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Pakistan's Automotive Industry: A Case of Stalled Development

Usman Qadir

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Usman Qadir
Pakistan Institute of Development Economics, Islamabad

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Pakistan Institute of Development Economics
Islamabad, Pakistan

E-mail: publications@pide.org.pk
Website: http://www.pide.org.pk
Fax: +92-51-9248065

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C O N T E N T S

List of Tables

List of Figures

ABSTRACT

The gap between developed and developing countries has been growing rather than shrinking, spurring the latter to accelerate their development processes. Rapid industrialisation has been shown to be at the core of numerous economic development efforts time and again. In particular the automotive industry is considered to hold the key to successful development agendas as it has been responsible for rapid transformation of economies. More specifically, the industry is ideally suited to channeling the benefits of technological advances upstream and downstream in an economy. Considering the state of the industrial sector that Pakistan inherited at the time of independence, the automobile industry has grown by leaps and bounds in more than half a century. Considerable growth and capacity was developed in the infant stages when the industry was first set up under government guidance and support, but technological prowess and competitiveness has eluded the industry for the most part. The burning question for development planners in Pakistan is to determine the state of the industry, to identify where success has been achieved and what bottlenecks still exist. This paper aims to review the current state of affairs of the automotive industry in Pakistan, focussing in particular on the development of domestic component manufacturers to tackle this question using industry responses to a survey of 140 component manufacturers. The paper concludes that industry performance is plagued with low levels of productivity and quality; stemming primarily from a lack of new production technology, low quality of raw materials and inadequate training. These bottlenecks will need to be addressed to allow the industry to achieve its full potential and drive development of the domestic economy.

Keywords: Automotive Industry, Pakistan, Technological Capabilities, Technology Acquisition

1. INTRODUCTION

The manufacturing sector has been shown to be at the core of economic development efforts time and again [see Datta (1952) and Kaldor (1966)]. Since the first time mass production was successfully introduced in the automobile factories of the US and the invention revolutionised not just the industry, but the country and eventually the world, the automotive industry has demonstrated time and again that it can serve as a conduit to channel and accelerate the development agenda of developing countries. More specifically, the industry is ideally suited to channeling the benefits of technological advances[1] upstream and downstream. Considering the state of the industrial sector that Pakistan inherited at the time of independence, the automobile industry has grown by leaps and bounds in more than half a century. Considerable growth and capacity was developed in the infant stages when the industry was first set up under government guidance and support, but technological prowess and competitiveness has eluded the industry for the most part though a handful of firms have managed to achieve a measure of global competitiveness (in terms of establishing export markets) and developing local technological capabilities[2] (primarily in terms of locally designed and produced components, parts and products). In the present context, competitiveness can be achieved in late developing countries such as Pakistan, through a process of learning and emulation, rather than innovation (while the link between innovation and development was dealt with in detail by Schumpeter (1934), the emerging consensus by scholars such as Bell and Pavitt (1997) and Amsden (1989), is that developing countries can advance through learning and emulation). According to Lundvall (1992), this is an interactive process that cannot be properly understood without taking into account the institutional and cultural context [see also Reinert (2009)].

Against this backdrop, the aim of this paper is to review the current state of affairs of the automotive industry in Pakistan, focussing in particular on the development of domestic component manufacturers. Towards that end, Section

[1]Technological advances have been considered as an endogenous process (pioneering work done in this area by Nelson and Winter (1982), and developed further in the evolutionary context by Dosi (1988), Dosi, Pavitt, and Soete (1990). Grossman and Helpman (1994) and Aghion and Howitt (1998) on the other hand explored the neoclassical context of technological advances.

[2]See Lall (1992) for a comprehensive discussion of the notion of technological capabilities as it has evolved at the firm level from evolutionary theories of Nelson and Winter (1982) and the need for further research at the national level [see Lall (1990) and Lall (1991)].

01 assesses where the industry stands at present, and the key developments that have taken place are reviewed in Section 2. Section 3 recounts the institutional framework, while the trends in Pakistan's automotive industry are explored in Section 4, and an in-depth look at the development of the component manufacturing industry based on the results of a survey conducted in 2010 is covered in Section 5. The technological capabilities development of the component manufacturers backed by the major automobile OEMs are covered in Section 6. The financing of technology acquisition efforts is highlighted in Section 7, while Section 8 concludes the discussion on the state of the automotive industry in Pakistan.

2. PAKISTAN'S AUTOMOTIVE INDUSTRY— SOME STYLISED FACTS

2.1. Key Statistics

The automobile industry of Pakistan does not have a major share in total value added in the manufacturing sector (see Table 1); that distinction belongs to the two categories of textiles and food, beverages and tobacco, both of which are heavily dependent on the agricultural sector for raw materials, and which still account for over 50 percent of valued added in manufacturing (in 2009-10).

Table 1

Component Ratio of Value Added in Manufacturing (2009-10)

(%)

Manufacturing Group	Ratio
Textile and Apparel	35.16
Food, Beverage and Tobacco	19.11
Petroleum	6.96
Pharmaceutical	6.69
Non-Metallic Minerals	5.58
Automobile	**5.27**
Fertilisers	4.50
Chemicals	3.84
Electronic	3.31
Leather	3.02
Paper and Paper Board	0.79
Engineering	0.59
Tyres and Tubes	0.40
All Manufacturing	100.00

Source: Government of Pakistan (2009).

The automotive sector still manages to make an important contribution to the domestic economy in terms of employment, revenue and foreign exchange generation, not to mention human resource development (as shown in Table 2). The annual turnover for the industry is in excess of PKR 30 billion, while it contributes less than 3 percent to GDP.

The automobile industry in Pakistan today consists primarily of several units producing original components for assembly (under license) under the deletion program [which was phased out by July 2006 under the WTO regime and replaced by the Tariff Based System] and other units producing reconditioned and original components for local use. The various units in operation can be categorised in one of three categories:

(1) Big Brand Original Equipment Manufacturers,
(2) Independent Manufacturers, and
(3) Ancillary Industry (Tier 1-3 firms producing small parts and non-automotive items).

Table 2

Key Statistics of the Automotive Industry of Pakistan

Key Statistic	Value
Economic Multiplier	1.3
Annual Turnover	PKR 30 Billion
Investment	USD 1.09 Billion
Contribution to GDP	2.8 % (USD 3.6 Billion)
Contribution to Revenue	USD 0.82 billion (indirect taxes)
Direct Employment	215,000
Job Multiplier	1.8
Vendor Base	**2,200 units**
Organised and Tier One	450
Tier Two	425
Unorganised and after-market suppliers	1325

Source: Author's estimates based on data provided by PAMA, PAAPAM, EDB.

There are 2,000 vendors in the country with a total investment of over USD 1.09 billion; that are engaged in the manufacturing of original components for the assembly operation under the deletion programme (before it was replaced by the TBS system) as well as producing reconditioned and original components for sale in the local market. The parts being manufactured for local supply include pistons, engine valves, gaskets, camshafts, shock-absorbers, struts, steering mechanism, cylinder head, wheel hubs, brake drums, wheels, bumpers, instruments and instrument panels, gears of all types, radiators, cylinder liners, blinkers, lights, doors and door locks as well as auto air-conditioners. In terms of

the global automobile industry tiered supply chain, Pakistan entered the market at the Tier 3, and the ancillary industry has been able to make limited progress up the value chain, with a number of units reaching a Tier 1 status. In fact, the automotive industry of the country can be classified as full-line production of the major automotive vehicles (including buses, tractors, trucks, 3 wheeler rickshaws and motorcycles). The industry has not managed to significantly increase the purchase and use of domestically manufactured components and is regarded as labour intensive assembly shops rather than modern production lines. Local component manufacturers by and large have not yet managed to reach international levels of operation, though a small number do manage to export. The majority of these manufacturers have the capability to supply only one component, and not an assembly of components as Tier I manufacturers do in other countries. The Tier I function traditionally undertaken by component manufacturers that have achieved sufficient technological capabilities to provide complex assemblies and collection of components preassembled to OEMs is currently being managed by the OEMs themselves in Pakistan. Moreover, component manufacturers can be classified as OEM suppliers/vendors or aftermarket parts suppliers.

As mentioned earlier, the domestic automobile industry is comprised of a number of Original Equipment Manufacturer (OEM) firms manufacturing a variety of products in the industry, ranging from two and three wheelers to passenger cars, commercial vehicles and even buses and trucks. The distribution of these manufacturers is skewed in favour of two and three wheelers (motorcycles and auto rickshaws) and there is a high degree of concentration in the remaining segments of the industry, as shown in Table 3.

Table 3

OEM Assembling Units in Pakistan

Sector	OEM Assembling Units
Motorcycles	57
Auto-rickshaw	17
Trucks and Buses	7
Cars	6
Tractors	6
Pickup Truck/Van	1

Source: Pakistan Association of Automotive Parts Accessories Manufacturers (2014).

The distribution of installed capacity of the various OEM firms in the industry is given in Table 4 below and it can be seen that the majority of OEM plants for four wheel vehicles have been established in Karachi, while two and three wheel vehicle OEMs are concentrated in Lahore. There are two major OEMs for tractor production, of which only one is a member of PAMA, though

both operate in the city of Lahore. This clustering of assemblers/manufacturers in two major cities has prompted the growth of clusters of component manufacturing industries to support their operations, a trend the state is intending to capitalise on by setting up industrial parks or clusters in those cities to support the component manufacturing industry under the AIDP.

Table 4

Installed Capacity at PAMA Members OEM Plants

	Company Name	City	Year of Establish-ment	Installed Capacity	Primary Automotive Category Produced
1	Pak Suzuki Motor Co. Ltd.	Karachi	1983	150,000	Passenger Cars
2	Indus Motor Co. Ltd.	Karachi	1989	54,800	Passenger Cars
3	Honda Atlas Cars (Pakistan) Ltd.	Lahore	1993	50,000	Passenger Cars
4	Dewan Farooque Motors Ltd.	Karachi	1998	20,000	Passenger Cars
5	Millat Tractors Ltd.	Lahore	1964	45,000	Tractors
6	Ghandhara Nissan Ltd.	Karachi	1981	8,500	Buses
7	Hinopak Motors Ltd.	Karachi	1986	7,800	Buses
8	Master Motor Corporation Ltd.	Karachi	2002	Unknown	Buses
9	Sigma Motors Ltd.	Karachi	1994	1,320	Jeeps
10	Atlas Honda Ltd.	Karachi	1963	750,000	Motorcycles
11	Sazgar Engineering Works Ltd.	Lahore	1991	20,000	Motorcycles
12	Plum Qingqi Motors Ltd.	Lahore	1994	Unknown	Motorcycles
13	Ravi Automobile Pvt. Ltd.	Lahore	2004	75,000	Motorcycles
14	Fateh Motors Ltd.	Hyderabad	unknown	Unknown	Motorcycles
15	Habib Motorcycles Pvt. Ltd.	Karachi	unknown	Unknown	Motorcycles
16	Pakistan Cycle Industrial Cooperative Society Ltd. (Sohrab)	Lahore	1953	Unknown	Motorcycles
17	Ghandhara Industries Ltd.	Karachi	1953	Unknown	Passenger Cars
18	DYL Motorcycles Ltd.	Karachi	1976	200,000	Motorcycles

Source: Pakistan Automobile Manufacturers Association (PAMA).

Not having the indigenous capability and production facilities to manufacture automobiles, the state undertook numerous joint venture agreements with firms in various developed countries to acquire the requisite technology and production know-how when development efforts in the industry got underway (as detailed in Table 5). The majority of the agreements have been formed with Japanese companies, though not for three-wheel production (China and Italy) or tractors (USA and Italy).

Table 5

Joint Venture Agreements by OEMs

	Domestic Company	OEM Affiliation	
		Company	Country
1	Pakistan Cycle Industrial Cooperative Society Ltd. (Sohrab)	Jincheng	China
2	Ghandhara Industries Ltd.	Isuzu	Japan
3	Atlas Honda Ltd.	Honda	Japan
4	Millat Tractors Ltd.	Massey-Ferguson	USA
5	DYL Motorcycles Ltd.	Yamaha	Japan
6	Ghandhara Nissan Ltd.	Nissan	Japan
7	Master Motor Corporation Ltd.	Mitsubishi	Japan
8	Pak Suzuki Motor Co. Ltd.	Suzuki	Japan
9	Hinopak Motors Ltd.	Hino	Japan
10	Indus Motor Co. Ltd.	Toyota	Japan
11	Sazgar Engineering Works Ltd.	n/a	n/a
12	Honda Atlas Cars (Pakistan) Ltd.	Honda	Japan
13	Sigma Motors Ltd.	Land Rover	UK/India
14	Plum Qingqi Motors Ltd.	Qingqi	China
15	Fateh Motors Ltd.	Belarus MTZ	Belarus
16	Dewan Farooque Motors Ltd.	Hyundai	South Korea
17	Ravi Automobile Pvt. Ltd.	Piaggio	Italy
18	Habib Motorcycles Pvt. Ltd.		
19	Daewoo Pakistan Motors Ltd.	Daewoo	South Korea
20	Raja Motors	Vespa/Fiat	Italy

Source: Pakistan Automobile Manufacturers Association (PAMA).

2.2. Market Shares

The trend in market share of companies in the domestic economy reflects the joint ventures undertaken over the years with various international OEMs. Japanese companies have managed to dominate the truck and buses subsector by taking 100 percent of the market share, and the majority (90 percent each) of passenger cars and motorcycle market in Pakistan, while non-Japanese brands; namely Massey Ferguson and Fiat dominate the tractor market. The market for light commercial vehicles is evenly split between two Japanese firms and a South Korean firm (see Table 6).

Table 6

Market Share by Sector and Company

OEM Affiliation	Passenger Cars	Motorcycles	Trucks/ Buses	Tractors	LCVs
Japan	90% Suzuki Toyota Honda Nissan Daihatsu	90% Suzuki Yamaha Honda	100% Nissan Hino Mazda	0%	50% Suzuki Toyota
Others	10% Hyundai Fiat Kia	10% Various Chinese Firms	0%	100% Massey Ferguson Fiat	50% Hyundai

Source: Pakistan Automobile Manufacturers Association (PAMA).

Among the four-wheel vehicle Japanese OEMs, Pak Suzuki Co. has secured 40 percent of the market (Table 7) due to the popularity of its 800-1,000cc passenger cars. Indus Motor's Toyota sedan is popular due to easy availability of spare parts in the domestic market and accounts for almost 30 percent of the market.

Table 7

Passenger Cars Market Shares by OEMs

(%)

Brand	Domestic Company	Market Share
Suzuki	Pak Suzuki Co.	40.20
Toyota	Indus Motors	29.80
Honda	Honda Atlas	14.70
Kia-Hyundai	Dewan Farooq Motors	14.50
Nissan	Ghandhara Nissan	0.80

Source: Pakistan Automobile Manufacturers Association (PAMA).

In the market for two wheeler vehicles, Atlas Honda has maintained its dominance, though it is facing increasing competition from other Japanese brands and various Chinese brands that are beginning to establish themselves in the domestic market on account of lower prices (see Table 8). However, due to a better after sale support network and warranty service, Honda is managing to maintain its lead over the other companies, and a state of the art assembly plant at the Sheikhupura site that is capable of turning out a motorcycle every 30 seconds is expected to ensure the maintains its position in the future as well.

Table 8

Motorcycle Market Shares by OEMs

(%)

Brand	Domestic Company	Market Share
Honda	Atlas Honda	65.70
Rustam and Sohrab	Chinese brands	2.90
Chinese brand	Saigol Qingqi	3.70
Yamaha	Dawood Yamaha	19.30
Suzuki	Pak Suzuki Motorcycle	6.20
Hero	Fateh Motors	2.20

Source: Pakistan Automobile Manufacturers Association (PAMA).

Pak Suzuki has also managed to establish itself in the market for LCVs by capturing 50 percent of total shares, while Indus Motor Co. and Dewan Farooq Motors account for the other 50 percent (Table 9).

Table 9

LCV Market Share by OEMs

(%)

Brand	Domestic Company	Market Share
Suzuki Pick-up/Van	Pak Suzuki	50.00
Kia Pick-up	Dewan Farooq Motors	37.50
Toyota Hilux	Indus Motors Co.	12.50

Source: Pakistan Automobile Manufacturers Association (PAMA).

The bulk of agricultural tractors used in the country are manufactured by two companies; Millat Tractors and Al-Ghazi Tractors. Rebranded Fiat tractors under the name of Universal Tractors are also manufactured by a local firm, G. M. Tractors, but accounts for only 1 percent of the market, thus not offering much competition to Millat or Al-Ghazi Tractors (Table 10).

Table 10

Tractor Market Shares by OEMs

(%)

Brand	Company	Market Share
Fiat	Al-Ghazi Tractors	50.90
Massey Ferguson	Millat Tractors	48.10
Universal	G. M. Tractors Ltd.	1.00

Source: Pakistan Automobile Manufacturers Association (PAMA).

Pakistan is one of the few countries in the world that implemented a local content requirement program when the industry was first set up to encourage import substitution of foreign manufactured components in the automotive manufacturing process. The tractor firms have managed to achieve the greatest measure of local content of all the other firms in the industry (in excess of 96 percent as shown in Table 11, with the passenger car manufacturers having the lowest level of local content level, at roughly 70 percent. The key components required in the design and manufacture of an automobile are being imported from abroad and incorporated with the remaining components manufactured locally, decreasing the chances of manufacturing those components locally. Foreign firms will be averse to local firms manufacturing the components since quality control will be difficult to maintain, and they will be in danger of losing their bargaining power and market position. This does not bode well for the industry in terms of developing the level of local technological capabilities and

thereby having the capacity to successfully develop and produce a local brand that is capable of competing with the other established brands being assembled. The high degree of local content achieved in tractors and motorcycles means that only small components such as timing belts, bearings, springs and screws etc. are being imported from abroad, while the bulk of the vehicle is being manufactured locally.

Table11

Local Content Level Achievement by Sector (2012)

(%)

Sector	Local Components Used
Cars	Up to 70
Tractors	96
Motorcycles	95
Three Wheelers	80

Source: Pakistan Automobile Manufacturers Association (PAMA).

The Auto Industry Development Policy (AIDP) was formulated by the state to transform the domestic automobile industry into a globally competitive player through expansion of production and contribution to GDP of 5.6 percent by 2012. The targeted increase in production rates has not been realised since the policy was first implemented (see Table 12) and as a result the planned contribution to GDP has also not been achieved.

Table 12

AIDP Targets versus Actual Production Rates

('000 Units)

	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
AIDP Production Target	200	250	310	380	440	560
Actual Production	203	194	112	143	154	179
Shortfall (Excess)	(3)	56	198	237	286	381

Source: [JICA (2011)] and author's calculations.

A comparison of actual production of four wheel vehicles versus AIDP targets shows actual production exceeded the target only in the first year of implementation of AIDP. Since then the shortfall has grown by leaps and bounds and without expansion of installed capacity it is unlikely the future targets can be realised by the domestic industry.

2.3. Key Characteristics of the Domestic Automotive Market

There are several key characteristics of the Pakistan automotive market that sets the country apart from other developing countries and that should be borne in mind.

2.3.1. *Skewed Market Share*

The domestic automotive market for four wheel (except tractors) and two wheel vehicles (till recently) was heavily skewed towards Japanese companies that had managed to maintain their market shares even in difficult economic circumstances. For example, Suzuki had a 73 percent market share in LCV, vans and jeeps, but when Master entered the market with low cost vehicles, Suzuki adjusted its production patterns and withdrew from the market and concentrated on the remaining vehicle types in production. The market share of Suzuki in pickup trucks for example increased from 20 percent in 2004-05 to 80 percent in 2009-10. However, this allowed Master to attain a virtual monopoly in the LCV, van and jeep segment [JICA (2011)]. A similar situation occurred in the motorcycle market with the introduction of low-cost Chinese clones of the popular Honda CD-70 brand motorcycle, with Japanese firm's market share dropping from 97 percent in 1999-2000 to 37 percent in 2009-10.

2.3.2. *Demand Preferences of Domestic Consumers*

In contrast to other developing countries, the high income group in Pakistan dominates demand in the market for large passenger cars, which means that market expansion is limited since the high income group accounts for the smallest percentage of the country's population. On the other hand, the markets in India and China (for example) are dominated by smaller, lower priced passenger cars being demanded by the low and middle income groups of the population. Small business owners and individuals dominate the market for buses and trucks in Pakistan, rather than companies and the state, as is the case in other developing countries.

2.3.3. *Popularity of Specific Brands*

Consumer preferences are skewed in favour of specific brands in each category of the industry, with the result that companies that manufacture the popular brands tend to operate at capacity in peak demand season. With demand exceeding supply consumers are left waiting extended periods of time before receiving delivery of their vehicles, and this creates an unhealthy attraction towards paying a fee or bribe to expedite delivery of the vehicle.

2.4. Institutional Framework

The institutional framework surrounding the domestic automotive industry is comprised of numerous associations representing stakeholders in the industry and state institutions set up for the purpose of guiding and nurturing the industry as it grows.There is substantial literature on the notion that institutions and policies are essential for industrial development [see Gerschenkron (1962), for knowledge accumulation [see for example Cimoli, Dosi, Nelson, and Stiglitz (2006)), for coordination problems [see Nurkse (1953); Gerschenkron (1962); Rosenstein-Rodan (1943); Murphy, Shleifer, and Vishny (1989)], and for externalities [Hoff and Stiglitz (2001)]. For the historical context of policies used in various economies now considered developed, see Reinert (2004). With this context in mind the discussion now turns to a closer look at the institutional framework related to the automotive industry in Pakistan; the industry associations, state institutions and the policy framework.

2.4.1. *Industry Associations*

There are a number of entrepreneurial associations established in the country to represent the interests of various different groups in dealings with the state and promote their goals and objective in policy formulation and implementation.

Pakistan Automotive Manufacturers Association (PAMA)

PAMA is a politically strong group established in 1994 to safeguard the interests of its members by playing a role in policy making process and also lobbying the state. The major automotive manufacturers operating in all segments of the industry are members of PAMA. In the case of four wheel vehicles, PAMA members combined account for 99.9 percent of the domestic market share.

Association of Pakistan Motorcycle Assemblers (APMA)

Motorcycle assemblers/manufacturers that are collaborating with Chinese brand manufacturers and entered the domestic market in the 1990s have opted not to join PAMA and have instead formed an informal association amongst themselves; the Association of Pakistan Motorcycle Assemblers.

Pakistan Association of Automotive Parts and Accessories Manufacturers (PAAPAM)

PAAPAM was formed by the organised segment of the automotive parts manufacturers, all supplying parts to OEMs, in 1988 to represent component manufacturers' interests at state level and provide technical and management support to its members. PAAPAM was the result of continued dissatisfaction

with implementation and weak enforcement of the deletion/localisation policy and the core demand of the association has continued to be greater transparency in government policy (deletion earlier and now in the TBS and AIDP).

Regional Chambers of Commerce and Industries (CCI)

There are Chambers of Commerce and Industries (CCI) in the major cities of the country representing the interests of all manufacturing sector enterprises, including automotive manufacturers and component manufacturers alike.

All Pakistan Motor Dealers Association (APMDA)

Automotive sales representatives and dealers have formed the All Pakistan Motor Dealers Association to represent their interests in dealings with the state.

2.4.2. *State Institutions*

Ministry of Industry and Production (MoIP)

It was highlighted earlier that at the time of Independence Pakistan did not possess a meaningful industrial base that could be used to drive the growth and development of the new born economy. The task of formulating the appropriate policy and serving as the focal point for developing the industrial sector of the economy was entrusted to the Ministry of Industry (MoI) established in the early 1950s. The Ministry of Production (MoP) was set up in the aftermath of the wave of nationalisation that took place in early 1970s to supervise and manage the new public sector industrial units created. When state emphasis shifted back to private sector led growth in the 1990s, the management role of the two ministries in public sector enterprises was curtailed and remaining operations were merged into a single institution, the Ministry of Industries and Production (MoIP), now tasked with leading the formulation and implementation of a comprehensive strategy of industrialisation of the economy. A total of eighteen organisations fall under the purview of the MoIP (core functions for nine organisations most relevant to the automotive industry are given in Table 13 below). It is clear that combined the organisations cover a wide spectrum of activity related to the development of the industrial sector, however, they appear to have overlapping functions at times and coordinating and communicating among the organisations is problematic at best which will create difficulty in implementing policies.

To complicate the matter further, it appears that the view of the state on how best to proceed with the industrial development of the country has again undergone change, with the Ministry being bifurcated into two independent

Ministries; MoP and MoI. These changes do not send a promising signal to potential investors or inspire confidence in the plans of the state for guiding the growth and development of the sector.

Table 13

Organisations of MoIP and their Core Functions

	Name of Organisation	Core Function
1	Export Processing Zone Authority (EPZA)	Export promotion
2	Engineering Development Board (EDB)	Promote industrial development in 19 subsectors
3	National Industrial Parks Development and Management Company (NIPDM)	Develop and manage infrastructure and industrial sites and clusters
4	National Productivity Organisation (NPO)	Promote improvement of productivity and competition in industrial sector
5	Pakistan Industrial Technical Assistance Centre (PITAC)	Provide technical advice and training related to engineering sector
6	Pakistan Institute of Management (PIM)	Provide training for managers
7	Small and Medium Enterprises Development Authority (SMEDA)	Provide support to SME
8	Technology Upgrading and Skill Development Company (TUSDEC)	To establish Common Facility and Skill Development Centres for engineering sector
9	Pakistan Automotive Corporation (PACO)	

Source: Ministry of Industries and Production (MoIP).

Engineering Development Board (EDB)

The EDB is currently responsible for strengthening the engineering sector of the economy and integrating it in the global marketplace for the purpose of driving economic growth and accomplishes this goal through policy formulation and implementation. However, the Board was initially set up in 1995 to deliberate and recommend tariff adjustments to MoIP for the purpose of developing domestic industries and also coordinate and cooperate with industries in this regard. Thus, EDB has taken over a ministry level role while not being afforded the full powers that would normally go along with that role.

National Industrial Parks Development and Management Company (NIPDMC)

NIPDMC was established as special public-private partnership initiative of MoIP to encourage industrial growth in the country by developing industrial parks and clusters across the country, and has yet to yield any tangible benefits to the automotive industry.[3]

[3]Clusters and cluster based approaches to development are important as they offer a positive-sum view of competition and competitiveness [see Porter (2000)].

Pakistan Industrial Technical Assistance Centre (PITAC)

PITAC was established in 1962 with the merger of Industrial Research and Development Centre (IRDC) and Industrial Productivity Centre (IPC) under MoIP for the purpose of rendering assistance in a number of activities related to industrial production, ranging from the design and manufacture of production tooling equipment, prototyping and training workers in various industries. It should be noted that the automotive OEMs have independent facilities and sources for such activities, and it is not clear to what extent the component manufacturers in the country are managing to avail the services offered.

Technology Upgradation and Skill Development Company (TUSDEC)

TUSDEC was established in 2005 for the express purpose of assisting key industries in upgrading their production technology and has completed a number of projects to accomplish this goal in various industries, some of which naturally have links with the automotive industry. Again, the major automotive OEMs have upgraded technology on their own initiative rather than relying on TUSDEC.

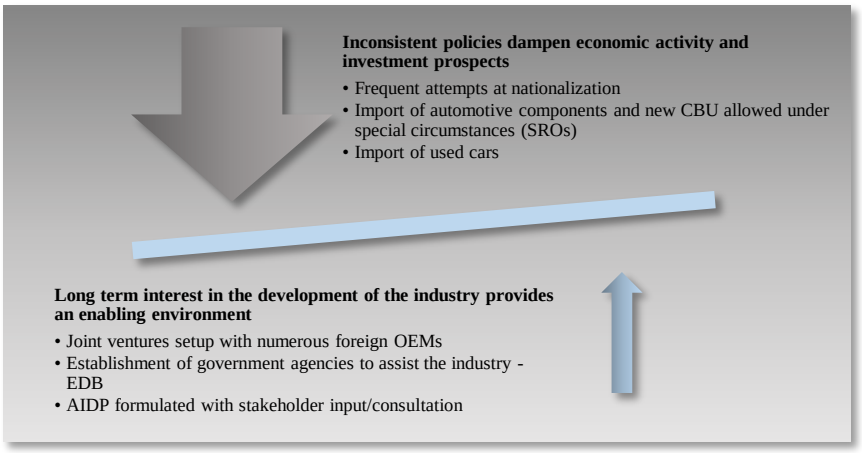
2.4.3. *Policy Framework*

Industry stakeholders firmly believe that inconsistent policies formulated and implemented by the state have led to the difficulties the industry currently finds itself facing [The use of Industrial policy as a tool to achieve rapid industrialisation and growth has been well established in the literature [see for example Pavitt (1988), Evans (1995), Lall (1992, 1994, 2004) and Cimoli, Dosi, and Stiglitz (2009)]. The automobile industry has in fact been the subject of state policy and attention since the time of independence, and this could account for the inconsistencies that have been observed by the industry as the state attempts to reconcile demands on limited resources and the desire to promote industrial development. Private sector support by the state in the years after Independence gave way to asserting control of industrial activity under nationalisation in the 1970s. A state corporation was set up under a joint venture agreement with Suzuki Motor Corporation (SMC) of Japan at this time, and state involvement continued till there was a renewed interest in privatisation and promoting the role of the private sector. This move towards the open economy after 1977 led to the entry of several foreign assembly OEMs in the industry for CKD production of various automotive brands. Policy focus then shifted to localisation of parts under deletion/localisation programme promoting local component production. The need to comply with WTO guidelines led to replacement of the deletion programme with the Tariff Based System (TBS) which continued to support local production of components under the tariff system. Promising growth by the industry led to the formulation of the Auto Industry Development Programme (AIDP) that included the TBS as one of its components. These developments

have been interspersed with policy changes relating to the import of various automotive components, and CBUs to satisfy domestic demands (such as mounting public pressure on the state to counter price increases or long delivery delays imposed by local OEMs). It has been observed that the clientelist nature of political settlements in the country is such that the state invariably attempts to accommodate the demands by various groups that have conflicting interests which leads to inconsistency at the policy level (see Fig. 1. for the trade-offs between impact of state policies and interests on industrial performance).

Under the umbrella of national economic development guided by five year development plans that cover virtually the entire history of the country since Independence (see Table 14 for years covered), MoIP has been mandated with developing the industrial sector of the country to become competitive in a global environment. To achieve this goal MoIP formulated a number of policies; and the key features of the more notable ones in recent years are briefly covered here.

Fig. 1. Impact of State Policies and Interests on Industrial Performance



Source: JICA (2011), author.

The policy of 2005 (see Box 1) covered a wide range of areas, however due to an unfavourable external environment, poor law and order situation within the country and natural calamities, the policy goals were not achieved. Whereas the state in countries such as South Korea was able to use crises to motivate the desired economic activity and achieve development goals, the state in Pakistan lacked the strength and leadership to guide economic activity in a similar fashion. Given the wide coverage of the policy the likelihood is that the demands placed on the state by interested parties were considerable and conflicting and it was unable to allocate the resources effectively to achieve policy objectives.

Table 14

Coverage of Pakistan's Five Year Plans

Title of Plan	Years Covered
First Five-Year Plan(s)	1948 – 1955; 1955 - 1960
Second Five Year Plan	1960 – 1965
Third Five Year Plan	1965 – 1970
Fourth Five Year Plan	1970 – 1975
Fifth Five Year Plan	1978 – 1983
Sixth Five Year Plan	1983 – 1988
Seventh Five Year Plan	1988 – 1993
Eighth Five Year Plan	1993 – 1998
Medium Term Development Framework	2005 – 2010
Tenth Five Year Plan	2010 - 2015

Source: [JICA (2011)].

Box 1

Highlights of Industrial Growth Policy 2005

Towards A Prosperous Pakistan: A Strategy for Rapid Industrial Growth (2005)

Goal:

- To encourage industrial growth

Focus on:

- Deregulation of factor input markets for capital, land and labour force
- Proper execution of contracts
- Simplification of tariff and tax systems
- Export promotion (as well as trade with Central Asia)
- Human resource development
- Infrastructure development (including power, transportation and industrial parks)
- SME promotion

Source: [JICA (2011)].

Box 2

Highlights of Vision 2030 (2006)

Vision 2030 (2006)

Goals include: increasing Per Capita Income to USD 4,000 by the year 2030

Focus on:

- Promotion of high value added industries (including automobile industry)
- Effectiveness of industrial policies

Source: [JICA (2011)].

Box 3

Highlights of Industrial Policy 2010

National Industrial Policy 2010: Rebuilding Pakistan's Manufacturing Base (2010-11)

Goal: Turn Pakistan into a factory for the world rather than a shop by doubling labour productivity in ten years

Focus on:

- Macroeconomic stabilization
- Bringing provincial development into parity
- Priority given to development of various high value-added industries (including the automobile industry) and engineering industries
- Reorganization of EDB as Industrial Development Board (IDB)

S*ource:* [JICA (2011)].

2.5. Trends in the Automotive Industry

Over the decades, the automobile industry has exhibited mediocre performance in terms of sustainable and persistent growth (see Table 15). Data on production in the automobile industry is available for the period from 1974-75 to date, and shows that the industry's performance has been the highest during the 1970s and then again during the 2000s. Performance declined in the 1980s, and fell further in the 1990s to less than 4 percent during the 1990s. The high growth registered in the last four or five years has generally been attributed to the country's business friendly policies along with lower tariff rates, persistent growth in GDP, and per capita income, while the initial increase is most likely on account of the massive investment undertaken during the formative years when the country's industrial base was being established from scratch.

Since 2001-02, the automobile market has grown by over 40 percent per annum and if an average growth of 30 percent is maintained during the coming years, the country's auto market was expected to cross the milestone of 500,000 units by the year 2010.

Table 15

Decade-wise Automobile Industry Growth Performance

(%)

Growth Rates	1970s	1980s	1990s	2000s
Industry Total	22.7	8.4	3.6	30.6
Cars		20.3	4.1	24.4
Trucks	7.8	-8.4	18.7	25.3
Buses	7.1	5.3	23.3	0.8
Jeeps	-5.9	3.9	-1.6	32.5
Light Commercial Vehicles	108.4	8.0	-1.5	19.2
Tractors	6.8	13.6	13.4	7.0
Motorcycles	31.6	9.7	4.2	37.3

Source: Pakistan Bureau of (Statistics, n.d.).

The tremendous rise in automobile production has resulted from increased domestic demand, giving a healthy impetus to the industrial output and generating over 150,000 direct employment opportunities besides contributing substantially in duties and tax revenues to the national exchequer.

Pakistan has made its debut in the vehicle export market by exporting its first batch of Land Rover Defenders to Sri Lanka. M/s Sigma Motors—the sole distributor and assembler of Land Rovers in the country—holds the distinction of being the first exporter of these diesel engine vehicles. Since starting assembly operations in May 2002, Sigma motors have assembled over 3,000 Land Rover Defenders, which are in use all over the country. Now, the company is geared to assemble 2,000 vehicles per annum. In addition to looking after the needs of fleet customers, the company is also pursuing export opportunities in the regional countries.

As far as the production of cars in the country is concerned, against 33,419 cars in 1995-96, production stood at 165,965 units in 2005-06, showing an increase of 430 per cent during the last 10 years. Local carmakers manufactured 176,016 cars in 2006-07, but production levels have since fallen as the country has fallen in the grips of a severe global and domestic economic crisis with 164,710 cars being produced in 2007-08. Projections were made for the domestic industry to have achieved an annual production target of 500,000 cars by the year 2010.

Similarly, the indigenous production of motorcycles increased by 25 percent during 2005-06, reaching to an all-time high of 520,124 as compared to 106,797 units in 1996-97, which accounts for around 380 per cent increase in motorcycle production during the last nine years. Pakistan aimed at producing 700,000 units of motorcycles during the year 2006-07. Having matched the local demand for motorcycles, the country has started exporting the units over and above its national requirements to a number of foreign markets.

The production of trucks as well as that of buses has also shown promising growth during the last 10 years. Some 2,994 units of trucks were being produced in the country in 1995-96 which, over the years, have increased to 4,518 units, showing a rise of 51 percent. In the case of buses, the rise in production is more pronounced as compared to that of trucks as their production augmented by around 74 percent during the last decade or so.

One hopes that the cycle of rise in demand and supply in the auto sector would have a healthy effect on the national economy as a whole, ensuring continuity in its growth. It has already led to the growth of a fairly strong auto-parts manufacturing / vending industry, which is not only meeting the demand of the local assemblers in a sizeable number of auto-parts, but some firms are also competing for a share in the global auto-parts market.

3. SURVEY METHODOLOGY AND DATA

The nature of the automotive industry has changed as it has evolved, moving from craft production to mass production to Just-In-Time and most recently to lean and agile production systems. Along the way the industry has developed deep linkages with a number of other industries and also seen the birth of a supporting industry to produce the parts and components used in the manufacture of automotive vehicles. Thus this supporting industry, the automotive parts manufacturing industry, plays a vital role in determining the competitiveness of the domestic automotive industry since the OEMs productivity depends on the efficiency of the components they are supplied. In Pakistan the majority of automotive parts manufacturers are in the unorganised sector and of approximately 2,200 (mostly small and medium-size) enterprise units, 450 units supply OEM manufacturers with parts. The remaining units are catering to the local repair parts market, forming the unorganised sector of the industry. Compared to the automotive parts industry that generally emerges in developed and developing countries, in Pakistan components and parts vendors manufacture single unit products rather than complex parts, though they supply OEMs directly.

Location on the supply chain of these firms is Tier I, but the complexity of the products manufactured is rather simple, which would put them in Tier II category. This suggests that Tier I vendors as they are known are not present in Pakistan, and the reason is likely due to the stunted development of the parts industry since the 1970s. The industry itself at the time was lacking in several key respects; most notably in the development of technical know-how, presence of organised manufacturing facilities and also R & D facilities. Working with what was available, the parts industry initially brought in production technology from abroad to produce castings, gears and cylinder blocks. Production was later expanded when the industry underwent a phase of privatisation and LCP was accorded priority in the 1990s. In 1995, the state launched Product Specific Deletion Programme (PSDP) to nurture the industry in its infancy and support its growth by requiring OEMs to achieve local content levels of at least 70 percent. Production volumes increased as a result and the industry prospered in terms of the number of operating units; however, the international competitiveness of the industry is lacking especially in quality levels. The PSDP was discontinued in 2006 when the Tariff Based System (TBS) was launched which allowed imports of components manufactured locally as long as customs duty has been paid. This has put strong pressure on domestic component manufacturers to match the international quality levels of foreign manufacturers, and it is not clear the industry is up to the challenge given its weak base. It also needs to be highlighted that raw materials and structural members required for the manufacture of most automotive parts tend to be imported into the country, suggesting that the lowest tier in the automotive supply chain is another weak

link that would need to be strengthened if the industry is attain global competitiveness.

In light of the issues highlighted above, a survey designed to assess the level of production technology of automotive vendors, quality and safety standards and management was carried out by Japan International Cooperation Agency (JICA) in 2011. A total of 140 firms in the organised segment of the automotive components industry, all members of PAAPAM, were interviewed to analyse the state of the industry.

An appropriately weighted sample selection was determined by classifying the industry according to 11 categories of components produced, and the sample of firms was selected to represent the population of 253 manufacturers. Sheet metal manufacturers are the most prevalent in the domestic industry, followed by casting, machining, resin, forging and electrical subsystems. The noteworthy trend that is evident from the distribution is that the component manufacturers are concentrated in the lower value added segment of the industry as evident from Table 16, and relatively few firms are operating in the high value added segment. To be globally competitive, the component manufacturers will have to ramp up production rates which may be problematic since the majority are small and medium enterprises.

Table 16

Distribution of Manufacturers Surveyed According to Component Category

Component Category	Number of Vendors in	
	Population	Sample Selected
Sheet Metal	110	63
Casting	26	17
Machining	31	15
Resin	20	10
Forging	19	7
Electrical Subsystem	13	5
Rubber	6	4
Springs	5	3
Radiator	2	2
Tyre	1	1
Other	20	13
Total	253	140

Source: [JICA (2011)].

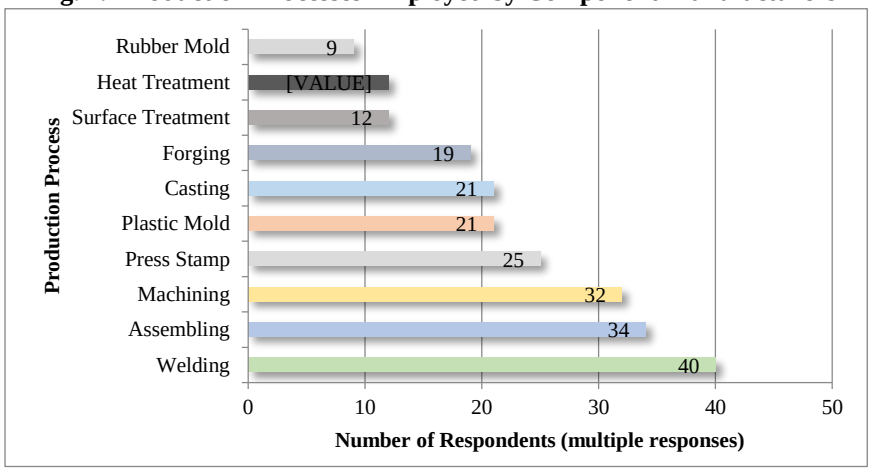
The majority of the manufacturers cater to the domestic market, though it was found that of a total of 31 manufacturers[4] that reported exporting their products abroad in 2011, 21 manufacturers successfully exported their products and in addition supplied products to the domestic market, while 10 only catered to the international market. Thus, with only a small minority of component manufacturers in the industry supplying to the global market, the industry is clearly not considered to be export-oriented in nature. The question then is whether the firms capable of meeting the quantity, quality and cost requirements of the global market in a timely manner, or do they lack the technology and/or capabilities to compete?

4. ANALYSIS OF KEY FINDINGS

4.1. Production Processes and Technology

The JICA study reviewed the production processes used by the component manufacturers and found that the majority of them are using simple and relatively more labour rather than capital intensive technology (for example, welding by hand is employed in 40 companies while castings and forging are done in 32 and 21 companies respectively, as shown below in Fig. 2.). In fact, processes requiring specialised equipment, such as heat treatment and surface treatment, are carried out by only a dozen companies in the industry, which limits the choice of suppliers of these products for OEMs. If quality standards are not met, OEMs have no choice but to either internalise production of the component or procure it from abroad at higher cost.

Fig. 2. Production Processes Employed by Component Manufacturers



Source: JICA (2011).

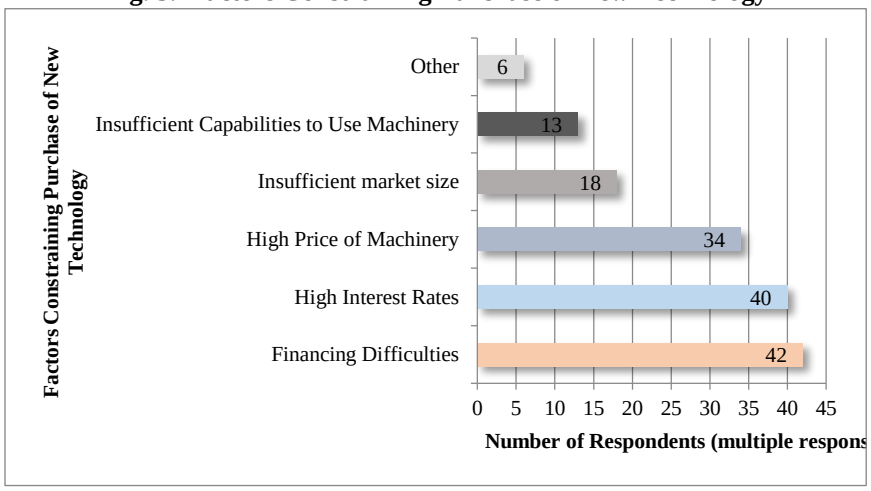
[4]This figure increased to 34 manufacturers in 2013.

Furthermore, a large number of manufacturers use more than one production process on the shop floor and have not yet specialised in a product type, possibly because domestic demand is not sufficient to warrant the change and quality problems preclude the possibility of export expansion. No doubt the labour intensive processes will be less costly for the manufacturers to finance, but productivity will low, not to mention quality level and standardisation of parts. To be competitive in the global market, it is painfully evident that component manufacturers will need to improve their production processes. The fact that not many manufacturers have improved their processes suggests that there are market failures constraining their ability to do so; the manufacturer may not be so inclined, or there may be financing issues.

The JICA survey team observed that the production technology used in a many of the plants and shops was manufactured in the 1980s and has not been updated with the passage of time. Interestingly, the general view among the survey respondents (74 percent) has been that the production technology is sufficiently modern to not require updating. This suggests that the manufacturers have had limited exposure to the recent advances made in production technology or feel that they can manage to be competitive even with outdated technology. Clearly an incentive will need to be provided by the state to compel the component manufacturers to update their production technology or risk going out of business.

It emerged that there are several reasons why survey respondents are averse to the idea of updating their production technology; the most common reason being difficulties in securing the financing required to purchase the new technology (42 manufacturers out of the total of 115, as shown in Fig. 3.). More specifically, it emerges that the small and medium size enterprises are unable to offer collateral or mortgage that satisfies the strict guidelines that financial institutions impose for access to the loan amount. The cost of securing the loan, in terms of the interest rate they are charged, is also another impediment for component manufacturers (40 manufacturers expressed their dissatisfaction with the interest rate). For example, the interest rate rose between 2007-08 and 2009-10, to an average of 17.25 percent. Then there is also the issue of lack of adequate domestic capabilities to operate the new machinery in addition to the already higher price charged for the new machinery, which together impede the process of acquiring new technology. As a result of these difficulties, a major proportion of respondents (79 percent) prefer to purchase less costly, second hand machinery, rather than newer more expensive machinery.

Fig. 3. Factors Constraining Purchase of New Technology

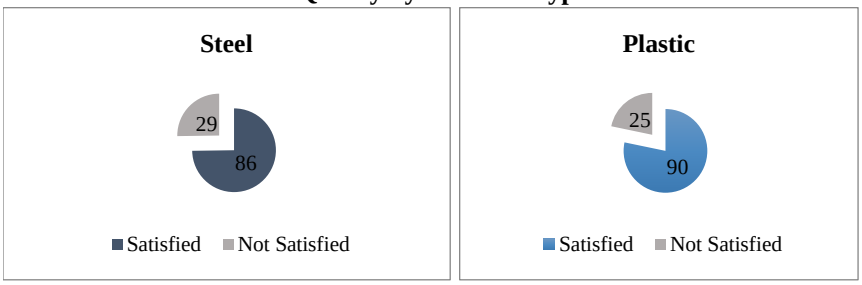


Source: JICA (2011).

4.2. Quality Control

The technological capabilities of employees are reflected in the quality of products produced by a firm. Quality standards in the automotive components industry are another area that deserve closer attention, especially since the level of quality has a direct bearing on the competitiveness of automotive firms. The JICA study found that the quality of steel plates produced in the country was of a poor standard, necessitating the import of steel from abroad to meet domestic needs. According to the respondents of the JICA survey, only 75 percent were satisfied with the quality of steel, while 25 percent expressed their dissatisfaction (the variation in satisfaction levels is evident from Fig. 4.). The quality of plastic resin raw materials was perceived to be marginally better, with 78 percent of respondents satisfied with the quality while only 22 percent were dissatisfied (see Fig. 4.).

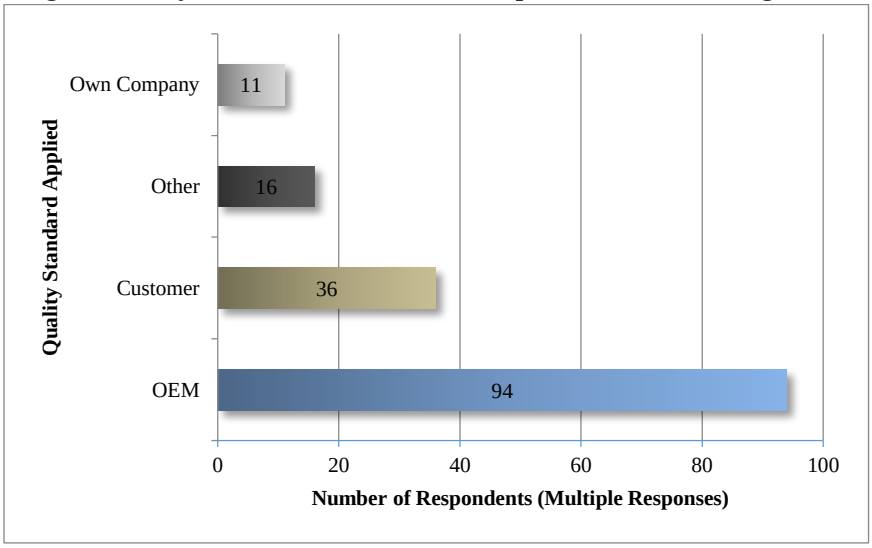
Fig. 4. Component Manufacturers Satisfaction with Raw Material Quality by Material Type



Source: JICA (2011).

Quality control practiced in component manufacturing firms is varied and implementation is far from universal, suggesting that these firms are aware of quality control measures and the attendant benefits, but only a small proportion actually take steps towards implementing them. The most common approach employed by firms to improve product quality through quality control is establishment of a Quality Control Department. A total of 76 firms (out of the 115 surveyed) reported a QC Department had been established for quality improvement purposes, while 22 firms have implemented a *kaizen* system of continuous improvement of production processes, and 13 now benefit from Quality Control Circles for identifying, analysing and resolving work problems that impede the firm's performance (see Fig. 6. for the distribution of firms).

Fig. 5. Quality Standards Followed in Component Manufacturing Firms

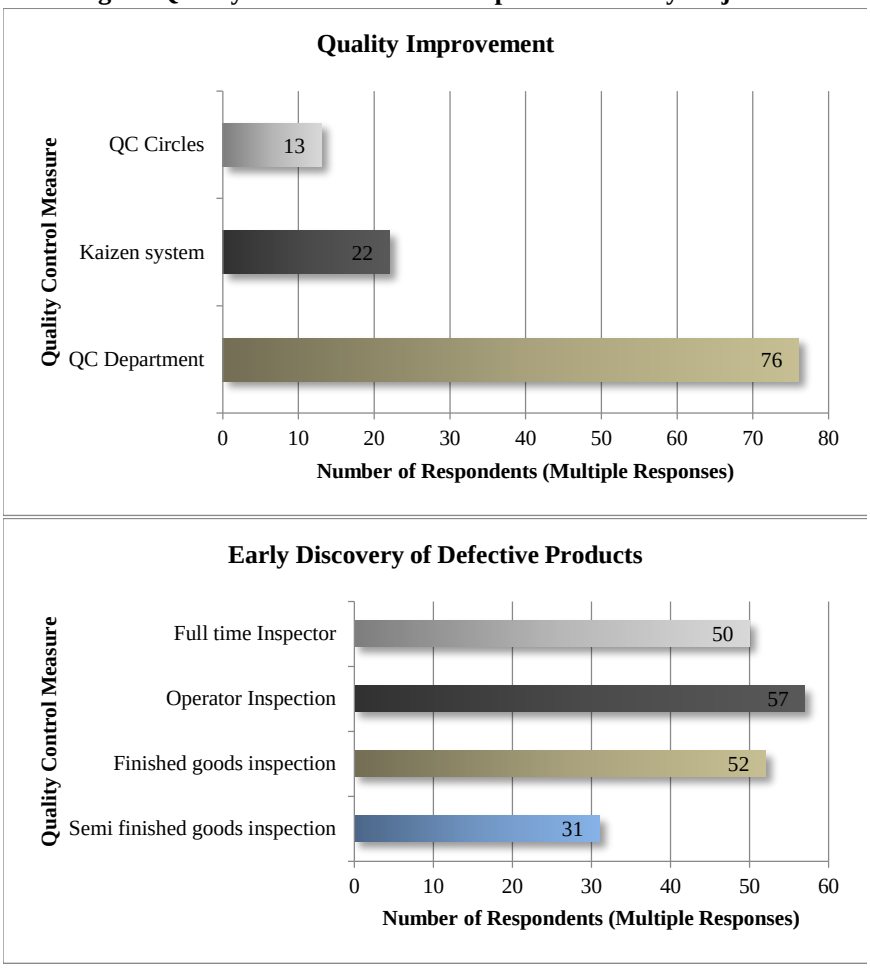


Source: JICA (2011).

Early discovery of defective products also prompted firms to implement quality control practices in the form of inspections by operators (57 firms) or full time operators (50 firms). A number of firms also inspected goods in semi-finished condition (31 firms) or finished condition (50 firms) as evident from Fig. 6. Implementation of quality control measures in this manner is bound to have implications for the OEM operations. First of all, due to the higher cost of imported components, OEMs proceed with procuring the products manufactured locally, but the benefit of lower costs is offset by the cost of conducting total inspection of the products and making any adjustments necessary before assembly. Second, OEMs have to adjust their own production schedules and operations to account for the increased quality inspections taking place both at

the component manufacturer and at the OEM assembly facility as well. On the other hand, from the perspective of the component manufacturers, customer quality standards are easy to meet (109 firms) while only 2 firms believe the standards are hard to meet.

Fig. 6. Quality Control Measures Implementation by Objective



Source: (JICA, 2011).

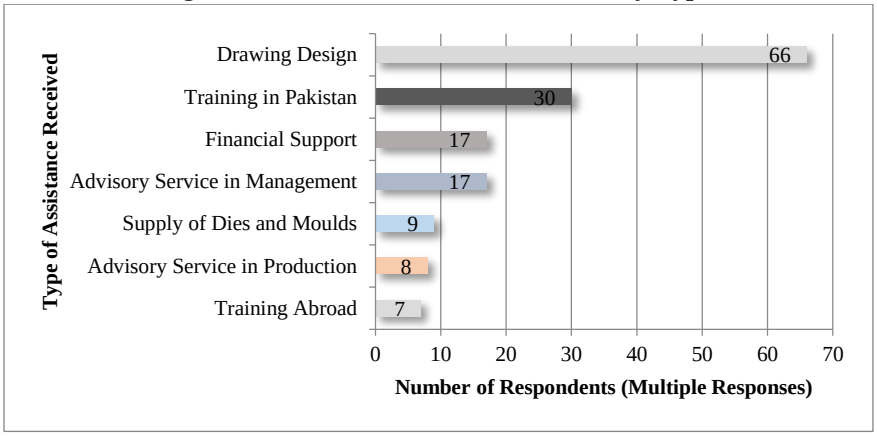
4.3. Inter and Intra Industry Collaboration and Interactions

Not all component manufacturers expressed a desire to acquire financing for their operations. Of the 78 firms that were interested in financing their operations, 29 required it for purchasing new equipment, while 14 intended to use it as working capital. The low demand for financing is due in part to the downturn of the economy after 2008-09 that saw automobile sales fall to 2004-

05 levels of 123,000 units sold, and in part to the difficulty in securing the loan amount (as highlighted earlier). The loan application procedure is considered to be complicated by 19 firms, involving the submission of business plans detailing future profits. The firms that lack employees or access to such knowledge will undoubtedly be unable to successfully apply for a loan. 13 firms viewed the attitude of banks towards themselves as non-conducive and passive at best, which hinders the application process, while 9 firms were dissatisfied with the amount they could secure as loan. From the perspective of the banks however, lending finances to small and medium enterprises is a risky venture with uncertain prospects for repayment.

Unlike the case of Japan, where *keiretsu* or informal business groups of companies are prevalent, component manufacturers in Pakistan supply competing customers and tend not to have captive relationships with them and this constrains the linkages that form between the two parties. Thus for example, only a handful (numbering 8) of component manufacturers receive "advisory service in production" from OEMs that target production technology and are designed to improve product quality by streamlining production processes, reduce waste and suggest ways to improve energy efficiency. However, a large number of component manufacturers (a total of 66) receive technical support from customers in the form of drawing design that aid in product development. Of the manufacturers surveyed, 30 reported receiving training within Pakistan for human resource development purposes, while only 7 manufacturers received training abroad due to financial and logistical constraints. To assist in the acquisition of new technology, 17 companies received credit from customers, while 17 manufacturers received assistance in management related to *kaizen* and *5S* (see Fig. 7. for the distribution of type of assistance rendered by OEMs to component manufacturers in recent years).

Fig. 7. Assistance Received from OEMs by Type

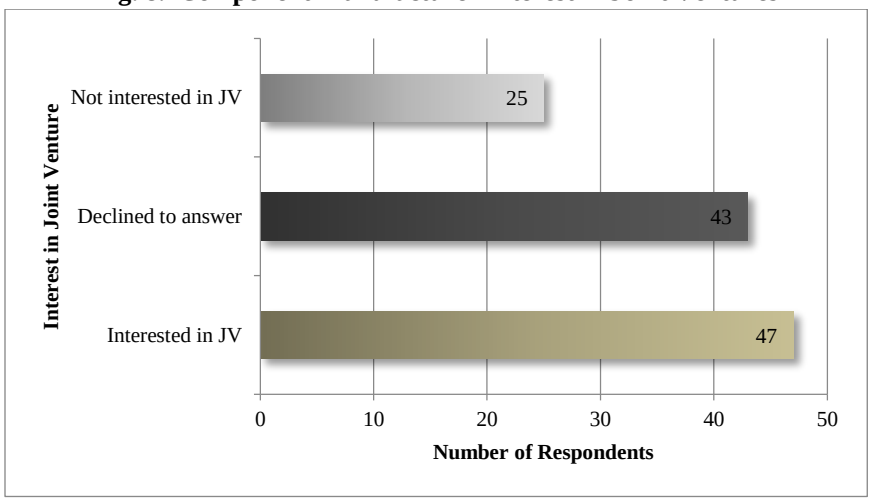


Source: JICA (2011).

One noteworthy trend that emerged was that in connection with securing new customers and exporting their products, only a small number of components manufacturers view their internal technological capabilities as lacking, more than 100 of the manufacturers surveyed expressed satisfaction with their internal level of technological capabilities. A total of 10 firms reported lack of productive capacity as limiting their operations, while only 7 firms felt their products lacked the necessary competitiveness.

Component manufacturers by and large did express a desire to export their products, but cited a number of difficulties that were preventing them from doing so. The most commonly reported difficulty is with regard to marketing of their products abroad (23 manufacturers) and a lack of information about potential markets and customers. This we believe reflects poorly on the working of the Export Promotion Bureau (EPB), now known as the Trade Development Authority of Pakistan (TDAP), which was set up by the state in 1963 under the Ministry of Commerce (MoC) to promote and encourage growth in the country's exports.

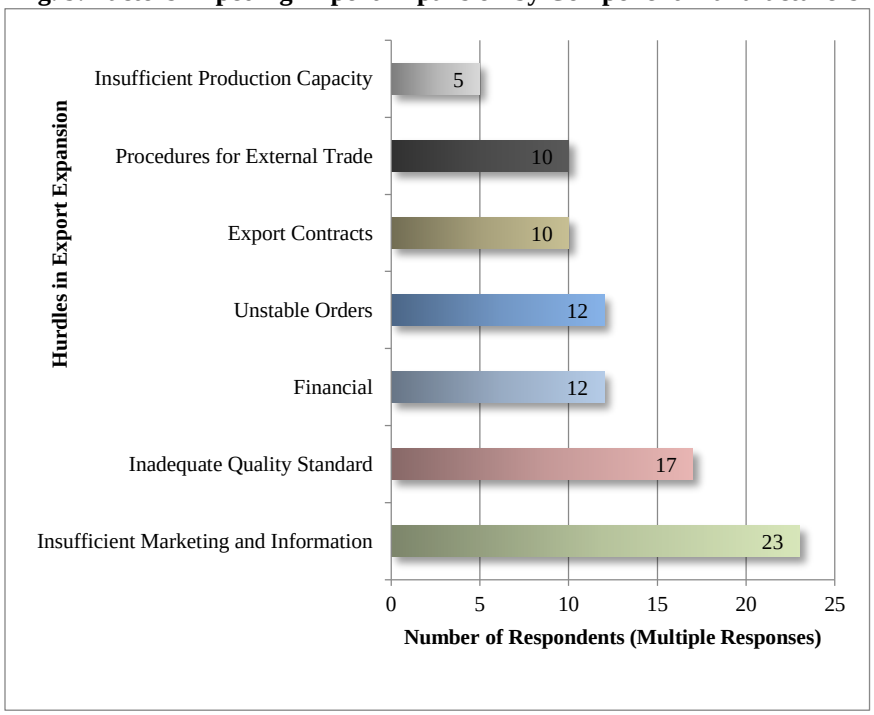
Fig. 8. Component Manufacturer Interest in Joint Ventures



Source: JICA (2011).

Quality of the products is of a concern to 12 manufacturers (see Fig. 9) wishing to export; we believe these manufacturers realise their products are not of international standard but adequate for the domestic market only. Again, securing the financing need to expand operations and meet international standards impedes export efforts for 12 manufacturers. Related to financing difficulties, insufficient production capacity is viewed as a hurdle by only 5 firms. Lastly, export contracts and the procedures related to external trade are viewed as hurdles by 10 firms each.

Fig. 9. Factors Impeding Export Expansion by Component Manufacturers



Source: JICA (2011).

4.4. Perceptions of Policy Environment

The Automobile Industry Development Programme [Ministry of Industries and Production (2008)] was launched by the state in 2007 with the vision of transforming the domestic automotive industry into a "global player", expanding production to achieve competitiveness and contributing by 5.6 percent to GDP while strengthening development of technological and human resources. To achieve this vision, the state planned to integrate Pakistan's automotive industry into the global value chain by targeting six policy areas through the AIDP; tariff plan, human resource development, investment incentive, technology acquisition, cluster development, and industry specific investment policy (a brief outline of the components is presented in Box 4).

The mixed performance of the Programme has been highlighted earlier and the JICA survey covered the component manufacturer's perceptions regarding the AIDP. First, it was determined whether the manufacturers were aware of the AIDP and its role in the industry's development path or not and second, an assessment was made of its impact in terms of how many manufacturers received support from the Programme.

Box 4.

Six Components of the AIDP (2007-12)

Six Components of the AIDP (2007-12)

The five year tariff plan (details in Appendices C-F) was formulated by the state in consultation with industry stakeholders for the purpose of providing the bare minimum protection, and a stable and predictable tariff environment to stimulate investments in the automotive industry requiring long gestation periods.

Human resource development (HRD) component focused on addressing the deficiencies of skilled labour in the industry; low educational background and a fixed mind-set. The Programme realizes changing the mindset is long term prospect and instead called for the prompt setting up of Centres of Excellence to train manpower and management in the sector.

Productive asset investment incentive (PAII) component was designed to stimulate investment in productive capacities of component manufacturers and encourage localization of components by offsetting the duty on import of CKD kits.

The Technology acquisition support scheme (TASS) component provides grants to component manufacturers for enhancing their technology levels and encouraging localization to assist those manufacturers cope with the high cost of technology acquisition.

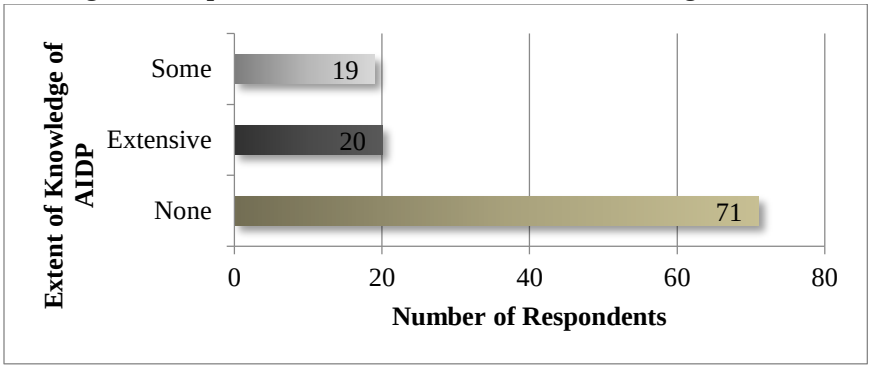
Cluster development component is designed to encourage knowledge transfer, supply chain management, process and product development by locating component manufacturers close to vehicle assemblers; namely in two clusters, one in Karachi and one in Lahore.

Auto Industry Investment Policy (AIIP) component covers the rules and procedures applicable to new foreign investors entering the automotive sector focusing on production of high technology products catering to current consumer demands. The policy allows import of complete CKD kits for a period of three years to facilitate assembly operations.

Source: Ministry of Industries and Production (2008).

It emerged that the majority of component manufacturers (71) did not have any knowledge of the AIDP, its components or aims, while 19 had some knowledge and only 20 manufacturers were well versed in the aims and intricacies of the AIDP (Figure 10). If this trend is indeed representative of the entire population of component manufacturers in the industry, it is very worrisome and suggests that on paper the AIDP is formulated well enough, but awareness of the Programme is far from ideal and this will adversely affect its impact.

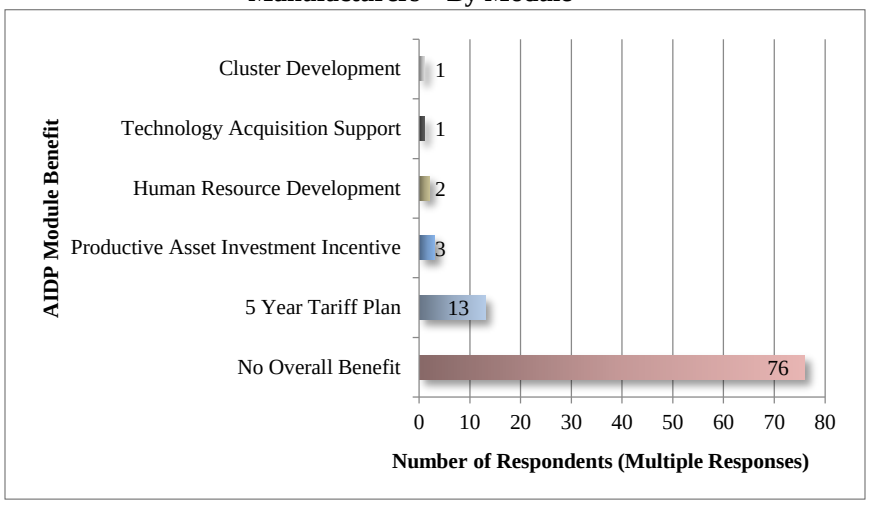
Fig. 10. Component Manufacturers Extent of Knowledge of AIDP



Source: JICA (2011).

On further examination, it emerged that 76 manufacturers reported receiving "no benefit" from the Programme, while 13 manufacturers highlighted benefitting from the Tariff Plan component (Figure 11). The Productive Asset Investment Initiative was known to only 3 manufacturers, while 1 manufacturer reported having any knowledge of Technology Acquisition Support Scheme. Considering the fact that the AIDP was formulated with input from all stakeholders, including component manufacturers and OEM assemblers/ manufacturers in the industry, it is indeed very surprising to see how little awareness there is of the programme among the intended beneficiaries. A similar response was observed when component manufacturers were questioned about the USAID funded Competitiveness Support Fund (CSF) that was intended to boost competitiveness of domestic manufacturers in various industries of the economy.

Fig. 11. Perceived Benefit of AIDP to Component Manufacturers—By Module



Source: JICA (2011).

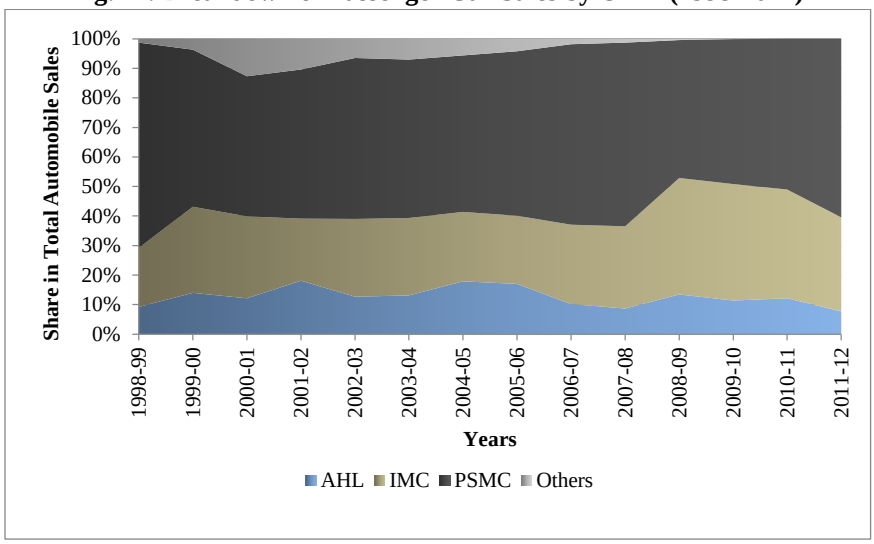
4.5. OEMs and Technological Capabilities Development of Parts Manufacturers

It has been observed that the technological capabilities and level of production technology in use by automotive parts manufacturers are not uniform in the industry (in the case of capabilities) or the most modern (in the case of technology). To achieve economies of scale and be competitive, assemblers require the timely provision of parts of suitable quality that the parts manufacturers can be hard pressed to provide in the absence of new technology and the capabilities to make maximum use of it. Since the state in Pakistan has not been proactive in this area (as compared to the efforts of other developing

countries), the major assemblers in each segment, and even the three passenger-car assemblers in Pakistan have stepped in to compensate for these deficiencies some extent. The response of each manufacturer has been different and likely reflects the company policy and preference regarding dissemination of knowledge and technology to outsiders.

The passenger-car segment of Pakistan's automotive industry is dominated by three assemblers; Indus Motor Company Ltd. (IMC), Pak Suzuki Motor Company Ltd. (PSMC), and Honda Atlas Cars (Pakistan) Ltd. (HAC), as evident from the trends in Figure 12. Initially PSMC was the sole assembler of passenger cars for the domestic market and had no trouble establishing its brand name and market dominance after 1984 on account of its product (the Suzuki FX 800cc) being priced lower than the imported passenger cars available in the market. However, when IMC entered the market in 1990, PSMC was faced with some competition in the mid-range of passenger cars (1,000cc and above). To retain its market dominance, PSMC introduced the Margalla brand and offered a lower priced alternative to IMC's Corolla brand. Naturally, both companies were subject to the ISDP and used lower priced domestic products to drive down prices. However, the approach taken by the two towards component manufacturers differed significantly.

Fig. 12. Breakdown of Passenger Car Sales by OEM (1998-2012)

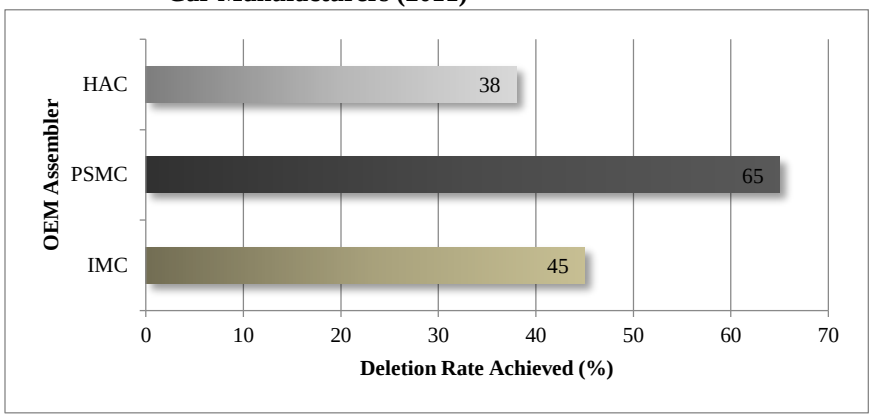


Source: PAMA (n.d.).

In the case of IMC, not only the manufacturing facility, but the infrastructure available to the component manufacturer is monitored before product samples are provided for testing and approval. The samples are tested locally by TMC experts before being sent to Japan for extensive testing and

trials. By 2011, only 45 percent of the components produced locally for various models had been approved for use by TMC (see Figure 13 for a comparison of indigenisation rates achieved by the three local competitors). The technical assistance provided to component manufacturers is contingent upon the latter possessing the requisite skills and adequate infrastructure without which the technology transfer of parts, drawing and process sheets is bound to fail. TMC retains ownership of technology by limiting transfer of manufacturing knowhow to component manufacturers and transferring assembly and operational knowhow to IMC.

Fig. 13. Deletion (Indigenisation) Rates Achieved by Passenger Car Manufacturers (2011)



Source: PAMA (n.d.).

Industry perception is that PSMC has allowed quality control to fall by the wayside in its quest to lower costs and increase profits. A similar procedure is adopted for selecting component manufacturers to supply the factory; the level of existing infrastructure and manufacturing facility present in addition to the potential to meet firm's demand schedule determine whether a sample is tested for approval. However, no strict quality control standards are enforced, which has resulted in deteriorating quality of the finished product, especially at the lower end of the product range.

The third entrant in the passenger car assembly segment; HAC, has achieved the lowest deletion rate among the three manufacturers on account of an unwillingness on the part of the company (according to HAC employees) to compromise on quality of the components supplied for the final product.

5. FINANCING OF TECHNOLOGY ACQUISITION

The initial round of technology acquisition in the automotive industry under the guidance of MoIP and PACO was naturally financed by the state and

the manufacturing concerns that were set up were managed by the state. The state pioneered and also set up the manufacturing concerns in areas where the need for domestic capabilities was required and the private sector was hesitant to invest. The public sector entities were divested and put under private sector control when the state took a renewed interest in private sector led growth. The majority of larger manufacturing concerns were taken over by conglomerates that had the political and financial resources required for profiting from these endeavours. Once this initial round of investments in technology acquisition was complete the state took a less active role, and the private sector stepped in to fill the vacuum to gain access to technology from abroad.

Firms turned to the financial sector to secure the financing required for gaining access to technology. Banks in the financial sector provided the loans needed in exchange for collateral in the form of property ownership documents or personal wealth in most cases. However, the easy terms of the loans resulted in misuse of loans and non-performing loans (firms unable to make a profit in the allotted time). Firms and entrepreneurs with political connections were able to avoid consequences of defaulting on their loans while smaller firms were mired in difficulties. Banks tightened their requirements and increased the amount of collateral required to secure a loan. The large conglomerates did not have difficulty in securing loans that they needed. By and large smaller firms (component manufacturers) could not satisfy the bank requirements and were unable to invest in technology acquisition. OEM assemblers still required components of a certain quality and quantity that could not be produced without enhancing the productive capacity of component manufacturers. They responded to the loan constraint by providing the loan themselves on easy terms or serving as guarantors to the bank for the component manufacturers. In exchange the OEMs tied the component manufacturer in a binding agreement to provide the components needed for a specified period of time or quantity. The AIDP was formulated to facilitate the financing of technology acquisition by component manufacturers; however, the requirements for securing financing are so strict, few if any firms have been able to avail the facility on account of the strict conditionalities imposed by the EDB.

6. CONCLUSION AND POLICY IMPLICATIONS

The aim of this paper has been to provide an overview of the state and current status of the automotive industry in Pakistan, and a detailed look at the development of the domestic component manufacturers. The home-grown, domestic industry has yet to take off and the foreign affiliated firms continue to command the market share in virtually every sector. The component manufacturing industry has established itself in clusters to support the major OEMs, based primarily on small and medium size enterprises with a number of large enterprises also operating in the mix, and contributed to the national

economy over the years. However, performance of the industry has been plagued with low levels of productivity and quality; stemming primarily from a lack of new production technology, low quality of raw materials and inadequate training. The worrying trends that have emerged are centred on one hand on the uphill task associated with securing funding for upgrading technology which serves as a major deterrent to acquiring new technology, and on the other hand on the risk-averse nature of manufacturers who appear to be content to manufacture and supply to the local market with their existing outdated production technology. These issues have been compounded with the issue of quality control of not just components, but of the supply of raw materials as well. The state on the other hand appears to have taken a mostly passive stance and appears content to focus on providing a level playing field and letting the free hand of the market reign. The low quality of Pakistani steel has been acknowledged by the MoIP and EDB, but it apparently up to the manufacturers and the OEMs to improve quality standards.

The industry has had to face its fair share of growing pains and issues; ranging from political uncertainty, security, a weak infrastructure to unstable policy environment. Recognising its importance in recent years, the state has attempted to nurture the industry by formulating the five year AIDP in consultation with various institutions involved and industry stakeholders. The outcome of the Programme, while initially promising has stalled and the industry has fallen behind in achieving the targets set for achieving production as well as localisation of parts. The AIDP was designed to offset these hurdles, but to all accounts it does not appear to have succeeded, especially considering the fact that most of the component manufacturers were unaware of the benefits of the programme. Or perhaps they are aware, but a lack of trust in the actions of the state that has been further exacerbated by the unstable policy framework appears to have tainted their views and hence diluted the intended impact of the programme.

The processing technology employed by 40 large component manufacturers was reviewed by a JICA team as part of the study and the effort yielded some very interesting results. More specifically the press stamping, metalworking, machining, and casting processes were examined. It was found that the press stamping manufacturers do not specialise in the process and manufacture products made by reverse engineering the physical samples provided by the OEMs. A high degree of manual labour work is involved in this process for several manufacturers who cannot make the die necessary; reminiscent of craft production before the advent of mass production, and placing a great deal of emphasis on worker’s skill level. Press stamping is done by a hydraulic press or a small power press, consists of many steps that breed inefficiencies. Pak Suzuki has the only press stamping lines capable of high volume production, while Honda Atlas and Indus Motors have second hand 40

year old presses imported from Japan. High quality production runs using this equipment are not possible. The study found that there is no manufacturer in Pakistan capable of producing dies of a sufficiently high quality to meet OEM assembler demands. Press die technology is required to make sheet metal parts and plastic moulds but has been lacking in Pakistan. The global automobile industry is making strides in incorporating the latest technology and advances in its production process and CAD/CAM is one of them. OEM assembler and manufacturers will expect component manufacturers to be able to use specifications provided in such a format. Though CAD/CAM systems have been introduced by a number of manufacturers, they are not utilised fully in Pakistan. Also, these systems are used for die making, but lacking the proper facilities for creating dies using *Full Mold Casting*, manufacturers resort to welding the dies, which introduces imperfections in the finish of the product being manufactured and thus reduces their quality level.

The level of precision required in the manufacture of transmissions and parts for motorcycles and tractors is less than that required for passenger cars since the latter have an added requirement of comfort. Component manufacturers are under the mistaken impression that by successfully manufacturing and exporting machined parts and transmissions for tractors and motorcycles means they will be successful in producing the same for cars. Component manufacturers have the facilities to test individual products produced but not an assembled component which means that they are not able to meet the stringent requirements set by passenger car OEMs.

This paper has also shed light on the institutional and policy frameworks operating in the country that relate to the automotive industry. It is evident that there are a number of interest groups that impose often times conflicting demands on the state with regard to policy formulation and even implementation. Case in point is the representation of PAMA and PAAPAM in the Automotive Industry Development Committee (AIDC) formed under the AIDP. It is felt that the terms and conditions that apply to potential entrants are less stringent than what the incumbent firms had to face; particularly with respect to the timeline for achieving localisation and applicable rates. It has been argued that the same conditions should apply to new entrants to put them on an equal footing with the incumbent firms. Technically the incumbent firms should not be afraid of the increased competition as it will force them to be more competitive, but the fact of the matter is that no new passenger car manufacturers have entered the industry since the AIDP was implemented. Or there is the decision of the state to allow the import of old second hand cars from abroad; a decision that has the support of APMDA but is vehemently opposed by PAMA and PAAPAM who argue that the easy availability of imported passenger vehicles will drive down demand for locally manufactured vehicles and adversely affect operations of domestic firms and labour employment as

well. On the flip side of the coin, the quality of the locally manufactured vehicles is below international standards and long wait times for orders to be fulfilled suggests the state has been ineffective in raising the efficiency of the local manufacturers. The strong bargaining position of PAMA has allowed them to successfully oppose state policy for some time at least.

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