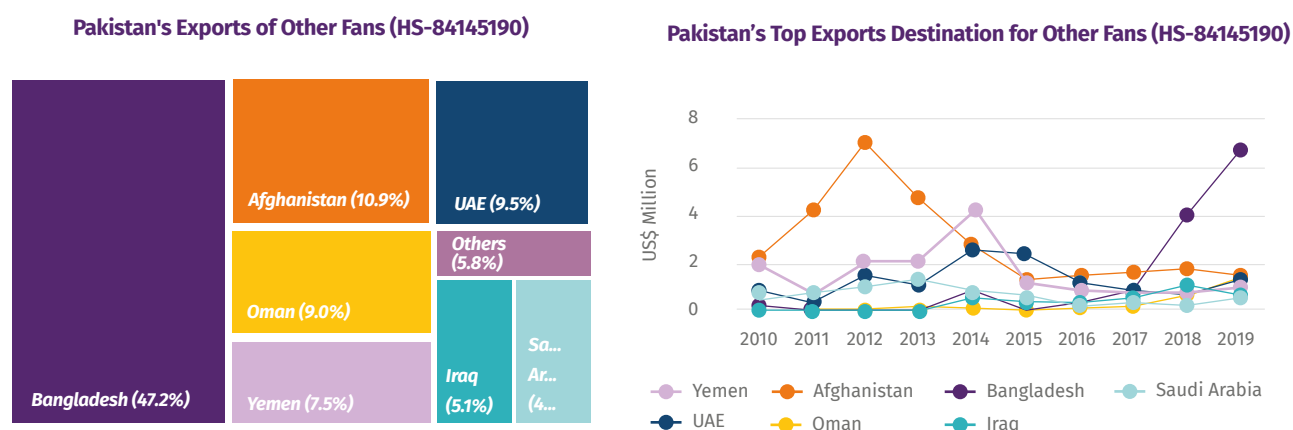


Other Fans (HS-84145190)

Other Fans (HS-84145190) mainly include louver fans, circumatic fans, and bracket fans. Pakistan's exports of 'Other Fans' were mainly directed towards Bangladesh (47.2%), Afghanistan (10.9%), the UAE (9.5%), Oman (9.0%), Iraq (5.1%), and Saudi Arabia (4.5%). Overall exports of 'Other Fans' to the world increased by 39.8 percent in 2019. The surge is mainly driven by a higher level of exports to Bangladesh. The right hand panel of the figure below shows the trend in Pakistan's exports of other fans to its top export destinations. Exports to Iraq, Oman, and Yemen reflect a steady but increasing trend whereas an abnormal increase in exports of 'Other fans' from Pakistan to Bangladesh is visible between 2017 and 2019.

Figure 14:

Pakistan's Exports of Other Fans (HS-84145190)



2.6. Pakistan's Imports of Domestic Fans

Pakistan's overall imports of domestic fans in 2020 were US\$ 4.7 million, showing a decline of 24.5 percent as compared to 2019. Imports are mainly dominated by exhaust fans, battery-operated fans, DC fans and decorative fans. China is the major import source of domestic fans for Pakistan and is followed by Turkey, Germany, and Thailand.

Table 5:

Pakistan's Imports of Domestic Fan (HS-841451)

Exporters	Imports (in US\$ million)			Growth (2019-2020,%)	CAGR (2016-2020,%)	Average Unit Price (US\$/unit)	Average Tariff (%)	Share in Imports (%)
	2018	2019	2020					
World	15.7	6.2	4.7	-24.5	-36.4	35.0	0	-
China	13.7	4.8	4.0	-16.4	-38.3	35.0	20	85.4
Turkey	0.2	0.5	0.2	-48.9	198.8	74.7	20	5.1
Germany	0.1	0.4	0.1	-78.1	-18.2	73.1	20	1.7
Thailand	0.0	0.0	0.1	60.6	-23.0	79.5	20	1.1
Sweden	0.0	0.0	0.0	57.1	82.1	82.5	20	0.9
Saudi Arabia	0.0	0.0	0.0	35.7	-	71.3	20	0.8
UAE	0.0	0.1	0.0	-34.0	8.3	82.5	20	0.7
Italy	0.1	0.2	0.0	-84.8	-0.9	65.0	20	0.6
USA	0.1	0.0	0.0	-16.1	-28.6	65.0	20	0.6
Malaysia	0.0	0.0	0.0	240.0	-20.7	63.8	20	0.4

Source: ITC Trade Map

2.7. Tax Structure of the Domestic Fan Industry

2.7.1. Direct Tax Regime

Taxes on Corporate Income. The tax rate on corporate income for the manufacturing sector is currently at 29 percent whereas the tax rate applicable to small companies is 23 percent.

Withholding Tax. The threshold for withholding tax for supplies under section 153 of the Income Tax Ordinance, 2001 is PKR 30,000. Section 153(1)(b) as applicable to the domestic fan industry, has the following implications:

- In case of a company, the tax rate is 8 percent of the gross amount (equal or above the threshold)
- In all other cases, the tax rate is 10 percent of the gross amount (equal to or above the threshold)
- In respect of persons making payment to electronic & print media for advertising services, tax rates is 1.5 percent of the gross amount (equal or above the threshold)

The tax rate shall be increased by 100 percent in case persons are not on the Active Taxpayers List (ATL).

2.7.2. Indirect Tax Regime

Sales Tax. The Sales Tax Act, 1990 updated in June 2019 through Finance Act, 2019 has included electric fans in Schedule 3 (i.e., Retail Price Taxation).

Taxable supplies and import of goods specified in the Third Schedule shall be charged to tax at the rate of seventeen percent of the retail price or in case such supplies or imports are also specified in the Eighth Schedule, at the rates specified therein and the retail price thereof, along with the amount of sales tax shall be legibly, prominently and indelibly printed or embossed by the manufacturer, or the importer. Electric fans are incorporated in the third schedule of Sales Tax under the following title:

'Household electrical goods, including air conditioners, refrigerators, deep freezers, televisions, recorders and players, electric bulbs, tube-lights, electric fans, electric irons, washing machines and telephone sets.'

Duties. Some of the components and raw materials used in manufacturing domestic fans are subject to customs duties, additional customs duties and regulatory duties. A list of these components/raw materials along with their PCT codes are provided in the table ahead:

PCT Codes	Description	Existing Rate 2020-21 (%)			Proposed Rate (%)		
		CD	ACD	RD	CD	ACD	RD
3911.1090	Impregnating Resin	20	6	0	0	0	0
3920.6300	Polyester Film	20	6	0	0	0	0
7225.1900	Electrical Silicon Steel Sheet	0	2	11	0	0	0
8482.1000	Ball Bearings	11	2	0	0	0	0
8483.3020	Plain Shaft Bearings	20	6	0	0	0	0
8536.5099	Push Button Switch	20	6	0	0	0	0
8544.1900	Enamelled Aluminium Wire	20	6	0	0	0	0
3208.9090	Polyurethane Varnish	20	6	5	0	0	0
3208.9011	Polyamide Varnish	11	2	5	0	0	0
9107.0000	Timer 5-15 Min	3	2	0	0	0	0
3902.3000	Polypropylene Co Polymar	11	2	0	0	0	0
3901.9000	LLDP	11	2	0	0	0	0

Source: Federal Board of Revenue (FBR)

2.8. Future Outlook for Pakistan's Domestic Fan Industry

A top-down forecasting approach has been used to forecast the future outlook for the industry. The International Monetary Fund's (IMF) projected real GDP growth rates for Pakistan are utilized to forecast domestic demand over the 2021-2025 period. The average share of electric fans in GDP is used to project the production of domestic fans over 2021-2025. It is estimated that domestic fan production would nearly double by 2025 to 3.1 million units as compared to 1.6 million units in 2020. Assuming constant prices and exchange rates, the value of the market for domestic fans is forecast to touch PKR 19.12 billion and US\$ 120.24 million by 2025.

Table 6:

Sales Projections for Pakistan's Domestic Fan Industry

	Years	Real GDP growth rate (%)	GDP (at constant Price)	Electric Fans (No. 000's)	Value of Fans (PKR million)	Value of Fans (US\$ million)
Actual	2013	3.7	9,819,055	1,949.29	11,968.64	75.27
	2014	4.1	10,217,056	1,990.19	12,219.79	76.85
	2015	4.1	10,631,649	1,890.06	11,604.95	72.99
	2016	4.6	11,116,802	2,288.22	14,049.65	88.36
	2017	5.2	11,696,934	2,712.67	16,655.79	104.75
	2018	5.5	12,344,266	2,391.40	14,683.20	92.35
	2019	1.9	12,580,174	2,951.98	18,125.18	113.99
Forecasts	2020	-0.4	12,531,790	1,671.13	10,260.72	64.53
	2021	1.0	12,657,108	2,598.71	15,956.09	100.35
	2022	4.0	13,163,392	2,702.66	16,594.34	104.37

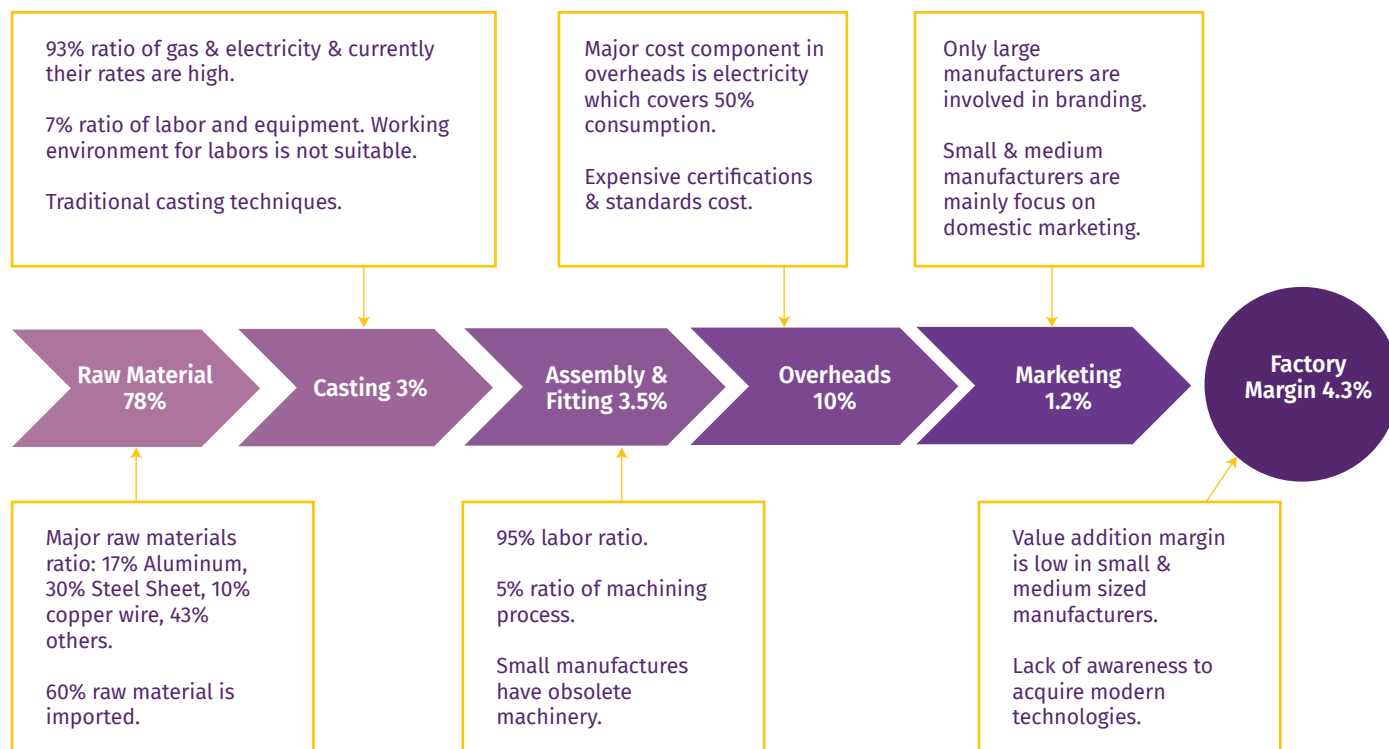
	Years	Real GDP growth rate (%)	GDP (at constant Price)	Electric Fans (No. 000's)	Value of Fans (PKR million)	Value of Fans (US\$ million)
Forecasts	2023	4.5	13,755,745	2,824.28	17,341.08	109.06
	2024	5.0	14,443,532	2,965.49	18,208.14	114.52
	2025	5.0	15,165,709	3,113.77	19,118.54	120.24

Source: International Monetary Fund (IMF), Pakistan Bureau of Statistics, Author's calculation

CHAPTER 03

Value Chain Analysis

Among domestic fan categories, ceiling fans dominate both manufacturing and exports, ceiling fans are followed by pedestal fans in both the numbers manufactured and exported. Value chains however are almost similar for all types of fans, this section discusses the value chain of ceiling fans as an example.



3.1. Raw Materials Procurement

The domestic fan industry operates as an assembly line with large as well as small producers relying on key inputs from vendors. Raw materials account for around 80 percent of the total cost. Vendors provide around 50% of the components with the remaining being either imported or manufactured in-house. The table below categorizes major components/raw materials as either imported or domestically available.

Table 7:

List of Components - Imported/Domestically Available

	Part Name	Material Composition	Import/Domestically Available
1	Electric Motor	Induction Motor	Domestically Available
2	Electric Steel Sheet	Electrical Steel Sheet: Si 0.06%	Imported
3	Rotor	Rotor – Electrical Steel	Domestically Available
4	Copper Wire	Copper Wire 99.99%	Domestically Available
5	Insulation Paper	Laminated Paper	Imported
6	Silicate Sleeve	Insulation Sleeve	Domestically Available
7	Thermal Protector	Thermal cut out – 160 OC	Imported
8	Body	Aluminium Body	Domestically Available
9	Plate	Aluminium Plate	Domestically Available
10	Bush	Bush Universal – 9.0 mm	Domestically Available
11	Tie Lock	Nylon tie lock	Domestically Available
12	Single Core Wire	20 AWG – copper 99.99%	Domestically Available
13	Axle	Round – standard	Domestically Available
14	Screw RH	Round head screw – 3/8 x 3/16	Domestically Available
15	Capacitor	2.5 MFD – 450 V AC	Domestically Available
16	Wire Connector	Wire Connector	Domestically Available
17	Switch	1-2-3-G-0	Domestically Available
18	Power Cable	3x1.00 mm ² – 300 volts	Domestically Available
19	Plug	UK – BS 1363 -9518	Domestically Available
20	Insulating Bushing	Wire washer 6N-4	Domestically Available
21	Plastic Material	Polylac – PA707	Imported
22	Paint	Solvent Paint	Domestically Available
23	Printed Circuit Board PCB)		Imported

Source: PEFMA

3.2. Production Stages of a Ceiling Fan

The fan major assembly process consists of body turning, body drilling, axel turner and winding, fitter, painting, and finally testing and packaging. All of these processes run parallel to each other. The steps of the manufacturing process of a ceiling fan are given below:

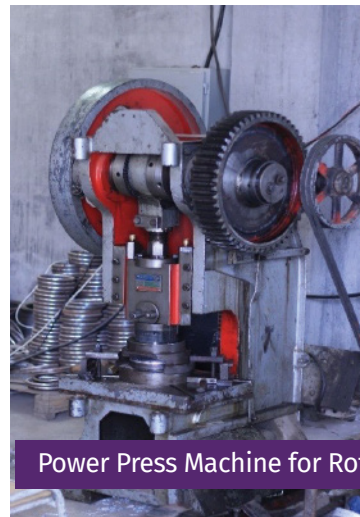
a. Steel Sheet Cutting (Rotor/ Stator)

In this section, the laminated Electric Steel Sheets (ESS) or any other type of sheet (Mild or Drum), used for rotor and stator armature (in which copper wire is wound) are cut to sizes in circular form. They are perforated

to accommodate the windings in them and are aligned and riveted together according to the required thickness. Automatic Hydraulic Press, as well as shearing machines, power press, stamping press and cutting dies, are used in this process. Few top companies are using progressive stamping, which is one of the most advanced processes of sheet metal processing.



Hydraulic Press Machine



Power Press Machine for Rotor/ Stator



Shearing Machine



Surface Grinding Machine

b. Rotor Die Casting and Finishing

The die casting process involves the melting of metal in the furnace. The molten metal is poured into a die to get the part in the shape of the die. Usually, it involves rotor casting, in which the rotor is filled with molten aluminum metal to form squirrel-cage winding. The rotary furnace, hydraulic presses, furnace oil, and/or natural gas as fuel and dies are used in this process to make high-quality steel alloy.

Further, the cast parts undergo processing for finishing, where the external diameter and upper edges of the rings of the rotor are finished on a lathe machine to make it fit easily in the grooves of the fan body. Local belt type lathe machines are being used for this process, but few medium and large-scale manufactures are using automatic CNC lathe machines for roughening process.



Die Casting Plant



CNC Lathe Machine

c. Rotor/ Stator Turning

In the ceiling fan, the stationary part bearing the copper winding is known as the stator (commonly called armature). The rotor bearing the squirrel winding rotates around the stator. In the case of a pedestal fan, the rotor having the squirrel winding rotates inside (as opposed to outside in case of a ceiling fan) the stator, bearing copper windings. A pre-sized fabricated iron axle is pushed into the center of the stator. Both sides of the axle are ground to fit bearings. In parallel, the rotor undergoes turning and finishing. Hydraulic power press, grinding machines both imported and local are used for the process.

d. Winding



This process involves the coiling of enameled copper wire in the slots of the core of the electric fields. Before winding, paper is inserted inside the slots to avoid short circuits. The large-scale manufacturers use automatic winding machines, wedge inserter machines and automatic paper insertion machines, this helps them in improving material saving, improvement in quality, mass production and labor-saving.

However, small and few medium manufacturers are using manual winding machines for rotor/stator winding.

e. Varnishing

After the winding process, the copper wire is varnished and then baked in the oven to dry it. This process is used to avoid the chance of a short circuit in the electrical field and to keep the coils intact. Further cabling and lead joining process are done manually. Large scale manufactures have varnishing plants and wire short circuit testing facilities, whereas small and medium scale manufacturers are mostly depending on vendors for this process.



f. Body & Plate Turning

First, the rotor is pushed into the groove of a pre-casted aluminum body. Then bearing of sizes are adjusted in the body (lower side) and the plate (upper side). The machining process is performed on the inside of the rotor to clean it. After this process, the body and the plates go to the other machines for external turning and finishing. Hydraulic press and lathe machines are used for the process.

g. Drilling and Tapping



Drill & Tapping Machines

At this stage, different sizes of holes and threads are made for the fitting body, plate, and other parts. The machines involved in this process are drilling and tapping machines.

h. Molding of Plastic Parts

Only large-scale manufactures have facility to make a few plastic parts, whereas small and medium scale manufacturers are depending on vendors. The plastic parts are made through the process of molding. This process is done through injection molding machines. The plastic grains are melted in the injection molding machine and then injected into the mold to attain the desired shape.



Plastic Injection Molding Machine

i. Assembling and fitting

The finished body, plate, stator, connection box and other components are brought together in this section. Here they are properly washed with petrol, flushed with air blow and cleaned to remove the metal chips, oil and dust, which stick to the parts during different processes. Usually, press machines are used in the assembling process.

j. Blade Making



Power Press Machine for Blade Bending

All fan manufacturers are purchasing the required sizes of fan blades from vendors. Commonly, there are two different types of blades available, these are aluminum blades and recycled aluminum blades. The blades made of recycled aluminum are heavy because of the high levels of impurities that increases the density of the finished product. The use of recycled aluminum rises due to the cost factor. In the fan manufacturing area, the blades are pressed at an angle of 12 degrees and later they are drilled to connect to the body of the fan. A power press machine is used in this process.

k. Painting

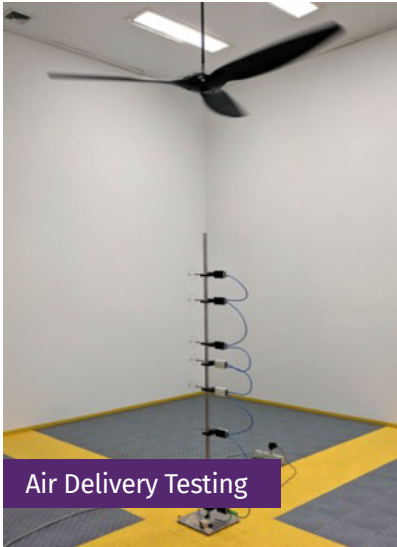
After completion of assembly / fitting, the finished product is painted. There are two types of practices commonly used in paint technologies, which are enamel and powder coating. Enamelling is a wet process, in which the oil-based enamel is sprayed over the required surface and then dried either in an oven or in the open air. Only a few small manufacturers use enamel coating methods. Powder coating is the latest technology, in which the surface required for the painting process is ionized first and then powdered paint is sprayed on that surface, further it is heated in the oven to produce a high-class finish.



Powder Paint Plant

l. Final Testing and Packing

After painting the fan goes for final testing and packaging. The fan is hooked and is supplied with power for checking power consumption, current, revolutions per minute, air delivery and noise (db). Variation of speed at different voltages is also checked. After testing, the blades are detached; capacitor and power connectors are installed, and nameplates are fitted. The fan is then packed for storing and marketing. Testing equipment involved is local as well as foreign manufactured.



Air Delivery Testing

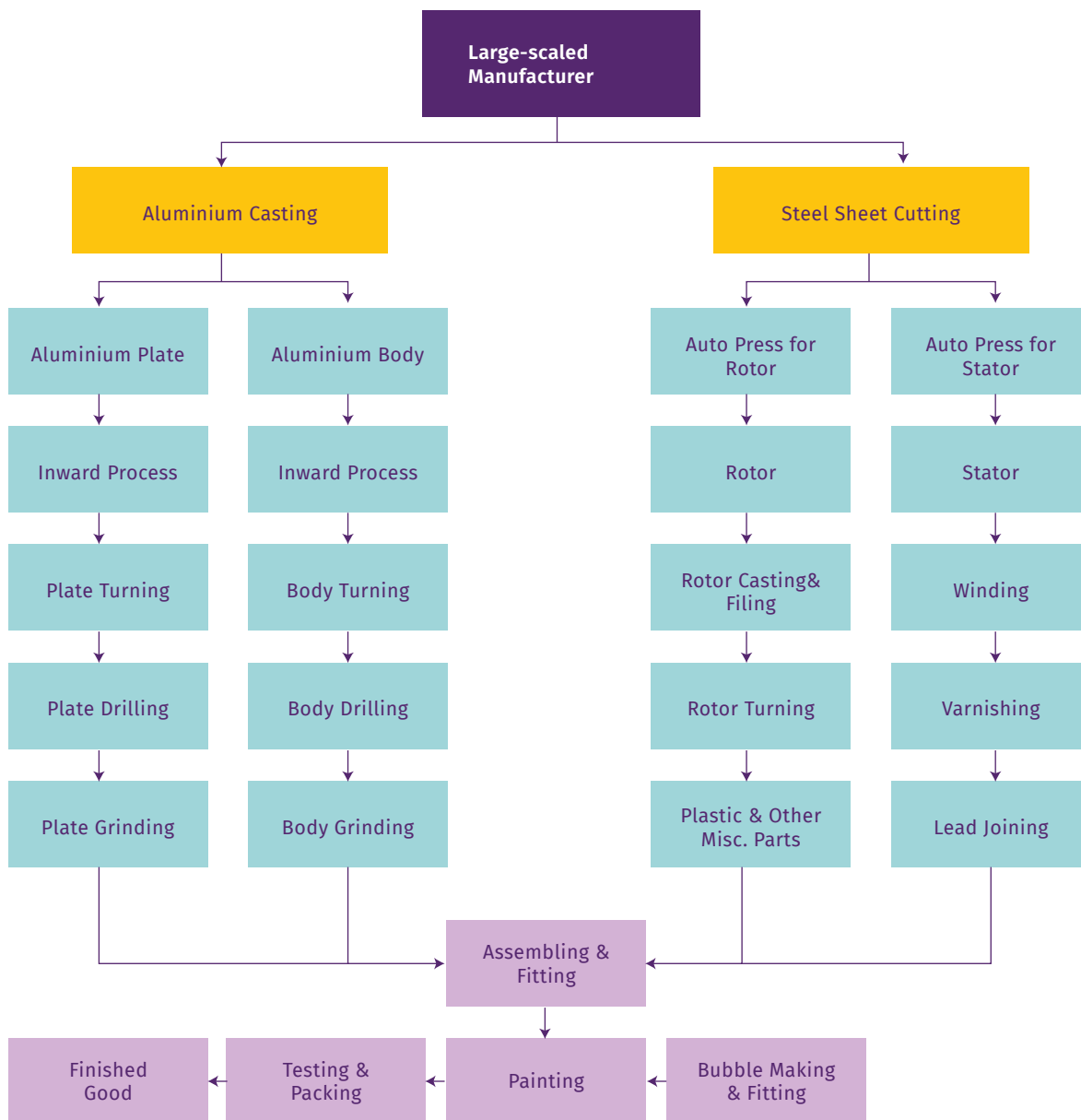


Watt & RPM Testing

Table 8:
Tests carried out during Domestic Fan Manufacturing

S.No	Description	S.No	Description
1	Magno Test	7	Ampere Test
2	Starting & Running Test (RPM)	8	Sound Level Test
3	Voltage Function Test	9	Barring Noise Test
4	Air Delivery Test	10	Winding Test
5	Copper Wire Test	11	Phase Current Test
6	Watts Test	12	Insulation Resistance Test

Process Flow Diagram of Ceiling Fan



3.3. Quality Checks

PSQCA based standards for quality are complied with. Following characteristics are checked to confirm adherence to quality standards:

- Power consumption test
- Current
- Revolutions per minute
- Air delivery

Standards Required for Domestic Fan

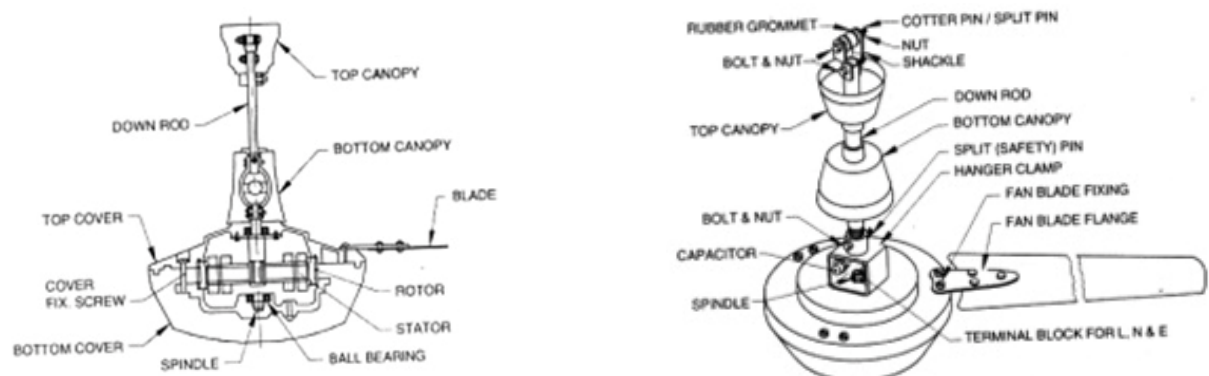
- Performance Standard (PS-1-2010 IEC60879).
- Safety Standard (PS-IEC60335-1 & IEC60335-2-80).

3.4. Outbound Logistics

The dealers and retailers place orders to distributors who in turn forward these orders to manufacturers. The figure below provides a view of the ceiling fan along with a description of its components.

Figure 15 :

Ceiling Fan and its Components



CHAPTER 04

Potential Export Markets for Pakistan Manufactured Domestic Fans



4.1. Potential Export Markets

Pakistan's domestic fan manufacturers produce almost all types of fans and cater to most of the domestic demand. However, production can be scaled up by expanding into international markets. For this purpose, potential markets are identified based on the following criteria:

- Top-ranked in terms of imports from the world, or
- Either robust increase in imports from the world in 2019-20, or
- A positive compound annual growth rate over the period 2016-20, or
- Any other attributes favoring Pakistan's exports (e.g., distance, consumer preferences, etc)
- Countries with less stringent non tariff barriers
- Developing countries with low but increasing GDP per capita, in these markets customers are more likely to switch to Pakistani fans because of quality

Export potential is calculated using the following equation:

Export Potential =

Country 'i's Imports of Fan (HS:841451) - Pakistan Exports of Fan (HS:841451) to Country 'i'

The export potential identified for a market is the maximum possible potential for exports into that market and does not reflect consumer preferences as well as the ability of Pakistani manufacturers to meet this demand.

Potential markets identified using the above formula are further classified in terms of those having intensive and extensive margins across each region. The intensive margin of exports is defined as the opportunities for growth of exports in markets where goods are already being exported whereas the extensive margin of exports is the opportunity for growth of exports in new markets. Countries for which Pakistan has export potential are classified based on regions.

4.2. Potential European Markets for Exports of Domestic Fans

Europe is a well-developed market and one which has very high safety standards. That a product is safe for consumers is usually demonstrated by it bearing a CE marking and this is why a CE marking represents a 'passport' that allows products to be sold in the EU. The CE marking is also recognized in other markets such as the Middle East, North Africa, and some ex-Soviet Republics.

Pakistan currently has only marginal exports of domestic fans (HS-841451) to the European region. There exists an export potential of around US\$ 1.0 billion for exports of domestic fans to the EU. Although Pakistan faces zero tariffs (due to GSP+ status), imports of fans in the EU are dominated by China.

Table 9:

Potential European Markets for Exports of Domestic Fans (HS-841451)

Europe	Potential Markets	Imports from the World				Tariff Faced by Pakistan	Pakistan's Exports in 2020 (US\$ million)	Export Potential (US\$ million)	Top Exporters		
		Value in 2020 (\$ million)	Change 2019-20 (%)	CAGR 2016-20 (%)	Average Unit Price (US\$)				Top Exporters	Share (%)	Tariff (%)
Intensive Margins	United Kingdom	103.2	-19.0	13.2	116	0.00	0.03	103.2	China	64.7	1.6
									Spain	7.2	0.0
	Belgium	75.5	12.0	20.4	50	0.00	0.04	75.4	China	65.7	1.6
									Netherlands	18.3	0.0
	Italy	70.6	26.0	9.5	104	0.00	0.07	70.5	China	83.0	1.6
									Spain	2.8	0.0
	Austria	25.5	20.5	10.8	71	0.00	0.00	25.5	China	47.0	1.6
									Germany	40.4	0.0
	Greece	15.9	21.3	15.0	72	0.00	0.02	15.9	China	73.7	1.6
									Spain	9.3	0.0
Extensive Margins	Germany	226.7	35.7	23.4	102	0.00	0.00	226.7	China	69.7	1.6
									Netherlands	7.0	0.0
	France	178.1	36.5	21.3	95	0.00	0.00	178.1	China	67.0	1.6
									Spain	12.2	0.0
	Netherlands	117.1	54.2	33.1	50	0.00	0.00	117.1	China	66.4	1.6
									Belgium	13.6	0.0
	Spain	115.6	29.5	12.4	96	0.00	0.00	115.6	China	86.0	1.6
									Germany	3.0	0.0

Source: ITC Trade Map

European Market Dynamics and Pakistan's Position

- Obtaining CE marking is dependent on stringent certification requirements. These mainly include Low Voltage Direct current (LVD) test, Electromagnetic Compatibility (EMC) test, and Restriction of the Use of certain Hazardous Substance in Electrical & Electronic Equipment (RoHS) test. Pakistani exporters currently need to send their products to China for EMC and RoHS tests.
- The overall estimated cost for getting the CE mark is between PKR 1.0 to 1.1 million for each model of domestic fan.
- Lightweight disposable plastic body fans are much in demand in European countries for which China is the major supplier.
- Pakistan cannot offer plastic disposable fans at rates similar to that of China due to relatively expensive imported raw materials
- Consumer preferences in Europe are however shifting towards durable and better-quality fans as opposed to cheap disposable fans due to changes in climatic conditions.

4.3. Potential African Markets for Export of Domestic Fans

Africa is one of the fastest-growing consumer markets in the world. Household consumption has increased even faster than its gross domestic product (GDP) in the past decade. The domestic fan market is segmented into price-driven and quality-driven segments. The market is dominated by Chinese exporters due to low-end cheap domestic fans. The table below provides potential African markets for exports of domestic fans from Pakistan. Despite internationally competitive domestic fan manufacturing, Pakistan is only able to get a meager share in African markets which include South Africa, Sudan, Tanzania, Djibouti and Mozambique whereas Ghana, Cote d'Ivoire, Nigeria and Togo have remained largely untapped.

Table 10:

Potential African Markets for Exports of Domestic Fans (HS-841451)

Africa	Potential Markets	Imports from the World				Tariff Faced by Pakistan	Pakistan's Exports in 2020 (US\$ million)	Export Potential (US\$ million)	Top Exporters		
		Value in 2020 (\$ million)	Change 2019-20 (%)	CAGR 2016-20 (%)	Average Unit Price (US\$)				Top Exporters	Share (%)	Tariff (%)
Intensive Margins	South Africa	20.7	-15.7	-6.0	24	5.0	0.2	20.5	China	89.2	5.0
									Spain	3.9	0.0
	Sudan	9.8	-34.6	-10.7	-	0.0	0.5	9.2	India	47.7	-
									China	40.5	-
	Tanzania	8.2	-34.3	15.8	-	25.0	0.0	8.2	China	91.9	25
									India	6.5	25
	Djibouti	3.4	45.0	8.9	-	19.5	0.6	2.8	China	72.3	19.5
									Pakistan	16.6	19.5
	Mozambique	1.2	-7.1	5.1	-	20.0	0.1	1.2	China	49.1	20
									South Africa	23.2	0
Extensive Margins	Ghana	39.5	157.3	25.5	-	20.0	0.0	39.5	China	82.7	20
									India	13.3	20
	Côte d'Ivoire	17.6	232.0	50.4	-	20.0	0.0	17.6	China	80.5	20
									Taipei, Chinese	17.6	20
	Nigeria	11.5	23.2	30.0	13	20.0	0.0	11.5	China	81.8	20
									Malaysia	7.7	20
	Togo	11.3	1163.6	142.9	-	20.0	0.0	11.3	China	98	20
									India	1.5	20

Source: ITC Trade Map

African Market Dynamics and Pakistan's Position

- Warm weather conditions along with a rapidly increasing consumer class are major drivers for the demand for ceiling fans in the region.
- Fans with high revolutions per minute (rpm) and better air quality are generally preferred in the quality conscious segments in African countries for which Pakistani manufacturers have an edge in producing such fans over India and China.

- Pakistani domestic fan exporters have sufficient capacity to obtain certifications required in African countries such as SABS by South Africa.
- Lack of awareness among exporters and difficult payment regimes are the major reasons cited for the low levels of domestic fan exports to African markets from Pakistan.
- The inclusion of African countries among high-risk countries and Pakistan's continued inclusion in the FATF grey list has meant that informal channels used previously for remittances are no longer available.

4.4. Potential Asian Markets for Exports of Domestic Fans

The Asian market is expected to dominate the global electric fan market owing to infrastructure development and construction activities in emerging economies such as China & India. In addition, rapidly changing environmental conditions and increasing temperature levels in various countries such as India, Pakistan and China along with their huge populations are majorly propelling the demand for domestic fans in the region.

Table 11:

Potential Asian Markets for Export of Domestic Fans (HS-841451)

Asia	Potential Markets	Imports from the World				Tariff Faced by Pakistan	Pakistan's Exports in 2020 (US\$ million)	Export Potential (US\$ million)	Top Exporters		
		Value in 2020 (\$ million)	Change 2019-20 (%)	CAGR 2016-20 (%)	Average Unit Price (US\$)				Top Exporters	Share (%)	Tariff (%)
Intensive Margins	Sri Lanka	27.6	1.1	-5.7	-	0.0	0.1	27.4	China	74.8	0.0
									India	13.8	0.0
	Bangladesh	17.9	-19.3	-11.8	-	25.0	4.2	13.8	China	69.6	25.0
									Pakistan	23.1	25.0
	Afghanistan	3.2	134.7	-	-	5.0	2.2	1.0	Pakistan	67.4	5.0
									China	26.9	5.0
Extensive Margins	Korea	166.0	-19.7	5.3	48	8.0	0.0	166.0	China	93.7	2.9
									Vietnam	1.2	0.0
	Viet Nam	153.9	140.8	27.4	-	26.7	0.0	153.9	China	76.1	15.0
									Malaysia	13.4	0.0
Asia	China	134.0	-13.0	0.1	39	5.4	0.0	134.0	Malaysia	42.6	0.0
									Germany	12.6	6.0
	India	80.2	-29.7	3.5	112	9.0	0.0	80.2	China	89.0	9.0
									Singapore	2.4	0.0
	Singapore	42.8	1.4	-3.5	-	0.0	0.0	42.8	China	52.6	0.0
									Malaysia	37.3	0.0

Source: ITC Trade Map

Asian Market Dynamics and Pakistan's Position

- The highest potential is in markets classified under Extensive Markets where penetration by Pakistani exporters is negligible.
- Due to somewhat similar consumer preferences and shared climate conditions, Pakistani fans have a potential to penetrate various Asian markets.
- Pakistan faces more tariff restrictions than non-tariff barriers mostly in identified potential Asian markets.
- Domestic fan manufacturers from Pakistan appear able to fulfil certification and other compliance requirements for exports to most of the Asian markets.
- Vietnamese electric fan importers believe that Pakistani fans complement the demand for luxury light fans in resorts, hotels, and spas. However, relatively higher tariffs for Pakistani domestic fans have been impeding exports to Vietnam.

4.5. Potential Middle Eastern Markets for Exports of Domestic Fans

Growth in the construction industry has been identified as the major driver of demand for domestic fans in the Middle Eastern region. Commercial construction activities are ongoing at a fast pace and global events such as the Dubai Expo 2020 and FIFA World Cup 2022 are prime examples of large-scale construction activities.

Table 12:

Potential Middle Eastern Markets for Exports of Domestic Fans (HS-841451)

Middle East	Potential Markets	Imports from the World				Tariff Faced by Pakistan	Pakistan's Exports in 2020 (US\$ million)	Export Potential (US\$ million)	Top Exporters		
		Value in 2020 (\$ million)	Change 2019-20 (%)	CAGR 2016-20 (%)	Average Unit Price (US\$)				Top Exporters	Share (%)	Tariff (%)
Intensive Margins	UAE	82.8	20.5	15.4	-	5.0	3.6	79.2	China	52.8	5
									India	22.5	5
	Saudi Arabia	82.2	97.2	14.9	34	5.0	1.8	80.4	China	51.6	5
									USA	11.4	5
	Iraq	73.9	-2.1	11.9	-	0.0	5.2	68.6	China	76.6	-
									Malaysia	8.3	-
	Yemen	16.2	51.9	12.4	-	5.0	2.4	13.8	China	83.2	5
									Pakistan	14.8	5
	Oman	14.8	-2.2	1.0	-	5.0	3.6	11.2	China	50	5
									Pakistan	24.4	5
	Jordan	8.8	57.9	-0.9	-	20.0	0.0	8.8	China	2.5	20
									Taipei	2.4	20

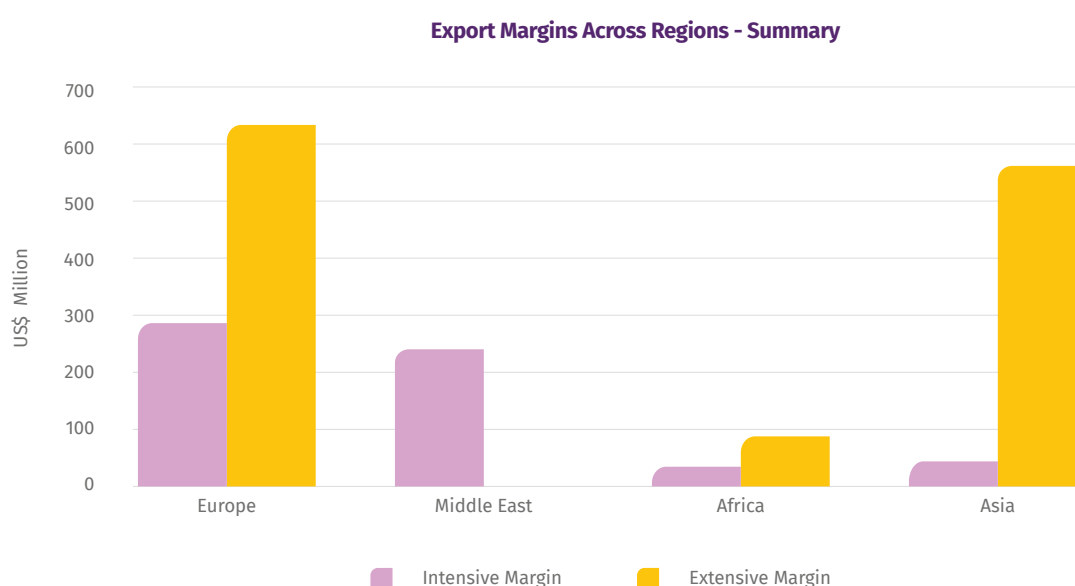
Source: ITC Trade Map

Middle Eastern Market Dynamics and Pakistan's Position

- Middle Eastern countries like Iraq and Yemen are among the top potential Middle Eastern markets for domestic fan exports from Pakistan based on consumer preferences. However, payment mechanisms as well as the inclusion of these countries among high-risk countries for financial transactions has made trading with these markets challenging.
- Gulf or 'G' marking is required for domestic fans to enter these markets. Pakistani exporters have sufficient capacity to get these markings.
- The estimated cost for getting the G-mark is between PKR 700 – 800,000 for each model of domestic fan.
- The market is clustered among low-end and high-end consumers. Low-end consumers prefer cheap fans and treat fans as a necessity whereas high-end consumers require more sophisticated fans with good aesthetics.

The figure below summarizes the intensive and extensive margins across different regions. It appears that the European and Asian markets are largely untapped and they thus offer a greater extensive margin.

Figure 16:
Export Margins Across Regions



4.6. Opportunities under Trade Agreements

Table 13 shows trade agreements where duty concessions are being offered by the partner country for domestic fan exports. Some opportunities under these trade agreements are as follows:

- Indonesia offers concession under Pak-Indonesia PTA for two tariff lines relating to domestic fans, export potential under these tariff lines from Pakistan is worth USD 22.68 million.
- Pakistani domestic fans can enter the European market at zero duty under the GSP plus scheme. The CE marking is the major requirement for exporting to the European market.

- Although preferential tariff is given to Pakistani fans under Pak-Malaysia FTA, there is zero tariffs on imports from China due to the ASEAN China FTA..
- Under the Pakistan China FTA Phase-II; preferential access for Pakistani fans has been provided. However, China is the largest exporter of domestic fans (relatively cheap plastic disposable fans). Pakistani exporters can cater to the quality conscious high-end Chinese consumers.

Table 13:

Opportunities under Trade Agreements

HS Codes	Real GDP growth rate (%)	Pak-China FTA Preference	Pak-Malaysia FTA Preference	Pak-Indonesia PTA Preference	GSP Plus
84145110	Ceiling fan	20.0*	10.0	-	0
84145120	Pedestal fan	0.0	10.0	-	0
84145140	Exhaust fan	-	-	-	0
84145130	Table fan	4.8	-	-	0
84145190	Others	3.0	10.0	-	0
84145191	Table fan with protective screen	-	-	5.0	-
84145199	Table fan – other	-	-	5.0	-

* It will be reduced to 16% by 2022.

Note: Other trade agreements do not provide any tariff concession specific to domestic fans.

Source: Ministry of Commerce of Pakistan

CHAPTER 05

Barriers To Trade

5.1. Analysis of Tariff Barriers

Countries impose tariffs to discourage imports of certain products. The table below summarizes the tariff faced by Pakistan, India, and China while exporting domestic fans (HS-841451) in the identified potential markets across different regions.

It can be seen that Pakistan and India enjoy zero tariffs for exports to potential markets in Europe thus having a competitive advantage over China. However, African and Middle Eastern countries offer a level playing field to all three countries. Among Asian potential markets, import tariffs are relatively higher for Pakistan for exports of domestic fans to Vietnam. Similarly, Pakistan faces import tariffs of 3.3 percent whereas China faces zero-tariffs while exporting to the Indonesian market.

Table 14:

Tariff faced by Pakistan on Exports of Domestic Fans (HS-841451) to Potential Markets

Europe	List of Potential markets	Tariff Faced by (%)		Africa	List of Potential markets	Tariff Faced by (%)		Asia	List of Potential markets	Tariff Faced by (%)		Middle East	List of Potential markets	Tariff Faced by (%)	
	United Kingdom	Pakistan	0.0		South Africa	Pakistan	5.0		Sri Lanka	Pakistan	0.0		Iraq	Pakistan	-
		India	0.0			India	5.0			India	0.0			India	-
		China	1.6			China	-			China	0.0			China	-
	Belgium	Pakistan	0.0		Sudan	Pakistan	-		Bangladesh	Pakistan	25.0		UAE	Pakistan	5.0
		India	0.0			India	-			India	25.0			India	5.0
		China	1.6			China	20.0			China	25.0			China	5.0
	Germany	Pakistan	0.0		Cameroon	Pakistan	20.0		Viet Nam	Pakistan	26.7		Saudi Arabia	Pakistan	5.0
		India	0.0			India	20.0			India	25.2			India	5.0
		China	1.6			China	25.0			China	15.0			China	5.0
	France	Pakistan	0.0		Tanzania	Pakistan	25.0		Indonesia	Pakistan	3.3		Oman	Pakistan	5.0
		India	0.0			India	25.0			India	6.7			India	5.0
China		1.6	China	20.0		China	0.0	China		5.0					

Table 14:

Tariff faced by Pakistan on Exports of Domestic Fans (HS-841451) to Potential Markets

	List of Potential markets	Tariff Faced by (%)			List of Potential markets	Tariff Faced by (%)			List of Potential markets	Tariff Faced by (%)			List of Potential markets	Tariff Faced by (%)	
Europe	Netherlands	Pakistan	0.0	Africa	Nigeria	Pakistan	20.0	Asia	Nepal	Pakistan	7.3	Middle East	Yemen	Pakistan	5.0
		India	0.0			India	20.0			India	7.3			India	5.0
		China	1.6			China	20.0			China	15.0			China	5.0

Source: ITC Trade Map

5.2. Non-Tariff Barriers

A non-tariff barrier is any measure, other than a customs tariff, that acts as a barrier to international trade. Certification requirements are the major non-tariff trade barriers for exporting domestic fans to the world.

Certification Requirements for Exports

The major non-tariff barrier for domestic fans are certification requirements. Domestic fans need to be tested on various parameters to obtain a certification which is specific to countries and regions. The 'CE Marking' for the EU and the 'UL Marking' for the US both have stringent testing requirements. Although Pakistani manufactured domestic fans are able to get these markings/certifications, the cost to outsource some tests (not available domestically) and additional time involved in getting testing done impedes operating efficiencies.

	Compliance Requirement	Countries/Regions
1	CE Marking	Europe
2	UL Marking	USA
3	G Marking	Saudi Arabia
4	SABS	South Africa
5	SONCAP	Nigeria
6	SIRIM	Malaysia
7	SIRIM	Sri Lanka
8	G Marking	Gulf Countries

Source: TRTA II, UNIDO

Pre-Shipment Inspections for Exports

Exporters reported strict pre-shipment inspections at Karachi port especially for consignments directed towards African countries. The aim of such inspections is primarily to check for contraband products. Such inspections however damage product packaging.

CHAPTER 06

Analysis of Competitors Strategies

Manufacturing facilities in India and China have a competitive edge over Pakistan. The Corporate tax and policy rates prevailing in Pakistan are higher than those in either India or China. Other factors such as labor productivity, capital efficiency, energy productivity, and electricity tariffs are also non-competitive in Pakistan. Demand conditions such as the share of the urban population in the total population and the urban population growth in Pakistan appear somewhat better than that for both India and China.

Table 15:

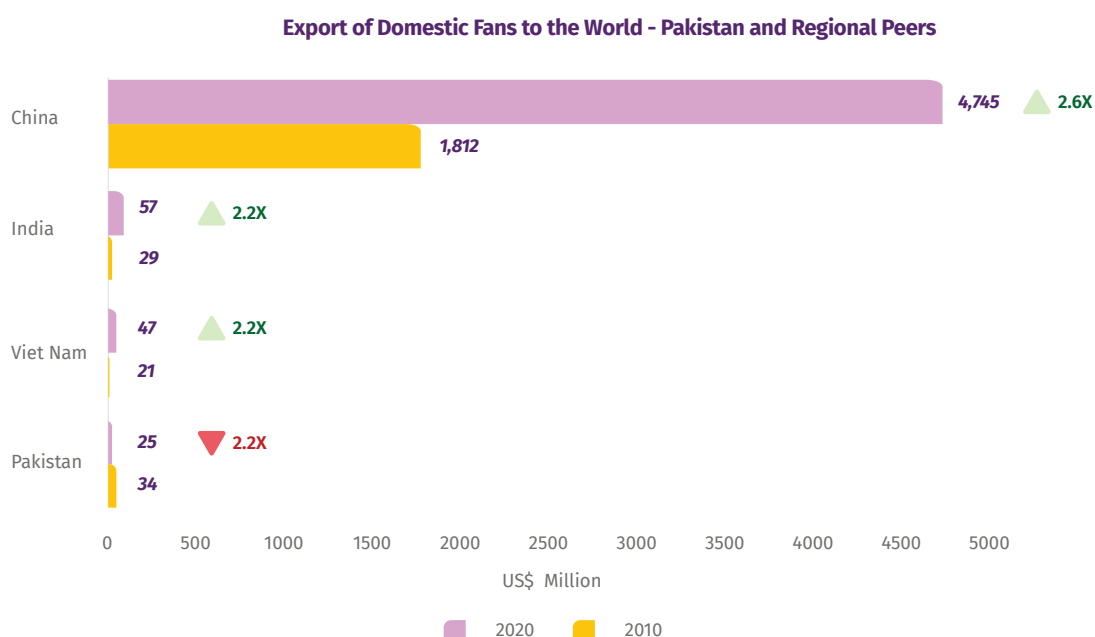
Key Economic Indicators

Indicators	Pakistan	India	China
Corporate tax rate (2020, %)	29.0	25.2	25.0
Policy rate (February 2021, %)	7.0	4.0	3.9
Labor Productivity Growth in Manufacturing ² (%) 2010-2017	0.3	0.7	2.4
Urban Population ² (2019, %)	36.9	34.4	60.3
Urban Population growth ² (2019, %)	2.7	2.3	2.3
Total Factor Productivity Growth ¹ (2017-2020, %)	0.7	1.2	1.0
Labour productivity ¹ (US\$ per hour worked, 2017)	8.8	8.3	47.7
Capital stock per hour worked ¹ (US\$, 2017)	7.8	18.7	102.5
Energy productivity ¹ (US\$ 000' per toe, 2016)	12.4	14.4	16
Electricity Tariffs (US cents/kWh)	15	6.6	8.4

Sources: ¹Asian Productivity Organization (APO), 2019; ²World Bank;

Figure 17 shows the export performance of domestic fans for Pakistan and regional peers between 2009 and 2019. Domestic fan exports from India and China increased 2.4 and 2.5 times in 2019 as compared to 2009 whereas a decline is seen in the case of Pakistan over the same period.

Figure 17:

Exports of Domestic Fans - Pakistan and Regional Peers**6.1. The Indian Fan Industry**

An electric fan is a high market penetration product category. The fan industry in India is segmented on the basis of price. There are three categories in which the organized fan market is divided, i.e., economy fans, regular fans, and premium fans. Economy fans are those which are priced below INR 1,800, regular fans are in the range of INR 1,800 to INR 3,500 whereas premium fans are priced above INR 3,500. The regular fans category is the largest selling category in India. The fan market in India broadly includes four types of fans i.e., ceiling fans, table fans, pedestal fans and wall fans. Ceiling fans dominate the market in terms of volume followed by table fans, pedestal fans and wall fans. The unorganized sector primarily sells to the price sensitive ceiling and table fans segments.

The Merchandise Exports from India Scheme (MEIS)

With the aim of making Indian products more competitive in global markets, this scheme provides an incentive in the form of a duty credit to an exporter to compensate for his loss on payment of duties on his inputs. The incentive is paid as a percentage of FOB value for notified goods going to notified markets, MEIS reward rates for domestic fans are as follows:

Table 16:

Reward Rate under MEIS

	HS Codes	Description of Products	MEIS Reward Rate ^a (%)		
			Country Group A	Country Group B	Country Group C
1	84145120	Ceiling Fans	0	2	0
2	84145130	Pedestal Fans	0	2	0
3	84145190	Others	0	2	0

^a Countries in group A, B, and C can be found here: <http://islf.in/merchandise-exports-from-india-scheme/>

Foreign Direct Investment

National Policy of Electronics in India allows 100.0% foreign direct investment in the electronic-hardware manufacturing sector. The foreign direct investment (FDI) in India was USD 2.60 billion in the electronics manufacturing sector between April 2000 and December 2019⁹.

Production Linked Incentive Scheme (PLI)

To boost India's manufacturing capabilities and exports, the Production Linked Incentive Scheme (PLI) in 10 key sectors was approved in November 2020. The PLI for large-scale electronics manufacturing provides an incentive of 4 to 6 percent on international sales of goods manufactured in India for a period of five years with the base year as FY2019-20.

Key Characteristics of the Indian Domestic Fan Industry

Innovation in product aesthetics. Demand for premium fans with better aesthetics has been on the rise over the last 3-5 years with an increasing consumer preference for enhanced and appealing features.

Energy-saving technology. Orient, India recently introduced a new ceiling fan dubbed Ecotech based on Brushless Direct Current Motor (BLDC). It is a 32W fan which saves 50% power compared to conventional fans that consume 75W.

IoT-enabled ceiling fans. Smart fans can be connected through the Internet and can automatically adjust their speeds according to changes in ambient temperature. They can be controlled from anywhere through cloud computing. LG plans to launch an IoT-enabled fan in India this year.

Production. In FY2020, the production of fans increased by 4.4% to reach 23.42 million units.

Rate of penetration. The rate of penetration of electric fans in rural areas is expected to reach 76-78 percent in 2019-20 from 65 percent in 2017.

6.2. The Chinese Fan Industry

China is one of the world's largest producers of consumer goods and the world's fastest-growing market for consumption of goods and services. The Chinese electric fan market is expected to continue to grow at 8 percent till 2029 due to high demand¹⁰. The production of domestic fans in China amounted to approximately 180.0 million units in 2018¹¹.

Government Policies

Table 17 summarizes some favorable government policies which have substantially improved the penetration of home appliances in the Chinese market.

⁹ <https://www.fdi.finance/sectors>

¹⁰ <https://www.researchandmarkets.com/reports/3734980/electric-fans-market-trends-in-china>

¹¹ Statista

Table 17:

Chinese Government Policies for Consumer Durables

Date	Policies
"Home appliances to the countryside" (1 February 2009 to 31 January 2013, nationwide)	
Dec 2007	Pilot programme (3 provinces, 3 types of home appliances, subsidy: 13% of product sales price)
28 Nov 2008	Extended to 14 provinces in Dec 2008, planned to have a nationwide rollout in Feb 2009, began to include a washing machine, subsidy: 13% of the product sales price
26 Feb 2009	Expanded subsidies coverage for 10 types of the home appliance, raised unit purchase limit for rural households, expected to stimulate over RMB 1 trillion rural consumption
16 Apr 2009	Raised subsidized TVs' limiting price from c.RMB 2k to c. RMB 3.5k
"Old-for-new" (June 2009 - December 2011)	
28 June 2009	Pilot programme (9 provinces and municipalities, subsidy: 10% of product sales price)
04 June 2010	Extended to another 19 provinces and municipalities, subsidy: 10% of the product sales price
Total subsidies	Chinese central government subsidized RMB 32 billion for the "old-for-new" program during 2009 and 2011.
"Energy-saving home appliance subsidy" (June 2012 - June 2013)	
4 June 2012	Promote energy-saving home appliance by introducing subsidy with proposed subsidies of RMB 26.5 billion

Source: Ministry of Finance, Ministry of Commerce; China

Key Characteristics of China's Domestic Fan Industry

Plastic-made disposable fans. Chinese electric fan industry is dominated by lightweight plastic and disposable fans. In the plastic-made disposable segment, China has a clear advantage owing to economies of scale.

Availability of raw materials. Basic raw materials are abundantly available in China. The availability of plastic granules has provided a competitive advantage to Chinese manufacturers.

Cost-effectiveness. China has been able to diversify its production of materials required for fan manufacturing moving into PVC, composites, etc. Pakistan on the other hand is still relying on pure materials which is not as cost-effective.

Economies of scale. Due to the large-scale production of domestic fans, overall costs are distributed over a large number of units leading to economies of scale. The Chinese fan manufacturers on average produce 45-50,000 fans/ day whereas the average manufacturer in Pakistan produces only 200-300 fans/day.

Domestic testing facilities. Testing facilities are domestically available in China. . For example, CE marking requirements such as Low Voltage Directive (LVD) test, Electromagnetic Compatibility (EMC) test, and test for Restriction of the use of certain Hazardous Substance in Electrical and Electronic Equipment (RoHS) are locally available in China.

CHAPTER 07

Competitiveness, Definition, Facts and Approaches for Measurement

7.1. Competitiveness Definitions

Literature pertaining to competitiveness is rich in dimensions, however, there is no clear consensus on defining competitiveness. This study benchmarked the definition of competitiveness from a European Commission study on measuring competitiveness and which defines competitiveness at three levels for analysis: firm-level, sectoral/industrial level, and the macroeconomic level (Penender & Rammer, 2018). The definitions of competitiveness from literature based on relevance at the stated levels are as follows:

Firm-level Competitiveness

The OECD (1992) defines competitiveness at the firm level as the “capacity of firms to compete, to increase their profits, and to grow”. It is based on cost, prices, technology, quality and performance of products.

Sectoral-level Competitiveness

The European Commission cited Momaya's (1998) definition of sectoral competitiveness as “the extent to which a business sector offers potential for growth and attractive returns on investment”.

Economy-wide Competitiveness

The European Commission defines the economy-wide or macroeconomic level of competitiveness as “an economy is competitive if its population can enjoy a high standard of living and high rates of employment while maintaining a sustainable external position”.

7.2. The Facets of Competitiveness

According to the European Commission¹², the three facets of competitiveness are as follows:

Price Competitiveness: For international businesses, price competitiveness refers to relative export performance in terms of prices. This is affected by a number of factors including relative inflation, the real effective exchange rate, and input costs.

Quality Competitiveness: Two broader notions here are the structure of an economy (such as the structural composition of the manufacturing sector which can be broken down into value addition, input sophistication, etc) and its capabilities, for instance, innovation and the education system. The quality of non-price competitiveness includes a variety of aspects including product quality & design, R&D, brands, effective marketing, dynamic efficiency of the industry, labor productivity and others.

¹² WWWFOREUROPE Working Paper no 44

Outcome Competitiveness: It defines competitiveness as the ability of a country, region, or location to deliver beyond GDP goals. It aggregates the indicator into three pillars: an income pillar, a social pillar, and an ecological pillar.

7.3. Approach Used in this Study for Measuring Competitiveness

This study uses a hybrid of a top-down and a bottom-up approach for measuring competitiveness at the industry level. The top-down approach employs comparing global competitiveness indicators as well as calculating competitiveness indicators at the industry level. The bottom-up approach includes interviewing individual manufacturers and aggregating their inputs at the industry level. A hybrid of these two approaches (i.e., top-down and bottom-up) provides a comprehensive view of the industry's competitiveness by encompassing multiple dimensions.

Chapter 08 and Chapter 09 are based on the bottom-up and the top-down approaches for measuring the competitiveness of Pakistan's domestic fan industry.

CHAPTER 08

Market View on Competitiveness of Pakistan's Domestic Fan Industry

Interviews in collaboration with the Engineering Development Board (EDB) were conducted with domestic fan industry participants. Respondents included 21 domestic fan manufacturers, 4 vendors, participants representing a testing laboratory, and the secretary-general of the Pakistan Electric Fan Manufacturers Association (PEFMA). A set of questions were developed that largely addressed the challenges faced by the industry; capabilities of the sector to understand its export orientation; to identify potential opportunities; and to highlight policy shortcomings along with recommendations to address the same.

To better analyze the competitiveness of the domestic fan industry, responses were organized in line with Porter's Diamond model (1980). The latest version of NVivo (released March 2020) was used to code interview transcriptions. Each code (node) reflects a unique attribute of Porter's Diamond Model; however, some additional codes were also included for other sections of the study. These codes helped identify common trends within the industry related to various attributes of the model¹³. Below are the attributes of the augmented Porter's Diamond Model:

Factor Condition. The industry's position in factors of production such as labor, raw materials, utilities, etc

Demand Condition. The nature of the consumer base for products

Related and Supporting Industries. The presence or absence of allied industries and their level of competitiveness.

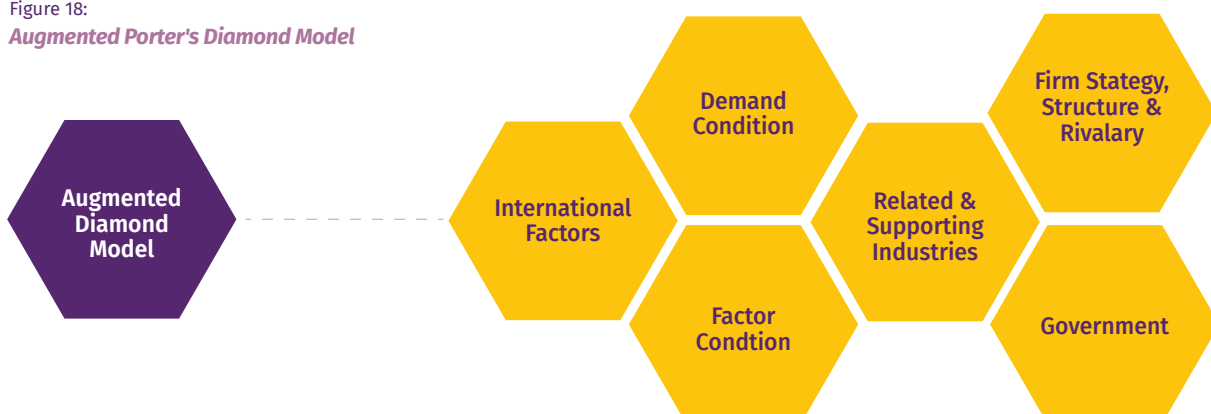
Firm, Strategy and Structure. This reflects the size, capacity, and market structure of the industry.

Government Factor. Industry's perception regarding current government policies.

International Factor. It includes the industry's exposure to international factors.

Figure 18:

Augmented Porter's Diamond Model



¹³ Project map and mind map from the NVivo are provided in the appendix.

8.1. Factor Conditions

Absence of domestic supply of raw materials

Domestic fan manufacturers use around 50-60 percent imported raw materials whereas the rest are procured from local vendors. Moreover, components procured through vendors are mostly manufactured using imported raw materials.

Steel Sheets: Electric steel sheet is the key raw material used in manufacturing energy-efficient fans. A RD of 11.0 percent on imports of these sheets is levied. Although RD-free import quota is available under concessionary SRO. the small manufacturers are unable to avail the quota as these manufacturers are mostly undocumented.

Plastic: Manufacturers and vendors import plastic granules under a low tariff regime which is rightly classified by the National Tariff Commission (NTC). Import substitution cannot be expected in the foreseeable future as Pakistan does not have a basic naphtha cracker plant.

Copper and Aluminium: After the removal of regulatory duty on the exports of recycled copper and aluminum, the recycling industry has started exporting recycled copper and aluminum ingots to China. This is posing a serious threat to the industry’s competitiveness and survival as competitively priced, locally available recycled copper and aluminum is in short supply

Printed Circuit Board (PCB): Industry is currently relying on imported PCBs from China for Direct Current (DC) fans. Demand for DC fans is picking up, localization of PCB manufacturing will be feasible once demand reaches a critical level.

Cost components of Pakistan’s domestic fan industry

The major cost components of the industry are raw materials and components. The cost breakup for producing a fan varies across large, medium, and small manufacturers. However, the best estimates are: (1) Raw materials: 70-80 percent (2) Utilities: 2-3 percent (3) Labor: 5-7 percent (3) Overheads: 10-12 percent. Among raw materials; steel sheets (27-28%), copper (20%), and aluminium (21%) together account for around 68-70 percent of the total raw material costs.

Absence of skilled labor

There is a shortage of skilled labor. In the context of domestic fan industry, workers having awareness of lathe machine handling, winding, die casting, and fitting process are counted among skilled labor. Due to seasonal employment opportunities, SMEs in the domestic fan industry are unable to retain skilled labor.

Moreover, technical education provided in educational institutions is not aligned with the specific needs of the industry.

The total labor employed in the industry is about 40,000. Out of these, about 15,000 workers are working for vendors.

Table: Current Employment Status of Overall Domestic Fans Industry (Source: PEFMA)

Current Employment Status	
Total Labor Employed	40,000
Skilled	16,000
Semi-Skilled	14,400
Un-Skilled	9,600

According to an industry survey of the workforce based on education, approximately 9 to 10% are diploma holders, 1 to 2% are engineers, about 65% are Middle to Matric pass and the remaining are uneducated. From the above statistics, it is easily observed that 24% of the labor force employed in the fan manufacturing industry is mostly un-skilled. Only 40% of the total labor force can be considered skilled in some regard. Mostly employees in the skilled category have low capability levels to cope with the ever-changing technology. The introduction of new technology in the fan sector is increasing day by day and industry is inducting the latest machinery for processes such as injection molding, die casting, CNC lathes, automatic presses, and stamping machines. To operate such machines and tools, well-trained manpower is required in increasing numbers. Technical institutes operating in Gujrat and Gujranwala therefore need to upgrade their programs to meet emerging demands of industry.

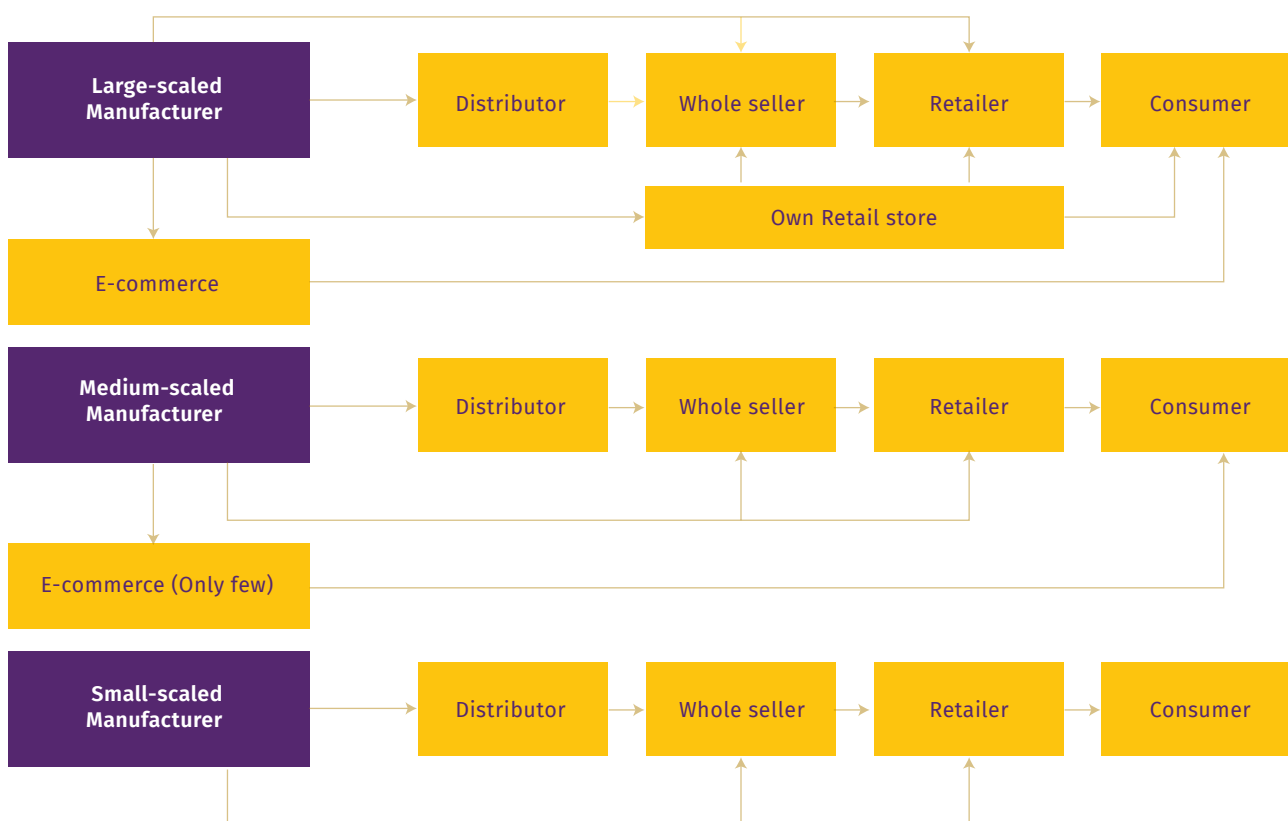
8.2. Demand Conditions

Domestic market and seasonal nature of sales

The major production of the cluster is for the domestic market. It is estimated that almost 55% of the fan market is located in the rural areas while the rest comprises of urban consumers. The annual demand for domestic fans in Pakistan is estimated to be between 8 to 10 million units. The seasonal sales of domestic fans start in January and peak in July each year.

Various marketing methods are adopted by the fan manufacturers including hoardings, wall chalkings, newspapers, key chains, writing pads, clocks, calendars, cable & television. In big cities like Karachi, Peshawar, Lahore, Hyderabad, large manufacturers sell their products mostly through their own outlets / distributors. The distributors further engage other clients including dealers, sub-dealers, and retailers. On the other hand, medium & small sized manufacturers sell their products through several intermediary agents and small retailers. The process flow of distribution channel of the fan industry is described below:

Distribution Channels for Small, Medium & Large Sized Manufacturers:



Market dynamics

The domestic fan industry offers a wide range of products including ceiling fans, pedestal fans, table fans, circumatic fans, and others. The market for domestic fans can be divided into two major segments:

Household: The demand in this segment is usually for general utility fans including ceiling, pedestal, and exhaust fans.

Institutional: The bulk demand is for general purpose fans by institutions such as hospitals, educational institutions, companies, industrial units, and other organizations.

Consumer preferences

Consumer preferences vary across income groups and regions. High-end consumers are generally brand conscious and demand aesthetically pleasing designs.

Solar fans are mostly demanded by the rural population where there is either no or limited access to electricity.

Local consumers demand fans which are heavier in weight, this is due to a general perception that weight is a measure of durability, on the other hand global consumers usually prefer lightweight fans and tend to replace them more frequently than the local consumers. Vendors are of the view that weight can be reduced by reshaping the rotor/stator. There is a tradeoff between cost efficiency and performance efficiency. Currently, there is no standard weight of a domestic fan. However, 36 slot stators are being used in domestic fans for the local market. Weight of the fan and rpm are directly proportional to the number of slots used in the stator.

Demand for imported fans

Only a limited quantity of domestic fans are being imported each year. These imports mainly include decorative fans and battery-operated fans. Previously, DC fans accounted for the largest share in imports, but these are now being manufactured locally, however, the printed circuit boards (PCBs) still need to be imported to manufacture DC fans. On average, the price difference between DC inverter fans and conventional fans is around PKR 1,500 in the local market. The price difference between an imported and locally manufactured DC fan is around PKR 500-700.

Local market penetration and replacement rate

The domestic market has largely been tapped after the introduction of solar fans. The domestic fan penetration rate in Pakistan is in the high 90s (percent) despite access to electricity for only 71 percent of the population. The local demand is mainly driven by replacement sales. The domestic fan replacement rate is between 2-3 percent per annum.

8.3. Related and Supporting Industries

Local vendor industry

Local vendors complement the domestic fan industry. Within the fan clusters in Gujrat and Gujranwala, there are about 700 specialized vendors that produce different components including castings, fan guards, stands, rods, enamelled copper wire, fan bodies, bush gears, shafts, capacitors, canopies, blades, and other small

components. Small manufacturers also outsource the production of rotors and stators. The quality of these vendor-supplied components is at an acceptable level.

The structure of some of the major vendor industries are discussed below:

Guard manufacturers: The fan guard industry has been set up in Gujranwala and Gujrat for the last 30-40 years with an average annual capacity of between 0.6-0.9 million guards. The industry is currently comprised of around 20-25 manufacturers. Their major cost drivers are local raw materials (70-75%), electricity (10-15%), and labor (10-20%).

Rotor & Stator manufacturers: The number of rotor and stator manufacturers in Pakistan varies between 8-10 manufacturers and together they meet the demand of up to 250 manufacturers. There are only around 15 large fan manufacturers who have in-house rotor and stator manufacturing facilities whereas the rest are dependent on local vendors. Economies of scale and their participation in exports are primary factors that allow large manufacturers to setup such facilities in-house. The major cost driver in the rotor-stator vendor industry is raw materials which account for 75-80 percent of the total cost. Vendors do not normally meet the criteria to avail zero-duty quota for importing electrical steel sheets under SRO-565 (I)/2006.

Capacitor manufacturers: There are around 20 capacitor vendors in Pakistan, mostly located in the Punjab province. The product range for capacitors varies between 1-35 μ F and the major cost components as: (1) raw materials ~ 70 percent (2) labor ~ 10 percent, and (3) miscellaneous ~ 20 percent. Large individual units (such as Amber Capacitors, GFC Capacitors and Khawaja Electronics) have an average manufacturing capacity of around 4-5 million capacitors per annum. The capacitor manufacturing industry is sufficient to cater to the demand of domestic market. Capacitors are also being exported with fans depending on consumer requirements.

Fan Development Institute

The Fan Development Institute (FDI) which was established in 2005, offers die-casting and moulding diploma courses. An updated curriculum, in consultation with industry experts, needs to be implemented. Specifically, training on lathe machine handling, winding, die development, and fitting process need to be provided at the FDI. Moreover, separate courses/sessions/trainings are required for already experienced workers.

Local Universities and R&D

Industry suffers from a lack of institutional linkages providing R&D support to the domestic fan industry. Novel trends in technology are therefore mostly demonstrated by large units who have in-house research and development capabilities.

Pakistan Council of Scientific & Industrial Research (PCSIR)

The Electrical Measurement & Test Laboratory (EMTL) of PCSIR in Lahore, provides testing services related to performance and safety standards. With the necessary investments, EMTL can be equipped for testing facilities related to Electromagnetic Compatibility (EMC) and RoHS which are the primary requirements for obtaining CE markings.

8.4. Firm Strategy, Structure and Rivalry

Domestic Fan Industry Structure

The industry is mainly comprised of small, medium, and large manufacturers of domestic fans. Distinct characteristics of these manufacturers are discussed below:

Small-scale manufacturers have the ability to produce low-quality fans at low costs. The low cost is achieved by widely diffused technology and older machines. They generally hire seasonal workers and focus on the far-flung domestic rural markets through wholesalers. The major cost saver for the small manufacturers is the usage of 'drum steel', made from recycled metal drums, to produce rotor armature. However, it leads to the production of low-quality fans which are highly inefficient in terms of electricity consumption. Small-scale manufacturers rely heavily on the vendor industry and have no participation in exports.

Medium-scale manufacturers mostly focus on ceiling and pedestal fans. These firms mostly employ local machinery including rotary die casting machines, refurbished imported CNC lathe machines, presses, and drilling machines. The primary market for such manufactures is domestic, however their participation in exports is also visible. Around 60-70 percent of the value chain is available in-house for these manufacturers.

Large-scale manufacturers produce high-quality fans. They use imported raw materials and components including electric steel sheets, ball bearings, and insulation materials under the zero-duty quota regime provided by the government. These manufacturers have developed brands that are both domestically and internationally recognized. Brand-conscious and quality-conscious local consumers in cities like Karachi, Lahore, and Islamabad are the primary target for these manufacturers.

Table 18:

Comparison among small, medium, and large manufacturers

Parameters	Small Manufacturers	Medium Manufacturers	Large Manufacturers
Product Line	2 kinds of fans (Ceiling, Pedestal).	4 to 6 kinds of fans (Ceiling, Pedestal, Wall Bracket, Metal Exhaust, Circomatic, Table).	All kinds of fans.
Technological Status	No R&D activities.	Negligible R&D activities.	Completely involved in R&D activities.
Managerial Infrastructure	-Usually one or two persons are involved in overall management. -Experts in the related business.	-Competent, well-educated and experienced management. -Low autonomy. -Learning structure.	-Competent, well-educated and experienced management. -Unified decision making. -Learning structure.
Human Resource	-Around 98% labor is contractual. -Shortage of skilled labor.	-Around 50 to 60% labor is contractual. -Skilled and unskilled workforce, having strong relations with contractors. -Facility of on job trainings and development.	-Around 25% labor is contractual, depending upon the order. -Most experienced and well-trained labor. -Facility of on job training and development. -Job security for all types of workers. -Good on job training facility.

Table 18:

Comparison among small, medium, and large manufacturers

Parameters		Small Manufacturers	Medium Manufacturers	Large Manufacturers
Procurement		-Around 90 to 95% of the operations are outsourced. -Procurement is demand driven	-Around 30% to 40% of the operations are outsourced. -High quantity purchases of input materials allow them to get better rates. -Friendly relations with vendors.	-Around 5% to 10% of the operations are outsourced. -Large purchase quantities allow them to avail quantity discounts.
Participation in Exports		No	Limited	Yes
Distribution Channel		Only through local dealers.	Mostly through local dealers but few manufacturers are involved in e-commerce.	Mostly through local dealers and also through e-commerce.
Inbound Logistics		No storage facility is available. The purchases are done based on demand.	No large storage facility is available, as production is not in bulk.	Suitable material storing facilities. These warehouses allow purchasing in bulk and getting quantity discounts
Out Bound Logistics		Production is limited with obsolete mode of transportation.	The production flow follows the market demand.	Sufficient storage capacity for finished goods that allows timely order processing and scheduling systems.
Manufacturing		Only winding, varnishing, painting & assembling are done in-house.	Better local manufactured machines are used to achieve maximum quality.	Better local and imported machinery is used to achieve maximum quality.
Services		Least support is provided to the distribution channel.	Spare parts are provided to the distribution channel.	-Offers lifetime guarantees to the final customer. -Spare parts are provided to the distribution channel.
Testing Facilities		-Wattmeter (Manual). -RPM meter.	-Wattmeter (Manual). -RPM meter. -Test chamber to check the air delivery.	-Wattmeter. -RPM meter. -Test chamber to check the air delivery. -In-house laboratory (wire short circuit test, pin hole test, and durability tests etc are available in the in-house lab).
Machinery	No.	Around 9 to 12.	Around 15-30.	Around 40 to 60.
	Types	-Lathe Machine (Belt type). -Drill machine (Bench type). -Automatic winding machine for ceiling fans (Locally made). -Hand coil machine for pedestal fans. -Die for blade bending. -Air compressor & gun for painting. -Oven for baking Paint (natural gas-operated).	-Lathe Machine (Belt type). -CNC Lathe Machine (Only a few Medium sized Players have this facility). -Drill Machine (Bench type). -Automatic winding machine for ceiling fans (Locally made). -Hand coil machine for pedestal fans. -Die for blade bending. -Rotary die casting machine. -Dies for body casting. -Semi-automatic press for rotor-stator. -Air compressor & gun for painting. -Oven for baking Paint (natural gas-operated).	-CNC lathe machine. -Lathe machine (Notched Gear type). -Drill machine (Bench type). -Air compressor & gun for painting. -Oven for baking paint (natural gas operated) -Automatic winding machine ceiling fans (Imported & Locally made). -Automatic coil winding machine (pedestal fan). -Automatic paper insertion machine (pedestal fan). -Coil & wedge inserting machine (pedestal fan). -Coil shaping machine (pedestal fan). -Lacing machine (pedestal fan). -Automatic progressive die Stamping power press. -High pressure die-casting machine. -Enameled copper wire plant. -CNC wire cut machine (for die making).

Limited scope for manufacturing fans outside Gujrat and Gujranwala

Vendors and raw material suppliers have developed their manufacturing facilities within or around Gujrat and Gujranwala cities. Most of the local testing facilities¹⁴ are also available in the vicinity of these regions.

The fan cluster in Gujrat and Gujranwala is a vibrant one and attracts new entrants on a regular basis, however, it is difficult for any manufacturer located outside the region to compete with the mostly family-oriented businesses in this region.

Underutilized production capacity

The average production capacity utilization rate for the domestic fan industry is between 40-70 percent. The first half of the calendar year sees the peak of both the production and sales cycle while the second half is marked as low periods for production and sales. The excess production capacity in the lean months can be utilized for enhancing exports to existing and potential markets. Production capacity utilization is even lower for small manufacturers.

Domestic market concentration

Sales in the local market are mainly dominated by the top 4-8 large manufacturers. They cater to roughly 80-90 percent of the domestic market demand for household fans.

8.5. Government

Non-Competitive Regulatory Duties

Although the domestic fan industry is adequately protected in terms of the tariff structure however prevailing regulatory duty structure has an inherent anti-manufacturing bias.

Regulatory duties on imported electric sheets

Domestic fan manufacturers, who are unable to obtain import quotas, have to face significant regulatory duties on direct imports of electric sheets as well as in procuring through vendors.

No regulatory duty on exports of raw materials

After removal of regulatory duty on exports of aluminum and copper, recyclers import discarded components/parts (such as compressors, etc) and separate aluminum and copper to export in the form of ingots. As a consequence, local manufacturers have been facing an acute shortage of recycled raw materials.

Anamolies in the tax regime

Some of the imported inputs are not rightly classified and are hence subject to higher tariffs. The inclusion of the domestic fan industry in the third schedule of sales tax is a concern for the industry. Previously sales tax was levied at 17 percent on cost-plus factory margin only whereas by inclusion of industry in the Third Schedule of sales tax, now requires industry to charge 17 percent sales tax on the final consumer price.

¹⁴ List is provided in Table 35 of appendix.

8.6. International Factors

Potential export markets

Export opportunities are available in almost all markets of the world due to climate change. In particular, relatively hot countries located in African and Middle Eastern regions import fans with high r.p.m and better air flows which provide scope for Pakistani domestic fans to be exported to these markets. Asian markets such as Bangladesh, Sri Lanka and Vietnam are also among the top potential markets for exports of domestic fans.

International competitiveness

The competitiveness of Pakistani fans is notable in terms of attributes such as better air delivery, high r.p.m., and metal body as opposed to Chinese and Indian fans that are lighter in weight and cheaper in price.

In consumer clusters where plastic body and disposable fans are generally preferred, Pakistani domestic fans cannot compete with their Chinese counterparts which are more cheaply priced. This is especially true for most of European markets, however climate change is shifting consumer preferences.

Table 19:

Pakistan's Competitive Position against Peers

Inputs/Attributes	Pakistan's Position Relative to India and China
Labour	Abundant but less skilled
Exchange rate	Competitive advantage for exporters
Quality	Competitive than that of India and China
Cost	Disadvantage due to import dependency
Economies of scale	Lower than that of India and China
Raw materials	High import dependency and recent shortage due to exports of raw materials

Implications of Pakistan's placement in FATF grey list for the domestic fan industry

State Bank of Pakistan took several measures related to international payments which have made exports to high-risk countries challenging. The following two are among the major challenges being faced after Pakistan's inclusion in the FATF gray list:

Requirement of Foreign importer's profile. Commercial banks now require complete profiles and details of importers in high-risk countries. Both exporters and importers are reluctant to share such details.

Crackdown on Informal payment mechanisms. Traditionally, exporters used informal payment mechanisms for receiving export proceeds. Due to FATF monitoring, it has become difficult to use informal payment channels, Pakistani exporters are struggling to find alternate payment mechanisms.

Risks in international businesses

Participation in international businesses exposes manufacturers to additional risks. The high dependency of the domestic fan industry on imported raw material along with exports to high risk countries leads to international risk exposures. Risks include:

Credit Risk. Pakistan's domestic fan exports are mainly directed towards high-risk countries like Yemen, Iraq, and low-end African and Middle Eastern markets. Payment mechanisms in these countries are largely insecure causing exporters to bear credit risk.

Exchange Rate Risk. The market-based exchange rate regime has increased volatility of local currency substantially which has increased both import and export risks.

CHAPTER 09

Measuring Competitiveness

This chapter is devoted to measuring the competitiveness of the domestic fan industry of Pakistan using the top-down approach. It employs an analysis of global competitiveness indicators as well as industry competitiveness indicators which are discussed in the following sections.

9.1. Global Competitiveness Indicators

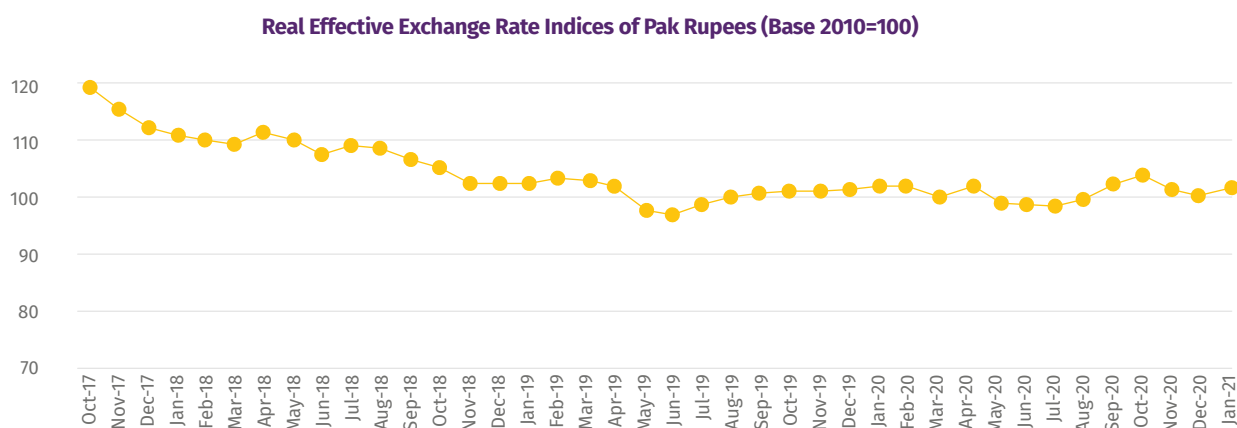
Real Effective Exchange Rate (REER)

The Real Effective Exchange Rate (REER) compares the value of a nation's currency against the weighted average of a basket of other major currencies. It is a major driver of the external competitiveness of any country and determines its economic performance to a large extent. An increase in REER implies that exports become more expensive and imports become cheaper, thus, an increase reflects a loss in export competitiveness.

The figure below presents a decreasing trend in the real effective exchange rate of Pakistan till July 2019 whereas an increasing trend has been observed between July-2019 and January-2021. It indicates that exports have lost some price competitiveness in recent months. Exports however are still competitive as compared to the level in October 2017. International price competitiveness can be translated into a higher level of exports as a result of the lower price of domestic products in international markets. Domestic fans and (other consumer durables) are found to be price elastic, therefore, a higher level of domestic fan exports can be anticipated with a decrease in REER.

Figure 19:

Trend in Real Effective Exchange Rate, Oct 2017 - Jan 2021



Doing Business Indicator

Doing Business Indicator of the World Bank Group measures the regulations that enhance business activity and those that constrain it. Doing Business covers 12 areas of business regulation. Ten areas—starting a business, dealing with construction permits, getting electricity, registering property, getting credit, protecting minority investors, paying taxes, trading across borders, enforcing contracts, and resolving insolvency—are included in the ease of doing business ranking.

Pakistan has improved 28 positions, from 136 to 108 on Doing Business Indicators in 2020. A sub-indicator i.e., 'Trading across the Borders', and its components, which measure the time and cost to export or import a product, is shown in the table below. It is evident from the table that Pakistan performed poorly as compared with other countries in the table below and none of the sub-indicators represents a competitive edge for Pakistan. Austria is ranked 1st on the 'Trading across the Borders' indicator whereas India and China which have a comparable domestic fan industry to that of Pakistan are ranked at 68 & 56 respectively.

Table 20:

Trading across the borders sub-indicator, Doing Business indicator 2020

Trading across the borders sub-indicator, Doing Business indicator 2020											
Economy	Doing Business Indicator	Trading across Borders rank	Trading across Borders score	Time to export: Border compliance (hours)	Cost to export: Border compliance (US\$)	Time to export: Documentary compliance (hours)	Cost to export: Documentary compliance (US\$)	Time to import: Border compliance (hours)	Cost to import: Border compliance (US\$)	Time to import: Documentary compliance (hours)	Cost to import: Documentary compliance (US\$)
Pakistan	108	111	68.8	58	288	55	118	120	287	96	130
China	31	56	86.5	21	256	9	74	36	241	13	77
India	63	68	82.5	52	212	12	58	65	266	20	100
Austria	27	1	100	0	0	1	0	0	0	1	0

Source: Doing Business 2020, World Bank

Global Competitiveness Index (GCI)

The global competitiveness index of the World Economic Forum (WEF) integrates the macroeconomic and micro/business aspects of competitiveness into a single index. The index assesses the ability of countries to provide high levels of prosperity to their citizens. This index depends on how productively a country uses available resources. Thus, the Global Competitiveness Index measures the set of institutions, policies, and factors that set the sustainable current and medium-term levels of economic prosperity. The index comprises 12 pillars of competitiveness which are shown in table 21.

Pakistan ranked lowest i.e., 110 among the countries selected, and is only more competitive than India on the 11th pillar i.e., business dynamism. Singapore was ranked highest on GCI in 2019.

Table 21:
Global Competitiveness Indicator, 2019

Global Competitiveness Indicator (World Economic Forum, 2019)													
Economy	Ranks												
	Overall	Institutions	Infrastructure	ICT adoption	Macroeconomic stability	Health	Skills	Product market	Labour market	Financial system	Market size	Business dynamism	Innovation capability
Pakistan	110	107	105	131	116	115	125	126	120	99	29	52	79
China	28	58	36	18	39	40	64	54	72	29	1	36	24
India	68	59	70	120	43	110	107	101	103	40	3	69	35
Singapore	1	2	1	5	38	1	19	2	1	2	27	14	13

Source: World Economic Forum

Logistics Performance Indicator (LPI)

A useful measure of logistics efficiency is the Logistics Performance Index (LPI) which is calculated by the World Bank. The index is based on perceptions of a country's customs clearance process, quality of trade and transport-related infrastructure, ease of arranging competitively priced shipments, quality of logistics services, ability to track and trace consignments, and frequency with which shipments reach the consignee within the scheduled time.

Pakistan's performance on LPI is also the poorest as compared to selected countries in the table below. However, infrastructure and connectivity projects under China-Pakistan Economic Corridor (CPEC) are likely to improve Pakistan's performance in the Logistic Performance Indicator.

Table 22:
Logistics Performance Indicator, 2018

Logistics Performance Indicator (World Bank, 2018)							
Economy	Ranks						
	Overall LPI	Customs	Infrastructure	International shipments	Logistics quality and competence	Tracking and tracing	Timeliness
Germany	1	1	1	4	1	2	3
Pakistan	122	139	121	97	89	136	136
China	26	31	20	18	27	27	27
India	44	40	52	44	42	38	52

Source: Logistic Performance Indicator, World Bank

9.2. Industry Competitiveness Measures

This section discusses some indicators for measuring competitiveness at the industry level. Lack of industry-level competitiveness is a critical impediment in tapping global markets. This section quantitatively assesses the competitiveness of Pakistan's domestic fan industry using indicators including change in market share, revealed comparative advantage, and Vollrath's (1991) indices for competitiveness.

Change in Market Share

Measuring changes in export market shares is a natural way to assess a country's competitiveness as rising market shares reveal a strong performance of a country's producers in international markets. According to the OECD's definition of competitiveness¹⁵, "Competitiveness is a measure of a country's advantage or disadvantage in selling its products in international markets", mathematically,

$$M_1 = \text{Market Share (\%)} = \left\{ \left(\frac{X_{ijt}}{X_{njt}} \right) - \left(\frac{X_{ij(t-1)}}{X_{nj(t-1)}} \right) \right\} \times 100$$

Where X represents exports, i is the country, j is a commodity (i.e., fans in this case), n is the set of countries (world), and t is the time period.

Revealed Comparative Advantage (RCA)

Revealed comparative advantage (RCA) is based on the Ricardian trade theory, which posits that the pattern of trade among countries is governed by their relative differences in productivity. Although such productivity differences are difficult to observe, an RCA metric can be readily calculated using trade data to "reveal" such differences. RCA is calculated as follows:

$$M_2 = \text{RCA} = \frac{X_{ij} / X_j}{X_{iw} / X_w}$$

Where X_{ij} are the exports of product i of country j, X_j is the total exports of country j, X_{iw} are the exports of product i by the world and X_w are total exports of the world. A country has a comparative advantage if $\text{RCA} > 1$ and a comparative disadvantage if $\text{RCA} < 1$.

Vollrath's Indices for Competitiveness

Vollrath (1991) indices are used to measure comparative advantage as well as trade competitiveness. These three indices discussed below use exports and imports for measuring competitiveness. According to Vollrath (1991), positive indices reveal a competitive advantage whereas negative values reveal a competitive disadvantage. These indices are defined as follows:

Relative Trade Advantage:

The first measure of Vollrath (1991) is the relative trade advantage (RTA) which accounts for exports as well as imports. It is the difference between the relative export advantage (RXA) and relative import advantage (RMA).

¹⁵ <https://stats.oecd.org/glossary/detail.asp?ID=399>

$$M_3 = RTA = RXA - RMA = \frac{x_{ij} / x_{it}}{x_{nj} / x_{nt}} - \frac{m_{ij} / m_{it}}{m_{nj} / m_{nt}}$$

Where x and m represent exports and imports respectively, i is the country, j is a commodity, t is a set of commodities and n is a set of countries.

Revealed Export Advantage:

Volrath's (1991) second measure is simply the logarithm of the relative export advantage.

$$M_4 = \ln(RXA) = \frac{x_{ij} / x_{it}}{x_{nj} / x_{nt}}$$

Where x represents exports, i is the country, j is a commodity, t is a set of commodities and n is a set of countries.

Revealed Competitiveness:

The third measure of Volrath (1991) is the revealed competitiveness and is calculated as the difference between the logarithm of relative export advantage and the logarithm of relative import advantage.

$$M_5 = RC = \ln(RXA) - \ln(RMA)$$

The table below provides the competitiveness indicators across top exporting countries of domestic fans. These indicators are measured for top 11 exporters as well as for Vietnam and Pakistan.

Changes in the global market share indicates that international competitiveness of domestic fans manufactured in China, Malaysia, Belgium, and Vietnam have improved in the global markets. However, Pakistani fans have lost their international competitiveness as their market share has declined by 26 percent over 2019-2020.

Revealed Comparative Advantage (M2) highlights that comparative trade advantage for domestic fans is revealed for China, Malaysia, Taipei Chinese, and Pakistan. The domestic fan industry of Pakistan has been participating in exports for a long time and is now developed enough to compete further.

Finally, the Vollrath Indices (M3 – M5) for measuring competitiveness are also provided in the table below. The advantage of Vollrath Indices is that it incorporates both export and import perspectives. Comparing these indices across the above mentioned countries shows that China, Malaysia, Taipei Chinese and Pakistan are the top three countries having competitive advantage for exporting domestic fans.

Overall, despite losing some export share in recent years, Pakistan's domestic industry is globally competitive and can be ranked among the top four exporters when compared on revealed comparative advantage (RCA) and Vollrath Indices.

Table 23:

Competitiveness Measures at Industry Level

Ranks	Exporters	Change in Market Share over 2019-20 (%)	Revealed Comparative Advantage (M2)	Relative Trade Advantage (M3)	Relative Export Advantage (M4)	Revealed Competitiveness (M5)
1	China	6.1	5.2	5.0	1.6	3.2
2	Malaysia	18.8	2.1	1.1	0.7	0.7

Table 23:

Competitiveness Measures at Industry Level

Ranks	Exporters	Change in Market Share over 2019-20 (%)	Revealed Comparative Advantage (M2)	Relative Trade Advantage (M3)	Relative Export Advantage (M4)	Revealed Competitiveness (M5)
3	Taipei, Chinese	-10.9	1.0	0.7	0.1	1.1
4	Germany	-13.3	0.2	-0.4	-1.6	-1.1
5	USA	-22.3	0.2	-2.4	-1.7	-2.6
6	Netherlands	21.0	0.4	-0.3	-0.8	-0.5
7	Spain	-6.8	0.8	-0.3	-0.3	-0.3
8	Thailand	-20.0	0.9	0.7	-0.1	1.5
9	Belgium	1.4	0.4	-0.2	-0.9	-0.3
10	Mexico	-17.4	0.4	-0.5	-0.9	-0.8
11	India	-17.8	0.6	-0.1	-0.5	-0.1
13	Viet Nam	51.5	0.4	-1.3	-0.9	-1.5
17	Pakistan	-26.0	3.2	2.8	1.1	2.3

Source: Author's estimates based on data from ITC Trade Map

CHAPTER 10

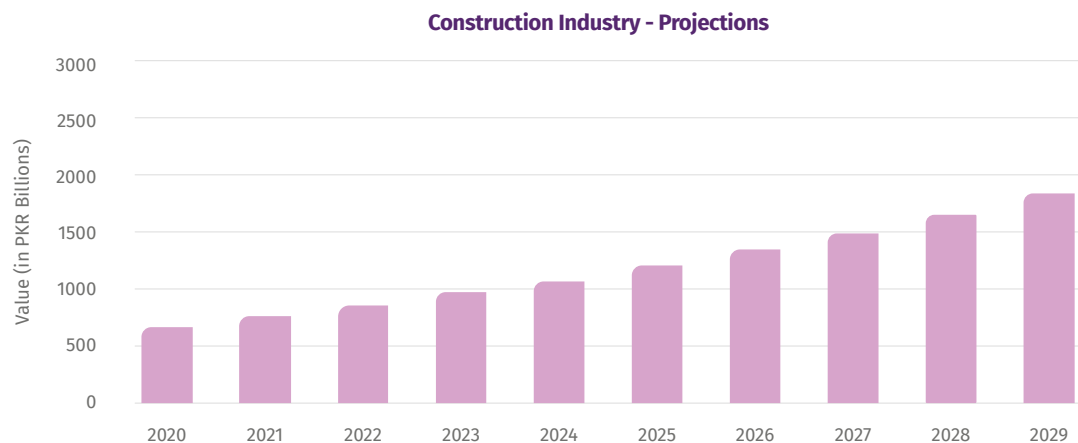
Demand – Supply Analysis

10.1. Demand-Side Factors

Housing Sector Growth

Pakistan's annual demand for housing is estimated to be about 700,000 units while only half of this demand is currently being met¹⁶. Growth in the housing sector is instrumental in boosting demand for domestic fans as well as other consumer appliances. Despite the economic slowdown amid COVID-19, overall, the construction industry is expected to grow at a rate of 111.4 percent per annum (CAGR 2020-2029) and would reach PKR 2,705.5 billion by 2029¹⁷. The government's new fixed tax regime for builders and developers, exemption from withholding & capital gain tax, and soft loans for the housing sector are important growth drivers for the housing sector, this is expected to lead to a substantial increase in the demand for domestic fans.

Figure 20:

Construction Industry - Value Projections

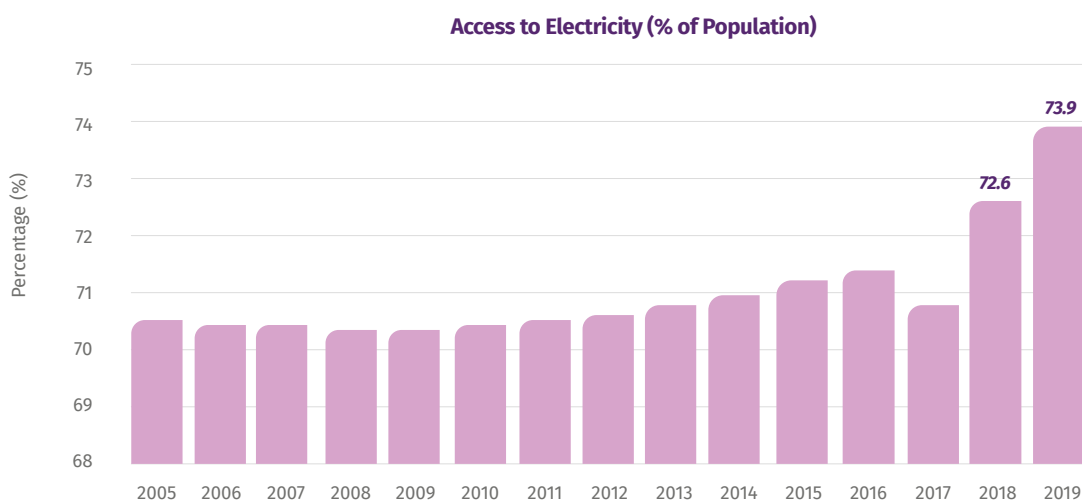
Access to electricity

In Pakistan, around 74 percent of the population has access to electricity with nearly 100 percent access available in urban areas. Any increase in access to electricity, especially in rural areas would increase the demand for electric fans.

¹⁶ Board of Investment, Pakistan

¹⁷ Fitch Solutions

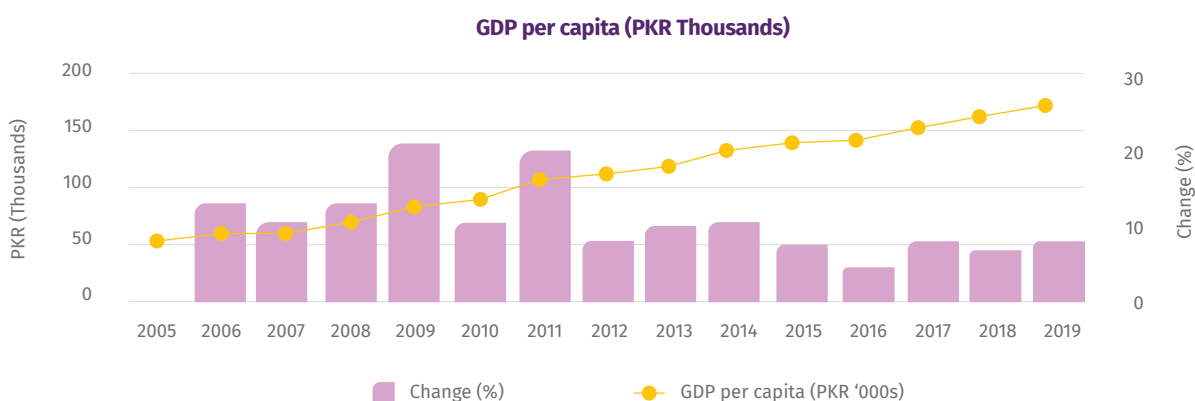
Figure 21:
Access to Electricity (% of Population)



Disposable Income (GDP per capita)

GDP per capita proxies the income level and reflects the purchasing power of the population. In terms of local currency units (i.e., PKR), there is an increasing trend in GDP per capita which reflects in a general increase in demand for products and services available in the economy.

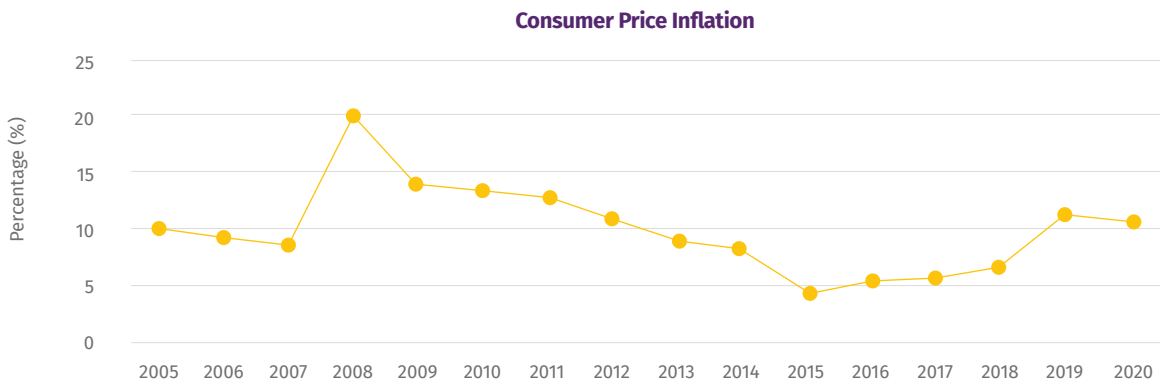
Figure 22:
GDP per capita



Consumer Purchasing Power (Inflation)

Inflation erodes the purchasing power of consumers. In the last couple of years, cost-push (rather than a demand-pull) inflation is driving inflation in Pakistan. Cost-push inflation is mainly due to multiple rounds of currency depreciation against the USD which has increased prices of imported raw materials. The demand-supply framework predicts lower demand in an inflationary environment.

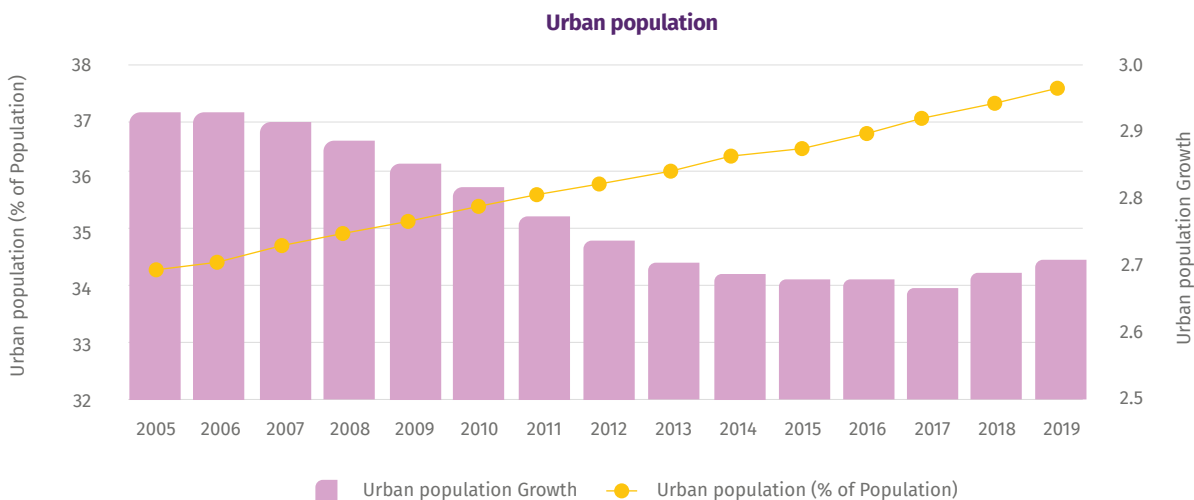
Figure 23:
Consumer Price Inflation



Urban population

The overall population growth rate of Pakistan is around 2 percent whereas, the urban population growth rate was around 2.3 percent in 2020. The continuous growth in the urban population causes demand for consumer durables to increase.

Figure 24:
Urban Population

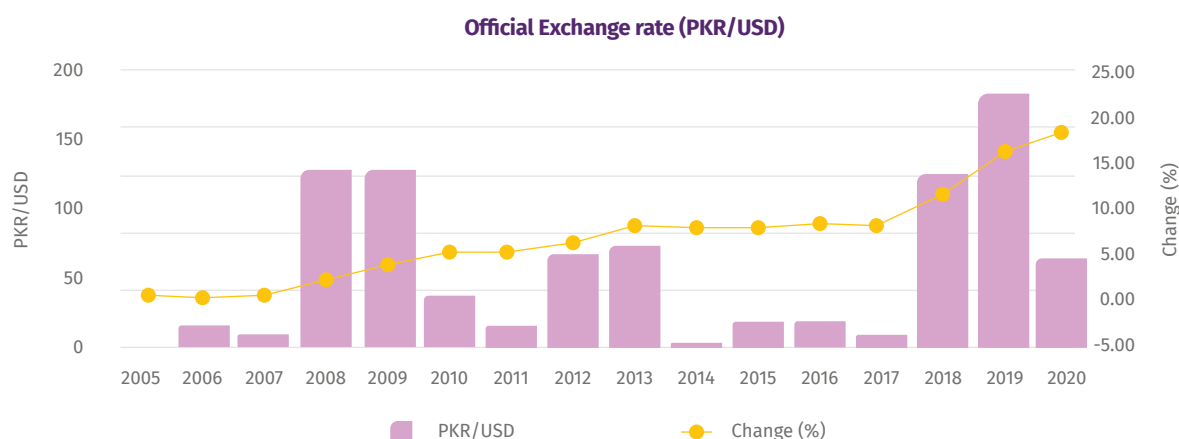


10.2. Supply-Side Factors

Exchange rate

Pakistani rupee (PKR) has been losing its value against the US\$ since 2005, however steep depreciation was observed during 2017-2019. The figure on the next page shows the annual exchange rate of the Pakistani Rupee against the US\$ (i.e., PKR/US\$). The exchange rate is a crucial supply-side factor as the domestic fan industry relies heavily on imported raw materials, and depreciation of the currency, therefore, impacts the value chain.

Figure 25:

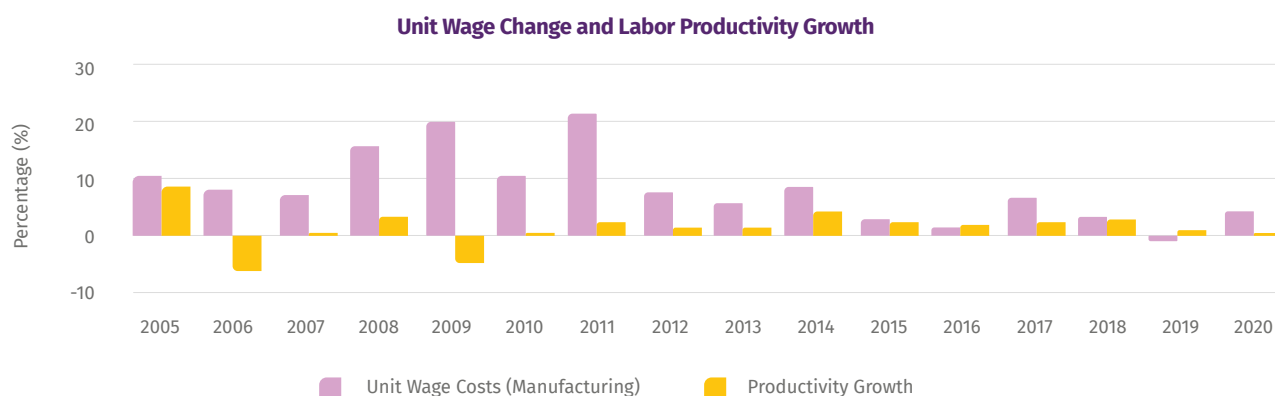
Official Exchange rate (PKR/USD)

Unit wage change and labor productivity growth

Any surge in unit wage increases the cost of production whereas productivity growth fosters a higher level of production. It is evident from the figure below that the growth in unit wage exceeds labor productivity growth over the period 2005-2020 which reflects a deterioration in labor market competitiveness in Pakistan.

Moreover, there is a demand-supply mismatch of the skillset required in the domestic fan industry. For instance; industry requires skills such as lathe machine handling, winding, die development, and fitting skills.

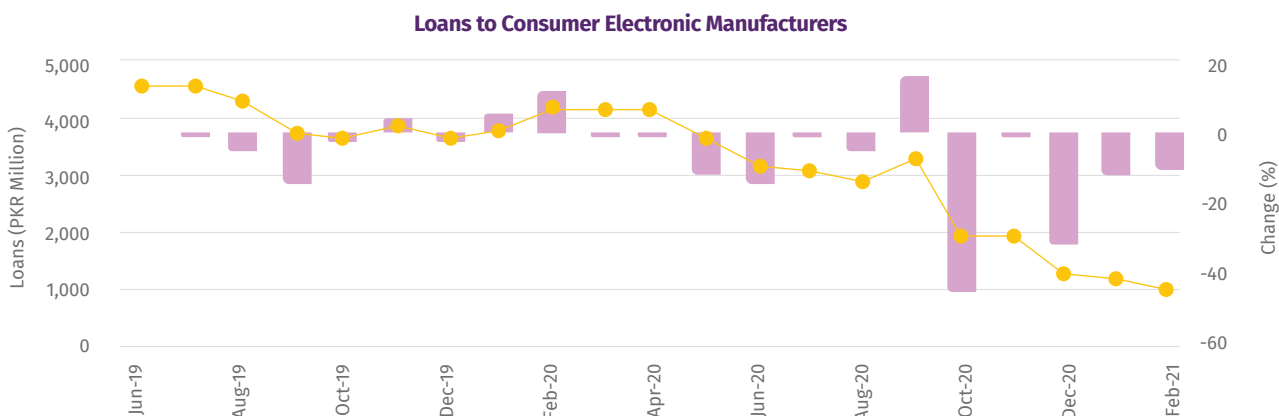
Figure 26:

Unit Wage Change and Labor Productivity Growth

Loans to consumer electronics manufacturers

Borrowing allows businesses to fuel growth and meet short-term liquidity requirements. A downward trend in loans to consumer electronics manufacturers since January 2020 is mainly due to a lower level of production amid COVID-19. Moreover, the domestic fan industry relies less on bank borrowing mainly because of four reasons: (1) complex procedures (2) higher cost of borrowing (interest rates), (3) sharia sensitivity to interest-based financing, and (4) undocumented small and medium enterprises (SMEs).

Figure 27:

Loan Provisions to Consumer Electronic Manufacturers**10.3. Equilibrium Analysis****Correlation Analysis of Domestic Fan Production with Supply and Demand Side Factors**

Correlation coefficients between domestic fan production and socio-economic indicators are measured using the Pearson correlation coefficient. The direction and magnitude of correlation can be summarized as follows:

- Domestic fan production is highly and positively correlated with GDP per capita reflecting a robust relationship between income-induced demand and the supply of domestic fans.
- The low correlation between domestic fan production and policy rate suggests a lower level of leverage in working capital financing which is also endorsed by industry participants.
- The moderately negative correlation coefficient between change in unit wage cost and production of domestic fans implies the labor-intensive nature of the domestic fan industry. Any increase in wages of labor tends to negatively impact the industry.

Table 24:

Correlation Matrix

	Access to electricity (% of population)	GDP per capita (constant \$)	Inflation Policy Rate (%)	Productivity Growth Rate (%)	Unit Wage Cost (% YOY)	Exchange Rate	Urban Population Growth rate (%)	Production of fans
Access to electricity (% of population)	1.00							
GDP per capita (constant \$)	0.78	1.00	1.00					
Inflation	-0.32	0.12	0.64					
Policy Rate	-0.55	-0.29	-0.09	1.00				
Productivity Growth Rate (%)	0.13	0.00	0.68	-0.18	1.00			

Table 24:

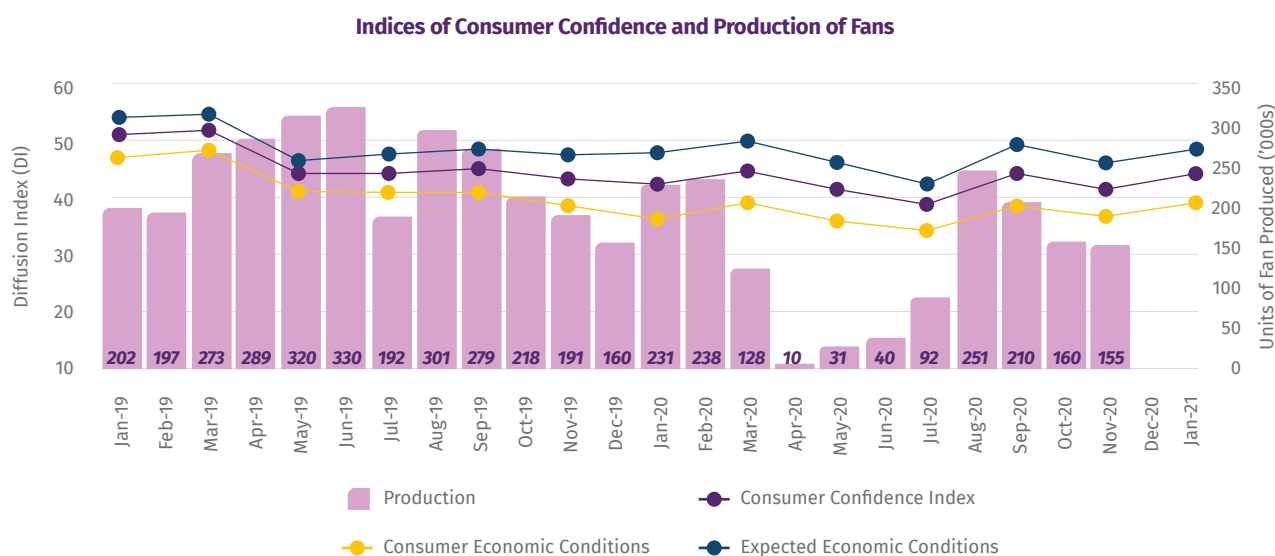
Correlation Matrix

	Access to electricity (% of population)	GDP per capita (constant \$)	Inflation Policy Rate (%)	Productivity Growth Rate (%)	Unit Wage Cost (% YOY)	Exchange Rate	Urban Population Growth rate (%)	Production of fans
Unit Wage Cost (% YOY)	-0.49	-0.12	0.56	-0.21	1.00			
Exchange Rate	0.78	0.86	0.03	0.12	-0.34	1.00		
Urban Population Growth rate	-0.71	-0.88	-0.18	0.06	-0.07	-0.78	1.00	
Production of fans	-0.11	0.61	0.08	0.02	-0.42	0.08	-0.02	1.00

Source: Author's estimates based on data from IMF, World Bank, and SBP

The figure below presents indices of consumer confidence and the number of fans produced. Consumer Confidence Index is the average of two indices i.e., Consumer Economic Conditions (CEC) and Expected Economic Conditions (EEC). This study proxies the overall demand for consumer durables by using the Consumer Confidence Index. It is evident from the figure below that any deterioration in consumer confidence, in general, decreases the production of domestic fans in the next period. Since the beginning of the financial year 2021, consumer confidence has improved thus the production of fans is also expected to increase. The period from March 2020 - July 2020 marked the lowest level of production of electric fans with consumer confidence also touching its lowest level.

Figure 28:

Consumer Confidence Indices and Production of Fans

CHAPTER 11

Government Policies/Initiatives

11.1. Duty Drawback for Electric Fans (S.R.O. 859(I)/2020)

The Federal Board of Revenue has revised the duty drawback structure from 1.7 percent to 4.4 percent for exports of electric fans vide S.R.O. No. 859(I)/2018 dated September 10, 2020. The table below shows the HS codes related to the domestic fan industry under the aforementioned S.R.O.

Table 25:

Revised Duty Drawback Rates for Electric Fans, SRO 859(I)/2020

Description	PCT codes	Decision
Ceiling fan, pedestal fan, table fan, exhaust (metal/plastic) fan, and other (bracket fan, louver fan, circumatic fan, etc.)	8414.5110 8414.5120 8414.5130 8414.5140 8414.5190	Duty drawback rates have been revised from 1.7% to 4.4% with effect from 10.09.2020.

Source: Federal Board of Revenue (FBR)

11.2. Duty and Tax Remission for Exports (DTRE) (S.R.O. 450(I)/2001)

The Duty and Tax Remission of Exports Scheme (DTRE) operates under the simple concept of no payment of duties/taxes and no duty-drawbacks. The scheme provides duty exemption either on the basis of export performance or on the basis of past or existing contract orders. It can be availed by manufacturers, 'indirect exporters', 'commercial exporters', contracted vendors of foreign manufacturers, or foreign buyers. Some important characteristics of the DTRE scheme are as follows:

- The above mentioned participants can procure zero-rated locally manufactured input goods from a registered supplier, who will issue a zero-rated invoice under Section 23 of the Sales Tax Act, 1990.
- Under performance-based DTRE, the approval in the base year is granted on the anticipated value of exports as mentioned by the exporter in the application.
- In the second year, the permit is granted subject to an increase in exports as compared to the previous year.
- The scheme covers supplies that need to be made against international orders and there must be a minimum of 15 percent value addition. Moreover, sales of finished goods in the local market is not allowed.

11.3. Drawback on Local Taxes and Levies (DLTL) (S.R.O. 711(I)/2018)

The facility provides Drawback on Local Taxes and Levies (DLTL) to the exporters from non-textile sectors on exports of specific tariff lines at a specified rate. Characteristics and mechanisms for DLTL are as follows:

- Fifty percent of the specific rate of drawback shall be provided without the condition of an increment in exports. Specific rates for domestic fan exports are provided in the table below.
- The remaining fifty percent of the rate of drawback payment is based on annual export performance, where the exporter has to achieve an increase of ten percent or more in exports during the current financial year as compared to the previous financial year.
- In order to improve the cash flow of exporters, disbursement of the remaining 50% percent of the rate of drawback on annual performance is further relaxed and allowed on the performance during July-December of each year. This relaxation is subject to the submission of a bank guarantee that, the exporter shall return the excess amount, in case his annual exports are less than the eligibility criteria stipulated to avail the remaining 50% percent of the rate of drawback payments.
- Further, the facility incentivizes the exports of products under the stated categories to non-traditional markets by allowing an additional 2% drawback. The non-traditional markets consist of five regions including Africa, Latin America, Non-EU European countries, Commonwealth of Independent States, and Oceania.

The fan industry is of the opinion that they should get a higher rate than the textile sector which in as per their understanding is getting 7% with a lower rate of value-addition.

Table 26:

Duty Drawback Rates on Pakistan's Exports of Fans (HS-841451)

Description	PCT codes	Specific rates
Ceiling fan	8414.5110	3%
Pedestal fan	8414.5120	3%
Table fan	8414.5130	3%
Exhaust fan	8414.5140	3%
Other	8414.5190	3%

Source: Federal Board of Revenue (FBR)

11.4. Quota for Imported Raw Material under SRO-565 (I)/2006 & 2014

Electric fan manufacturers can avail SRO-565(I) for mainly importing electrical steel sheets. The Input-Output Coefficient Organization (IOCO) allocates import quota under concessionary tariff regime for the available manufacturing capacity to importer-cum-manufacturer having suitable in-house facilities and who are registered with the Sales Tax Department under the category of manufacturer. Manufacturers availing such quota facility are subject to the following:

- In case of non-consumption of imported goods within one year from the date of import, the importer shall pay the customs duty and other taxes involved or obtain an extension for a further period from the concerned Director of IOCO after giving plausible reasons for seeking extension in utilization period.
- The Director of IOCO may, whenever deemed necessary, get the records of the importer-cum-manufacturer audited and may also get the stocks verified. In case it is found that the inputs have not been properly accounted for or have not been consumed in the manufacture and supply of goods as prescribed, recovery of duties and penal actions may be taken by customs authorities.

11.5. Export Finance Schemes (EFS)

The Export Finance Scheme (or refinance scheme) is in operation since 1973 with the objective to boost exports. Under the scheme, short-term financing facilities are provided to exporters through banks for exports of all manufactured goods with the exception of basic & primary raw materials.

EFS Part-I: Part-I is a transaction-based facility. The commercial banks provide export finance to the exporters on a case-to-case basis at the pre-shipment and/or post-shipment stage against Firm Export Order/Contract/LCs. Exporters must raise export proceeds equivalent to the loan amount as performance. The tenor of the facility is up to 180 days with a rollover option for a further 90 days subject to showing performance equivalent to 117 percent of the borrowed amount in case of availing rollover option.

EFS Part-II: It is a performance-based facility, where entitlement of exporter for revolving export finance limit is equal to 50 percent of the export proceeds realized through the export of eligible commodities in the preceding financial year. The export performance of an exporter has to match annually with the total loan availed during the financial year on a daily product basis.

The exporter has to realize export receipts from the export of eligible commodities, excluding any exports for which finance is obtained under Part-I of the Scheme during the relevant period. The maximum tenor of the loan under Part-II of the scheme is also 180 days which could be rolled over for another 180 days subject to showing at least 70 percent shipment of loan availed in initial 180 days.

Mark-up Rate: The mark-up rate includes SBP refinance rate plus 2 percent. The SBP refinance rate is linked with the weighted average yield on six months T-Bills.

11.6. Long Term Financing Facility (LTFF)

Under the Long-Term Financing Facility (LTFF), the Participating Financial Institutions (PFIs) can provide long-term local currency finance for imported and locally manufactured new plants and machinery to be used by the export-oriented projects. The facility is available to the export-oriented projects with at least 50% of their sales constituting exports or if their annual exports are equivalent to US\$ 5.0 million, whichever is lower.

11.7. Refinance Facility for Modernization of SMEs

The State Bank of Pakistan has launched a refinancing facility for the modernization of small and medium enterprises as part of its overall strategy to focus on the development of the SME sector in the country. Financing is available to a wide range of SME clusters/sectors.

Following are the key features of SBP's refinancing facility:

- Medium to long-term financing is available to SMEs for modernization of their existing units or setting up of new SME units.
- Financing is available against local purchase/import of new machinery at a mark-up rate of up to 6 percent per annum.
- Financing is also available for carrying out civil works up to 20 percent of total project cost, for conversion of conventional brick kiln and up to 50 percent of total project cost for a new zigzag technology-based brick kiln.
- The financing limit for Small Enterprises is Rs. 25 million and for Medium Enterprises it is Rs. 200 million.
- The maximum financing tenor is 10 years including a grace period of 6 months.

11.8. SME Bank Loan Regime

Running Finance: This is a short-term finance scheme and is used to meet the short-term funding requirements of the borrowers. This type of finance does not have a fixed number of payments, as in the case of installment financing. Once the finance limit is approved, the borrower is free to withdraw amounts to the extent of that limit. The borrower can withdraw and repay the amount as many times as he wishes to but has to pay mark-up on the amount which he has actually used on a monthly basis.

Table 27:

SME Bank Loan Financing Facilities

Product Features	Short Term	Medium Term	Seasonal
Tenor	1 year	3 years	11 months
Finance Facility Limit	Rs. 0.5 Million to Rs. 100 Million		
Mark-up rate	6 Month KIBOR + 8.5% per annum		
Mortgage	Urban residential/commercial/industrial properties acceptable to the bank (Max. financing will be 70% of Forced Sale Value of the security & collateral)		
Cash Near Cash Security	10 to 20%		
Hypothecation of Plant & Machinery/stocks	25% Margin		
Personal Guarantees	Sponsor/partner/directors/third party (optional)		

Source: SME Bank

11.9 Cash Margin on Imports

Cash margins or margins against LC aim to discourage the import of certain products. The State Bank of Pakistan has imposed a 100 percent cash margin on imports of domestic fans including Ceiling Fan (HS-84145110), Pedestal Fan (HS-84145120), Table Fan (HS-84145130), Exhaust Fan (HS-84145140), and Other Electric Fan (HS-84145190) in 2017.

CHAPTER 12

Swot Analysis

Strengths

- Pakistan's capacity to produce high-quality fans matches the demand of high-end sophisticated consumer markets.
- The domestic fan industry's internal processes allow it to meet the stringent requirements under international certifications such as CE and UL markings.
- Over the years, the industry has developed a strong backward linkage with its supplier/vendors located mostly in the vicinity of Gujrat and Gujranwala.
- Pakistan's Domestic Fans Industry has also developed e-commerce, retail and marketing channels.
- The domestic fan industry is mature enough to adapt to technological advancements in parallel with any shifts in consumer preferences.
- The local industry is catering to around 99 percent of the demand of domestic fans in the Pakistani market providing economies of scale and competing with imports.
- Pakistani brands such as GFC, Pak Fan, Royal Fan, and others have strong consumer loyalty both in domestic as well as in international markets.
- The extensive domestic dealer and distributor networks facilitate higher penetration rates and availability of products even in remote areas.
- The availability of Fan Development Institute in Gujrat, having upgraded machinery for trainings, material testing and other common facilities.

Weaknesses

- A large mismatch between technical education and R&D needs of the industry causing a shortage of skilled labor.
- Small manufacturers are mostly unregistered and as a consequence have limited or no access to financial and other facilities provided by the government.

- Lack of marketing and branding limit the premium pricing of domestic fans.
- The size of the largest domestic manufacturers is relatively small as compared to regional and global competitors. This inhibits the ability of domestic manufacturers to compete on volumes and prices.
- There are no Joint-Ventures in the sector, this impacts technology transfer and product upgradation.
- There is lack of awareness of standards and ISO certifications.
- Sales and marketing strategy of some potential manufacturers is not developed for exports.
- There is lack of awareness of export schemes.

Opportunities

- Global demand for domestic fans has been increasing due to a change in global climate. Pakistani domestic fans can penetrate in most markets. However, the top potential markets are mostly from the African, Middle-Eastern, and Asian regions.
- Innovation towards energy-efficient and décor fans would allow the domestic fan industry to mark its footprint further in the international markets.
- Direct current (DC) fans can increase domestic replacement sales further. These types of domestic fans are more efficient in terms of energy utilization and their performance does not vary across different voltages.
- In hot rural areas, solar-powered fans have shown robust growth in sales. There still exists further scope of penetration.
- Pakistan's Real Effective Exchange Rate (REER) has depreciated significantly which improves price competitiveness in international markets. Pakistani manufacturers can capitalize on this opportunity by making strategic entries in price-sensitive markets such as Africa.
- Pakistan's Trade Agreements & unilateral trade concessions such as the EU GSP+ provide an opportunity for Pakistani exporters to enter new markets.
- Participation in trade fairs and exhibitions can bring in new technology and joint ventures.
- Product design and development through institutes offers new markets.
- Investments for building international brands as well as acquiring existing brands and distribution networks would further expand export opportunities.

Threats

- Electric sheets are subject to regulatory import duties whereas this is no restriction on the exports of recycled aluminum and copper ingots.

- Product suffers from seasonality and a large number of factories have to shut their production from August to December each year.
- Access to finance is a major issue, viable credit and means of financing are not generally available. Three-way collateralization of loans by commercial banks has compelled industry participants to rely more on equity capital.
- The volatility of raw material prices has been exposing the industry to a continuous threat. The market-based exchange rate regime has increased the sensitivity of prices of imported raw materials.
- Non-competitive prices of Pakistani fans in international markets is adding export risk to the industry.
- Inconsistent tariff regimes, burdensome tax policies, and harassment by revenue officers are also impeding growth in the domestic fan industry.
- Extraordinary events such as COVID-19 induce both demand and supply-side shocks to the consumer durable industry. Demand decreases due to lower purchasing power and the value chain gets disrupted due to distortions in raw material supplies.
- Despite a huge vendor base around the fan industry clustered in Gujrat and Gujranwala region, the non-standardization of these parts/components does not allow export of a consistent quality product. Therefore, large firms rely on imported raw materials such as electric steel sheets, copper enamelled wire, ball bearings, etc.
- Suppliers of raw materials are able to exert considerable pressure on SMEs in peak production periods

CHAPTER 13

Recommendations for Improving Competitiveness of Pakistan's Domestic Fan Industry



13.1. General Recommendations

Exports of Recycled Raw Materials Must be discouraged

Recycled copper, steel, and aluminum are major inputs in the manufacture of various components of fans such as blades, rotors, stators and others. Pakistan's recycling industry has started exporting these materials to China in the wake of a ban on recycling activities in that country.

Regulatory duty needs to be restored on exports of recycled metals in order to protect domestic industries in the engineering sector.

Special Arrangements are Needed for Allocating Import Quotas of Electric Sheets

Most of small and medium-size domestic fan manufacturers are unable to get import quota for electric steel sheets and end up producing energy-inefficient domestic fans. These manufacturers alternatively use scrap materials to produce rotor and stator components for fans.

Special arrangements such as a cumulative quota needs to be given to domestic fan associations (i.e., PEFMA) or the larger vendors based on estimated production capacity of SMEs.

Difficulties in Export Receipts Needs to be Addressed

Foreign importers in developing or least developed countries generally use informal channels for remitting export proceeds. After Pakistan's inclusion in the Financial Action Task Force's (FATF) grey list, remittances through informal channels have become difficult. SBP needs to develop a mechanism to facilitate Pakistani exporters facing this issue.

A smooth foreign payment mechanism is especially required to facilitate and promote exports in high-risk countries such as Yemen, Iraq, Sudan, and other African countries.

To reach certain markets, it can take upto 80 days after issuance of B/L for the consignment to reach its destination. Currently, the SBP requires export proceeds be realised within 30 days for shipments made against Cash Against Documents and LC's where payment terms are sight. It is suggested that for markets where exporters are able to prove to the SBP's satisfaction long transit times, the SBP may allow upto 80 days for realization of export proceeds.

Greater Participation in International Trade Fairs

Govt needs to finance participation in international trade fairs for fan exporters to allow exporters to display products in new markets and to build business contacts. This can be funded from the EDF.

Fan Sector Trade Delegations to Identified Markets

Govt needs to finance trade delegations to prospective markets, with meetings arranged by commercial attaches with prospective buyers.

TERF¹⁸ 2.0 for Upgrading Technology of Fan Sector SMEs

TERF 2.0 needs to be rolled out for all SME sectors. The last scheme was mostly targeted at larger companies. Concessional financing under TERF will allow SMEs in the sector to upgrade their plant and machinery to not only improve the quality of existing products, but also to enter new markets and new products.

Review of Current Duty Drawback Rate

The fan industry had submitted calculations of Duty Drawback at 8.0% but only 4.39% was approved. Industry is requesting a review & revision.

Hiring of Sector Specialists in Key Markets

It is recommended that the proposal for hiring sector (fan / engineering industry) specialists in key existing and potential markets be considered. Hired specialists would work under the commercial attache at Pakistani embassies in these markets.

Building Further on the Positive Impact of DTLT

Industry believes that since value addition by the fan industry is significant and since there is a huge export potential, the DTLT scheme needs to be continued and a case can be made for increasing the rate. Since implementation of the DTLT scheme, exports increased by about 33.0 % in FY'21.

Access to finance Needs to be simplified

Manufacturers do not have access/awareness to/of soft loan regimes and fan manufacturers are reluctant to seek interest-based financing schemes. The cumbersome collateral requirements of commercial banks also discourage bank borrowing. For instance, securing loans from commercial banks is gruelling mainly due to a three-way collateral securitization for a single loan, that is, a real estate mortgage, personal guarantee, and charge creation on current assets.

State Bank of Pakistan is requested to simplify the financing regime by reducing collateral requirements and encouraging banks to look at cashflows as a basis for financing of SMEs. In addition, the SBP needs to simplify procedures, and provide alternate Islamic financing products.

¹⁸ TERF – Temporary Economic Refinance Facility

Advancing Technical Knowledge Pool Will Improve Industry Competitiveness

The Fan Development Institute was established in 2005 jointly by the Ministry of Science & Technology and the Pakistan Electric Fan Manufacturers Association (PEFMA). The purpose of setting up this institute was to produce skilled/semi-skilled industrial workers for meeting the needs of the fan industry of Gujrat and Gujranwala. These vocational training programs are not yielding desired results compelling manufacturers to provide on-job trainings to new workers.

The curriculum for skill development programs needs to be revised in consultation with relevant stakeholders including industry participants, PEFMA, and relevant government bodies. Courses and trainings on lathe machine handling, winding, dye development, and fitting processes should be covered under the ambit of the Fan Development Institute (FDI).

Diversification of Product Mix

Domestic Fan Industry needs to broaden its product offering by venturing into Industrial Fans with categories such as Axial & Propeller Fans for industrial use and roof extractors and air curtains for domestic use.

Promoting Plastic Fans Especially for Exports

Exports of the fan sector can increase by producing disposable plastic fans, which are aimed at the richer consumer markets like the United States of America and Europe. China has a major market share in this segment.

Since the manufacturing of plastic fans requires injection molding and 3-D printing machines, both of which consume large amounts of electricity, the government may support such exports by providing incentives in the form of higher drawback rates on exports of plastic fans.

Upgradation of National Laboratories to Enhance Testing Facilities

Currently, Pakistani exporters need to send their products abroad (mostly to China) in order to fulfil certain marking requirements. For instance, testing requirements for getting a CE mark requires tests for which a local testing facility is not available. The absence of these facilities has increased both the compliance time and costs.

PCSIR, Lahore can be upgraded to provide testing facilities such as Low Voltage Directive (LVD) test, Electromagnetic Compatibility (EMC) test, and test for Restriction of the use of certain Hazardous Substance in Electrical and Electronic Equipment (RoHS).

National Standards Should Align with Global Standards

The production of fans in Pakistan is mostly aligned with the preferences of local consumers and the product does not comply with international standards. To promote export competitiveness, Industry needs to lobby for the implementation of domestic standards aligned to international standards. This will lead to less difficulties in complying with standards of major importing countries

New Markets Could Resolve the Issue of Seasonality

Given 80 percent of the sales from Gujrat are confined to the local market where demand only exists between January to early July, a large number of small factories have to shut down during the remaining part of the year. Fan exports from Pakistan can be developed to cater to demand in countries in the Southern Hemisphere to ensure that during those months when local sales are not taking place, fans can be exported to countries in South America and Africa.

Bangladesh's High Import Tariffs Need to be Addressed

There is a market for Pakistani fans in Bangladesh, however high tariffs are preventing Pakistani exporters from exploiting this opportunity. It is recommended that the Government of Pakistan take up this issue with the Government of Bangladesh, and ensure that fans are part of any FTA/PTA that Pakistan signs with Bangladesh.

Tariff Parity Needs to be Taken Up with the Government of Vietnam

There is a huge demand for domestic fans in Vietnam for which Pakistani manufacturers have a comparative advantage. However, the customs tariff in Vietnam currently favours India and China over Pakistan. Ministry of Commerce needs to take this up with the Vietnamese government to allow Pakistani domestic fans to enter the Vietnamese market on similar terms as those offered to Chinese & Indian fan imports

Government Needs to Subsidize Costs for Obtaining International Certifications

International certifications are among the major non-tariff barriers for exporting domestic fans to major markets. The estimated cost for getting the CE mark is between PKR 1-1.1 million and, for the G mark, it is between PKR 700,000 to 800,000.

The government should utilize export development fund (EDF) to provide subsidies in order to cover certification costs.

Vendor Support & Development

The electricity tariff should be reduced for fan vendors on that proportion of their production which feeds into the value chains of exporters.

Moreover, DC fans have a huge global and domestic market. The localization for the PCB kit is necessary; in this regard a separate vendor industry should be established for the development of PCB kits for DC fans under the supervision of government and private manufacturing firms in Gujrat and Gujranwala.

Definition of SMEs and the Classification Criteria Must be Harmonized

Lack of consistency in the definition of what constitutes an SME causes ineffective, less targeted, and delayed policy responses. A National Industrial Policy must provide a standard and consistent definition of SMEs in order to prevent the exclusion of SMEs from various schemes offered by different agencies.

State Bank of Pakistan and SMEDA must work on harmonizing the definition of SMEs which may broadly have three components i.e., (i) no. of employees, (ii) total assets, and (iii) net sales

Table 28:

SMEs Definition Across Different Institutions

Institutions in Pakistan	Criterion	Medium Scale	Small Scale	
Small and Medium Enterprise Development Authority (SMEDA)	No. of employees	Between 36-99	Between 10-35	
	Productive assets	PKR 20-30 million	PKR 2-20 million	
SME Bank	Total assets	PKR over 100 million	Less than PKR 100 million	
Federal Bureau of Statistics	No. of employees	NA	Less than 10 employees	
State Bank of Pakistan	No. of employees	Less than 250	Less than 250	
	Capital employed	Less than PKR 100 million	Less than PKR 100 million	
	Net sale value	Less than PKR 300 million	Less than PKR 300 million	

Source: Policy Brief - 76, SDPI

Customs Duties & Levies on Imports Need to be Rationalized

Certain raw materials used in the fan industry are not classified properly and face high customs duties under the current tariff regime. A list is provided in the table below.

The government needs to remove import and regulatory duties on imported raw materials/components that are not domestically available. In line with the PEFMA's suggestion, the following tariff lines should be placed under a zero-duty regime.

Table 29:

Duty Structure for Raw Materials

PCT Codes	Description	Existing Rate 2020-21 (%)			PEFMA Proposed Rate (%)		
		CD	ACD	RD	CD	ACD	RD
3911.1090	Impregnating Resin	20	6	0	0	0	0
3920.6300	Polyester Film	20	6	0	0	0	0
7225.1900	Electrical Silicon Steel Sheet	0	2	11	0	0	0
8482.1000	Ball Bearings	11	2	0	0	0	0
8483.3020	Plain Shaft Bearings	20	6	0	0	0	0
8536.5099	Push Button Switch	20	6	0	0	0	0
8544.1900	Enamelled CCA Wire	20	6	0	0	0	0
3208.9090	Polyurethane Varnish	20	6	5	0	0	0
7601.2000	Aluminium Ingots			10			10
7208.2590	HRC	11	2	6	0	0	0
9107.0000	Timer 5-15 Min	3	2	0	0	0	0
3902.3000	Polypropylene Co Polymar	11	2	0	0	0	0
3901.9000	LLDP	11	2	0	0	0	0

Source: Federal Board of Revenue (FBR)/ Pakistan Electric Fan Manufacturers Association (PEFMA)

13.2. Recommended Marketing Strategies

The National Brand-Building Program

The international competitiveness of Pakistani fans is firmly linked with the perception of quality. Branding would allow exporters to charge an additional premium. Product-level branding has been adopted by large exporters in their individual capacities, however, SMEs suffer in the absence of strong brands.

Country-level branding is recommended to cover small industries as well. Moreover, a national brand development program should be launched – similar to the TURQUALITY program in Turkey and the domestic fan industry should be covered under this program. Government should also roll out subsidies for registering brands in potential markets.

Digital Marketing

Virtual Business-to-Business (B2B) Sessions: Trade Development Authority of Pakistan (TDAP) should hold virtual B2B sessions to help exporters understand product and market dynamics of domestic fans in different regions.

Commercial sections in Pakistani Embassies abroad also need to facilitate these sessions by taking foreign buyers, local manufacturers, and other stakeholders on board. By matching demand and supply, the focus must be given to lead generation.

Webinars: Pakistan's trade missions should hold webinars for domestic fan manufacturers for each of the potential countries identified by the Pakistan Electric Fan Manufacturers Association (PEFMA) as well as for markets identified in this report.

Local sales through the e-commerce channel: Around 95 percent of domestic fan manufacturers do not utilize e-commerce channels for promoting their sales. Pakistan has already been included among Amazon's approved sellers, additionally local e-commerce channels such as Daraz could provide greater outreach.

In the post-COVID-19 era, the new normal involves a long-term shift to e-commerce for shoppers (Forbes, 2021). A comprehensive awareness campaign needs to be launched to introduce e-commerce opportunities to manufacturers as well as exporters. Moreover, the government should cover partial costs for product registrations on international platforms.

Exchange of Trade Delegations

After taking importers from the host country on board, trade delegation should be sent to potential markets. Also, trade envoys from these markets should be invited and facilitated by the respective trade missions of Pakistan.

13.3. *Technical Recommendations*

Internet of Things (IoT) based Model for DC Fans

Currently, only a few large manufacturers are in the process of adopting Internet of Things (IoT) technology to control the parameters (speed and ON/OFF) of DC fans. The Internet of Things (IoT) based model is an emerging trend and increasing day by day in the global market. Pakistani manufacturers need to be made aware of this important development.

Application of Bio Pellets in the Casting Process

Biomass pellet is a kind of bio fuel resource. It refers to renewable energy sources such as solar, wind energy, etc. which can both generate heat or electricity with less damage to the environment at the same time. Its major raw materials consist of various kinds of agricultural waste including rice husk, straw material, cotton stalk, coffee husk, alfalfa straw, coconut shell, palm shell, sugarcane, etc. It has multiple applications in different types of furnaces, power generations, heating and cooking. It is also cost and energy-efficient technology. The overall environmental pollution can be reduced using this technology.

Appendix



Electric Fans Performance Requirements – Table Fans

Table 30:

Electric Fans Performance Requirements - Table Fans

Sweep Size in Inches & mm		Rated Power Consumption in Watts	Minimum Air Delivery in M ³ / Min	Minimum Service Value in M ³ /Min/Watt	Maximum Speed in R.P.M
08	200	28.00 – 33.60	14.00 – 15.40	0.50 – 0.45	1475 – 1770
10	250	30.80 – 37.00	20.00 – 22.00	0.65 – 0.59	1475 – 1770
12	300	40.00 – 48.00	30.00 – 33.00	0.75 – 0.67	1475 – 1770
14	350	48.00 – 57.60	35.00 – 38.50	0.73 – 0.66	1475 – 1770
16	400	55.00 – 66.00	45.00 – 49.50	0.82 – 0.74	1475 – 1770
18	450	65.00 – 78.00	70.00 – 77.00	1.07 – 0.96	1475 – 1770

Source: PEFMA

Electric Fans Performance Requirements – Bracket Fans

Table 31:

Electric Fans Performance Requirements - Bracket Fans

Sweep Size in Inches & mm		Rated Power Consumption in Watts	Minimum Air Delivery in M ³ / Min	Minimum Service Value in M ³ /Min/Watt	Maximum Speed in R.P.M
10	250	30.80 – 37.00	20.00 – 22.00	0.65 – 0.59	1475 – 1770
12	300	40.00 – 48.00	30.00 – 33.00	0.75 – 0.66	1475 – 1770
14	350	42.00 – 50.40	35.00 – 38.50	0.80 – 0.72	1475 – 1770
16	400	50.00 – 60.00	45.00 – 49.50	0.82 – 0.74	1475 – 1770
18	450	65.00 – 78.00	70.00 – 77.00	1.07 – 0.96	1475 – 1770

Source: PEFMA

Electric Fans Performance Requirements – Pedestal Fans

Table 32:

Electric Fans Performance Requirements - Pedestal Fans

Sweep Size in Inches & mm		Rated Power Consumption in Watts	Minimum Air Delivery in M ³ / Min	Minimum Service Value in M ³ /Min/Watt	Maximum Speed in R.P.M
12	300	40.00 – 48.00	30.00 – 33.00	0.75 – 0.66	1475 – 1770
14	350	42.00 – 50.40	35.00 – 38.50	0.80 – 0.72	1475 – 1770
16	400	50.00 – 60.00	45.00 – 49.50	0.82 – 0.74	1475 – 1770
18	450	65.00 – 78.00	70.00 – 77.00	1.07 – 0.96	1475 – 1770
20	500	90.00 – 108.00	100.00 – 110.00	1.11 – 1.00	1475 – 1770
22	550	110.00 – 132.00	145.00 – 159.50	1.31 – 1.18	1475 – 1770
24	600	125.00 – 150.00	170.00 – 187.00	1.36 – 1.22	1475 – 1770
30	700	165.00 – 198.00	240.00 – 264.00	1.46 – 1.31	975 – 1770

Source: PEFMA

Energy Performance/Energy Efficiency Levels

Table 33:

Energy Performance/Energy Efficiency Levels

Product Type	Sweep (mm)	Energy Performance/Service Value		
		Energy Efficiency Levels/Stars		
		Level-1 One Star	Level-2 Two Stars	Level-3 Three Stars
Table/Desk, Wall/Bracket, Box/Exhaust, & Pedestal/Floor Fans (Capacitor type)	200	0.54	0.60	0.71
	230	0.64	0.70	0.84
	250	0.74	0.79	0.91
	300	0.80	0.86	0.98
	350	0.90	0.95	1.08
	400	1.00	1.06	1.25
	450	1.10	1.19	1.42
	500	1.13	1.25	1.45
	600	1.30	1.45	1.65
Ceiling Fans (Capacitor type)	900	2.75	2.87	2.95
	1050	2.79	2.93	3.10
	1200	2.93	3.08	3.22
	1400	3.15	3.32	3.45
	1500	3.33	3.52	3.68
	1800	3.47	3.67	3.81

Source: NEECA

List of Domestic Fan Industry Participants Interviewed

Table 34:

List of Domestic Fan Industry Participants Interviewed

Domestic fan participants				Vendors and other participants	
1	Khurshid Fans	12	Champion Fans	1	Khawar Guard Industries (Vendor)
2	Zubaida Industries	13	Bless Engineering (Belvin Fans)	2	GFC Capacitors (Vendor)
3	Starco Fans	14	Pak Punjab Fans	3	Adam Industries (Vendor)
4	China Fans	15	Indus Fans	4	Multi Alloy (Vendor)
5	Four Star Fans	16	Al-Noor Fans	5	Pakistan Electric Fan Manufacturers Association (PEFMA)
6	Muzammil Fans	17	Dream Fans	6	Testing labs at Intertek-PEFMA
7	Al-Rehmat Fans	18	Pak Fans		
8	General Fan Company (GFC)	19	ST International		
9	Super Asia Fans	20	Al-Ahmed Fans		
10	Anwar Asia Fans	21	Royal Fans		
11	Amin Fans				

Local Testing Facilities Available at Electrical Measurement & Testing Laboratory, PCSIR

Table 35:

Local Testing Facilities Available at Electrical Measurement & Testing Laboratory, PCSIR

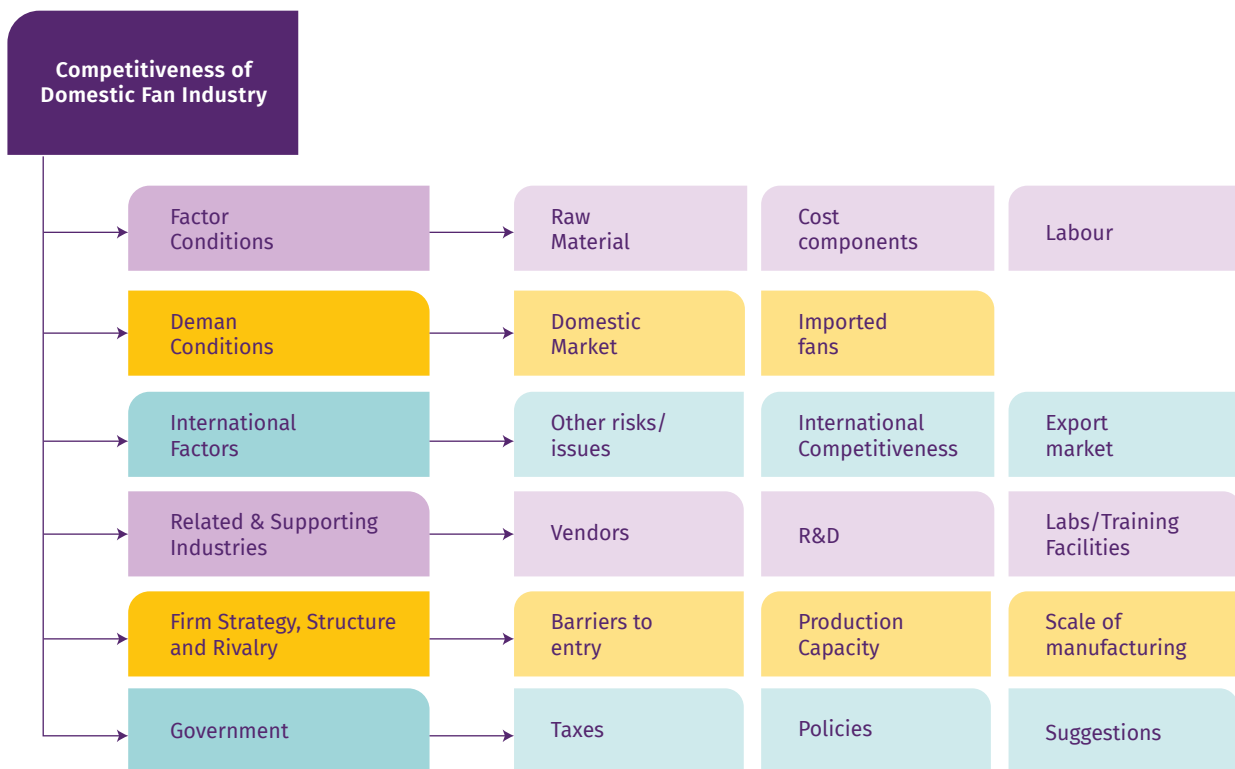
Testing Fields	Type of Test/Properties Measured
Safety Testing	Classification
	Marking and instructions
	Protection against access to live parts
	Power input and current
	Heating
	Leakage current and electric strengths at operating temperature
	Transient over voltage
	Moisture resistance
	Leakage current and electric strengths
	Abnormal operation
	Stability and mechanical hazards
	Mechanical strength

Table 35:
Local Testing Facilities Available at Electrical Measurement & Testing Laboratory, PCSIR

Testing Fields	Type of Test/Properties Measured
Safety Testing	Construction
	Internal wiring
	Components
	Supply connection and external flexible cords
	Terminals for external conductor
	Provisions of earthing
	Screws and connections
	Clearances, creepage distance and solid insulation
	Resistance to heat and fire
	Resistance to rusting
	Radiation, toxicity and similar hazards
Performance Testing	Marking
	Test of air performance (air delivery test)
	Measurement of speed of the fan
	Measurement of power factor
	Measurement of power input
	Service value

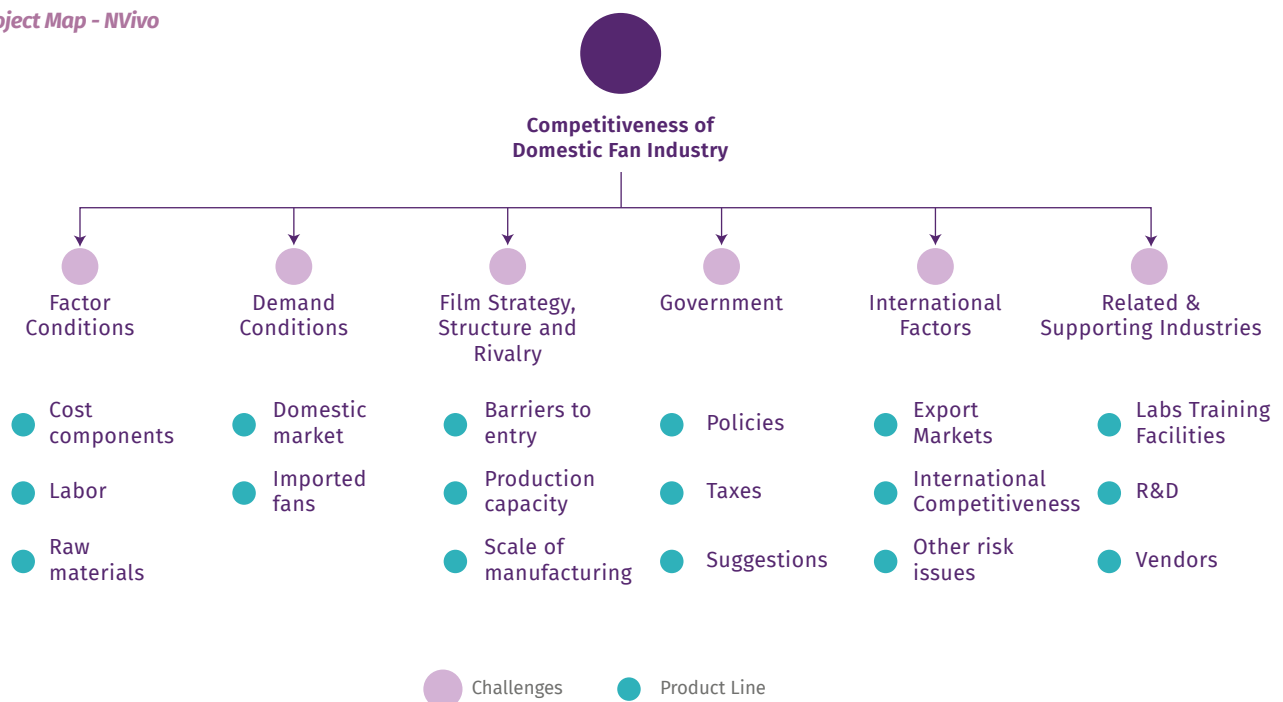
Mind Map

Figure 29:
Mind Map - NVivo



Project Map

Figure 30:
Project Map - NVivo



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