POLITICAL ECONOMY OF TECHNOLOGY ACQUISITION IN PAKISTAN: POLICY AND CONSTRAINTS IN THE AUTOMOTIVE INDUSTRY

USMAN QADIR

Thesis submitted for the degree of PhD in Economics

2014

Department of Economics
School of Oriental and African Studies
University of London

Declaration for SOAS PhD thesis

I have read and understood regulation 17.9 of the Regulations for students of the School of Oriental and African Studies, University of London concerning plagiarism. I undertake that all the material presented for examination is my own work and has not been written for me, in whole or in part, by any other person. I also undertake that any quotation or paraphrase from the published or unpublished work of another person has been duly acknowledged in the work which I present for examination.

Signed: Usman Qadir   Date: February 20, 2015

Abstract

This thesis examines Pakistan's success in technological and organizational capability development for enhancing competitiveness in its industrial sector, focusing on the automotive industry as a case study, under several policy regimes. Pakistan has had to face many adverse conditions since it gained independence and as a result its growth has been sporadic, with periods of growth spurts followed by periods of slow growth. Successful interventions supporting capability development have happened in other developing countries without 'good governance' and with rent-seeking so a deeper analysis of the institutional failures in Pakistan is required. The thesis locates Pakistan's institutional choices and performance in the context of changes in its political settlement to explain why performance was weak at key points in the automotive industry's history. The analysis focuses on the contests over potentially growth-enhancing rents in the context of the distribution of power between the groups and organizations affected by these policies. Policy had to be implemented in the context of extensive political clientelism that was increasing in its fragmentation with low levels of political stability and frequent changes in government. The proliferation of clientelist groups resulted in the state compromising on long term economic growth in an effort to ensure its short-term political sustainability. Production in the automotive industry has also become increasingly globalized in recent years and Pakistan has found it hard to break into global value chains on account of the weak technological capabilities that it could develop. Two case studies of relatively more successful instances of technology acquisition within the automotive industry of Pakistan show that even in this adverse policy environment, intervention can still assist some capability enhancement. The policy challenge is to develop instruments that can enable capability development on a broader level in the context of the clientelist processes that characterize the political settlement.

Table of Contents

List of Tables

List of Figures

Acknowledgements

This research has benefitted from the assistance of many individuals and organizations, foremost among them being my supervisor, Professor Mushtaq Khan who has provided invaluable guidance and support at times of great need and helped me focus my research for this PhD. My family who has stood by me unwaveringly during this long journey; and particularly my father who helped and encouraged me throughout. Also my wife, who has been exceedingly patient and supportive at all times of the day, all deserve my heartfelt thanks.

I was very fortunate to be awarded a scholarship from Pakistan Institute of Development Economics, Islamabad so I would like to take this opportunity to thank them for selecting me and also for allowing me the flexibility to see this PhD to its conclusion.

My fieldwork in Pakistan would not have been possible without the insight and guidance of many people in Pakistan, particularly the employees of Pakistani automotive companies who painstakingly answered all my lengthy questions and queries, and helped open doors for me that would otherwise have remained shut.

My stay in London has benefitted immensely from the support of my brothers-in-law and their families who made London seem like a second home to me.

I dedicate this PhD to my wife, Sabeen, without whose encouragement, advice and support I would have been lost.

Acronyms and Abbreviations

ACMA	:	Auto Component Manufacturers Association
AIDC	:	Automotive Industry Development Committee
AIDP	:	Automobile Industry Development Program
AIIP	:	Auto Industry Investment Policy
AIML	:	All India Muslim League
APDP	:	Automotive Production and Development Programme
APMA	:	Association of Pakistan Motorcycle Assemblers
APMDA	:	All Pakistan Motor Dealers Association
ATLG	:	Atlas Group
ATLH	:	Atlas Honda Limited
CAD	:	Computer Aided Design
CAE	:	Computer Aided Engineering
CAM	:	Computer Aided Manufacture
CBR	:	Central Board of Revenue
CBU	:	Completely Built-up Unit
CCI	:	Chamber of Commerce and Industry
CKD	:	Completely Knocked Down
DAC	:	Development Assistance Committee
DCC	:	Delivery Control Center
DFID	:	Department For International Development
DoE	:	Department of Explosives
EBS	:	Export Bonus Scheme
EDB	:	Engineering Development Board
EPLS	:	Export Performance Licensing Scheme
EPS	:	Enar Petro-tech Services
EPZA	:	Export Processing Zone Authority
EU	:	European Union
FBS	:	Federal Bureau of Statistics
FC	:	Factor Cost
FDI	:	Foreign Direct Investment
GDP	:	Gross Domestic Product
GNP	:	Gross National Product
GWH	:	GigaWattHours
HAC	:	Honda Atlas Cars
HMCL	:	Honda Motor Co. Ltd
HRD	:	Human Resource Development
HYV	:	High Yield Variety
ICT	:	Information and Communication Technology
IMC	:	Indus Motor Company
IPR	:	Intellectual Property Rights
ISDP	:	Industry Specific Deletion Program
JICA	:	Japan International Cooperation Agency
JV	:	Joint Venture
LCP	:	Local Content Program
LCV	:	Light Commercial Vehicle

MF	:	Massey Ferguson
MIDP	:	Motor Industry Development Program
ML	:	Muslim League
MNC	:	Multinational Corporations
MoC	:	Ministry of Commerce
MoI	:	Ministry of Industries
MoIP	:	Ministry of Industries and Production
MoP	:	Ministry of Production
MP	:	Market Prices
MTL	:	Millat Tractors Limited
MW	:	MegaWatt
NFC	:	National Fertilizer Corporation
NIPDM	:	National Industrial Park Management Company
NIE	:	New Institutional Economics
NIS	:	National Innovation System
NPO	:	National Productivity Organization
NWFP	:	North West Frontier Province
OECD	:	Organization for Economic Co-operation and Development
OEM	:	Original Equipment Manufacturer
OICA	:	Organisation Internationale des Constructeurs d'Automobiles - International Organization of Motor Vehicle Manufacturers
PAAPAM	:	Pakistan Association of Automotive Parts Accessories Manufacturers
PACO	:	Pakistan Automobile Corporation
PAII	:	Productive Asset Investment Initiative
PAMA	:	Pakistan Automotive Manufacturers Association
PGJDC	:	Pakistan Gem and Jewelry Development Company
PHSADC	:	Pakistan Hunting and Sporting Arms Development Company
PIDC	:	Pakistan Industrial Development Corporation
PIM	:	Pakistan Institute of Management
PITAC	:	Pakistan Industrial Technical Assistance Center
PML	:	Pakistan Muslim League
PPP	:	Pakistan People's Party
PS	:	Pakistan Steel
PSDC	:	Pakistan Stone Development Company
PSDP	:	Product Specific Deletion Program
PSMC	:	Pak Suzuki Motor Company
PTC	:	Pakistan Tractor Corporation
QC	:	Quality Control
R&D	:	Research & Development
RAND	:	Research And Development Corporation
RTEL	:	Rana Tractors and Equipment Limited
SDM	:	Service Delivery Model
SEC	:	State Engineering Corporation
SIAM	:	Society of Indian Automotive Manufacturers
SKD	:	Semi Knock Down
SMC	:	Suzuki Motor Corporation

SMEDA	:	Small and Medium Enterprises Development Authority
SROs	:	Special Regulatory Orders
STM	:	Social Transformation Model
TAI	:	Technology Achievement Index
TASS	:	Technology Acquisition Support Scheme
TBS	:	Tariff Based System
TDAP	:	Trade Development Authority of Pakistan
TFP	:	Total Factor Productivity
TFR	:	Total Fertility Rate
TMC	:	Toyota Motor Corporation
TRIMs	:	Trade Related Investment Measures
TUSDEC	:	Technology Upgrading and Development Company
UAW	:	United Auto Workers
UK	:	United Kingdom
UN	:	United Nations
UNDP	:	United Nations Development Program
UNIDO	:	United Nations Industrial Development Organization
US	:	United States
USAID	:	United States Agency for International Development
USC	:	Utility Stores Corporation
USD	:	US Dollars
WEF	:	World Economic Forum
WTC	:	Warranty and Training Center
WTO	:	World Trade Organization

CHAPTER 1. TECHNOLOGY ACQUISITION, CATCHING UP AND COMPETITIVENESS IN THE AUTOMOTIVE INDUSTRY

1.1. INTRODUCTION

Whereas developed countries have exhibited strong and fairly consistent growth performance historically, developing countries (including those in the South Asian region) have had a more chequered past. The crucial issue that confronts the international community is how to encourage growth and development in developing countries across the globe, to bring them at par with developed countries. The Commission on Growth & Development (2008) highlighted five areas where policy has historically been important for achieving **sustained high growth**[1] in economies. One vital area is in innovation promotion and imitation and accelerated or sustained catching up policies, while other areas include macroeconomic stabilization, supporting high levels of accumulation, effective allocation of factors of production (land, labour and capital), and social inclusion in developmental goals. It is generally agreed that positive progress is required on all the five policy fronts highlighted above, for there to be sustained growth over long time horizons. Against this backdrop, a key concern for developing countries that merits further research in the context of learning by doing and innovation promotion is: what has been the country's performance with regard to technology acquisition for purposes of enhancing productivity? Has the country been effective in its efforts to acquire the appropriate technology needed to boost productivity levels? Has the country made effective use of the technology acquired? What market failure(s), if any, are constraining the country's ability to acquire the technology and make appropriate use of it? This research will address these questions in the light of the experience of Pakistan's economy, focusing on the development of the automotive industry.

[1] A pre-requisite for poverty reduction, increased productive employment, education and health, and innovation.

For developing countries to converge with the developed countries in terms of their development and growth requires an increase in productivity[2]. This productivity growth is expected to result in an improvement in international competitiveness of the domestic economy and led to an increase in income levels, as well as demand for products, both imported and domestic. Johnson (1962) and Boltho (1996) found that the increase in demand is expected to lead to further increases in domestic output and trade, as supply adjusts to the increase in demand. Such was the experience of Great Britain after the Green Revolution in agriculture and the introduction of the steam engine, in the United States when there was a quantum increase in manufacturing output as a result of mass production techniques being perfected and applied and in Japan when Just-in-Time production techniques were introduced.

Dahlman (2007) has very convincingly argued for the key role played by technology since the 1500 when key developments led to increasing per capita incomes despite corresponding increases in population. This role has persisted till now when production activity in virtually all industries has become dependent on technology in one form or another and in one way or another. Developing countries tend to have a weak technological base on which to build their productive activities, and technology tends to be of a dated origin where it does exist, necessitating the acquisition of new technology and techniques in an effort to raise productivity levels. In fact, Amsden (1990) has argued that late developers all managed to grow without any original indigenous technology present to serve as an asset to be monopolized. The successful experience of these late developers suggests they were able to procure technology from foreign sources, absorb it into the domestic economy and utilize it effectively. The physical technology required is one piece of the puzzle; the recipient developing country also requires workers and managers to have the knowledge and capacity to make the most effective use of this technology. Lall (1992) refers to these particular qualities as the technological and organizational capabilities that are required to increase productivity levels and also have to be built up and developed in these countries as part of the technology acquisition efforts. This is the part where developing countries tend to falter.

[2] Numerous studies, by Denison (1967), Maddison (1970), Maddison (1972) and Denison & Chung (1976) to name a few, were founded on the classical belief of production functions and assumed Total Factor Productivity (TFP) as the sources of growth.

In contrast to the promising development outlook of the high growth economies (late developers) of South East Asia, the experience of many South Asian economies (including Pakistan) in catching up has been remarkably unimpressive, and as such development efforts in Pakistan warrant a closer look. As one of the latter countries, the development efforts of Pakistan are warranted a closer look. Since the time of independence in 1947, Pakistan has had to face multitudes of adverse conditions that have tempered its growth, with periods of growth spurts followed by periods of slow growth. High incidence of corruption and poor governance are two issues that are widely accepted as having marred Pakistan's development efforts over the years. However, other developing countries have successfully intervened in the economy to foster capability development in the presence of rent-seeking but without 'good governance' (a term first used in World Bank (1989)) so a deeper analysis of institutional failures in Pakistan is warranted. The discussion locates Pakistan's institutional choices and performance in the context of changes in its political settlement to assess weak performance at key points in the history of the automotive industry. The focus is on the contests over rents, in particular potentially growth enhancing rents, given the distribution of power between different groups and organizations affected by policies. Policies were implemented under extensive political clientelism with increasing fragmentation signified by low levels of political stability and frequent changes in government. The research that follows will show that the increased fragmentation and multitude of clientelist groups compromised the ability of the state to direct long term economic growth in favour of ensuring its short term political sustainability.

The global automotive industry as it has evolved is currently characterized by global production networks and with the weak domestic technological capabilities that have developed Pakistan has found it a challenge to successfully enter the industry's global value chain. The domestic automotive industry is composed of a number of foreign OEM affiliated manufactures/assemblers supported by a component manufacturing industry that is itself struggling to enter the global automotive component market. That is not to say that domestic technological capabilities are absent; firms in two segments, motorcycles and tractors in particular have managed to successfully develop their technological and organizational capabilities. Two case studies[3] of

[3] Millat Tractors and Atlas Honda Limited

relatively successful instances of technology acquisition and capability development within the automotive industry of Pakistan are proof that even in an adverse policy environment, intervention has borne fruit. The policy challenge now is to develop instruments that can enable and assist in capability development at a broader level in the context of the clientelist processes that characterize the prevalent political settlement. The discussion and analysis that follows will examine Pakistan's experience with acquisition of technology and the technological as well as organizational capability development for enhancing the competitiveness of its industrial sector, focusing on a case study of the automotive industry, under different policy regimes.

This chapter sets the stage for the discussion and analysis that follows and is organized as follows. Section 1.2 brings to light the issues surrounding technology acquisition, strategies of catching up and the competitiveness of firms in developing countries. The economic performance of Pakistan since independence and myriad of economic challenges that face the country are covered in Section 1.3, as is the changing political landscape in the country. Section 1.4 links the preceding discussion to the framework of analysis to be used in subsequent chapters; learning rents and their management in the context of political settlements that have emerged in Pakistan. Section 1.5 concludes this introduction.

1.2. THEORETICAL CONSIDERATIONS

In today's world, global competitiveness is considered a pre-requisite for achieving a high and sustainable level of growth; the greater the level of industrialization and productivity of the economy, the higher the level of competitiveness of the economy[4]. Economies across the globe can thus be categorized according to the level of industrialization of the economy and the degree of competitiveness they have achieved; more developed and advanced countries are considered to be highly competitive, while developing countries tend to have lower levels of industrialization and are less competitive. Over the years developing countries have utilized several approaches for the purpose of catching up with the more advanced developed countries in terms of their level of industrialization.

[4] based on a Kaldorian analysis of economic development in Kaldor (1967)

One approach for achieving this goal was pro-active intervention by the state through industrial policy with the aim of guiding and nurturing domestic industries to allow them to become globally competitive, as Japan and Korea did in more recent times. This policy stance was a variation of the 'infant industry'[5] argument, first proposed by Hamilton (1790) and Daniel Raymond and in general abandoned after the lukewarm performance of numerous developing countries in the 1960s and 1970s. The strategy was over-shadowed by adoption of the liberal route promoting free markets and exposure of domestic producers to the global market in a do or die scenario. This liberal policy view has come to be accepted as the more common and preferred response for dealing with any short-comings; to engage in market-enhancing governance reforms across the board, in the hopes of making markets more efficient and rent-free and thereby removing any hurdles and obstacles to achieving a high and sustainable rate of growth.

In the 1950s and 1960s, a number of countries took off on the path to development guided by the belief that a swift and rigorous industrialization process would put them on the convergent path with already developed countries. These countries implemented infant industry protection schemes that were at the heart of fairly ambitious industrial policies, and designed to promote domestic technological capabilities by subsidizing imports, exports, credit, inputs and other components of the production process. Due to the mediocre and lack-luster performance of economies in response to these policies, as compared to the massive financial burden of financing these subsidies, developing countries entered into a phase of liberalization across the board by the 1980s. The liberalization process yielded promising results in a number of economies, but the pertinent question remains as to how much of this improvement was due to the liberalization process in and of itself, and how much was due to the liberalization process coupled with technological capabilities built up during the preceding rapid industrialization process.

It is important to consider that if producers in developing countries are operating below the global technology and productivity frontier (as is likely to be the case given their lower level of industrialization) when they enter the global market, this

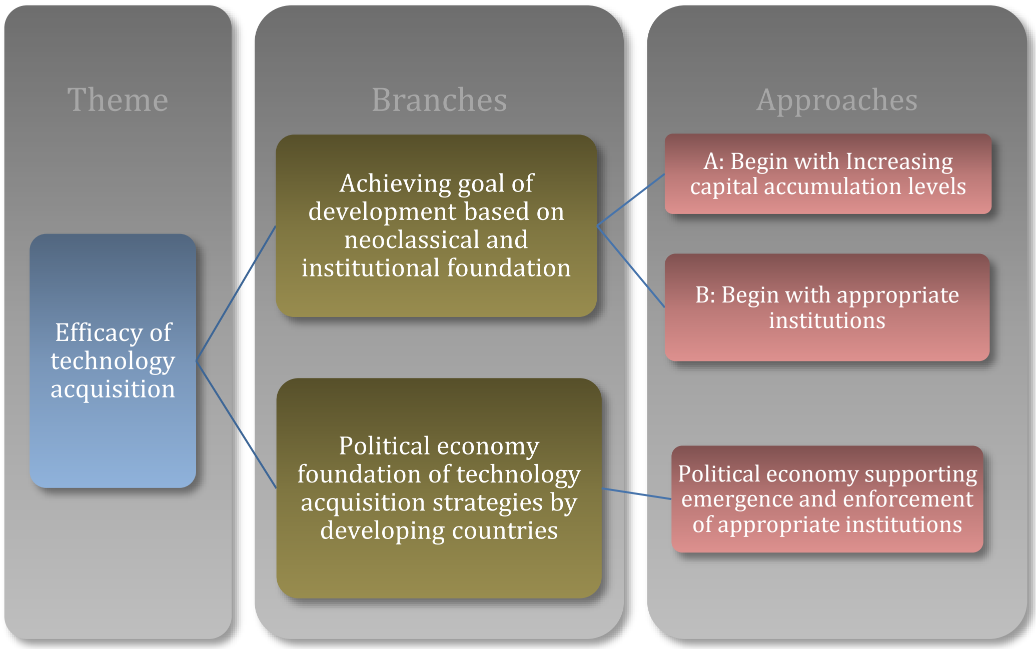
[5] See for example Chang (2002) for details

precludes the possibility of their receiving much, if any, support in competing globally when markets open up and can lead to a collapse of any domestic productive capacity that already exists. With the widespread market failures that are known to exist in developing countries, the result can be catastrophic as these countries can become trapped in vicious cycles of low growth. These outcomes have also been referred to as *low-growth traps* (by Stokey (1991) and Redding (1999)) or lock-in (by David & Greenstein (1990), David (1985), David (1986a), David (1986b), David (1992), David (1993), Arthur (1986) and Arthur (1989)) in the literature. Essentially these countries will be unable to complete the transition to a situation where they can reap the benefits of producing high value added products, and instead can remain stuck or locked in a state of producing low value added products. The missing link in this equation is the indigenous technological and organizational capabilities required to push the domestic industry to the global technology and productivity frontier and beyond, but this is generally underdeveloped or even lacking in developing countries. The crucial role played by indigenous technological capabilities in mastering new technologies (adapting the technology to use in the local environment, diffusing the technology throughout the rest of the economy and even allow greater access to foreign markets) did not receive much attention in economic literature till the 1980s.

The theoretical underpinnings of catching-up industrialization (as detailed by Suehiro (2008)) and the efficacy of technology acquisition and implementation in an economy for promoting growth have traditionally been focused along one of two branches. The first branch is concerned with the penultimate goal of achieving economic and social development and the competing approaches that can be used to achieve this goal. One approach (Approach B in Figure 1.1) is to set up the appropriate institutions to guarantee and secure property rights to create the conditions necessary for economic growth, and the second approach (Approach A in Figure 1.1) supports increasing capital accumulation levels, and accelerating the pace of capability development, which leads to economic growth and eventually effective institutions can be set up for securing property rights. To increase capital accumulation in this fashion requires many institutions to be set up for this strategy to be effective, and the institutions for securing property rights are not the most essential. The latter may even be poorly defined in the early stages and are strengthened selectively as sectors become globally competitive. The second branch is concerned with the political economy of technology acquisition strategies in developing countries; and more specifically focuses on the political economy supporting the emergence or introduction and enforcement of appropriate institutions that is essential for technology acquisition strategies to succeed and this is where the current research is located.

The conventional or neoclassical approaches to industrial development, championed by Balassa (1982), Krueger (1983) and others, minimize the role of technological activity in developing countries and by extension, the need for policies that nurture and promote such activity, according to Pack & Westphal (1986). The focus is on "getting prices right" and minimizing the role of the state in industrial activity. Lall (1992) found that any interventions that necessarily have to be made in industry are limited to being neutral or functional in nature, as opposed to selective, discretionary and sector specific.

Figure 1.1: Literature Tree



Source: Author

This traditional literature (in Nelson (1987) and elsewhere) has tended not to place any great emphasis on the demand for technological activity in developing countries; simply assuming that technology is freely accessible, countries opt for capital/labour intensities based on factor price ratios, all firms operate on the same production function and there are no complications in the acquisition and implementation of technology transfers, and so on. Developing countries are assumed to select and costlessly apply innovations in production (in other words movement of the production frontier rather than movement along it), and there is no role or need for state intervention. The political economy implications of this assumption are that it ensures stable property rights and encourages foreign investors to enter the domestic market bringing in foreign capital and technology to thus bolster economic development. In so doing it also sends a clear message to foreign investors that ownership of their investment will not be contested by the state.

Having the institutions in place to protect property rights as a precondition for achieving growth is what prompted Montesquieu (1752) and Smith (1776) to suggest constraining government, and this notion was later highlighted in various historical accounts of European development[6]. Walras (1874) developed those ideas further along traditional lines while theoretical support from new institutional economics proponents such as Buchanan & Tullock (1962), North & Thomas (1973), North (1981) and North (1990) emerged more recently. Early empirical support for this hypothesis was provided by, among others, Long & Shleifer (1993) using data on urbanization of European regions to find evidence of faster city growth under constrained governments. Knack & Keefer (1995) and Mauro (1995) initiated research along the lines of analysing the impact of good institutions on economic growth. Based on the work by researchers including Acemoglu, Johnson & Robinson (2001), Rodrik, Subramanian & Trebbi (2002), Dollar & Kraay (2003), Easterly & Levine (2003), Hall & Jones (1999), there appears to be an intellectual consensus that political institutions of limited government do cause economic growth. This suggests that economic growth can be achieved by having institutions that are market-promoting in developing countries; this will encourage technology to flow to these countries, and nothing more needs to be done. However, history has shown that this is not always the case.

When thinking of improved market access, it naturally begs the question of how useful is it to have open and free markets if the domestic economy does not have the capability, let alone the resources, with which to deliver competitive products in the

[6] Such as the account of the Norman d'Hauteville dynasty in Kantorowicz (1957) and Haskins (1915)

market (be it international, or even domestic). The less popular response mentioned earlier favours growth-enhancing strategies that target specific market failures and focuses on building the productive capacity and capability of industries given that markets are imperfect, through technology acquisition and implementation. A more thorough examination of this issue coupled with an understanding of the underlying structure of the domestic economy will shed light on the debate of whether it is better to focus on market-enhancing strategies or growth-enhancing strategies. This will in turn allow for the formulation of an effective policy mix that takes into account the conditions prevalent in the economy at the time, as well as the limitations that exist and constraints on proper implementation of the policy.

A proposition put forward earlier was that technological competitiveness and capability are vital for an economy's survival in today's global market, and a pre-requisite for achieving a high, sustainable growth rate. It was also suggested that the productivity and performance or competitiveness of producers critically hinges on the level of capabilities that they possess – the ability to efficiently turn inputs into competitive final products. The popular route for achieving this goal has been the introduction of free markets and exposing the domestic market to global competition (from developed as well as other developing countries) in a survival of the fittest sense. However, this approach does not address the more nebulous aspect of technological productivity, which is "capability"[7]; the ability to organize and produce effectively and efficiently.

Thus, a much more stimulating and far more noteworthy challenge to address is the acquisition of tacit knowledge and capabilities. It has been pointed out by Lall (1992) that neoclassical approaches ignore the "peculiar nature and the costs of technological learning in specific activities the externalities it generates and the complementarities" that can result, all can lead to market failures requiring selective policy intervention.

It is meaningful to think of 'capability' on two levels according to Sutton (2005); one level, the 'revealed' capability, is the unit variable cost of production as well as a measure of buyer's willingness to pay for a unit of output; i.e. the perceived quality of

[7] Lall (1992), Kim (1999) and others

the product. The second level is the 'underlying' capability or know-how and working practices by employees (or 'tacit knowledge'). The technological and entrepreneurial capabilities to effectively utilize investments in capital and machinery are intrinsically linked to said investments. Lall (2000) points out that while developing countries are able to attract the initial investment with relative ease, and even to find well qualified workers to operate the machinery, they are often unable to make sustained progress in acquiring the requisite tacit knowledge. Without this knowledge, the machinery will be operating at less than optimal capacity and the industries will be hard pressed to compete in the global market. The popular response to this failure (described earlier as one that downplays the role of state in developing technology and the capability to use it effectively) is to enhance the markets, in an attempt to make them more efficient by reducing the inherent transaction costs and let market forces weed out the weak and inefficient firms. This market-enhancing approach, according to Stiglitz (1996), is not without its problems and suffers from a variety of issues, on account of which it does not appear to be the ideal solution for developing countries

The alternative approach that acknowledges variation that exists between the operational levels of firms and the crucial role of technology and technological change (based on the evolutionary theory of technological change of Nelson & Winter (1982)) holds more water. Developing countries acquire matured technology (through various channels such as FDI, Joint Ventures and the like) from firms in the developed countries and the state implements policies and actions to assist in the absorption and assimilation of this technology in the domestic economy. According to Lall (1993a) the speed of absorption and assimilation of the technology is what depends on the level of capabilities (both revealed and underlying) in the domestic economy. These capabilities include technical and managerial skills and know-how that are lacking and more often than not need a long period of learning in the developing country, but that have already been developed in advanced countries. Development of these technological capabilities is not just a firm level effort, but a much broader social effort that involves substantial investment in a range of public goods by the state).

In a nutshell, and as laid out in Table 1.1, at the micro (firm-level), investments must be made by entrepreneurs that cover a host of activities that occur within a typical firm acquiring technology, all equally important and interconnected. First, labour (workers as well as management) will need on-the-job training to familiarize themselves with the new technology and new developments taking place in the industry. Second, the process of capabilities development is a dynamic phenomenon, not a static one, so investments will need to be made in the search for new technical and related information that the firm can absorb and utilize when a given level of capabilities have been developed. Third, spillovers from knowledge creation must be ensured by investing in an environment that encourages creating, communicating and diffusing any knowledge that has been acquired by the firm. Lastly, streamlining the production process requires prototyping of products and trial runs of the production process itself to identify any anomalies or issues with the final product, which in turn require substantial investment. Prototypes tend to be deficient in some fashion or the other and since they cannot be sold in the market, they represent a sunk cost for the firm that must be financed. Till workers are proficient in the use of production technology, production runs will lack the standard of quality the firm is aiming for, and again will represent a sunk cost that has to be financed if the firm is to continue production.

Table 1.1: Technological Capabilities Development Effort Requiring Investment

Micro (Firm-Level)	Social (State-Level)
Trainings	Trainings
Search for new technical and related information	Enabling access to information
Creating, communicating and diffusing knowledge within the organization	Education
Production trial runs and product prototyping	Promoting interactions between firms and institutions for research and learning, quality control

Source: Based on Lall (1993)

Industries are comprised of groups of firms operating independently but also collaborating in activities and benefitting from the public good nature of knowledge. It falls on the state to create an enabling environment for the industry and manufacturing sector as a whole that will facilitate access to information by any firm in the industry. As highlighted in the discussion earlier, capabilities cannot be developed independently of formal education, and the state is responsible for financing and investing in the education of society and its members. Finally, knowledge cannot be created in a vacuum, or by one firm alone, so it falls on the state to invest in and promote interactions and collaborations between firms and the various institutions that have been established for R & D, technical training and quality control.

Lall (2000) found that the period of learning that is essential to development of these capabilities will be risky as it is not guaranteed the firm will be able to absorb the technology and make efficient use of it. The costs incurred both in terms of financing as well as in terms of time, add to the risk. Developing countries will therefore depend on the incentive or return to firm. Moreover, the success of the endeavour will hinge on several factors, including the existing level of skills, and the complexity of the technology being acquired in relation to that which is already present in the economy and the firm. A conflict of interest may arise between the firm in the developing country and the provider of the technology if the developing country is aiming to expand its industrial base while retaining national ownership of technology and the capabilities developed. Such a goal will be perceived as a threat to the profitability of the provider and is likely to impact the outcome of the acquisition effort if the process is hindered.

Lall (1993b) pointed out that the complexity of the learning period points to the likelihood of market failures (externalities, lack of information, inability of the firm to finance the learning) occurring and disrupting the process in developing countries. The general response has been to finance the learning period by allowing the firm or industry to operate in a protected (closed) market free from international competition from firms that have already gone through the learning period, as was the case in a number of developing countries such as South Korea (see Kim (2001) for details). At a very basic level this can lead to a market failure itself, since the absence of competition will remove the incentive to streamline operations and reduce costs by developing the requisite capabilities. However, Kim (1999) showed that the East Asian Tigers were able to successfully compensate for this market failure by the credible threat of opening up domestic markets to international competition after a specified period of time had elapsed.

1.3. PAKISTAN'S ECONOMY AT THE CROSSROADS

1.3.1. ECONOMIC PERFORMANCE

When Pakistan gained independence from British rule and partition from India under the Indian Independence Act of 1947, the nascent state was faced with the daunting task of legitimizing itself with the migrant Muslim population while at the same time building up a viable economic base from the weak infrastructure it had inherited. Compared to several neighbouring countries and a number of countries that started on the journey to development facing roughly similar initial conditions, Pakistan's performance (in terms of GDP growth) has been relatively unremarkable, as shown in Table 1.2 below.

Table 1.2: Decade-wise Annual Average GDP and GDP Per Capita Growth Rates

(%)

Variable	Country	1960s	1970s	1980s	1990s	2000s	2010s
GDP	Bangladesh	3.89	1.52	3.22	4.80	5.81	6.37
	India	3.91	2.93	5.69	5.73	6.93	6.70
	Nepal	2.52	2.60	4.09	4.84	4.06	4.44
	Pakistan	**6.79**	**4.84**	**6.86**	**3.98**	**4.64**	**3.56**
	Sri Lanka	4.67	4.23	4.15	5.26	5.00	7.56
	China	3.01	7.44	9.75	9.99	10.29	9.17
	Korea	8.25	8.29	7.68	6.25	4.39	4.02
GDP per capita	Bangladesh	0.85	-0.65	0.50	2.57	4.34	5.16
	India	1.75	0.59	3.39	3.79	5.35	5.35
	Nepal	0.59	0.40	1.74	2.26	2.44	3.25
	Pakistan	**4.03**	**1.79**	**3.37**	**1.26**	**2.67**	**1.79**
	Sri Lanka	2.21	2.50	2.59	3.96	4.25	7.77
	China	0.89	5.34	8.19	8.75	9.62	8.64
	Korea	5.64	6.32	6.38	5.24	3.83	3.44

Source: World Bank (2014)

A commonly cited case (see Amsden (1989) and Rodrik (1999) for details) is that of South Korea, which also embarked on its development agenda in earnest in the late 1960s, but due to a combination of factors; including a strong developmental state, national cohesion and a favourable political settlement arrangement was able to leap frog ahead of Pakistan. Pakistan's neighbour India exhibited a more sluggish performance compared to Pakistan in the 1960s, but managed to surge ahead in the 1980s. Both South Korea and India invested heavily in human capital and infrastructure development, foregoing an immediate payoff in favour of reaping the benefits in later years from higher value added manufacturing output thanks to a solid technological capabilities base. However, Pakistan underinvested in education compared to India, as evident from the trends in Table 1.3 below.

Table 1.3: Decade-wise Public Expenditure on Education in Selected Countries

(%)

Decade / Years	Share of Public Expenditure on Education					
	in Government Expenditure			in GDP		
	India	Korea	Pakistan	India	Korea	Pakistan
1970s		18.73	4.88		2.95	1.97
1980s		24.57	6.03		3.94	2.29
1990s	12.64	17.34	7.34	3.56	3.61	2.66
2000s	11.14	15.34	10.51	3.43	4.37	2.45
2010-11	10.76		10.04	3.24		2.30

Source: World Bank (2014)

Historically, the national defence industry has overshadowed the social sectors in terms of government expenditure (31 percent versus 2.7 percent for Public Health and 7.3 percent for Education in Table 1.4) reflecting the priorities of the state. The trend has improved in recent years, with military expenditures falling to 17.6 percent while Public Health and Education have increased to 3.6 percent and 10.1 percent respectively.

Table 1.4: Major Social Sector Expenditure versus Military Expenditure Shares in Pakistan (1995-2011)

(%)

Year	Military	Education	Public Health
1995	31.37	7.34	2.67
1996	28.20	7.12	2.86
1997	27.52	8.07	2.76
1998	27.19		2.41
1999	26.34		2.42
2000	23.42		2.40
2001	24.84		2.41
2002	24.95		2.95
2003	25.23		2.76
2004	28.49	6.42	3.00
2005	27.67	10.94	3.11
2006	24.69	12.18	3.47
2007	21.90	11.24	3.19
2008	18.39	11.15	3.16
2009	19.28	11.15	3.29
2010	18.53	9.93	3.42
2011	17.55	10.14	3.58

Source: World Bank (2014)

In terms of per capita income, Pakistan's economic performance over the years has been quite respectable, averaging an increase of 2.5 percent in annual GDP per capita income growth (at 2005 prices) from USD 220 to 802, but pales in comparison to the performance of a number of other countries in the region such as China, India and Sri Lanka. However, all countries in the South Asian region have exhibited a more consistent positive trend in the decade wise growth rate of per capita income.

The sectoral contribution to GDP growth in Pakistan has been strongest from the manufacturing sector, averaging 6.83 percent (1961-2012), even though Pakistan is primarily an agrarian based economy, with agricultural sector growth of 3.71 percent over the same period (see Table 1.5). The economy has undergone substantial structural transformation over the years, with share of agriculture in GDP falling from over 46 percent in 1960 to 20 percent in 2012. To put this in a regional perspective, consider the fact that the corresponding share in India has gone down from 43 percent to 17 percent, in China from 22 percent to 11 percent and in South Korea from 38 percent to only 3 percent. The share of manufacturing sector on the other hand, has increased from over 14 percent to almost 19 percent over the same period, a shift that suggests the economy has become more resilient in recent years; less vulnerable to the seasonality of agricultural output driving GDP growth. This shift away from the agriculture sector has also been mirrored in the structure of labour employment, though it appears that rather than moving towards the industrial and manufacturing sectors, surplus labour force from the agriculture sector is starting to find its way to the services sector instead. This is not a detrimental shift per se for the economy; rather it is worrisome in terms of the fact that spillovers of improved performance in the services sector are unlikely to have as great an impact on the general economy as that from the manufacturing sector, or even the agriculture sector.

1.3.1.1. Agriculture

Value added in agriculture has grown at a rate of over 3 percent, highest among Pakistan's neighbours in the South Asian region, but less than China. Production of the major crops of Pakistan (wheat, rice, sugarcane and cotton) has grown at a rate of

3.3, 3.8, 4.2 and 4.5 percent respectively, the result of increase in area under cultivation as well as increase in yield per acre[8].

Table 1.5: Sectoral Contribution to GDP Value Added

(% of GDP)

Sector	Country	1960s	1970s	1980s	1990s	2000s	2010s
Agriculture	Bangladesh			31.59	27.13	21.19	18.13
	China	37.16	32.35	29.39	20.50	12.45	10.06
	India	42.23	38.57	31.71	27.38	19.75	17.64
	Korea	33.78	26.16	13.43	6.64	3.52	2.67
	Nepal	67.88	67.44	56.02	43.49	36.31	37.01
	Pakistan	**41.16**	**33.78**	**28.55**	**26.13**	**22.31**	**20.96**
	Sri Lanka	30.32	28.97	27.23	23.64	14.09	12.45
Industry	Bangladesh			21.17	23.94	27.12	28.40
	China	35.18	44.48	44.33	45.39	46.44	46.60
	India	19.87	22.27	25.52	26.11	27.35	26.68
	Korea	23.26	29.82	39.20	41.39	37.10	39.03
	Nepal	10.21	10.11	14.20	20.92	17.97	15.35
	Pakistan	**19.22**	**22.79**	**23.27**	**24.36**	**25.45**	**25.31**
	Sri Lanka	20.69	26.08	27.02	26.37	28.89	29.66
Manufacturing	Bangladesh			13.76	14.87	16.59	17.75
	China	29.02	37.22	36.04	32.93	32.37	29.52
	India	13.82	15.24	16.03	15.80	15.31	14.26
	Korea	15.57	21.61	27.51	27.14	27.21	30.75
	Nepal	3.57	4.11	5.24	8.77	8.28	6.44
	Pakistan	**14.30**	**15.89**	**15.98**	**16.44**	**17.24**	**18.44**
	Sri Lanka	15.59	19.02	15.39	15.68	18.19	18.11
Services, etc.	Bangladesh			47.24	48.93	51.69	53.47
	China	27.67	23.17	26.27	34.11	41.11	43.34
	India	37.89	39.16	42.77	46.51	52.89	55.68
	Korea	42.96	44.02	47.37	51.98	59.38	58.30
	Nepal	21.91	22.46	29.78	35.59	45.72	47.72
	Pakistan	**39.62**	**43.43**	**48.19**	**49.50**	**52.24**	**53.73**
	Sri Lanka	48.99	44.96	45.75	49.99	57.02	57.89

Source: Author's calculations based on World Bank (2014)

Though performance of the agriculture sector is considered to be quite satisfactory and the sector continues to form the backbone of the economy; however this performance has not been consistent. During the Fifties, adverse terms of trade resulted in a growth rate of 1.7 percent; agricultural produce was procured at low prices and subject to various restrictions at the time of export.

[8] areas under these crops having increased by 1.8, 1.6, 0.8 and 2.5 percent respectively.

Green Revolution technology[9] was introduced in the country in the Sixties and benefitted the agricultural sector as expected, with growth averaging 5.1 percent per annum. Agricultural growth was adversely affected in the Seventies due to uncertainty arising from failed land reforms, poor weather and a cotton virus, resulting in a slow-down of growth to 2.3 percent. The performance of agriculture sector in the Eighties improved, averaging 4.10 percent over the decade and rising to 4.5 percent in the Nineties. This performance is impressive when one takes account of the fact that the cotton crop had repeated failures and in certain years, wheat and sugarcane crops also suffered from water shortage due to drought conditions. Despite these hardships, the improvement in agricultural productivity has had the knock on effect of improving the per capita availability of various food items in the country[10]. The general trend has in fact now turned towards international export of high quality rice and cotton.

The state actively sought to intervene in the market for essential goods by implementing price support scheme to ensure prices were kept at a reasonable level; not too high to be out of reach of domestic consumers, and not too low as to incur a loss for local farmers, but the intervention had the unintended impact of depressing agricultural output. To offset this impact after the 1960s, the state undertook to boost infrastructure support by providing timely availability of adequate water supply, fertilizer, pesticides and improved quality seeds at affordable prices. The state also prioritized production of tractors for farm use, as a result of which tractor purchases per annum have increased from virtually nil in 1947 to as many as 20,000 in recent years. Water availability has been increased by more tube wells being installed every year; however, this would appear to be a short term measure since the state has neglected to increase reservoir capacity in the country, and water provision will be no doubt be adversely affected when the water table drops.

1.3.1.2. Manufacturing

At the time of independence, Pakistan inherited a very weak and limited industrial base, thanks in no part to being the agricultural hinterland of the British India.

[9] Including improved seeds, broader application and use of fertilizers and water use by both large and small farmers
[10] Cereal availability increased from 139.3 to 172.7 kg, sugar from 17.1 to 32.4 kg, milk from 107.0 to 148 kg, meat from 9.8 to 18.2 kg, and edible oil from 2.3 to 12.3 kg

Considering this low starting point, the industrial sector as it stands today has managed to advance significantly, even though in comparison to other developing countries the performance has been less than stellar. The large scale industrial base was comprised of only a few industrial units producing sugar, vegetable ghee, tea blending, cement and cotton textiles at the time of independence and they contributed only 1.8 percent of GDP, which has increased to over 12 percent in recent years. Large scale industries have grown at a rate of 8.8 percent and the total manufacturing sector at a rate of 6.8 percent during the period. The small-scale industries however, contributed 4.6 percent of GDP at the time of independence, but the share has witnessed only a nominal increase to 5.3 percent lately. Except for the Seventies and Nineties, the manufacturing sector has attained a respectable growth rate of 8 percent.

The manufacturing sector witnessed growth averaging 7.7 percent during the Fifties, with large-scale industries growth registered at a very impressive 15.8 percent. Given the state of the industrial sector this is not surprising, but foretells a bright future for the economy if the growth impetus can be maintained in the coming years and decades. In an effort to capitalize on the rich natural resources available domestically, the industrial policy at the time was designed to encourage the manufacture of products based on indigenous raw materials such as cotton, jute, hides and skins, etc. The assumption was that there was an assured market at home and abroad for these products and supply of raw material would be easier to facilitate and less of a burden on the local economy. Demand in the home market for consumer goods was rising and the country was therefore heavily dependent on imports to satisfy this demand. The state opted to develop the domestic consumer goods industry at the same time to relieve the pressure on imports. The state played a highly active and interventionist role in the development of industrial activity at this time, and the policies implemented tended to feature direct controls on imports, investment, and prices; all designed to regulate and guide economic activity in the sector. A number of key industries were also set up by the state and turned over to the private sector (dis-invested) for profitable operations.

Growth of manufacturing sector accelerated to almost 10 percent during the Sixties. A number of initiatives helped in realizing the high growth rate, including a liberal import policy, subsidies to encourage exports through a number of schemes such as

Export Bonus Scheme (EBS), Export Performance Licensing Scheme (EPLS), tax rebates, tax exemption, Pay-As-You-Earn Schemes etc. Of these incentives, two in particular (EBS and EPLS) received much attention from the state and private sector alike. The Export Performance Licensing Scheme (EPLS) was designed to alleviate the bottleneck created from the absence of imported raw material by deliberately linking licensing (import) of raw materials directly to export performance[11]. The Export Bonus Scheme (EBS) was another export promotion scheme launched in January 1959 for the purpose of boosting Pakistan's foreign exchange earnings and remained in effect for over a decade, finally being abandoned in 1972 (Spring) with the devaluation of the Pakistani Rupee against the US Dollar (see Box 1.1 for details of the mechanics of the scheme). The efficient running of these schemes was contingent on well-functioning, able state machinery, and it appears the schemes did not achieve their intended goals to the full extent possible. For example, the former scheme turned into "an administrative nightmare of such horrendous complexity" (Child (1968), p.176), which undoubtedly created many opportunities for rent-seeking behaviour.

Box 1.1: Mechanics of Export Bonus Scheme and Susceptibility to Rent-Seeking

i. Domestic exporter earns local currency equivalent of foreign exchange for sale of goods produced
ii. Foreign exchange is sold to SBP for local currency
iii. Domestic exporter also receives voucher entitling owner to purchase foreign exchange equal to 20 or 40 percent of amount initially earned by the exporter
iv. Vouchers issued for all exports except raw jute, raw cotton, hides and skins, raw wool, tea and rice
v. Transferable voucher can be sold at a market determined premium price

EBS Vouchers entitle the bearer to import foreign goods (consumer goods and capital goods alike) which makes them highly sought after, and in much demand. As a result the premium price for these Vouchers in the market escalates and the original exporter can receive a windfall gain from the scheme by selling Vouchers in the market rather than using them to import raw materials and capital goods as intended by the EBS.

Source: Ikram (1970), Ikram (1972)

Where the allocation of resources under EPLS was administratively determined, under the EBS it was partially market-oriented and price determined (see Table 1.6 for a comparison of key highlights of the two schemes). EPLS coincided with Ayub

[11] Ikram (1972)

Khan's more hands-on approach to development and was more selectively applied. This placed a greater burden on the bureaucracy and the state and created opportunity for rent-seeking behaviour among entrepreneurs. On the other hand, EBS reflected the more market-oriented and hands-off approach of the state, but the easy transferability of vouchers under the scheme created greater opportunities for rent-seeking and profiteering behaviour.

Table 1.6: Export Performance Licensing versus Export Bonus Schemes - Key Highlights

Key Highlight	Export Performance Licensing	Export Bonus
Operational Dates:	1961 (January) - 1968 (January)	1959 (January) - 1972 (May)
Allocation of Resources	Administratively determined	Partially market-oriented, price determined
Incentives	Exhortation, minor incentives, export quotas	Monetary
Import Licenses	Non transferable	Transferable
Rent-seeking	Considerable, but limited to licensees	Encouraged by scarcity of foreign exchange

Source: Hecox (1970)

The high protection rates afforded by these subsidy schemes meant that producers received excessive profits, which the state did not capitalize on, rather encouraged through provision of tax holidays and accelerated depreciation allowances that increased the post-tax profits in the production of manufactured products. According to Hecox (1970), there were well established opportunities for illegal transactions created by licensing that were even indirectly acknowledged by the state.

A sharp fall was witnessed in the growth of manufacturing sector in the Seventies, down to just 5.50 percent and for large scale manufacturing to only 4.84 percent. The policies pursued by state had a lasting impact on the industrialization process in the country, including the initiative to nationalize heavy industry and reserving a number of sectors (including cement, fertilizer, oil refining, engineering, chemicals etc.) exclusively for public sector operations. The bias against private sector profiteering by the state was also reflected in the discontinuation of the policy of dis-investing profitable public sector units. Moreover, the private sector industrialists were also subjected to a number of restrictions under Profiteering and Hoarding Act designed to curb price fixing. These measures created considerable amount of uncertainty and tainted the outlook of the private sector regarding the role of the state as a facilitator and enabler of entrepreneurial activity in the country, resulting in a fall in private investment and flight of capital.

During the Eighties direct controls were replaced with market-oriented forces to correct the bias against the private sector; import policy was liberalized, tariff structure was rationalized, par value of rupee was brought nearer to its equilibrium value and it was made convertible on capital account. The requirement for investment licensing was abolished, prices were de-controlled, and performance of public enterprises improved due to signalling system. The market friendly policies did result in a marked recovery of industrial activity, with growth accelerating to 8.21 percent.

However, political uncertainty on the domestic front and economic slowdown on the international front in the Nineties contributed to the growth rate decelerating to 3.88 percent. Large scale manufacturing also mirrored this disappointing trend, falling to 3.54 percent. Even more worrisome is the fact that growth in this sector slowed down even further to an average of 2.26 percent per annum during the last four years of the decade. A whole host of adverse conditions manifested themselves during this time. Political instability, a worsening of the law and order situation, and poor cotton crop yield, on the one hand, and on the other hand insufficient industrial and infrastructure investment resulted in an energy generation infrastructure that was woefully inadequate at meeting industrial demand, and further compounded by bottlenecks in infrastructure provision all caused a virtual stagnation of growth in the sector.

In the early years of industrial development, the state opted to develop domestic production in a number of key industries and also focused on developing consumer goods production by encouraging import substitution, as evidenced by its contribution to manufacturing industries growth of 96.9 percent for the period 1951-52 to 1954-55. On the other hand, export promotion has not had as great an impact on manufacturing sector growth till the latter half of the Eighties.

It is clear that the manufacturing sector has grown since concerted efforts first got underway, but value added in this sector is over-stated and highly distorted. If value added in the manufacturing sector is evaluated at the world prices, its contribution to GDP is relatively much smaller, reflecting gross inefficiencies and/or excessive profits. For instance, though some distortions had been removed by early 1990s, more than 30 percent of value addition in the sector could be ascribed to protection. It has been observed by Kemal, Din & Qadir (2002) that since then a number of initiatives have been taken to reduce the level of protection further and maximum import duty was reduced to 45 percent by the end of century and to 30 percent in the following years.

The manufacturing sector has evolved in not only breadth but depth as well over the years and is today represented by a number of very promising industries; including textiles, surgical goods, leather and vehicles (automotive). Of these sub sectors, the automotive sector is of particular interest; the sector has shown itself to be quite resilient and has evolved to encompass a great deal of versatility. Pakistan's automotive sector has not limited itself by specializing in the production of a single automotive category; rather it produces virtually the whole gamut of automotive products, from two and three wheel vehicles to large buses and trucks and all manner of passenger cars as well. Domestic firms in the industry are attempting to break into production employing emerging technologies such as alternative fuel sources, with varying levels of success. Technology acquisition in the sector holds the greatest promise for yielding spillovers with the rest of the economy and the greatest scope for development of local capabilities and competitiveness.

For sustainable economic growth and development to be achieved through industrialization, a diverse industrial base of the economy is required[12]. An analysis of disaggregated industrial output data from 1963 onwards suggests that though Pakistan established manufacturing capacity in a number of areas, the industrial structure remains concentrated in relatively few products. Three product categories; textiles, food and beverages and chemicals and chemical products (ISIC 17, 15 and 24 in Table 1.7) accounted for over 66 percent of total industrial output in the 1960s, and this share decreased to slightly over 61 percent by the end of 2000s. The remaining share was spread among 15 categories in the 1960s and 19 in the 2000s, primarily in comparatively low value added products. Of note is the share of automotive products (ISIC 34 in Table 1.7), which has increased from 2.99 percent in the 1960s to 5.14 percent in the 2000s. This marginal structural transformation suggests Pakistan is making progress is diversifying its industrial base, and moving towards the production of complex products.

[12] Kemal (2006)

However, what is not clear from the data, but will be apparent from the analysis of the automotive industry in later chapters, is that the increase in output shares is on account of assembly operations or production of basic products, rather than in movement up the value chain towards higher value added products.

Table 1.7: Disaggregated Industrial Output by Decade (1960 – 2000)

ISIC	1960s	1970s	1980s	1990s	2000s
D: Total manufacturing	100.00	100.00	100.00	100.00	100.00
17: Textiles	37.69	29.49	23.26	31.24	28.47
15: Food and beverages	21.62	23.03	20.64	18.29	20.40
24: Chemicals and chemical products	7.46	8.98	10.68	11.72	12.21
16: Tobacco products	6.09	5.41	4.57	2.44	1.90
23: Coke, refined petroleum products, nuclear fuel	3.44	7.77	11.57	6.85	9.11
27: Basic metals	3.43	3.81	5.98	4.98	2.79
31: Electrical machinery and apparatus	3.11	2.91	3.28	3.92	2.11
26: Non-metallic mineral products	3.06	3.35	4.53	4.33	4.37
34: Motor vehicles, trailers, semi-trailers	2.99	3.83	3.72	4.13	5.14
28: Fabricated metal products	2.23	1.61	0.95	0.79	0.86
18: Wearing apparel, fur	2.15	2.82	3.70	4.11	4.12
25: Rubber and plastics products	1.79	1.76	1.68	1.33	1.16
29: Machinery and equipment n.e.c.	1.45	1.79	2.51	2.08	1.94
21: Paper and paper products	1.29	1.32	1.10	1.48	1.90
22: Printing and publishing	1.16	0.88	0.86	0.99	0.32
36: Furniture; manufacturing n.e.c.	0.72	0.77	0.47	0.81	0.65
33: Medical, precision and optical instruments	0.23	0.33	0.26	0.30	0.39
20: Wood products (excl. furniture)	0.09	0.13	0.24	0.22	0.32
35: Other transport equipment	0.00	0.00	0.00	0.00	1.06
19: Leather, leather products and footwear	0.00	0.00	0.00	0.00	0.67
32: Radio, television and communication equipment	0.00	0.00	0.00	0.00	0.13
37: Recycling	0.00	0.00	0.00	0.00	0.01
30: Office, accounting and computing machinery	0.00	0.00	0.00	0.00	0.00

Source: UNIDO INDSTAT2 Industrial Statistics Database

The previous analysis of disaggregated industrial output has revealed that Pakistan has made limited progress with diversifying its industrial base. A similar analysis of disaggregated export data reveals that Pakistan's export comprised primarily of textile yarn and fabrics in the early years of 1972-77 (38.42 percent in Table 1.8), and this level of specialization increased by 1989-99 to over 50 percent. Articles of apparel and clothing accessories which comprised only 3 percent of exports in 1972-77 accounted for over 20 percent of exports in 1989-99.

As evident from the trends in Table 1.8, which presents the top ten export categories of Pakistan (by share), 7 categories in 1972-77 comprised 82 percent of all exports, while this share increased to 90 percent in 1989-99. By 1989-99 there were three new export categories (line 8-10) that accounted for 4 percent of all exports, while three categories that accounted for 5 percent of export in 1972-77 were not in the top ten export categories in 1989-99.

Table 1.8: Disaggregated Export Data by Period

Sr. No.	SITC Code	Classification	1972-77	1978-88	1989-99
1	65	Textile yarn, fabrics, made-up articles, NES, and related products	38.42	38.72	50.37
2	84	Articles of apparel and clothing accessories	3.06	9.23	20.14
3	04	Cereals and cereal preparations	19.25	12.79	5.78
4	26	Textile fibres (not wool tops) and their wastes (not in yarn)	10.20	12.74	5.01
5	89	Miscellaneous manufactured articles, NES	3.30	2.38	3.79
6	61	Leather, leather manufactures, NES, and dressed furskins	5.05	5.52	3.34
7	03	Fish (not marine mammals), crustaceans, molluscs and aquatic invertebrates, and preparations thereof	2.67	2.72	1.88
8	87	Professional, scientific and controlling instruments and apparatus, NES		1.01	1.49
9	06	Sugars, sugar preparations and honey	0.60	1.00	1.46
10	05	Vegetables and fruit	0.99	1.45	1.02

Source: UN COMTRADE Database, online access

It can be concluded from the trends described above that even though Pakistan has made substantial strides in generating growth; it has been unable to sustain a high level of self-reliant growth due to a myriad of challenges faced over the years.

1.3.1.3. Infrastructure

Infrastructure development plays a vital role in the development process of a country; without the road or railway links (at the very least) to get crops to the market, agriculture would collapse, and without adequate power generation and supply to today highly mechanized manufacturing firms, the industrial sector would be hamstrung and unable to compete effectively. Poor infrastructure availability also harms quality of life and wellbeing of the population of a country. Improved supply, quality and affordability of infrastructure is thus essential for stimulating growth and reducing poverty levels in a country.

Given the fact that the topography of the country is rugged with varied and significant mountainous regions, roads would be the preferred choice of transport, and in fact by 2012-13, the road network in Pakistan is responsible for over 96 percent of inland freight traffic and 92 percent of all passenger traffic in the country; the veritable transport backbone of the economy. 263,415 km of road are networked across the country, with 40 percent lying in Punjab, almost 31 percent in Sindh, a little over 16 percent in Khyber Pakhtunkhwa and 11.3 percent in Baluchistan.

The railway network which is considered essential for movement of freight has tended to be relegated to the back seat in terms of receiving funds from the state. Out of a total inventory of 515 locomotives, by June 2012 only 92 passenger locomotives and 8 freight locomotives remain in operation. Revenue of the state run Pakistan Railways has fallen by 25 percent while working expenses have increased by 33 percent, comprised for the most part by employee related costs and maintenance costs associated with operating over aged infrastructure and rolling stock.

Trends in growth of electricity generation suggest that the country lacks the capacity to generate sufficient power to meet its current needs, let alone those of the future. Losses due to transmission failures and theft have also placed a growing burden on the domestic economy while at the same time compromising the ability of the manufacturing industries to develop and grow. In fact, after the substantial investment made in installed capacity after independence, the rate of growth has been slowing down, except for a slight increase on account of commissioning of Tarbela Dam in the 1980s (see Table 1.9). Adequate generation of power has created a bottleneck for development of the economy, which the state has attempted to alleviate in the short term by importing power from abroad, renting private power plants and making long term investments in nuclear and hydroelectric power projects.

Table 1.9: Growth Rate of Installed Capacity and Generation of Electricity

(%)

Decade	Installed Capacity (MW)	Generation (GWH)
1950s	21.50	21.75
1960s	13.83	20.00
1970s	7.75	8.97
1980s	8.61	9.59
1990s	8.23	5.88
2000s	1.89	3.87
2010s	4.00	0.00

Source: Government of Pakistan, Economic Survey, various issues

Alternative sources of power, including wind and solar are also being pursued; however, the demand for power continues to outstrip any additions made to the installed capacity from these alternative sources, and the technology involved is relatively new and costly, which impedes its implementation in the economy. The continuing power brownouts and blackouts across the economy have prompted many firms to invest in independent generators and back-up power supplies to ensure production operations remain unhindered by the lack of this infrastructure component.

1.3.1.4. Demographic Trends

Pakistan is credited as being the 36th largest country in the world in terms of surface area, but it is also the sixth most densely populated country in the world, with an estimated population of 179.2 million in 2012, and among the highest growth rate in the region (see Table 1.10) according to World Bank (2014). If present trends continue unabated, the country is slated to become the fifth most densely populated country by 2050 (UN projections). It is generally accepted that the country is now in the midst of a demographic transition and it is on the threshold of a demographic dividend, which can yield immense benefits if state and society work together for the common good.

The age distribution of population has also been undergoing a transformation, with the population aged 0-14 years decreasing in number, while 15-64 year olds were also decreasing in number till the end of the 1980s, and on the upward trend since then. Finally, the proportion of 65 years + individuals has also been increasing. Thus, overall population growth has been driven by the increase in the young and energetic 15-64 age group who represent almost 60 percent of the total population by the end of the 2000s. The rising number of youths will place an increasing strain on already scarce resources available for health care provision, while also requiring education and jobs to be productive.

Table 1.10: Population Growth Rates by Decade

(%)

Country	1960s	1970s	1980s	1990s	2000s	2010s
Bangladesh	3.03	2.17	2.70	2.18	1.41	1.14
China	2.37	1.99	1.45	1.14	0.61	0.48
India	2.13	2.32	2.23	1.87	1.50	1.29
Korea, Rep.	2.46	1.85	1.22	0.96	0.54	0.55
Nepal	1.94	2.19	2.31	2.53	1.58	1.15
Pakistan	**2.67**	**2.99**	**3.38**	**2.68**	**1.92**	**1.75**
Sri Lanka	2.36	1.68	1.52	1.25	0.71	-0.18

Source: World Bank (2014)

Total fertility rates (TFR, or number of births per woman) paint a very disturbing picture (as evident in Table 1.11) when the rates are compared across countries since the time of independence. For the decade of 2000, by the end of 2009, Pakistan's TFR stood at 3.9; the highest among countries of the region, including China and India.

Table 1.11: Cross Country Comparison of TFR by Decade

(births per woman)

Country	1960s	1970s	1980s	1990s	2000s	2010s
Bangladesh	6.9	6.8	5.6	3.8	2.7	2.3
China	6.0	4.1	2.7	1.9	1.6	1.7
India	5.8	5.1	4.3	3.5	2.9	2.5
Nepal	6.0	5.9	5.5	4.7	3.4	2.6
Pakistan	**6.6**	**6.6**	**6.4**	**5.4**	**3.9**	**3.4**
Sri Lanka	5.0	3.9	3.0	2.3	2.3	2.3

Source: World Bank (2014)

Infant mortality rates (cross country comparison presented in Table 1.12) in Pakistan paint a similarly disturbing picture, with the country making major strides in reducing the number of infant deaths (from 157.8 in the 1960s to 70.7 per 1,000 live births in 2010s); though the number is the highest in the region.

Table 1.12: Infant Mortality Rates

(Numbers per 1,000 live births)

Country	1960s	1970s	1980s	1990s	2000s	2010s
Bangladesh	156.2	144.0	118.8	82.9	52.4	35.3
China	82.7	63.6	43.0	37.9	21.7	12.9
India	152.2	129.8	101.6	78.6	57.4	45.4
Korea, Rep.	60.0	25.4	9.0	5.1	4.8	3.4
Nepal	201.2	162.1	121.8	80.4	48.5	35.0
Pakistan	**157.8**	**130.2**	**114.8**	**97.8**	**80.4**	**70.7**
Sri Lanka	60.5	48.9	27.5	17.3	11.8	8.6

Source: World Bank (2014)

1.3.2. ECONOMIC CHALLENGES FACING THE ECONOMY

The discussion above has highlighted the trends in Pakistan's economy as it has evolved since the time of independence almost 65 years ago. Between 1949 and 2013, GDP growth has averaged 5.29 percent which compares quite favourably with other countries in the region. Despite a swift rise in population, per capita income has managed to more than triple since 1960, and the growth in GDP has been made possible due to substantial increases in output from the agricultural and industrial sectors. Production of wheat rose almost ten-fold from 2.4 million to 23.9 million tonnes, rice 0.83 million to 6.9 million tonnes, maize also witnessed a ten-fold increase from only 0.35 million to 3.5 million tonnes and cotton from 1.9 million to 12.9 million bales between 1953 and 2010. Industrial production began with only a textile mill and cement plant and has since then blossomed into a wide variety of food industries, cigarettes, fertilizers, engineering and automotive, electrical and mechanical engineering, metallurgy, pharmaceutical and even ship building industries.

Despite the quantum increases in agricultural crop yields, production in the sector is subject to weather conditions, and industrial firms are finding it difficult to break into the global market for their products. Unable to export products of any meaningful value addition means that import levels invariably exceed exports and this places an almost intolerable strain on the economy's foreign exchange reserves and has led to a mounting external debt. Traditionally debt servicing has been the major component of the federal budget, second only to funds set aside for defence, with the result that only meagre amounts are set aside for investment in other areas considered crucial for successful development; infrastructure, health and education, to name a few. It can be concluded that the development of human capital is more of an afterthought, rather than a national imperative, and the fruits of economic growth are not in evidence in the lives of the ordinary populace of the country. Economic growth has clearly taken place, but the distribution of gains has been uneven, as evidenced by the persistent levels of poverty across the country. With a high growth rate of population, the country is on the brink of witnessing a demographic dividend; the proportion of able bodied, young persons is increasing by the day, and the pressure is mounting on the labour market which is ill-equipped to handle the increased levels joining the market. The state is faced with a new challenge of effectively managing this demographic transition, a challenge that can be met by focussing on industrial sector development, but the outcome will be determined by the nature of political settlements in the country, as will be further explored in the next section and following chapter.

Despite the bias towards promoting industrial sector development and the growing importance of the services sector, agriculture sector continues to be the mainstay of the economy to this day. This has implications for the consistency and sustainability of medium and long-term growth of the economy since it is painfully clear that agricultural output is subject to the vagaries of the weather. Traditionally the industrial sector is tapped as the engine of growth in developing countries; as the sector most suited to absorbing and utilizing large pools of labour for productive means and generating the spillovers that will ensure productivity in the other sectors of the economy also increases. Even though the industrial sector has shown the potential time and again to drive growth of the domestic economy, the state has failed to put forward a meaningful ideology and vision for long term development of the sector.

The lack of investment in infrastructure development, especially power generation and affordable rail transport has meant that firms have to allocate resources towards meeting their needs from private sources, which tend to be more costly. Not only that, but the industrial sector as a result is unable to realise its full potential due to the infrastructure bottlenecks. Despite inheriting only a very meagre industrial sector at the time, the state had the foresight early on to make significant investments in building up the infrastructure required to industrialize successfully while at the same time directing the development of the local industrial sector and deepening of production capabilities through technology acquisition efforts. Both the internal and external environments since independence have not been truly conducive to promoting economic growth and development.

1.3.3. THE CHANGING POLITICAL LANDSCAPE

Pakistan's political history since gaining independence has been colourful, to say the least, and quite turbulent at the best of times, being ruled by a powerful military for over half of its 64 years in existence, and by democratic parties that struggled to remain in power once they were elected, for the remainder of the time. Attempts at finding stability have been constrained by the disharmony between the provinces on the domestic front, and on the international front a fundamental conflict with its neighbour India. The powers that be have attempted to legitimize their rule by capitalizing on secular policies or by taking on the mantle of "frontline state" (see Baxter (1985) and Hussain (2008)) in the Cold War or the war against terror.

The founding of Pakistan marked the largest ever migration of population between what is now known as India, Pakistan and Bangladesh; almost seventeen million Hindus, Sikhs and Muslims moved between India and the East and West Pakistan wings.

Despite having been founded on the idea of having a separate homeland for all Muslims to live freely without fear of persecution or prejudice, Pakistan has continued to struggle in establishing a national identity and settling on a political system capable of accommodating a diverse population. Officially the country has two main languages, English and Urdu however, unofficially provinces are partial to their own regional languages. This has led to regional tension, an inability to form a constitution and repeated contestation over allocation of scarce funds. The perception in the smaller provinces and the Eastern wing of the country was that the province of Punjab had a monopoly on power, patronage and profits and this has created further tension.

The All India Muslim League (AIML) under the leadership of Mohammad Ali Jinnah proposed that Indian Muslims should share the reins of power with Hindus and AIML should represent the interests of Indian Muslims in Muslim majority as well as Muslim minority provinces of India. Interestingly enough, the power base of the AIML rested with the Muslims in the minority provinces, and not the majority provinces as would have expected. This lack of support meant that AIML was unsuccessful in setting up effective political machinery in the majority provinces and lacked the ability to influence politicians or the population of those provinces in a meaningful way. A unified religious ideology was deemed to be the best option of bringing the disparate provinces and wings together, however the differing traditions and language preferences impeded this process, and AIML was unable to solidify its support to represent all Indian Muslims after rallying the population under the banner of religion. Thus, at the time of independence the main central political party (Muslim League) lacked a central administrative apparatus to govern the provinces and was weakened by politicians who did not have the support of the population. Millions of refugees within its borders created a great strain on limited resources, while the lack of an industrial base meant that the administrative setup had to extract resources from the landed elite (who dominated the ML). All these factors combined to create conditions that would compromise the ability of the state in subsequent years in directing development efforts.

The years immediately following independence were chaotic and the country ran through a number of corrupt politicians who were more interested in remaining in power and forging closer ties with elites than ensuring the democratic process provided freedom and justice to all Pakistanis. All these factors combined to prime the economy for the first successful military coup led by General Ayub Khan. Under the authoritarian rule of General Khan, government functions were consolidated and a stop was put to unstable ministerial coalitions that had characterized the earlier political climate. Ayub Khan was of the view that the politicians in their quest for power were causing irreparable harm to economic development and needed to be replaced. All politicians were disqualified under an Elective Bodies Disqualification Order (1959) and a coalition of Punjabi army officials and civil bureaucrats, and a small influential group of industrialists and landed elites was formed to replace the existing admittedly flawed governmental setup with a Basic Democracy system. Only a limited number of voters or basic democrats were chosen to elect members of provincial and national assemblies to office. Ayub Khan had hoped to legitimize his rule by addressing the core grievance of the people of injustice, inequality and misrepresentation and giving the chosen few in bureaucracy a role in politics. The earlier corrupt system was deemed undemocratic and thus swept away; to be replaced by a new system that was supposed to embody democracy suited to the people, but in fact turned out to be flawed itself since the basic democrats could be bribed or coerced into voting for particular candidates. What actually transpired was a tightening of bureaucratic control by a state that implemented policies that widened the gaps between provinces and especially the two wings of the country, while productivity increases in West Pakistan were offset by rising inequalities in the agricultural sector and lack of representation, and mounting concentration of wealth with a handful of families.

Coupled with the war with India in 1965, Ayub Khan's authority was undermined and General Yahya Khan led the second successful military coup against the establishment in 1969. Things came to a head in the general elections of 1970 which revealed how authoritarian attempts at centralization under Ayub Khan had resulted in politics in Pakistan coming to be dominated by regionalism and social conflict. The Awami League capitalized on discontent in the East Pakistan wing to capture all but one seat in East Pakistan and an absolute majority in the national assembly by promising a program of provincial autonomy. Zulfiqar Ali Bhutto's Pakistan People's Party rose to the front in West Pakistan on a populist platform and managed to oust Muslim League. West Pakistani politicians were naturally against the shift of power to East Pakistan under Awami League led by Mujibur Rahman as they feared loss of power that would inevitably followed, and conspired with the military to prevent the transfer of power. The result was an armed rebellion in East Pakistan against the injustices of the West wing and intervention by India to quell the disturbance led to Pakistan's third war with India since gaining independence only a few years earlier.

The aftermath of the war saw the creation of Bangladesh in 1971, and a severely crippled bureaucracy and military. PPP drew its political power from Punjab and Sindh only and used the state of affairs to wrest control from General Yahya Khan. However, lacking sufficient backing in the provinces of Baluchistan and NWFP, Bhutto had to rely on support from the civil bureaucracy and military to maintain a working government. Despite losing credibility due to the events that led to the separation of Bangladesh in 1971, in the eyes of the public the military was still a crucial pillar of the state. The 1973 constitution was formed to provide a measure of national cohesion by granting substantial concessions to NWFP, Baluchistan and even Sindh. Bhutto was only able to achieve a marginal modicum of success from implementing economic reforms which meant that he was unable to draw on support from all quarters of the economy and PPP did not emerge as a national party. The army once again intervened when charges of vote rigging were made against the PPP in the 1971 election and resulted in violent political unrest. Military rule was again established in 1977 under General Zia-ul Haq.

To solidify support for his rule and legitimize the role of the military in Pakistani politics, General Zia used religion as the justification for banning all political parties, and non-party elections were held while policies for Islamization of society picked up speed. The Zia regime received support from the international community when Afghanistan was invaded by the Soviet Union in 1979 and the country became a front-line state bordering Soviet territory. Despite receiving substantial military and financial aid, discontent within the country started to rise again, no doubt fuelled by the exodus of Afghan refugees fleeing Soviet occupation and continuing disparities in the distribution of wealth. Martial law was finally lifted by Zia in 1985 after holding an “Islamic” referendum to confirm his own position and non-party elections of provincial and national assemblies.

What followed was a democratic era in the country’s political history that proved to be just as turbulent and fraught with controversy as earlier attempts. Political parties boycotted the 1985 elections, but candidates and voters participated in the renewed attempt at democracy as hope for a brighter future was rekindled. To further consolidate his power, the newly elected President Zia implemented constitutional amendments that guaranteed his right to power would not be challenged or usurped by his subordinates. The President first exercised this power when he dissolved the National Assembly in 1988 on the charge of corruption and failure to enforce an Islamic way of life and removed sitting Prime Minister Muhammad Junejo from power on the pretext of conspiracy against the presidency.

President Zia attempted to hold non-party elections again, but this was challenged by the Supreme Court. The President responded by turning to religion again and attempted to mould the political system according to Islam, but this was met with scepticism and political confusion. These developments culminated in the death of the President in a plane crash and appointment of Ghulam Ishaq Khan as President till elections could be held in November of 1988 on a political party basis for the first time in fifteen years.

The political events that followed read like a game of catch between the two main political parties in the country, the PPP and the PML. Benazir Bhutto, the daughter of Zulfiqar Bhutto was elected as Prime Minister when PPP secured the most seats in elections of 1988, but rather than working with the opposition led by PML, the two parties developed an antagonistic relationship. Politicians were bribed by either party to sway their allegiances and little to no progress was made in economic development. Benazir Bhutto was dismissed by the President on charges of corruption less than two years later, and the elections of 1990 saw Nawaz Sharif as leader of the PML being sworn in as the new Prime Minister. The political parties continued their squabbles unabated till Nawaz Sharif was dismissed in 1993 and the President was accused of conspiring with the leader of the opposition to oust the sitting Prime Minister. Nawaz Sharif and the PML were reinstated to power by the Supreme Court, but the victory was short lived as allegations of incompetence against the Prime Minister surfaced in Punjab in 1993. Both the President and Prime Minister were forced to resign and new elections held with the PPP again securing more seats and Benazir Bhutto once more taking over as Prime Minister.

Benazir Bhutto was able to get the candidate of her choice elected as President, the expectation being that a sympathetic President would not oust her government from power. However, when governmental processes were again corrupted, the opportunity presented itself to President Leghari and the Chief Justice to solidify their own position and joined forces to dismiss Bhutto from power. In early 1997, the country was preparing to go to the ballot boxes and cast their votes for the fifth time in the short span of twelve years. This time the misconduct of the PPP had left a bad taste in the mouths of the public and PML headed by Nawaz Sharif came to power. The PML worked to limit the powers of the President (that had been expanded by Zia) and restored the parliamentary form of government. The PML government inherited a Pandora's Box of issues plaguing the economy and their time in power was not a resounding success as a result, but Nawaz Sharif appeared to be gaining power and support, which was a cause for concern for the military as they were being side-lined in important decision making. What ensued was a tussle between the Prime Minister and the military headed by General Musharraf, which ended when the latter staged a successful coup to unseat Nawaz Sharif from power in 1999. There were ample reasons to justify leading a coup against the government that General Musharraf cited; chief among them being terrorism, factional disputes and a volatile situation in Kashmir that had led to a worsening law and order situation and merited action by the nation's military.

Tired of the corruption, infighting and poor state of the economy, the country received the General with open arms and assumed elections would be held when the situation stabilized. General Musharraf declared himself President in 2001 and agreed to hold elections in 2002 only after a deadline had been set by the Supreme Court. By allying himself with the US and the Western world at large in the "war on terror"[13], Musharraf strained relations with Afghanistan on the international front, and factions sympathetic to religious ideologies on the domestic front.

Thus, it can be seen that politics in Pakistan has evolved over time to include more interest groups and factions over time that are actively contesting power with the elected government, leading to frequent changes in the setup that are interspersed with military rule when the situation is deemed to have got out of hand. The same two political parties hold the majority votes despite being repeatedly charged with corruption and unfair practices.

1.4. FRAMEWORK OF ANALYSIS

One of the frameworks which have been used to study technology acquisition and capability development builds on the importance of rents in creating the appropriate incentives, opportunities and compulsions required. In advanced countries the role of Schumpeterian rents in innovation is well known, and in developing countries there has been considerable research on the importance of rents in the *'learning'* process as referred to by Amsden (1989) and Khan (2000a). We begin with a general discussion of rents before discussing the specific issues relevant for technology acquisition in developing countries.

[13] A term first coined by US President George W. Bush after the September 11, 2001 attacks.

First, one needs to establish what is meant by a rent, and establish the role of rents in enabling the learning process in developing countries. According to Milgrom & Roberts (1992), a rent is "the portion of earnings in excess of the minimum amount needed to attract a worker to accept a particular job or a firm to enter a particular industry". This definition suggests that a rent is the amount over and above the minimum amount needed to attract an unemployed worker to accept a job (for example). In many developed countries the minimum amount needed is an unemployment benefit, but according to this definition it would not be considered a rent. However, if the worker has no desire to re-enter the job market in the first place, then the benefit would be considered a rent. Therefore, this view appears to be a bit simplistic in nature and limited in its scope, and a more precise formulation has been given by Khan (2000a) describing a situation where an economic agent is the recipient of a rent if the agent earns an income higher than the minimum that agent would have otherwise accepted, the minimum being income from the agent's next-best employment opportunity. With this definition in mind, and quite contrary to the prediction of simplistic models, one comes to the conclusion that rents are a part and parcel of economic activity, and one even finds numerous examples of rents in developed as well as developing countries ranging from monopolistic profits to income accruing to ownership of scarce resources, and politically organized transfers of subsidies and rebates. This suggests that many rents can be useful to economic activity completely efficient, rent-free markets are a pipe-dream and rents, in one form or another, are part and parcel of the modus operandi of real world markets. The question then remains as to the impact of rents on economic activity and ultimately growth and development? Which rents are beneficial to economic activity and which rents are like a cancer eating away the healthy economic body?

If some rents can aid growth and development, while others can spur inefficiency and mis-use of scarce resources, then following the popular liberal policy prescription that all rents are bad and must be done away with, would likely cause more harm than good. Further investigation and a deeper understanding of the role of rents in a specific economic set-up is required to design reforms that will deal effectively with growth-retarding rents as well as enabling other rents to benefit the economy.

It is believed that developing countries that achieved, or came close to convergence with the growth paths of industrialized countries, did so by addressing the market failures in acquiring technology effectively and thereby boosting their technological productive capacity. These countries did so with arrangements that were uniquely suited to the conditions prevalent in individual countries and not by opting for a generic set of arrangements designed for developing countries. The infant industry protection of the 1950s and 1960s provided the revealed capability needed for the countries to grow, while the liberalization policies allowed the underlying capability to be developed, and the growth process to be sustained in some cases. Addressing the hurdles in learning by doing and acquisition of tacit knowledge is the key to ensuring developing countries achieve and maintain high growth rates.

Learning by doing by its very nature requires a period of loss-making that needs to be financed by investors (be they private, or public, or both), and its success depends on the level of effort made by firms' employees. Market failures result when investors are unwilling or unable to finance the period of loss-making and the effort required to make the venture a success cannot be effectively monitored and enforced. Understanding the nature of these two market failures is the main ingredient in formulation of an effective policy mix that will promote successful technology acquisition initiatives in developing countries.

Policy interventions that are designed to address market failures associated with learning by doing will create rents and encourage rent-seeking activity that can have the effect of completely off-setting any potential benefit correction of the market failure(s) achieved in the first place. Since rents can be value and welfare enhancing for the society or welfare reducing, as explained by Khan (2000a) and Khan (2007) , a crucial element here is the management of rents to prevent the creation of new market failures while enhancing or increasing social welfare.

Keeping in mind the fact that a rent is the difference between the minimum amount needed to attract inputs to an industry and the payment necessary to induce the inputs to produce the good or service of interest, one can see that not all rents are damaging to economic activity. This fact, though glossed over in early neoclassical models that were based on hypothetical perfectly competitive markets, was later acknowledged in analysis as intrinsic to ensuring some measure of efficiency of resource use. Models of asymmetric information by Stiglitz (1996) and institutions analysis of Milgrom & Roberts (1992) that followed demonstrated a fundamental weakness of competitive market models, and allowed for the possibility that rents may be necessary or required to compensate for deficiencies in information generation and monitoring and ensuring markets function.

The theoretical discussion on rents in Khan (2000a) and elsewhere makes it clear that there are no clear cut growth and efficiency implications of rents . Moreover, an analysis of rents is incomplete without an understanding of the process(es) through which rents are generated and maintained. Without this insight we are unable to determine why rents that are designed to be welfare enhancing do not achieve their desired goals; especially in the context of learning rents in developing countries.

The process of rent seeking is the expenditure of resources to generate, sustained or transfer rents, a definition which does not limit the analysis to illegal rents only, but encompasses legal rents as well. The resources expended are a social cost on the economy in either case and as such warrant further study. From the given definition of rent seeking, it is apparent that the ability to generate and sustain or transfer rents depends not only on economic, but also socio-political factors as well. Rents are related to rights, and rights can only be changed through the process of institutional change. Determining the beneficiaries of rents (especially in developing countries) depends to a fair extent on political power and political settlements. Thus a meaningful approach to implications of rent and rent seeking activity must incorporate aspects of political and institutional economics to explain how much effort is expended, and the types of rights and rents created in the process.

Rent seeking literature has its roots in the work of Krueger (1974) and Posner (1975), and others who showed that the costs involved in attaining monopoly rents were greater than the deadweight loss of the monopoly themselves. However, history has shown that when individuals have access to rents, considerable effort is made to secure this access and this in turn can lead to the creation of other rents, favouring particular individuals, and associated rights to maintain or change the status quo. Naturally then the overall effect of rent seeking activity depends on both the cost incurred and the rent created. Khan (2000b) considered it as analogous to the traditional production process. The rent seeking cost is equivalent to the cost of inputs used in production, and the rights and rents created are the equivalent to output. However, the literature on rent seeking has focused on social costs of the resources expended in rent seeking and not so much on the rents created by such activity in different contexts.

The net social benefit of rents varies, depending not only on the rent itself, but also on prevailing political and institutional conditions. History has shown that learning rents that do not generate any learning due to state inability or weakness in effective monitoring and allocation result in significant losses to the economy, while the same rents can deliver rapid technological development if they are managed effectively. In much the same way, the cost of rent seeking also varies.

The early rent seeking models Krueger (1974), Posner (1975), Buchanan (1980), Tullock (1980), etc. considered monopoly rents to be associated with high rent seeking cost, with high negative net effect, and represented by a high degree of intervention by the state in the market. Pro market states were represented in these models as generating high positive net effect. Later models relaxed some assumptions and showed this was not necessarily the case. Congleton (1980), Rogerson (1982)Congleton (1980); Rogerson (1982) and others showed that not only could rent seeking cost vary significantly, but also that a rent being present did not necessarily imply high rent seeking costs.

Bhagwati (1982) showed that rent seeking could result in destruction of value reducing rents, rather than in their creation. This led eventually to the notion of rent seeking as a process through which the structure of rights in society can change by North (1990). Chang (1994), and others developed models arguing that institutions in the East Asian economies (at the time of the promising growth experience), were able to keep rent seeking cost low and coupled that with a combination of rents associated with substantial value enhancements to achieve growth. The differences in rent seeking cost across countries were not significant, but the types of rents sustained were significantly different. This suggests that more important than high rent seeking cost is the ability or failure to create and maintain socially valuable rents to explain the success or failure of countries development trajectories.

Analysis of rent seeking costs and outcomes is not very meaningful unless it relates to a specific part of the rents process. It is virtually impossible to determine total rent seeking cost in an economy, or the structure of rights in the absence of any rent seeking activity. However, it is possible to look at the rent seeking process in the context of creation or reallocation of specific rights such as a particular type of import license or rent seeking activity in a particular sector in the context of policies promoting technology acquisition and learning by doing.

Given the importance of rent seeking activity in influencing economic development, it would be useful to look at the empirical evidence of this relationship. One approach, following Krueger (1974) was to estimate the input cost of rent seeking activity as a percentage of GDP, explaining differences in performance across countries in terms of their differential exposure to rent-seeking costs. However, according to Khan (2000b), it is not possible to accurately measure these costs in the manner prescribed nor will the magnitude of differences be sufficient to explain all the variations in performance observed across countries and periods.

Khan (2000b) looked at overall output and industrial growth rates and corruption indices in the South Asian region for the period 1970-2000, and found that while production increased after the 1980s, rent seeking expenditures had increased since the 1960s, as the contestation over ownership of rents had escalated. The liberalization process which started in the late 1980s did not appear to have resulted in reduction of rent seeking expenditures, or in the subjective perceptions of corruption levels in the countries. Though rent seeking was present in South Asian countries as well as in the East Asian Tigers, "a subjective assessment of the balance of evidence suggests that over the 70s and 80s, relative rent seeking expenditures were greater in the Indian subcontinent and Thailand, less so in Malaysia, and least in South Korea." Some variations in rent-seeking expenditures were observed by the author in the sample countries; however, these were relatively small while the differences in cross country performance indicators were substantially more. This suggested that the types of rents that were created, and the subsequent management of the conditions governing the rents were significantly different in these countries, and this variation has implications for the growth experience of these countries.

Rent seeking outcomes have exhibited considerable variation across countries. In the case of South Korea, for example, the industrial policy of the 1960s was found to have created learning rents from subsidies that ensured recipients did in fact reap the benefits of the learning process. Furthermore, Amsden (1989), Chang (1994) and Kim

& Ma (1997) found that these rents and rent-seeking activity were thus growth and value enhancing. Pakistan's experience was not so fruitful; rents created from barriers to entry for infant industry protection did not encourage widespread learning, and technology acquisition was sporadic. A substantial portion of rent-creation activity in this case appears to have created rents that in the end turned out to be value reducing. Khan (2000b) found that the failure to allocate and manage the conditions associated with these rents meant that they (the rents) effectively took the form of redistributive rents (for competing groups and factions that protected them in the prevailing political settlements) rather than true learning rents.

This naturally begs the question of why the state in Pakistan and other developing countries was unable to effectively manage industrial policy and learning rents effectively. Opponents of industrial policy have argued that policy may fail if the state lacks sufficient information to "pick the winners" (Bruton (1989) and Grossman (1988)) or if state-created rents lead to "social waste" by diverting resources from productive activities towards unproductive activities such as lobbying (Krueger (1974) and Buchanan (1980)), or if state-induced rents are harder to remove once they have been implemented (as in the case of infant industries). According to Chang (1993), the information problem is not the real cause of such failures. Moreover, the existence of state created rents and therefore the opportunity of rent-seeking does not imply there actually will be social waste. Therefore, the key factor here is the unwillingness and inability of the state to withdraw support whenever performance has lagged.

Khan (1999) has argued that measures to encourage technology acquisition in Pakistan did two things that undermined the effectiveness of the policy initiative. One, the measures led to the exclusion of the middle class groups from the immediate benefits of development. Second, the measures were designed to discipline capitalist recipients of state subsidies. However, the mechanisms for disciplining of the subsidy recipients were inadequately developed and enforced which meant that those same recipients could buy protection from any of the strong political factions that had emerged. These political factions were interested in gaining access to the resources and subsidies the recipients had preferential access to, and the cost of protecting them from discipline by the state was insignificant in comparison. Due to the nature of the socio-political framework in South Asia, and Pakistan in particular, sustained exclusion of the middle class was not possible, and attempts to accommodate the demands of this class compromised the effectiveness of industrial policy when subsidies and licenses were allocated in response to political pressure, and not based on economic criteria such as the productivity growth that the recipients were potentially and actually achieving. Capitalists cultivated relationships with powerful political figures to protect their interests. Thus, India and Pakistan were unable to reap the benefits of East Asian industrial policies since they lacked the political settlements that would allow effective compulsion for high levels of effort according to Khan (2009). Well-connected firms were able to benefit from various types of "learning rents", and at the same time secured protection through various factions to circumvent threats of subsidy withdrawal from the state. Khan (2000b) found that the outcome was significant levels of industrialization in the economy in the early stages, accompanied by slow growth of competitiveness that resulted in the growth eventually slowing down.

President Ayub Khan staged a coup and assumed leadership of Pakistan and was faced with the task of ensuring his political sustainability and legitimacy. This was accomplished in East Pakistan with the creation of a Bengali bourgeoisie that would ensure he had political support in the province. Educated Bengalis with powerful contacts in the bureaucracy were provided permits and licenses which could be sold to businessmen from West Pakistan in exchange for ready cash. According to Alavi (1973) this process created a parasitic group of individuals, the contactors, who capitalized on their contact with political figures(s) to attain power and accumulate resources to live large while contributing little to industrial development of the country. A second group of individuals, contractors were also courted by the Ayub regime through the Industrial Development Bank. These small businessmen were encouraged to setup industries by putting up a mere 10 percent of the investment funds required, and later provided generous loans and support to become industrialists.

In aligning themselves with the political leadership and reaping the benefits from Ayub Khan's bid to create an industrialist class, Pakistan's business community were victimized by the incumbent leadership of Bhutto, and lost access to their rents, Kochanek (1983) found that this community emerged as a small, fragmented, family-oriented group dominated by the state and unable to play a significant role in transforming the domestic economy.

Chibber (2002) has argued that as long as state agencies have to compete for access to limited resources, they are bound to employ non-cooperative strategies when dealing with rival agencies, and the various economic ministries tend to be in tension with development focused policies. These two factors can combine to create a state bureaucracy that will be at odds with state cohesion. This is precisely what was observed in India where the Indian state was well poised to embark on a promising industrialization process, but it succumbed to a lack of state cohesiveness for policy design and implementation. As a result, the Indian state was unable to assert selectivity in resource allocation, and licenses were granted on the basis of technical feasibility rather than investment priorities. The South Korean state was able to successfully impose discipline within its ranks by giving the lead agency power over other agencies in the institutional setup and this kept state cohesiveness intact and also allowed discipline of domestic economic activity without fear of contestation.

In conclusion, we see that a number of explanations have been put forward to explain the promising performance of some economies in generating the requisite returns from learning rents, while other countries have had rather bleak outlooks; with the traditional explanations lacking the insight on state control and disciplining capabilities based on historical or other factors. There were significant differences between the industrial policy of the 1960s and 2000s in Pakistan, both in terms of the instruments used and the political settlements in which the instruments were located. In the 1960s the instruments (given the political settlement) achieved horizontal growth but not much capability development in the final stages of reaching global levels of competitiveness. The instruments of the post 1980s industrial policy were very different, as was the political settlement.

1.5. CONCLUSION

The divergence of industrial development and by extension, overall economic growth trends between developed and developing countries, and even among various groups of developing countries is a disturbing trend. The expectation had been that when late developers would accelerate their growth efforts the growth trajectories of all countries would converge. However, this has not turned out to be the case; several developing countries managing to close the gap while the majority languished behind, and this has rekindled interest in trying to identify the reason for this gap. Earlier explanations did not give much weight to the role of technology and technological capabilities, their acquisition and development, in determining competitiveness of firms and thus growth of the economy. Instead, openness, free markets and a minimal role of the state were showcased as the driving force of the success stories of development in early mainstream explanations. Later explanations drew inspiration from the work on evolutionary theory to argue convincingly for the key role played by technological change and capabilities in driving competitiveness and growth. Research in this area, and in particular on the political economy reasons that can explain and account for the varied experience of developing countries in improving their competitiveness and successfully driving growth is still at a nascent stage. This thesis seeks to contribute to this important area of research by examining the experience of a developing country in acquiring and absorbing foreign technology to develop its industry and competitiveness in the global market.

As a developing country, Pakistan has had a very turbulent history since gaining independence, managing significant growth of the economy, only to lose the momentum gained shortly thereafter with a change in political leadership and policies. Growth in the 1960s was achieved at the cost of high levels of inequality in the country and corruption, leading to a misplaced faith in the market enhancing growth strategies that were actually reaping the benefits of significant investments during the previous period in infrastructure and capacity building. Similar experiences by other developing countries have yielded positive results without ‘good governance’ (World Bank (1989)) and even in the presence of rent-seeking, so analysis of institutional failures in Pakistan is required. The aim is to locate institutional choices and performance in Pakistan in the context of changes in its political settlements that will shed light on why performance is weak in the country’s industrial sector, and specifically in the automotive industry.

The political landscape in Pakistan has become increasingly fragmented and unstable with frequent changes in power leading to extensive political clientelism and state policies had to be implemented in this unfavourable environment. Resources and opportunities were limited in Pakistan, and the distribution of power between various stakeholders affected by the development policies in the industry, led to contests over potentially growth-enhancing learning rents. Proliferation of clientelist groups has compromised the ability of the state to forsake long term economic growth and development in favour of actions to ensure its own short term sustainability.

Despite having built up substantial productive capacity in the early stages of the industry's establishment, only limited and fairly weak technological capabilities were built up in the industry. This has adversely impacted the industry's attempt to break into the global automotive value chains that symbolize the industry now. However, as the two case studies of relatively successful attempts at technology acquisition will show, intervention even in an unfavourable policy environment can lead to capability development. The policy challenge that emerges is to develop the policy instruments that can enable capability development at a broader, industry wide level in the context of the clientelist political settlement that exists in the country today.

Chapter 2 covers the evolution of political settlements and the link with rent-seeking behaviour in Pakistan's economic development, focusing on the growth take-off during Ayub Khan's regime and in the post-Zia democracy periods. Technology acquisition, technological capabilities and rent seeking are discussed in Chapter 3. The relevance of the automotive industry in serving as a driver of transformation and growth of not just the industry, but the economy at large are discussed in Chapter 4, while Chapter 5 takes a closer look at the general trends and characteristics of Pakistan's automotive industry. Technology acquisition efforts at Millat Tractors Ltd, one of two leading tractor manufacturing firms, and the efforts that have culminated in establishment of the most advanced motorcycle assembly plant by Atlas Honda Limited, the largest motorcycle manufacturer in Pakistan are covered in Chapter 6 and Chapter 7 respectively. The conclusions one draws from these case studies are covered in Chapter 8.

CHAPTER 2. POLITICAL SETTLEMENTS AND RENT-SEEKING IN PAKISTAN'S DEVELOPMENT: AYUB'S GROWTH TAKEOFF AND POST-ZIA DEMOCRACY PERIODS

2.1. INTRODUCTION

Developing countries are faced with the prospect of having to industrialize at an accelerated pace, if they hope to ever match the development and growth trajectory of developed countries. The focus of these countries is not on starting from scratch but on acquiring the capabilities (technological as well as organizational) and physical technology required to effectively compete in today's global market, and technology acquisition has been the preferred conduit for enabling such activity. However trends of such efforts among developing countries have not been very promising.

As a developing country, the experience of Pakistan in this regard has been far from consistent; the country has experienced a number of very promising periods of growth, but these have been followed by periods of great instability and faltering growth trends. Frequent changes in political leadership and reversals in policies by the state are linked to these shifts in growth trends. For example the period of the 1960s was characterized by high incidence of income inequality within the country and corruption within the state. As a result there was a shift towards market enhancing policies that were actually reaping the benefits of the capabilities built up during the previous period and did not yield the benefits one had come to expect based on the experience of other developing countries. The reason why Pakistan had such a lacklustre experience lies in the changes in political settlements in the country that impacted the institutional choices and performance of the domestic economy.

Keeping in mind the broad trends in the Pakistani economy highlighted in the previous chapter, we now turn to a brief discussion of the early development of the country, focussing on industrial policies and the industrialization process in key sub periods of the country's history[14]. A background of the political economy factors is

[14] For a chronology of major events in Pakistan's history see Ghazali (1996)

provided to understand how effectively the explicit and implicit subsidies involved in technology acquisition in the automobile sector were managed. The hypothesis is that in Pakistan these learning rents were managed in a suboptimal way as compared to other contemporary developing countries. By identifying the specific political economy factors that could explain this performance, this chapter aims to make a contribution to the policy debate on industrial policy in Pakistan. Towards that end, Section 2.2 deals with the evolution of political settlements during two major sub-periods of industrial development in Pakistan, while Section 2.3 presents the main findings.[15]

2.2. EVOLUTION OF POLITICAL SETTLEMENTS

2.2.1. IMPORT SUBSTITUTION DRIVEN INDUSTRIALIZATION (1947 – 1958)

As a result of the partition of the Indian sub-continent, Pakistan emerged as an independent sovereign State on August 14, 1947 under the Indian Independence Act of 1947. While both India and Pakistan were underdeveloped at the time of partition, Pakistan was relatively more underdeveloped and poor in comparison to India, and other developing countries at the time as well, the new born state was faced with the daunting task of legitimizing itself with the migrant Muslim population while at the same time building up a viable economic base from the weak infrastructure it had inherited. The early years of Pakistan's economic history were marked by the dominance of agriculture, absence of a well-developed industrial sector, and weak institutional and physical infrastructure. There were considerable regional disparities in the pattern of industrialization in the sub-continent, and the areas which constituted Pakistan lagged behind in industrial development.[16] To make the situation worse, infrastructural facilities were extremely inadequate. With less than 25 MW of power generation, even low levels of power consumption required import of power from India. Railways were particularly affected by the partition as many of the major railway lines were disrupted by the new borders. In addition, the limited handling capacity of Karachi and Chittagong ports did not help facilitate the country's foreign trade.

[15] The discussion that follows is based on work done by the author for the Global Research Project (see Kemal, Din & Qadir (2002))

[16] While major industries were established in India, Pakistan inherited a small industrial base that comprised mainly raw materials processing industries.

Khan (1999) has identified three critical factors that led to the initial import substituting industrialization phase of the country's industrial development. For one, the level of industrial development in the areas that comprised Pakistan, the agricultural hinterland of the Indian subcontinent before partition, was very low and it had a very weak industrial base. For another, Jalal (1990) found that the leadership at the time perceived the country to be at risk and a disadvantaged position with a strong and potentially hostile neighbour in India. Lastly, the leadership felt itself compromised internally by the lack of a strong power base in the areas that now comprised Pakistan. These reasons provided an exceptionally strong compulsion for the country to embark on an accelerated industrialization process that was beyond similar efforts undertaken in other comparable countries. It also led to an unhealthy allocation of resources among sectors; gearing the economy towards industrial development at the expense of social sector development and even the agriculture and services sectors. The severity of this strain can be judged from the fact that Pakistan's per capita spending on provincial development was much less than that of its neighbour, India (by a factor of 6 according to Jalal (1990)). Moreover, the military was able to gain a strong foothold in the power structure and ruled the country at various points in its history.

Khan (1999) also pointed out that the desire for political survival drove the leadership at the time towards authoritarianism and increased their reliance on the bureaucracy to help maintain control. This is contrary to Alavi (1983)'s view that the bureaucracy gained control because of the poor quality of political leadership. Creating a new capitalist class from scratch in society, in a relatively short period of time as opposed to their gradual evolution over time was accomplished through the import industrialization process; sacrificing equity and social inclusion in the near term to reap the benefits of a strong industrial base in the future. There were four key components of the industrialization process; one, de-linking of the currency from the Indian rupee and pound sterling to over-value the exchange rate and make Pakistani exports more profitable and imports cheaper. Two, a differentiated tariff regime was implemented to mould demand preferences in favour of domestically goods. This had the effect of encouraging industrialization in the consumer goods industry. The third component was import licensing, as a mechanism of rationing scarce foreign exchange resources required by industrialists to import capital goods. This was coupled with a centralized system of allocating the country's limited supply of credit to ensure it was efficiently utilized. The final component of the import substitution process was the innovative institutional initiative of the government to shoulder the risk of setting up new and emerging enterprises that would be divested to risk-averse Pakistani capitalists once they were established and viable[17].

The early death of Quaid-i-Azam Mohammad Ali Jinnah, and the assassination of Prime Minister Liaquat Ali Khan in 1951 led to considerable political instability immediately after the creation of Pakistan. There were frequent changes in the political leadership between 1951 and 1958: the country had six Prime Ministers and three Governors-General during this period. The first constitution of Pakistan was not approved till March 1956, and this too proved short-lived as Martial Law was declared on October 7, 1958 and the constitution was abrogated.

Economic policies in the early years were largely shaped by the need to establish a diversified industrial base, to build institutions, and to put into place critical infrastructure. A key aspect of economic policy in the early years was the provision of strong protection to industry after 1952 when serious shortages of foreign exchange emerged. Excessive protection to industry severely distorted economic incentives not only for agriculture but also within the industrial sector. For example, on the recommendation of the Economic Appraisal Committee, tariffs on consumer goods were set higher than the tariffs on intermediate and capital goods. This cascaded tariff structure obviously favoured the consumer goods industries by restricting the import of consumer goods and hampered the establishment of capital goods and intermediate goods industries since imports of these goods were either freely allowed or were subject to low tariffs. Furthermore, the policy regime was characterized by an excessive reliance on economic controls in the form of administered prices, industrial licensing, and a host of other regulations.

While the government vigorously pursued a pro-industrial development strategy, it neglected the development of the agriculture sector. Consequently, growth in the agriculture sector could not even keep pace with the rate of population growth leading to severe food shortages. The lack of agricultural growth also exposed the

[17] The PIDC was setup with precisely this objective in mind

limitations of the pro-industrial policies in that it led to stagnation in the domestic market for manufactured goods. To remedy these problems, the government began to place more emphasis on the development of the agricultural sector. In 1956, the government announced a comprehensive strategy for agricultural development that envisaged provision of fertilizers at subsidized rates, distribution of better seeds, pest control schemes, and control of salinity and water-logging. However, these policies largely remained unimplemented due to the political upheavals towards the end of the decade.

Economic policies to achieve longer term goals were embedded in the first five year plan (1955-60), which aimed to develop human and physical resources, to build infrastructure, and to maximize the productive capacity of the economy. However, for various reasons, mainly political instability, the plan's performance fell below the projected targets. Although the plan commenced in 1955, it did not get government approval until 1958. Adequate attention was not paid to its recommendations and priorities, and there was no proper coordination between planning and budgeting. Against the plan's expectation of a 15 percent increase in national income, the actual increase was about 11 percent. The rise in per capita income also did not exceed 3 percent mainly because of the rapid growth of population.

During the period 1949-50 to 1959-60, the economy grew at a moderate rate of 3.11 percent per annum. Given the predominant share of agricultural output in GDP, the growth performance was obviously influenced primarily by the agricultural sector, which grew by a modest 1.76 percent per annum (see Table 2.1). Notwithstanding an expansion in cropped area in West Pakistan, growth in agricultural output was dampened by stagnant average yields of major crops.

Owing to the low level of manufacturing activity in Pakistan at the time of partition, the manufacturing sector exhibited high growth rates during the Fifties: the growth rate in manufacturing averaged over 10 percent annually in the first half. Import substitution was the hallmark of the government's industrial policy in the early years, and protection of domestic industry provided strong impetus to the production of a broad range of commodities including cotton textiles, sugar, vegetable ghee, and cement. Though the expansion in large-scale manufacturing did not make an appreciable contribution to the overall performance of the economy due to its small share in the gross domestic product, the creation of a more diversified economic structure than was inherited at independence was a major achievement of these early years.

Table 2.1: GDP and Sectoral Growth Rates - (1950 – 1959)

(%)

Years	Sector			GDP (FC)
	Agriculture	Manufacturing	Services	
1950-51	2.55	8.39	4.60	3.82
1951-52	-8.28	7.74	4.01	-1.73
1952-53	0.16	9.96	2.25	1.86
1953-54	14.93	12.98	4.00	10.03
1954-55	-2.78	12.35	5.00	1.66
1955-56	2.32	10.05	2.94	3.49
1956-57	2.02	5.43	3.09	2.91
1957-58	2.07	3.74	2.33	2.63
1958-59	3.76	4.18	7.05	5.49
1959-60	0.83	2.53	0.85	0.93
Period Averages				
1950s	1.76	7.73	3.61	3.11
1950-51 to 1954-55	1.32	10.28	3.97	3.13
1955-56 to 1959-60	2.20	5.19	3.25	3.09

Source: Government of Pakistan (1999a)

The development of the industrial sector was made possible by heavy initial investments: fixed investment rate in Pakistan increased sharply from 2.8 percent of nominal GDP in 1949-50 to 9.3 percent in 1959-60. Despite a sharp increase in the price of investment goods triggered by the devaluation of the rupee in 1955, the rate of investment, especially public investment, remained upbeat primarily due to the fact that increased availability of foreign resources helped the government to meet the high cost of capital goods. Increased level of public investment in infrastructure – electric power generation and distribution, ports, telecommunications, and irrigation – laid the basis for faster growth.

Though the share of agricultural sector dropped from 52.58 percent in 1949-50 to 45.61 percent in 1959-60, the economy continued to be dominated by the agricultural sector, with an average share in GDP of around 47.70 percent (Table 2.2). There was considerable expansion in the manufacturing sector: its share in GDP increased from 6.39 percent in 1949-50 to 9.91 percent in 1959-60. While the services sector contributed significantly to national output (average share of 41.07 percent), there was little variation in its share over time.

Table 2.2: Sectoral Shares in GDP (1950 – 1959)

(%)

Years	Sector		
	Agriculture	Manufacturing	Services
1950-51	51.94	6.68	39.68
1951-52	48.48	7.32	42.00
1952-53	47.67	7.90	42.16
1953-54	49.80	8.11	39.85
1954-55	47.62	8.97	41.16
1955-56	47.08	9.53	40.95
1956-57	46.67	9.77	41.02
1957-58	46.42	9.87	40.90
1958-59	45.66	9.75	41.50
1959-60	45.61	9.91	41.47
Period Averages			
1950s	47.70	8.78	41.07
1950-51 to 1954-55	49.10	7.80	40.97
1955-56 to 1959-60	46.29	9.77	41.17

Source: Government of Pakistan (1999a)

On the external economic front, the surge in Pakistan's export earnings led by the Korean war-related commodity boom in 1950 quickly subsided owing to at least three broad factors. First, Pakistan's decision not to follow the sterling and the Indian rupee in devaluation hurt Pakistan's exports[18]. Second, stagnation in agricultural output meant lack of exportable surpluses in agricultural commodities. Third, international recession weakened the commodity prices of Pakistan's export products. Not surprisingly, therefore, there was a sharp fall in export earnings in the first half of the decade (as evident from the trends in Table 2.3). Export performance, however, recovered in the second half, helped mainly by the devaluation of the Pakistani rupee in August 1955. On average, imports grew at an accelerated pace in the second half of the decade mainly because of the need to import large quantities of food grains. Except for the year 1950-51 when Pakistan had a surplus on its trade account, the country has continued to face a growing deficit in its balance of trade.

[18] Kemal (1978) pointed out that the non-devaluation decision left the rupee over-valued, and was based on the presumption that the demand for cotton and jute was inelastic.

Table 2.3: Exports, Imports and Trade Balance (1950 – 1959)

(USD million)

Year	Current Prices			Growth Rate (%)		
	Exports	Imports	Balance	Exports	Imports	Balance
1950-51	406	353	53	-	-	-
1951-52	279	445	-166	-31.28	26.06	-413.21
1952-53	262	307	-45	-6.09	-31.01	-72.89
1953-54	194	249	-55	-25.95	-18.89	22.22
1954-55	149	237	-88	-23.20	-4.82	60.00
1955-56	156	203	-47	4.70	-14.35	-46.59
1956-57	147	319	-172	-5.77	57.14	265.96
1957-58	91	276	-185	-38.10	-13.48	7.56
1958-59	93	215	-122	2.20	-22.10	-34.05
1959-60	160	379	-219	72.04	76.28	79.51
Period Averages						
1950-51 to 1959-60	194	298	-105	-5.72	6.09	-14.61
1950-51 to 1954-55	258	318	-60	-21.63	-7.17	-100.97
1955-56 to 1959-60	129	278	-149	7.01	16.70	54.48

Source: Government of Pakistan (1999b)

2.2.2. MILITARY TAKEOVER AND DEVELOPMENT (1958 – 1971)

By the end of the 1950s, the foundations of the industrial sector had been laid and large scale manufacturing was rapidly expanding, the state bureaucracy was established, and while the agricultural sector dominated the economy, its growth was starting to stagnate. Moreover, high population growth in excess of agricultural growth meant there was a decline in per capita availability of food. Per capita income in the economy was also stagnant, and the economy was highly regulated. Import substitution had placed an intolerable strain on the various segments of the economy that resulted in political discontent, and culminated in a military coup in October 1958 to restore political stability and revive the country's growth trajectory. According to Khan (1999), the military regime led by Ayub Khan was "committed to the development of capitalism" and a willingness to intervene in the economy at a fairly micro level to achieve this goal. Moreover there was allocation of massive amounts of resources to a limited group of industrialists that was reminiscent of the earlier import substitution era, and the South Korean *chaebols*. This resulted in a rapid accumulation of assets that provided the stimulus for a highly accelerated rate of investment in the manufacturing industry (16.9 percent on average in the early 1960s, and dropping to a slightly over 10 percent on average in later years) that was the most promising among developing countries at the time. It is logical to attribute growth in the early 1960s to the rapid accumulation process and investment spurt (as suggested by Khan (1999), and not to the liberalization policies of the time, as suggested by Gardezi & Rashid (1983)).

Import controls were relaxed to facilitate the import of raw material and an Export Bonus Voucher Scheme for manufactured goods was introduced that gave exporters an additional claim on foreign exchange to import goods that they required. While the rapid accumulation process did stimulate growth, it also resulted in massive concentration of wealth in the hands of a few industrialists. The exact degree of concentration at the time is not clear; however, according to Mahbub-ul-Haq, 22 families controlled 66 percent of Pakistan's wealth in 1968. On the other hand, Amjad (1982) found that 18 industrial groups controlled 35 percent of all industrial assets and 44 groups controlled approximately 50%.

Large scale manufacturing industries were preferred for investment purposes; industries such as cotton and jute textiles, cement, chemicals etc., and these industries tended to be more capital intensive. In fact, according to Khan (1970), the capital labour ratios in most manufacturing industries were higher in 1962 than those in Japan, and Islam (1976) found similar results for the year 1969. This suggests that the small and medium scale sector, which was relatively more labour intensive, was neglected in favour of large scale manufacturing which was more capital intensive.

To complicate the situation further, the state was unable to deliver conditional subsidies based on output performance to the industrialists, as a result of which there was poor industrial performance in terms of output. In comparison, the South Korean state also allowed concentration, but this did not impede growth since the subsidies were made conditional on export growth. Most crucially, the conditionality was credibly enforced to ensure *chaebols* conformed to the state's objectives. Unlike South Korea, the Pakistani state was unable to intervene selectively and push development of priority/strategic sectors that would allow sustainable growth of the economy. Moreover, at a time when other countries had begun to push industrialization efforts towards new, riskier ventures, Pakistan was unable to follow through due to internal political instability. Resources had to be diverted away from more productive areas to deal with political contestation and unrest. To ensure its political survivability in the face of political agitation and to forestall the loss of power, the state opted to divert resources towards meeting the demands of political agents of unrest. According to

Khan (1999), subsidy withdrawal and other centrally allocated rights were being allocated on a political basis rather than on the basis of productivity, and this led to loss of credibility and the start of rent-seeking activity in the country.

To gain access to more resources and continued access to such resources, industrialists formed connections with the bureaucracy and the political leadership in a mutually beneficial way. Small and medium scale enterprises lacked the economic power to influence the state but were able to dominate trade associations and used their political power to contest for allocation of the scarce resources.

In the wake of the chaotic beginnings of the nation and once the dust had settled, the foundations of the industrial sector were laid and evident in the rapid growth of large scale manufacturing. The administrative machinery of the state, including various institutions such as the central bank, was put in place. The agriculture sector dominated economic activity in the economy, but growth in the sector stagnated during this period. Population growth on the other hand exceeded agricultural output growth, and as a consequence, domestic per capita food availability was reduced. With the establishment of the administrative branches of the state, the regulations governing investment, trade, pricing and a number of other economic areas increased. The military take-over in October 1958 followed a great deal of political instability during the most part of the Fifties. To introduce some form of democracy in the country despite the promulgation of Martial Law, a 'basic democracy' program was launched by Ayub Khan in an attempt to legitimize military rule with the masses. This set up allowed the military government to settle on a presidential rule, and to ignore the important constitutional issues of representation in the federal legislature and provincial autonomy.

On the economic front, the government set out to improve economic management and to deal effectively with corruption and unfair practices by the private sector especially in industry and retail trade. The windfall gains and profits arising after industries were set up and the situation was compounded with the earlier lack of regulations governing economic activity, which had allowed private sector profiteering and the concentration of wealth in the hands of a few families controlling key companies. While it was a necessary evil at the time to encourage economic activity in the desired areas, subsequent steps were not taken by the state to follow through and exert control over companies to invest the accumulated wealth in productive activities that would yield the maximum benefit to the economy. Besides introducing strict price and profit controls in the form of administered prices and profit margins, it also dealt with the menaces of hoarding, black-marketing, and smuggling with an iron hand. The initial impact of these measures was favourable and the general price index registered a fall in the early months after the Martial Law. But the government soon realized that the direct controls had introduced rigidities in the system and thus hampered the growth of the manufacturing sector.[19] Within just one year of taking over, the government began to dismantle the price control system and moved towards a general policy of economic deregulation through a greater reliance on the market mechanism.[20]

Development strategy during much of the Sixties continued to be heavily biased towards promoting industrial growth in Pakistan. The government maintained an over-valued exchange rate to ensure the cheap availability of capital goods and other imported inputs to the industrial sector. Also, by keeping prices of agricultural inputs at below world market prices, it made domestic raw materials available to the industrial sector at very cheap prices. This, together with the policy of import controls and tariffs, tax concessions such as tax holidays, accelerated depreciation allowances, and loans at very low interest rates, markedly accentuated the pro-industrial bias in the growth strategy. To further help its industrialization drive, the government adopted a series of measures to promote exports of manufactured goods. The most significant measure was the introduction of Export Bonus Scheme (EBS), which subsidized manufactured goods exports through a system of bonus vouchers[21]. Furthermore, preferential access to credit and a host of fiscal incentives were part of a policy package meant to enhance export competitiveness. These policies not only led to robust growth in the exports of manufactured goods, but also helped diversify the product composition of Pakistan's exports.

[19] Direct controls on prices and profits weaken the incentive to expand production.
[20] See Gauhar (1993)
[21] The bonus vouchers often carried a high premium in the market as import licenses were automatically issued against the vouchers. Kemal (1978) found that more than 80 percent of the total export subsidies were accounted for by this scheme.

The incentives provided to manufactured goods exports were partly meant to offset the anti-export bias inherent in the policy of import substituting industrialization followed during most of the decade, barring a few years when import regime was liberalized somewhat[22]. While protectionist policies did contribute to industrial diversification and growth, these had several shortcomings. In particular, protection of domestic industry through high rates of effective protection led to inefficiencies in domestic production, prevented the country from realizing its full export potential, and contributed to a worsening of balance of payments (the increase in capital goods and raw material imports outweighed the growth in exports).

The neglect of agriculture in the Fifties not only resulted in food shortages but also constrained the domestic supply of agricultural raw materials to the industrial sector. These complications led to an agricultural policy that was aimed at achieving self-sufficiency in food, increasing agricultural production, and reducing unemployment. The shift in emphasis in policy also coincided with the advent of 'green revolution'[23] technology in the economy. The revolution started with introduction of high-yielding varieties of seeds (HYV), chemical fertilizers, pesticides etc., and coupled with greater use of agricultural machinery, mainly in terms of number of tube-wells in operation as well as tractors. The state facilitated the adoption of new technology by heavily subsidizing high-tech varieties of agricultural inputs. These factors contributed to a marked improvement in the growth performance of the agricultural sector: the average annual growth rate jumped to 6 percent in the second half of the Sixties, up from 1.8 percent in the corresponding period of the Fifties.

With a view to restructuring land relationships, the state introduced land reforms which prescribed ceilings of landholdings at 500 acres of irrigated land and 1,000 acres of non-irrigated land. However, the reforms were not implemented properly, and landlords were able to use a variety of loopholes and exemptions to sidestep a bureaucracy hamstrung by political and administrative constraints. As a result only modest amounts of land being transferred to small farmers and landless labour, and the land reforms did not result in a meaningful redistribution of land holdings.

[22] To a large extent, import liberalization was made possible by the increase in foreign loans and grants. The process of import liberalization, however, had to be cut short owing to drastically reduced foreign aid inflows in the wake of the 1965 war with India.
[23] A term first used by former USAID director William Gauld in 1968 when noting spread of new technologies in agriculture (see IFPRI (2002)).

The long-term development strategy pursued during the first five years of the Sixties was outlined in the Second Five-Year Plan (1960-65). The plan sought to accelerate the pace of development and overcome the inadequacies of achievement during the First Plan period, and to ensure that the stage of self-generating growth was reached within a reasonable period. In addition, the plan attempted to restore the balance between agricultural and industrial development. Consequently, the pattern of public sector expenditure was heavily concentrated in the agricultural sector mainly because of the large expenditures on the development of water resources. The Second Plan was quite successful in fulfilling its major objectives: the increase in national income during this period was over 30 percent as against the target of 24 percent.

The Third Five-Year Plan (1965-1970) was formulated in the light of the achievements and shortfalls of the two previous plans. Its principal objectives were to attain rapid growth in national output, reduce the degree of intra and inter-regional income inequality, increase employment opportunities, strengthen the balance of payments, and improve the availability of social services like health and education. However, the plan targets were overly ambitious, and soon after the launching of the Third Plan, it had to be revised in respect of its resources and priorities in the light of various adverse circumstances. These included increased defence expenditures following the outbreak of war with India in September 1965, drastic cuts in foreign aid along with the hardening of the terms of loans and mounting repayment obligations, and successive droughts and floods leading to a fall in agricultural productivity and rise in food imports. Not surprisingly, then, achievements in most sectors fell short of expectations.

Despite rapid growth in both the industrial and the agricultural sectors, the Sixties witnessed rising economic and political tensions, not least because of a lack of interest in issues of equity and social justice which contributed to concentration of wealth in the hands of a few individuals. In addition, the suppression of provincial autonomy sowed the seeds of discontent between East and West Pakistan and there was a growing perception that the East wing was not receiving its fair share of resources. Besides regional disparities, there was a widespread feeling that income inequalities had increased in both the provinces during the Sixties. A statement by Mahbub ul Haq, then Chief Economist of the Planning Commission, to the effect that twenty-two families controlled 66 percent of the industrial wealth and 87 percent of the banking and insurance in the country, stirred up widespread disturbances in the winter of 1968 which eventually led to the downfall of the military government.

The fact that strong growth performance was not accompanied by an improvement in the living standards of the majority of population led many to question the government's economic policies in the Sixties. It must, however, be pointed out that regardless of the controversy on the overall economic policies pursued during this period, there is a broad agreement on the fact that the Sixties was a period of sound macroeconomic management which contributed to greater monetary discipline, price stability, and low budget deficits. Furthermore, in the backdrop of political instability that had characterized much of the Fifties to the detriment of economic planning and management, a major achievement of the military government was the strengthening of the administrative capacity, which greatly facilitated the formulation and implementation of policies and programs.

The country's economic performance in terms of broad macroeconomic aggregates in the Sixties is summarized in Table 2.4. Measured by GDP growth, economic performance in Pakistan in the Sixties clearly surpassed initial expectations: the growth rate of the economy more than doubled from 3.11 per cent per annum in the Fifties to 6.60 per cent in the Sixties. After exhibiting stagnant and even negative growth in the initial years, the agricultural sector recorded a healthy growth rate of 6.04 percent in 1961-62. Growth in the agricultural sector peaked at 11.66 percent in 1967-68, before decelerating sharply to 4.15 percent in 1968-69, and then rebounding to 9.12 percent in 1969-70. It is noteworthy that the agricultural sector performed relatively well in the second half of the Sixties as compared to the first half: the average annual rate of growth in the agriculture sector climbed from 3.88 percent in the first half to 6.36 percent in the second half.

Large scale manufacturing sector posted strong growth in both halves of the Sixties, though there was a marked slowdown in the second half when industrial output grew at an average annual rate of 8.11 percent, down from 11.72 percent in the first half. Several factors contributed to the impressive performance of the industrial sector in the Sixties. First, a large and lucrative market for domestic production was created by a restrictive import regime, especially for consumer goods, resulting in high profits in the industrial sector. Second, relaxation in direct controls on investment coupled with improved profitability in the industrial sector led to a substantial increase in real gross fixed investment. Third, there was cheap availability of agricultural raw materials to the industrial sector, thanks largely to export controls on these products which depressed domestic prices of these commodities relative to their world prices.

Table 2.4: GDP and Sectoral Growth Rates (1960 – 1969)

(%)

Years	Sector				GDP (FC)	Per Capita Income (PKR)
	Commodity Producing	Agriculture	Manufacturing	Services		
1960-61	3.75	-0.39	12.85	5.98	4.67	2.01
1961-62	6.86	6.04	13.28	3.89	5.61	2.65
1962-63	6.91	4.91	11.18	7.05	6.97	3.85
1963-64	6.86	3.83	11.34	6.34	6.65	3.76
1964-65	6.83	4.99	9.93	13.22	9.46	6.22
1965-66	3.01	0.86	8.58	11.67	6.70	3.84
1966-67	5.17	6.00	5.65	1.95	3.74	0.83
1967-68	9.57	11.66	6.37	3.48	6.90	4.08
1968-69	6.58	4.15	8.62	5.56	6.15	3.13
1969-70	10.83	9.12	11.32	6.72	9.10	6.20
Period Averages						
1960s	6.64	5.12	9.91	6.59	6.60	3.66
1960-65	6.24	3.88	11.72	7.30	6.67	3.70
1965-70	7.03	6.36	8.11	5.88	6.52	3.62

Source: Government of Pakistan (1999a)

With an average share in GDP of around 41 percent, the agricultural sector continued to play a dominant role in the economy (as evident from the trends in Table 2.5). On the other hand, while vigorous industrialization efforts helped to raise the share of manufacturing sector in GDP from 10.68 percent in 1960-61 to 13.44 percent in 1969-70, the average share of manufacturing sector remained low during the decade at about 12.41 percent. The share of services in GDP did not show much variation during the period, and its average share stood close to 42 percent.

Total investment increased from PKR 11.51 billion in 1960-61 to PKR 23.68 billion in 1969-70 (see Table 2.6 for trends), registering an average annual growth rate of 9.20 percent. Growth in investment considerably slowed down in the second half of the decade to -0.29 percent, from 18.69 percent in the first half. On average, the share of total investment in GDP stood at 17.36 percent during the period.

Table 2.5: Sectoral Contribution to GDP (1960 – 1969)

(%)

Years	Sector			
	Commodity Producing	Agriculture	Manufacturing	Services
1960-61	58.02	43.41	10.68	41.98
1961-62	58.70	43.58	11.45	41.30
1962-63	58.67	42.74	11.90	41.33
1963-64	58.79	41.61	12.43	41.21
1964-65	57.37	39.91	12.48	42.63
1965-66	55.39	37.73	12.70	44.61
1966-67	56.16	38.55	12.94	43.84
1967-68	57.56	40.27	12.87	42.44
1968-69	57.80	39.51	13.17	42.21
1969-70	58.71	39.52	13.44	41.29
Period Averages				
1960s	57.72	40.68	12.41	42.28
1960-61 to 1964-65	58.31	42.25	11.79	41.69
1965-66 to 1969-70	57.12	39.12	13.02	42.88

Source: Government of Pakistan (1999a)

Table 2.6: Total Investment and Share in GDP (1960 – 1969)

(%)

Years	Total Investment (PKR Millions)	Annual Growth Rate	Share in GDP
1960-61	11,508	9.59	13.81
1961-62	13,401	16.45	15.22
1962-63	17,040	27.15	18.08
1963-64	20,801	22.07	20.67
1964-65	24,587	18.21	22.34
1965-66	21,829	-11.22	18.58
1966-67	22,773	4.33	18.64
1967-68	20,534	-9.84	15.77
1968-69	20,588	0.27	14.86
1969-70	23,683	15.03	15.61
Period Averages			
1960s	19,674	9.20	17.36
1960-61 to 1964-65	17,467	18.69	18.02
1965-66 to 1969-70	21,881	-0.29	16.69

Source: Government of Pakistan (1987)

Note:
GDP MP used for analysis based on expenditure side
Total Investment = Gross Fixed Capital Formation + Change in Stocks (taken from table "Expenditure on GNP at Current Prices" in Pakistan Economic Survey)
Investment Series derived by dividing the respective investment series (in current prices) by the GDP Deflator
All figures are at constant 1980-81 base

Contrary to the popular belief, official figures on income distribution indicate a slight improvement in the distribution of income in the Sixties. The Gini coefficient, which is a convenient summary measure of the degree of income inequality, declined from 0.39 in

1963-64 to 0.34 1969-70, indicating an improvement in the distribution of income. Another indicator of income inequality is the share of the lowest 20 percent and highest 20 percent of households in income. During the period from 1963-64 to 1969-70, the share of the lowest 20 percent of households increased from 6.4 percent to 8.0 percent, whereas the share of the highest 20 percent of households declined from 45.3 percent to 41.8 percent (Table 2.7). Notwithstanding this, the pattern of income distribution remained skewed towards high income households, as indicated by the substantially high proportion of income accruing to households in upper income bracket. The incidence of poverty, as measured by the headcount ratio, increased during the Sixties: the percentage of total population falling below the poverty line was 46.53 percent in 1969-70, up from 40.24 percent in 1963-64.

Table 2.7: Household Income Distribution (1960 – 1969)

Year	Household Gini Co-efficient	Household Income Shares			Ratio of Highest 20% to Lowest 20%	GDP Growth Rate	Poverty Head Count Ratio: Total
		Lowest 20%	Middle 60%	Highest 20%			
1963-64	0.39	6.40	48.30	45.30	7.08	6.65	40.24
1966-67	0.36	7.60	49.00	43.40	5.71	3.74	44.50
1968-69	0.34	8.20	49.80	42.00	5.12	6.15	-
1969-70	0.34	8.00	50.20	41.80	5.22	9.10	46.53

Source: Government of Pakistan (2000),
Author's own calculations

Pakistan’s exports recorded a nearly three-fold increase during the period, increasing from USD 114 million in 1960-61 to USD 338 million in 1969-70 with an average annual growth rate of 10.72 percent (Table 2.8). The strong growth in exports was accompanied by rising imports, which grew at an average rate of 7.37 percent. The country’s trade balance remained in deficit throughout the decade.

Table 2.8: Exports, Imports, and Trade Balance (1960 – 1969)

(USD million)

Year	Current Prices			Growth Rate (%)		
	Exports	Imports	Balance	Exports	Imports	Balance
1960-61	114	457	-343	-28.75	20.58	56.62
1961-62	114	470	-356	0.00	2.84	3.79
1962-63	210	588	-378	84.21	25.11	6.18
1963-64	226	626	-400	7.62	6.46	5.82
1964-65	239	772	-533	5.75	23.32	33.25
1965-66	253	605	-352	5.86	-21.63	-33.96
1966-67	273	762	-489	7.91	25.95	38.92
1967-68	346	699	-353	26.74	-8.27	-27.81
1968-69	357	640	-283	3.18	-8.44	-19.83
1969-70	338	690	-352	-5.32	7.81	24.38
Period Averages						
1960-61 to 1969-70	247	631	-384	10.72	7.37	8.74
1960-61 to 1964-65	181	583	-402	13.77	15.66	21.13
1965-66 to 1969-70	313	679	-366	7.67	-0.92	-3.66

Source: Government of Pakistan (1999b)

2.2.3. DEMOCRATIC RULE (1972-1977)

The beginning of the 1970s decade was a bleak one indeed for Pakistan; when East Pakistan seceded from the country and became Bangladesh; the country suffered a military defeat at the hands of India, and the private sector was rife with inefficiencies and rent-seeking. After the breakup of the country, a democratically elected government came to power in late 1971. This government's policy stance shifted from one of being pro-private sector to that of being pro-public sector. In early 1972, 31 large firms in 10 basic industries were rapidly nationalized and handed over to the public sector. The aim of the government intervention was to retain control of basic industries, infrastructure and banking and finance with the public domain. Over the course of the next four years, 32 insurance companies, the shipping industry, education, banks, cotton ginning, rise husking and flour milling industries were nationalized in an attempt to curtail inefficiencies and wealth accumulation in the private sector. This was followed by labour and land reforms. The anti-agriculture sector bias in government policy was reversed when agriculture procurement prices were raised, the currency was devalued to remove the industry sector subsidy, and the Export Bonus Voucher Scheme was cancelled.

The industrial sector was no longer given priority over the other sectors and this was reflected in meagre large-scale manufacturing growth, while the agriculture sector was adversely affected by a spate of natural calamities; a drought, floods and pest attacks. As a result, overall GDP growth averaged 4.8 percent during 1972-77, with a boom in the early years and a slowdown from 1974. Industrial sector growth performance compared well with that of the 1960s (according to Sayeed (1995)). Over half of the manufacturing sector industries (at the 3 digit industrial classification level) exhibited double digit growth rates; with no discernable discrepancy between export-oriented or import substituting industries. Productivity growth presented a far worse picture; averaging a paltry 0.3 percent per annum as compared to the corresponding figure of 5 percent for the 1960s, and with far more variation between sectors.

If output growth did indeed cloak the underlying inefficiencies in factor allocation and use during the period, as suggested by Sayeed (1995), and capital input contributed the most to growth, then it leaves questions unanswered about the efforts, if any, of the state to increase production efficiency and learning-by-doing in the industrial sector. The persistent bias in policy that promotes investing in physical capital, especially in choice large scale manufacturing industries, while giving minimal attention to investment in human capital also resulted in unsustainable growth when production reached the point of diminishing return with respect to physical capital investment.

The industrial sector exhibited strong growth during this period, even more promising than the mainstay of the economy, the agricultural sector. However, the performance of the industrial sector during this time was marred by demonstrations that broke out in the latter half of the Sixties in response to the concentration of wealth by industrialists and their uncompetitive behaviour. At the same time, the state strengthened its administrative machinery and institutions, and attention shifted towards improving income distribution, wage rates and worker welfare in the wake of the demonstrations.

After the fall of the Ayub regime, general elections were held in December 1970. These elections were the first ever held throughout the country since independence on the basis of adult franchise. Two political parties emerged as the major political forces in the country after the elections: Awami League in East Pakistan and Pakistan People's Party in West Pakistan. This polarity in the country's politics led to disastrous consequences including the break-up of the country in 1971. The collapse of the

Yahya regime saw the advent of the Peoples Party government led by Zulfikar Ali Bhutto, who also assumed the office of Chief Martial Law Administrator – the first civilian to hold this position. Martial Law remained the source of legal authority till a new constitution was approved by the National Assembly in 1973. Following general elections in 1977, mass unrest erupted amid allegations of vote rigging, leading eventually to the military take-over on July 5, 1977.

Economic management during the People's Party government was beset by a number of exogenous shocks that caused significant macroeconomic instability. Firstly, the secession of East Pakistan led to a disruption of trade relations between the two countries and deprived West Pakistan of half of its export market. Secondly, thanks to a fourfold increase in petroleum prices induced by the newly created OPEC cartel, the Seventies witnessed phenomenal increases in Pakistan's import bill alongside a slowdown in exports due to the recession in the world economy. This deterioration in terms of trade led to widening resource and trade gap. Thirdly, Pakistan's commodity exports – rice, cotton, and sugarcane – remained vulnerable to wide fluctuations in international commodity prices. Fourthly, agricultural output, especially the cotton crop, was adversely affected by flooding and pest attacks.

The government of Pakistan People's Party embarked on its agenda of socialist oriented reforms with much enthusiasm. In 1972, the government nationalized all private banks and insurance companies, and a large number of manufacturing units with the stated objective of reducing the concentration of wealth. The government's nationalization drive is generally held responsible for the weak performance of the large-scale manufacturing sector especially in the first half of the Seventies. It must be emphasized, however, that the poor performance of the industrial sector owed as much to the policy of nationalization as to the pattern of industrialization that developed during the earlier decades. This is borne out by the fact that there were already signs of weakening in the growth momentum of the industrial sector by the end of the Sixties; thanks largely to an inefficient allocation of resources (promoted through excessive protectionism) that eroded the capacity to sustain high growth rates in the manufacturing sector.

A key development of the Seventies was the emergence of a strong small-scale industrial sector which was ignored in the early years due to the capital-intensive bias of Pakistan's industrial regimes. Small scale industries as diverse as leather manufactures, sports goods, and surgical instruments not only helped diversify Pakistan's industrial structure, but also created employment opportunities for the country's growing labor force. A combination of exogenous and policy factors were responsible for the growth of small-scale industries. First, private investment was diverted to small-scale industrial units as a result of nationalization policies that exclusively targeted the large-scale manufacturing units. Second, trade union activities in large-scale manufacturing made investment in these units less attractive, thus contributing to the growth of smaller production units. Third, export-oriented small-scale industries such as carpets, and garments and made-up textiles received a boost owing to devaluation of the rupee. Fourth, remittances from abroad stimulated the domestic market for consumer goods, a large proportion of which were produced by the small-scale industry.

Throughout the Seventies, the agricultural sector was plagued by stagnation, owing to a combination of exogenous and policy factors. Firstly, climatic shocks and viral diseases affected the crops, with marked damage to cotton production. Secondly, there was an overall shortage of the critical imported agricultural inputs that were needed to maintain the productivity gains of the high-yielding varieties. Thirdly, despite farm mechanization in the Sixties, inadequate utilization of water and fertilizers[24] continued to constrain agricultural production. Finally, government pricing policy discriminated against the agricultural sector by setting output prices well below those in international markets.

In response to the growing income inequalities especially in the rural sector, the government initiated important land reforms in 1972. However, the outcome of these reforms was not much different from the reforms of the previous decade mainly because of lax implementation and low amount of land coverage. Furthermore, the land reforms benefited only a small number of tenants while big landlords escaped the laws through loopholes such as transfer of land to relatives. It is, therefore, not surprising that land reforms did not make any significant contribution towards reducing the inequalities in the agrarian structure.

[24] There was a sharp increase in prices of fertilizers as a result of higher prices of petroleum products.

To improve the competitiveness of Pakistan's exports, the government devalued the rupee in 1972. While this bolstered Pakistan's export earnings, the country continued to face serious balance of payments difficulties, due mainly to a fourfold increase in the country's import bill in the wake of oil price shocks. The persistent deficit in the balance of payments necessitated large external loans to plug the gap in external payments and receipts, leading to mounting external debt. It must be emphasized here that the external debt problem would have been much more serious had there not been massive inflows of workers' remittances during the Seventies.

The overall performance of the economy during the Seventies was rather subdued as compared with the Sixties: on average GDP grew at a rate of 4.66 percent per annum as against 6.60 percent in the previous decade. With the relatively sluggish growth rates in the commodity producing sectors (agricultural and manufacturing sectors grew at average annual rates of 2.32 percent and 5.50 percent respectively), growth in the GDP was fuelled primarily by the services sector, which grew at a healthy rate of 5.94 percent per annum (Table 2.9). It is noteworthy that there was a sharp difference in the economic performance in the first and second halves of the Seventies, and an upturn in economic activity occurred in 1977-78 led by an impressive recovery especially in the manufacturing sector. Thanks largely to the high growth rate of agriculture and large-scale manufacturing, the commodity – producing sector exhibited a growth rate of 7.24 percent per annum in the second half, as against 4.62 percent per annum in the first half. The improvement in the performance of the commodity-producing sectors in the second half owed as much to a fuller utilization of the idle capacity in the manufacturing sector as to an unusual spell of good weather which helped recovery in the agricultural sector.

While the agricultural sector continued to dominate the economy, its share in national output decreased steadily throughout the decade to 31.5 percent in 1979-80, down from 38.02 percent in 1970-71 (Table 2.10). The share of the manufacturing sector in GDP fluctuated around 14 percent throughout the decade, averaging at 13.9 percent. The Seventies saw an increasing importance of the services sector relative to the commodity-producing sectors: whereas the share of the former in the GDP increased from 41.80 percent to 46.5 percent, that of the latter fell from 58.2 percent to about 53.5 percent.

Table 2.9: GDP and Sectoral Growth Rates - (1970 – 1979)

(%)

Years	Sector				GDP (FC)	Per Capita Income (PKR)
	Commodity Producing	Agriculture	Manufacturing	Services		
1970-71	0.16	-2.79	6.44	2.31	1.05	-2.29
1971-72	1.19	2.77	1.26	3.33	2.08	-0.12
1972-73	4.62	1.70	8.73	9.52	6.70	3.09
1973-74	5.45	3.85	6.35	9.05	7.01	3.80
1974-75	-0.74	-2.52	0.54	8.29	3.26	0.50
1975-76	4.74	4.47	1.39	1.79	3.37	2.19
1976-77	2.90	2.98	1.82	2.71	2.81	2.06
1977-78	5.76	3.50	10.21	10.31	7.84	9.60
1978-79	5.03	3.41	8.01	6.18	5.57	3.25
1979-80	7.84	5.89	10.25	5.87	6.91	3.31
Period Averages						
1970s	3.69	2.32	5.50	5.94	4.66	2.54
1970-71 to 1974-75	2.13	0.60	4.66	6.50	4.02	1.00
1975-76 to 1979-80	5.25	4.05	6.34	5.37	5.30	4.08

Source: Government of Pakistan (1999b)

Table 2.10: Sectoral Contribution to GDP (1970 – 1979)

(%)

Year	Sector			
	Commodity Producing	Agriculture	Manufacturing	Services
1970-71	58.20	38.02	14.16	41.80
1971-72	57.69	38.27	14.04	42.31
1972-73	56.57	36.48	14.31	43.43
1973-74	55.74	35.40	14.22	44.26
1974-75	53.58	33.42	13.85	46.42
1975-76	54.29	33.78	13.58	45.71
1976-77	54.33	33.84	13.45	45.67
1977-78	53.29	32.47	13.75	46.71
1978-79	53.02	31.81	14.07	46.98
1979-80	53.47	31.50	14.51	46.53
Period Averages				
1970s	55.02	34.50	13.99	44.98
1970-71 to 1974-75	56.35	36.32	14.12	43.65
1975-76 to 1979-80	53.68	32.68	13.87	46.32

Source: Government of Pakistan (1999b)

Total investment grew at a rate of 7.69 percent during the Seventies, increasing from Rs. 23.57 billion in 1970-71 to Rs. 48 billion in 1979-80 (Table 2.11). Growth in total investment accelerated in the second half to 8.90 percent, up from 6.48 percent in the first half. On average, total investment accounted for 16.25 percent of GDP during the period.

Table 2.11: Total Investment and Share in GDP (1970 – 1979)

(%)

Years	Total Investment (PKR Millions)	Growth Rate	Share in GDP
1970-71	23,571	-0.47	15.37
1971-72	23,591	0.09	13.87
1972-73	22,941	-2.76	12.67
1973-74	24,747	7.87	13.06
1974-75	31,592	27.66	16.26
1975-76	37,346	18.21	18.32
1976-77	40,473	8.38	19.10
1977-78	40,571	0.24	17.71
1978-79	42,594	4.99	17.75
1979-80	47,997	12.69	18.43
Period Averages			
1970s	33,542	7.69	16.25
1970-71 to 1974-75	25,288	6.48	14.24
1975-76 to 1979-80	41,796	8.90	18.26

Source: Government of Pakistan (1987)

Note:
GDP MP used for analysis based on expenditure side
Total Investment = Gross Fixed Capital Formation + Change in Stocks (taken from table "Expenditure on GNP at Current Prices" in Economic Survey)
Investment Series derived by dividing the respective investment series (in current prices) by the GDP Deflator
All figures are at constant 1980-81 base

Despite the government's declared emphasis on social justice and equity, income inequality increased in the Seventies. The Gini coefficient increased from 0.33 in 1970-71 to 0.37 in 1979, reflecting deterioration in the distribution of income (Table 2.12). This is also corroborated by the fact that the share of the lowest 20 percent of households in income declined from 8.4 percent to 7.4 percent, while that of the highest 20 percent of households increased from 41.5 percent to 45 percent.

Table 2.12: Household Income Distribution (1970 – 1979)

Year	Household Gini Co-efficient	Household Income Shares			Ratio of Highest 20% to Lowest 20%	GDP Growth Rate	Poverty Head Count Ratio: Total
		Lowest 20%	Middle 60%	Highest 20%			
1970-71	0.33	8.40	50.10	41.50	4.90	1.05	
1971-72	0.35	7.90	49.10	43.00	5.40	2.08	
1979	0.37	7.40	47.60	45.00	6.10	6.91	30.68

Source: Pakistan Economic Survey 2000-01

Total exports increased manifold in the Seventies, rising from USD 420 million in 1970-71 to USD 2,365 million in 1979-80, registering an average annual rate of growth of 22.35

percent (Table 2.13)[25]. The growth trend in imports exhibited a similar pattern: on average, total imports grew at about 24 percent per annum, increasing from USD 757 million in 1970-71 to USD 4,740 million in 1979-80. As in the previous decade, the country faced a growing deficit in its trade balance during the Seventies.

Table 2.13: Exports, Imports and Trade Balance (1970 – 1979)

(USD million)

Year	Current Prices			Growth Rate (%)		
	Exports	Imports	Balance	Exports	Imports	Balance
1970-71	420	757	-337	24.26	9.71	-4.26
1971-72	591	638	-47	40.71	-15.72	-86.05
1972-73	817	797	20	38.24	24.92	-142.55
1973-74	1,026	1,362	-336	25.58	70.89	-1,780.00
1974-75	1,039	2,114	-1,075	1.27	55.21	219.94
1975-76	1,137	2,067	-930	9.43	-2.22	-13.49
1976-77	1,141	2,325	-1,184	0.35	12.48	27.31
1977-78	1,311	2,810	-1,499	14.90	20.86	26.60
1978-79	1,710	3,676	-1,966	30.43	30.82	31.15
1979-80	2,365	4,740	-2,375	38.30	28.94	20.80
Period Averages						
1970-71 to 1979-80	1,156	2,129	-973	22.35	23.59	-170.05
1970-71 to 1974-75	779	1,134	-355	26	29	-359
1975-76 to 1979-80	1,533	3,124	-1,591	19	18	18

Source: Government of Pakistan (1999b)

2.2.4. MILITARY REGIME (1977-1988)

The military again came to power in a coup in 1977, and the country subsequently remained under one leadership for eleven years. Growth during this period has been classified as phenomenal by some Zaidi (2005), and most promising; overall GDP averaging 7 percent per annum, while manufacturing sector's contribution to GDP grew at a very impressive 9.5 percent during the period 1977-88. This positive growth performance can likely be attributed to reversal of the anti-private sector bias in government policies and attempts made to restore confidence in the private sector. An industrial policy was formulated and executed during this time, and the private sector was once again given the lead in driving growth of the industrial sector, benefiting from tax holidays, preferential interest rates and easing of various economic controls, as well as fewer regulations on investment decisions. Just as the time of the early 1970s marked a significant reorientation of government policy, so too did the time of the late 1970s when the military came to power.

[25] The high growth in export earnings was due mainly to the global inflationary trends, and not to strong growth in export volume.

The consensus reached in the literature on the causes of growth in the period has focused on the coming online of several public investment projects initiated under the previous government's rule, the linkages it created with the rest of the economy, and the revival of confidence in the private sector investing in industry once again spurred by buoyant demand in the economy as a whole. There was a surge in remittances from the Gulf and illegal trade from the Afghan war which fed into increased domestic demand for goods and services[26]. However, there is debate about the after effects of this growth in terms of "cloaked inefficiencies" that lurked under the surface of the positive growth trend. According to a study by the Institute of Developing Economies, "growth occurred, not because of the specific incentives provided in the industrial policy of the government but in spite of it." Also the aim of the government policy was to give priority to technology-intensive and non-consumer goods manufactures, enhancing value added in manufacturing exports, and increasing efficiency in the manufacturing sector. The study concludes that the only achievement of the government was to lure the private sector back into industrial activity, and it was "fortuitous circumstances" which were responsible for the growth performance. According to Sayeed (1995), "the country squandered the windfall gains that it received as a result of favourable exogenous conditions".

Growth rate of the industrial sector worsened during this time, while the agricultural sector also witnessed a slow-down in performance. The increased role of the state and public sector in the economy was much in evidence during this time.

The military intervention in July 1977 came in the wake of strong public protests against the Bhutto regime for the alleged irregularities in the elections held in March 1977. Unlike the two previous Martial Law regimes, General Ziaul Haq did not abrogate the Constitution but suspended it, and the period of constitutional suspension continued until November 1988, when party-based general elections were held, four months after General Ziaul Haq died in a plane crash on August 17, 1988. The period from 1988 onwards witnessed the revival of democracy in Pakistan and the difficult transition to civilian rule. The Pakistan People's Party secured the largest number of parliamentary seats in the general elections, and consequently Ms.

[26] See Arif (1995), Zahid (2011)

Benazir Bhutto, the head of the PPP, became the Prime Minister of Pakistan. However, owing to a lack of clear majority in the National Assembly, the PPP government could not last long: only twenty months after coming into power the National Assembly was dissolved and the Prime Minister was removed from office by a Presidential Order on August 6, 1990.

The economic policies during the Eighties accorded high priority to the restoration of business confidence, which was considerably eroded in the previous decade due to the nationalization drive of the Bhutto regime. Besides denationalization of a number of public sector enterprises, the government provided a host of incentives to revive private investment. Moreover, the government initiated wide ranging structural reforms that aimed at liberalizing and deregulating the economy, and streamlining the investment licensing procedures. Though the initial response of the private sector to the reform package was lukewarm, by the mid-Eighties there was a upswing up in private investment: the share of the private sector in total investment increased from 41.39 percent in 1980-81 to 44 percent in 1989-90. Nevertheless, the total investment failed to rise.

The agricultural sector continued to play a dominant role in the economy, despite its declining share in the GDP. The major objective of the agricultural policy during the Eighties was to revamp the agricultural sector through liberalization of agricultural markets and production. In particular, the government deregulated the sugar, pesticide, and fertilizer industries, removed the monopoly power of the Rice and Cotton Export Corporations, and lifted the ban on the private sector's import of edible oil. These measures were complemented by an agricultural pricing policy that aimed at bringing prices of critical inputs such as pesticides and fertilizers more in line with the market determined prices. In addition, the agricultural sector benefited from a large increase in bank credit as the formal lending institutions, led by the Agricultural Development Bank, paid greater attention to tackle the problem of credit shortages in the rural sector. The major breakthrough during this period was the development of a new high-yielding variety of cotton, which led to a three-fold increase in cotton production in a span of six years.

However, despite these favourable developments, growth in the agricultural sector remained depressed owing largely to the industrialization bias in the overall economic policy. The degree of industrialization bias can be gauged by the fact that while industry enjoyed high rates of effective protection, agriculture continued to have negative protection. The problems of the agricultural sector were further compounded by numerous indirect taxes – especially export taxes on agricultural products – and budgetary cuts on vital public services such as agricultural research and extension and irrigation. It is not surprising, then, that most of the increases in agricultural production were due to the increased utilization of land, and not to the improved crop yields, with the exception of cotton.

On the macroeconomic front, the Eighties were characterized by widening fiscal deficits, which averaged 8 per cent as a proportion of GDP in the second half of the Eighties. The high budget deficit created an upward pressure on interest rates, which led to a crowding out of investment on the one hand and mounting debt servicing problems on the other. The budget deficit was largely financed by attracting private savings at higher than market interest rates (through the National Savings Schemes), and this helped avoid the problem of monetization of the deficit, thus mitigating the inflationary consequences of higher budget deficits (inflation averaged 7.6 percent in the Eighties, in contrast to 13.9 percent in the Seventies).

A major departure in economic policy from the previous decades was the adoption of a managed floating exchange rate system. The transition to the new system led to an adjustment in the rupee which boosted Pakistan's exports: on average, total exports grew at an impressive rate of 10 percent during the decade. Pakistan's export earnings were further helped by an upswing in world trade which contributed to rapid increases in exports of cotton, rice, carpets, and leather products. The inflow of foreign aid during the Eighties also increased substantially, not least because of the Russian invasion of Afghanistan in 1979 that prompted the international community to support Pakistan in its endeavours to promote regional security. The Eighties also witnessed a strong growth in the inflow of workers' remittances, averaging at about USD 3 billion per year for most of the decade.

Pakistan embarked on a program of economic reforms towards the fag end of the Eighties. A key area where the government introduced reforms was the financial sector, whose performance was marred by years of excessive regulation through administered interest rates and credit ceilings. Furthermore, the government's reliance on non-bank borrowing to finance the deficit had created differential interest rate structures in the economy that led to flight of deposits from the banking system. Recognizing the importance of financial reforms in the process of economic growth, a series of measures were adopted with a view to removing various distortions in the financial system, minimizing government's interference in the banking system, and strengthening the prudential regulations. The government also allowed a freer flow of private foreign capital and permitted the opening of foreign currency accounts.

Economic growth averaged 6.12 percent per annum during the Eighties, matching the high growth performance of the Sixties (Table 2.14). The commodity producing sectors grew at an average annual rate of 7.33 percent, whereas the services sector exhibited an average growth of 6.60 percent. The manufacturing sector showed a healthy performance during most of the decade with an average annual rate of growth of 8.21 percent. The performance of the agricultural sector improved somewhat as compared with the Seventies but growth in this sector remained rather weak averaging 4.10 percent during the Eighties. Economic growth slowed down markedly during the second half of the decade owing largely to the slow pace of growth in the manufacturing sector: growth in GDP averaged 5.60 percent in the second half, down from 6.65 percent in the first half.

Table 2.14: GDP and Sectoral Growth Rates (1980 – 1989)

(%)

Year	Sector				GDP (FC)	Per Capita Income (PKR)
	Commodity Producing	Agricul-ture	Manufact-uring	Services		
1980-81	6.12	3.93	10.63	6.31	6.21	1.48
1981-82	7.27	4.72	13.75	7.90	7.56	3.78
1982-83	4.64	4.40	7.03	9.24	6.79	6.42
1983-84	0.38	-4.82	7.89	7.90	3.97	0.06
1984-85	9.48	10.92	8.09	7.92	8.71	3.79
1985-86	6.94	5.95	7.55	5.77	6.36	3.32
1986-87	5.76	3.25	7.53	5.86	5.81	0.94
1987-88	6.12	2.73	9.98	6.77	6.44	0.44
1988-89	5.77	6.87	3.96	3.81	4.81	0.93
1989-90	4.69	3.03	5.72	4.48	4.59	1.81
Period Averages						
1980s	5.72	4.10	8.21	6.60	6.12	2.30
1980-81 to 1984-85	5.58	3.83	9.48	7.85	6.65	3.10
1985-86 to 1989-90	5.86	4.37	6.95	5.34	5.60	1.49

Source: Government of Pakistan (1999a)

While the share of the agricultural sector in GDP peaked at 30.83 percent in 1980-81, it declined to 25.83 percent in 1989-90, averaging at 27.62 percent during the decade (Table 2.15). The manufacturing sector accounted for an increasing share in GDP: its share stood at 17.59 percent in 1989-90, up from 15.11 percent in 1980-81. There was a slight shift in the relative importance of commodity producing sectors and the services sector: whereas the share of commodity producing sectors declined from 53 percent in 1980-81 to 50.85 percent in 1989-90, the share of the services sector edged up from 46.57 percent to 48.62 percent during the same period.

Table 2.15: Sectoral Shares in GDP (1980 – 1989)

(%)

Years	Sector			
	Commodity Producing	Agriculture	Manufacturing	Services
1980-81	53.43	30.83	15.11	46.57
1981-82	53.28	30.01	15.98	46.72
1982-83	52.21	29.34	16.02	47.79
1983-84	50.41	26.86	16.62	49.59
1984-85	50.76	27.41	16.52	49.24
1985-86	51.04	27.30	16.71	48.96
1986-87	51.01	26.64	16.98	48.99
1987-88	50.86	25.71	17.55	49.14
1988-89	51.33	26.22	17.40	48.67
1989-90	51.38	25.83	17.59	48.62
Period Averages				
1980s	51.57	27.62	16.65	48.43
1980-81 to 1984-85	52.02	28.89	16.05	47.98
1985-86 to 1989-90	51.13	26.34	17.25	48.87

Source: Government of Pakistan (1999a)

Growth in total investment exceeded 5 percent in the Eighties (Table 2.16). While investment grew at an accelerated pace in the first half, at 7.78 percent, it slowed down in the second half to 3.39 percent mainly because of a sharp fall in the growth of public investment. Private investment registered a healthy rate of growth of over 6 percent. Private investment in the agricultural and manufacturing sectors grew respectively at 6.39 percent and 11.39 percent.

In contrast to the rising income inequalities in the previous decade, there was a slight improvement in the distribution of income in the Eighties, as indicated by the fact that the Gini coefficient fell from 0.37 in 1984-85 to 0.35 in 1987-88 (Table 2.17). The share of the lowest 20 percent of households in income edged up from 7.3 percent to 8.0 percent, while that of the highest 20 percent of households declined from 45 percent to 43.7 percent.

The incidence of poverty also declined sharply during the Eighties: the percentage of total population falling below the poverty line was 17.32 percent in 1987-88, down from 24.57 percent in 1984-85.

Table 2.16: Total Investment and Share in GDP (1980 – 1989)

(%)

Year	Growth Rates				Share in Total Investment	
	Public Investment	Private Investment			Public	Private
		Total	Manufacturing	Agriculture		
1980-81	-	-	-	-	49.99	41.39
1981-82	14.45	4.00	9.64	2.40	50.06	37.67
1982-83	8.85	11.19	20.65	18.54	51.26	39.40
1983-84	1.41	9.93	16.85	17.32	49.61	41.33
1984-85	9.13	11.62	21.30	7.55	49.15	41.88
1985-86	6.04	3.23	9.09	-7.31	49.96	41.44
1986-87	8.85	-0.68	-14.54	5.62	52.19	39.51
1987-88	-4.49	2.77	-1.26	-2.36	49.87	40.61
1988-89	6.14	8.94	22.85	2.33	49.86	41.68
1989-90	0.26	10.97	17.94	13.39	47.56	44.00
Period Averages						
1980s	5.63	6.89	11.39	6.39	49.95	40.89
1980-81 to 1984-85	8.46	9.19	17.11	11.45	50.02	40.33
1985-86 to 1989-90	3.36	5.05	6.82	2.33	49.89	41.45

Source: Government of Pakistan (1999a),
Government of Pakistan, various years

Table 2.17: Household Income Distribution (1980 – 1989)

Year	Household Gini Co-efficient	Household Income Shares			Ratio of Highest 20% to Lowest 20%	GDP Growth Rate	Poverty Head Count
		Lowest 20%	Middle 60%	Highest 20%			
1984-85	0.37	7.30	47.70	45.00	6.16	8.71	24.57
1985-86	0.36	7.60	48.40	44.00	5.79	6.36	-
1986-87	0.35	7.90	18.50	43.60	5.52	5.81	-
1987-88	0.35	8.00	48.30	43.70	5.46	6.44	17.32

Source: Government of Pakistan (2000),
Authors own calculations

Pakistan's exports increased from USD 2,958 million in 1980-81 to USD 4,954 in 1989-90, exhibiting an average annual growth rate of 8.55 percent (Table 2.18). As compared to the sluggish export growth (2.09 percent) in the first half of the decade, there was a marked improvement in the export performance in the second half when exports grew at an impressive rate of over 15 percent. Growth in total imports averaged 4.17 percent during the period. Despite healthy growth in exports, Pakistan faced a persistent deficit in the trade balance.

Table 2.18: Exports, Imports and Trade Balance (1980 – 1989)

(USD Million)

Year	Current Prices			Growth Rate (%)		
	Exports	Imports	Balance	Exports	Imports	Balance
1980-81	2,958	5,409	-2451	25.07	14.11	3.20
1981-82	2,464	5,622	-3158	-16.70	3.94	28.85
1982-83	2,694	5,357	-2663	9.33	-4.71	-15.67
1983-84	2,768	5,685	-2917	2.75	6.12	9.54
1984-85	2,491	5,906	-3415	-10.01	3.89	17.07
1985-86	3,070	5,634	-2564	23.24	-4.61	-24.92
1986-87	3,686	5,380	-1694	20.07	-4.51	-33.93
1987-88	4,455	6,391	-1936	20.86	18.79	14.29
1988-89	4,661	7,034	-2373	4.62	10.06	22.57
1989-90	4,954	6,935	-1981	6.29	-1.41	-16.52
Period Averages						
1980s	3,420	5,935	-2,515	8.55	4.17	0.45
1980-81 to 1984-85	2,675	5,596	-2,921	2.09	4.67	8.60
1985-86 to 1989-90	4,165	6,275	-2,110	15.02	3.67	-7.70

Source: Government of Pakistan (1999b)

Table 2.19 below provides a snapshot of decade-wise key economic policy and political changes that took place in Pakistan's history since the time of independence. The frequent changes in political leadership, not to mention reversals in economic policies are evident in the details given. The private sector was promoted in the early years, but the decision was reversed in the 1970s when the state was unable to effectively regulate economic activity and disparities between income groups reached unmanageable proportions. Inefficiencies in the state machinery led to a later reversal of this policy in 1990s and brought the private sector to the front again. While in the short term such decisions ensure sustainability of the political regime, in the longer term, developments such as these create uncertainty in the economic environment and clearly undermine the ability of the state to direct industrialization efforts by creating mistrust between the state and the private sector.

Table 2.19: Decade-wise Summary of Political Developments and Economic Policies

	Decade		
	50s	**60s**	**70s**
Political Framework	• Assassination of PM Liaquat Ali Khan • Frequent shifts in leadership: 6 PMs and 3 Governor Generals held office between 1951-58 • Martial Law imposed in 1958, and 1956 Constitution abrogated	Launching of "Basic Democracy Program" Provisions made in constitutions which led to Presidential rule	• Fall of Ayub regime and military backed takeover by Gen. Yahya Khan • General Election in 1970 • Secession of East Pakistan wing in 1971 • New constitution promulgated in 1973 • Military backed takeover by Gen. Zia in 1977
Economic Policies	• Policies geared towards protection of industry to encourage growth • Neglect of agricultural sector • Devaluation of Pakistani Rupee in 1955 • Excessive reliance by government on economic controls	• Strict price & profit controls - dismantled later • Heavy punishments for hoarding, black marketing, & smuggling • Bias towards promoting industrial growth • Maintenance of over-valued exchange rate • Prices of agricultural inputs below world market prices • Imports controls and tariffs • Tax concessions • Agricultural policy aimed at self-sufficiency in food • Loans at low interest rate • Land reforms • Export Bonus Scheme (EBS)	• Nationalization of large private manufacturing and financial institutions • Pro-Industrial bias • Devaluation of Pakistani Rupee in 1972 • Land reforms in 1972 • Shortage of imported farm inputs • Liberalization of trade –simplification of import system • Socialist oriented reforms during Bhutto regime

(contd. on next page)

(...decade-wise summary contd.)

	Decade	
	80s	**90s and later**[27]
Political Framework	• Public protests and unrest leading to military intervention in 1977 • Party-based elections in 1988 and a revival of democracy • Death of Gen. Zia in 1988 • PPP in power 1988 – 1990	• Dismissal of 4 elected governments in roughly eight and a half years • Removal of Nawaz regime by military coup in October 1999
Economic Policies	• Structural reforms to liberalize and deregulate the economy • Emergence of a more vibrant small-scale industrial sector • Liberalization of agricultural markets and production • Lifting of ban on numerous import items • Reform of price support system • A large increase in bank credit to farmers led by the Agricultural Development Bank • Numerous indirect taxes on agriculture • Switch over to managed float system of exchange rate • Financial sector reforms • High priority to restoration of business confidence, denationalization of a number of public sector enterprises • A host of incentives to revive private investment	• Continuation of "Structural Adjustment & Stabilization Program" adopted in 1988 • Major changes in industrial and trade policies in the form of deregulation, privatization, & trade liberalization • Privatization program launched • Agricultural policies aimed at bringing input & output prices closer to their international levels • Reformation of tariff structure • Encouragement of export-led growth

Source: Kemal, Din & Qadir (2002)

[27] For details see Ziring (1997)

2.3. CONCLUSION

Political settlements represent the distribution of power across economic, political and bureaucratic organizations in society (Khan (1995), Khan (2010), and Khan (2013a)), power which evolves over time. Such distributions are important in the context of policies aimed at learning because they determine the capability of organizations to affect allocation of various rents. Thus the actual outcome of a policy may be significantly different from the intended outcome due to rent allocation and its subsequent evaluation and enforcement that could not be enforced given the political settlement prevailing at the time. This chapter has provided an overview of developments in political settlements in Pakistan that are linked to changes in the policy framework and economic performance of the country. The evolution of political settlements will shed light on the experience of manufacturing firms in Pakistan's automotive industry that will be explored in the chapters that follow.

The early period of Pakistan's history was marked by an absence of a viable entrepreneurial class that meant the state had to step in and start the industrialization process before handing over newly created industries in key sectors to potential industrialists. Later, these industrialization efforts were given more structure and the state offered a number of rents, including subsidies, preferential access to markets, easy access to credit, and tariffs designed to encourage domestic production of products (Pakistan's "deletion program"[28]). On the political front there was considerable upheaval and unrest with frequent changes in leadership, and attempts to solidify and sustain themselves by assuring continued access to rents in exchange for support. For instance Ayub Khan started the system of basic democracies to gain support for his martial rule, while Zia-ul-Haq promoted religion and religious parties to rally support for his regime from the marginalized religious parties. In each case, the incumbent leadership gave rise to new or supported previously marginalized groups in order to guarantee support and sustainability. However, once established, these new groups established links within the existing political settlements and emerged with their own agenda and direction. This

[28] The deletion program refers to a programme of phased indigenization of production; components or products that manufactured locally are removed (deleted) from the list of components that enjoy concessionary duty rates.

development further fractured the existing political settlements in the country and compromised the ability of the state to effectively monitor and enforce policies designed to influence and direct economic activity.

The political settlement in each military period discussed earlier (Sections 2.2.2. and 2.2.4.) may be characterized as a clientelist political settlement with vulnerable authoritarian coalition (as explained by Khan (2010)) where stability is threatened by strong excluded factions, while the state has strong implementation capabilities while being weakly in favour economic growth and development. The democratic rule during the interim period on the other hand can be characterized as a clientelist political settlement with a weak dominant party where there is increased fragmentation, especially at the lower levels and excluded factions gained more power to disrupt growth and development efforts, as seen by the frequent shifts in power between political parties.

This is in contrast to the case of other countries, such as South Korea, where the state supported the local *chaebols* but also managed to exert sufficient control over their operations to effectively direct development of industrial activity. Firms in South Korea were faced with the credible threat of closure if performance was below expectation and provided the incentive to develop capabilities for achieving competitiveness. In South Asia, India was able to compel a foreign manufacturer, Suzuki, to upgrade the capabilities of domestic component manufacturers by threatening to open access to the protected domestic market to other firms if targets were not met. This threat was credible and worked as Suzuki did not have any deep connections within the political settlement prevailing at the time. In the case of Pakistan, automotive manufacturers have sufficient holding power to withstand changes in state policy that would impact their profits, as evidenced by the failure of the state to impose penalties on automobile manufacturers for failing to meet indigenization targets.

CHAPTER 3. TECHNOLOGY ACQUISITION, CATCHING UP INDUSTRIALIZATION AND RENTS

3.1. INTRODUCTION

Endowments of capital and skilled labour are insufficient to explain the significant differences in manufacturing productivity between advanced and developing countries. If these were the only differences between them convergence could be expected as developing countries should be able to build up their stocks of capital and skilled labour through appropriate investments over time. The work of Amsden (1989), Lall (1992), Lall (1998), Lall (2000) and others has established that a fundamental difference between countries is the level of technical and organizational capabilities embedded in firms and other organizations. Differences in technical and organizational capabilities mean that developing countries using the same machinery and labour with the same or comparable formal education as in more advanced countries achieve significantly lower productivity and are not able to achieve competitiveness.

Productive processes have undergone a transformation in recent years, with global value chains, clusters and tiered supply networks coming to the front. Technological capabilities (in a nutshell the competence and skills of labour), pro-active work ethics (discipline and willingness to train and learn), industrial cluster development, institutional and infrastructure support and organizational capabilities of management are some of the factors and capabilities that are found to be lacking or underdeveloped in developing countries. Lall (2004) and others have suggested that such a deficiency erodes their competitiveness. We have established the link between competitiveness and catching-up in Chapter 1, a link which suggests that the development of an economy's industrial base can be adversely affected if technological capabilities are underdeveloped, or otherwise lacking, resulting in a vicious cycle of low profitability, low investment and low levels of learning-by-doing that sustain these low capabilities. In contrast the dynamism of high capability countries enables these economies to operate at the frontier of the global production function; and to finance and conduct resource intensive research and development (R

& D) to innovate and keep pushing the frontier even further outwards while reaping the rewards of being first-movers in various product markets.

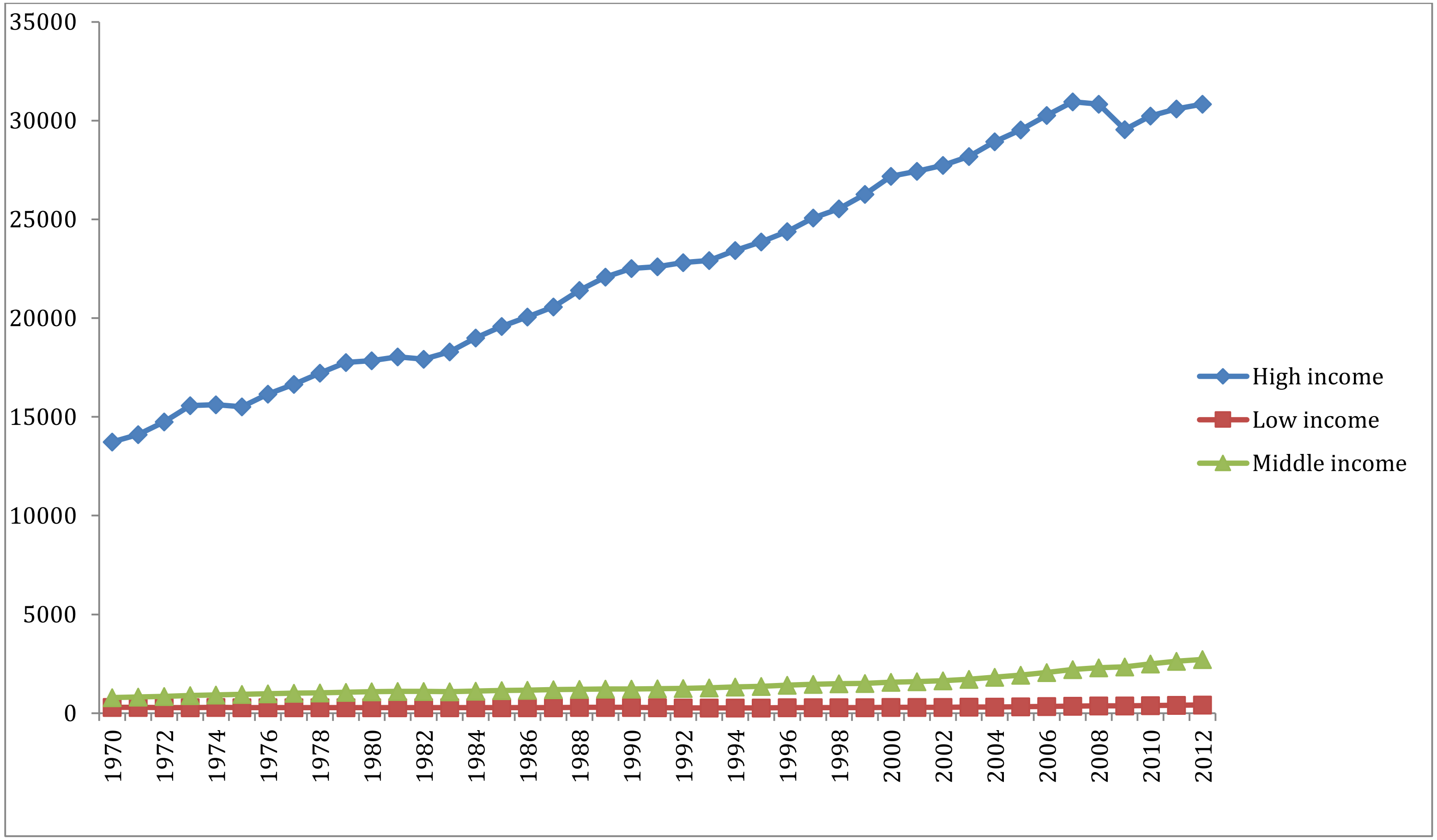
Against this backdrop, and in the context of the global economy as it stands today, the pertinent questions then are how developing countries can accelerate their industrialization and development process enough to catch up with, and possibly even overtake developed countries on the development highway. What roles do competitiveness and the acquisition of technology play in the catching up process of developing countries and what channels are available to facilitate this process in the presence of market and state failures common to developing countries, and given the foreign ownership of some important segments of technology? This chapter will link together the theoretical considerations of technology acquisition with the catching up model of industrialization and the competitiveness of firms in late developing countries in Section 3.2. The role played by the state in allocating and managing rents to overcome market failures plaguing acquisition of technology efforts in these countries will then be incorporated into the discussion in Section 3.3, while Section 3.4 will shed light on the implications of political settlements on technology acquisition efforts. Given the difficulties surrounding the measurement and comparison of capabilities across countries, the organizational capability model proposed by Khan (2013b) and Khan (2013a) is introduced in Section 3.5, which will allow for an assessment of firm-level competitiveness that represents the capabilities of a firm.

3.2. TECHNOLOGY ACQUISITION

3.2.1. COMPETITIVENESS AND CATCHING UP

Developing countries have in general found it a challenge to converge towards the growth trajectory of developed countries and thereby narrow the gap with their standards of living, despite having vast untapped pools of sufficiently educated labour and low wage costs. Figure 3.1 gives a concise visual representation of the growing gap between developed and developing countries, as represented by the high income countries on the one hand and middle and low income countries on the other hand. Though a number of developing countries have managed to converge with developed countries (as evidenced by the growth experience of the East Asian Tigers and China)

Figure 3.1: GDP Per Capita Trends by Income Group

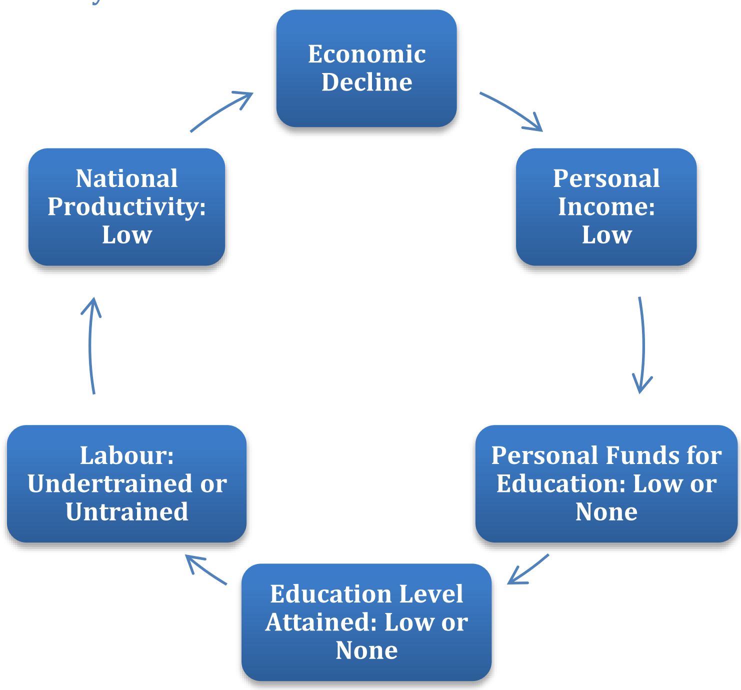


Source: World Bank (2014)

all developing countries have not shared in this success. The success of some countries in catching up was initially attributed to their openness and liberalization allowing resource allocation by the free market; but many other studies have shown that the role of the state was also critical in overcoming market failures that would have otherwise constrained their development.

Developmentalist theories of economic development came to the front after Marshall Plan was enacted for European economic recovery at the end of World War II. These theories were based on the premise that developing countries were trapped in a vicious cycle of economic decline (as shown in Figure 3.2) – a self-sustaining set of factors that hamper development unless interrupted by external stimulus/intervention. The emphasis was less on economic growth theory (such as the Solow growth model) and more on historical and practical approaches to the big concern of how to develop, though the approaches differed in their areas of emphasis.

Figure 3.2: Vicious Cycle of Economic Decline



Source: Author

The preferred approach to rapidly develop is to industrialize, which will raise the level of income and this increased prosperity will spill over through forward and backward linkages into other sectors of the economy. The ideal case envisaged a competitive market and an efficient state working in tandem to achieve the best results. In contrast to the classical models, competitive and free markets are the means to achieving the goal of development and not an end in itself, while the role of the state is to stabilize the economy.

The Big Push Model first proposed by Rosenstein-Rodan (1943), and subsequently developed and expanded on by Nurkse (1953), Scitovsky (1954), and Fleming (1955), dealt with harnessing the hidden potential in developing countries to achieve development through large scale industrialization and investment in infrastructure development. A concerted and coordinated investment effort is required in a number of areas of the economy that will result in an accelerated rate of capital accumulation and translate into pushing the economy out of a low level equilibrium. However, due to information asymmetries and appropriation externalities that result in market failures, the state is required to provide the Big Push. Though a relatively simple proposition at first glance, financing industrial efforts solely from domestic sources entails a curtailment of domestic consumption and reduced welfare in the short run till the investment yields a payoff. Moreover, developing countries tend to lack the financing and technical expertise and know-how to effectively implement such an endeavour. Rodan instead proposed industrializing with foreign or external assistance rather than relying only on internal sources.

Ragnar Nurkse's Theory of Balanced Growth[29] centered on the premise that the small size of the domestic market limited the development prospects of developing countries; industrialization can therefore only be achieved if the amount of investment utilized in numerous industries is increased many fold. Small incremental increases in investment in specific industries will not have the desired effect on the development trajectory of the whole economy. The key for the development process in developing countries is to invest in as wide a range of industries as possible with large infusion of new technology and physical capital, and new production processes in such industries. The large increase in supply would create its own demand and allow further expansion of demand by other firms and workers. Since prices for traditional exports of developing countries; primary products were observed by Nurkse to be relatively low, exports could not be counted on to provide the impetus

[29] For details, see Nurkse (1953)

for domestic industrialization. The desired stimulus could be achieved by forced savings through increased taxes on high income individuals and allocation of the investment funds to promising industries by the state.

Hirschman's Unbalanced Growth Theory (as detailed in Hirschman (1958)) attempted to address the shortcomings of the Big Push and Balanced Growth Models. Rapid industrialization could be achieved through large scale capital formation in selected industries and sectors. Unbalancing the economy in this way would create excess capacity in the selected industries and shortages in other areas, causing subsequent reactions to correct the imbalance which would accelerate the development process by presenting new entrepreneurs with unique opportunities to profit. The key to this theory is the presence of strong backward and forward linkages between the different industries and sectors of the economy and changing the social organization of the labour. Labour would be forced to become more efficient and responsible rather than lax, to keep pace with the advanced capital intensive production process being used and over time these would be passed along to the rest of society and lead to further increases in productivity.

Despite the shortcoming of not incorporating the role of institutions, and assuming adequate capabilities of the state and no market failures, by favouring a historical and more empirical based approach, these early models did open the debate to more relevant models of development for the developing countries.

Models of development that have been proposed (see Section 3.2.1 for details of various Big Push models) rely on industrialization to break the cycle of poverty and achieve self-sustaining economic growth. The structural change that takes place at the macro level is in the shifting of resources from the agricultural sector to the industrial sector. Kuznets (1971) believed that there is a bidirectional causality between economic growth and structural change and in fact economic growth would cause a structural shift from manufacturing or industrial activity to services. At the micro level, industrialization is expected to cause a structural shift from simple, low value added products towards more complex high value added products as the industry grows and matures. This structural change also drives inter-industry change as the economy transitions towards producing more high value added industries. This transition from simple production to high value added mass production is expected to result in increased efficiency, as well as domestic and international competitiveness.

Traditional Heckscher-Ohlin models of trade[30] based on comparative advantage theory assume identical technology across countries, but since then there has been a realization since that this assumption does not hold true for late developers. Several new models have been introduced to explain the trade and country specializations in manufactured products, including the technology gap model by Posner (1961) and the product life cycle model of Vernon (1966). Posner (1961) suggested that trade and industrial development is the result of technical change and there is a time lag associated with the diffusion of new technology to the rest of the world. According to the product life cycle theory of Hirsch (1965) and Vernon (1966), the life of a product has 5 distinct stages; Introduction, Growth, Maturity, Saturation and Decline. In the present context, the speed of diffusion of technology is fairly rapid, even in late developers, as a result of the spread of information technology. Moreover, it has been observed that developed countries exit the product market in the third stage with a transition to another product, usually higher value added and more technologically advanced, while late developers enter these mature markets by learning to use existing technologies with cheaper labour.

In contrast to the widespread use of technical and organizational capabilities in developed countries for innovation, late developers have more limited capabilities that constrain them from achieving high levels of competitiveness in even relatively simple technologies. Late developers can benefit from capturing previously untapped segments of the market based on their ability to produce with a lower cost of labour inputs and to rapidly adapt to changing consumer preferences. Acquisition of this know-how or tacit knowledge is a necessary step towards gaining the capability and proficiency to compete effectively with other developing countries as well as their counterparts in the developed world.

To achieve this goal requires a level of domestic organizational and technological capabilities that late developers lack and must take concerted efforts to acquire and

[30] Originally by Heckscher (1919) and Ohlin (1933) and developed further by other researchers subsequently

develop. Economic history has shown that technological capability can be developed in one of two ways (broadly speaking) in late developer nations, given certain constraints, as spelled out in Chapter 1. To recap, late developers lack the capabilities required to efficiently operate technology and have recourse to two different approaches, foreign MNC-led or domestic industry led, to acquiring the technology and capabilities they require. Under the MNC led approach, the focus is on achieving export ready production as quickly as possible without relying on domestic indigenous technological capabilities. This is accomplished by grafting MNC production technology and techniques on the domestic industry. What is noteworthy about this approach is that production operations do not rely on or even foresee cultivating and seeing significant development of domestic capabilities to ensure exports. The domestic industry led approach favours acquiring the technology needed, learning from it and improving on it where needed to develop domestic organizational and technological capabilities to compete effectively. These capabilities will be developed from the ground up, by learning-by-doing. Thus a base will be built up from which further advancements and improvements can be developed without relying on external sources.

The real difference between the two approaches is that foreign companies will bring in more advanced technologies that require many advanced inputs and sophisticated management and organizational capabilities. The likely outcome is assembly operations and limited backward linkages into the domestic economy. If national companies engage in learning they will begin with simpler technologies but a broader range of organizational capabilities may be acquired because domestic management will have to learn all levels of management and manage backward and forward linkages in the domestic market to a greater extent. This is not always the case, but is a plausible distinction.

Given these dissimilar approaches, late developers have had mixed experiences in their efforts to acquire technological and organizational capabilities and catch up with the more advanced countries. While it is unlikely that foreign MNCs will bring in the latest cutting edge technology into a developing country, the level of technology being brought in will likely be higher than the domestic level available since the recipient country will either lack the technology entirely or possess only a dated version. The new technology will require advanced inputs and complex management and organizational capabilities (such as Just-In-Time supply chains) that will be absent or underdeveloped in the recipient country. This gap in technology levels will translate into limited backward linkages with the rest of the domestic economy since inputs will need to be imported for assembly operations.

If domestic firms are encouraged to begin learning at a lower levels of technology they can focus their efforts on learning and developing a broader range of organizational and technical capabilities that will allow them to effectively assimilate more complex technologies at a later stage. Firm level managers will also acquire the knowledge and experience they need to manage and develop backward and forward linkages with the domestic economy. The contrasting experiences of automotive industries in Pakistan and India are examples of these differing approaches to technology acquisition. The state in Pakistan attempted to guide the development of the sector after it was set up, but it was unable to effectively manage the learning rents required for developing local technological capabilities and shifted focus to liberalizing the economy and inviting foreign firms. The expectation was that the new entrants would develop the organizational capabilities required in their local plants on their own. On the other hand, the state in India took a more hands-on approach to development of the domestic industry by first restricting access to allow domestic firms to engage in learning-by-doing without immediate international competition, and then slowly opening up the market to foreign production. Conditions were imposed in the second stage on technology transfer to and developing the organizational capabilities of domestic Tier 1 and 2 component producers (Khan (2013b) and Khan (2013a)). The large rents offered to the foreign investors (beginning with Suzuki) together with credible and enforceable conditions resulted in the rapid development of domestic technological and organizational capabilities in the industry and its supply network.[31]

[31] Interestingly enough, developed countries have also embarked on programmes to develop their domestic capabilities from time to time. One such instance is the Advanced Technology Vehicle Manufacturing (ATVM) loan program of the US Department of Energy (http://lpo.energy.gov/programs/atvm/) that is geared towards developing indigenous production of "Advanced Technology Vehicles" (currently focused on electric and hybrid vehicles) and imposes conditionalities on sourcing of production in exchange for a loan.

3.2.2. CONCEPT OF TECHNOLOGICAL AND ORGANIZATIONAL CAPABILITIES

It has been established in the preceding discussion that there have been significant cross-country variations in economic growth rates between groups of countries, and this has been the subject of much discussion in the literature. Numerous explanations have been proposed to account for this difference, but their applicability to the experience of all developing countries is uncertain, especially when one considers the experience of the East Asian countries and China.

Alternative explanations of failed technology acquisition and economic growth in Pakistan have hinged on corruption or on weak governance. The common misconception is that high levels of corruption lead to weak development and growth performance in countries. In actuality, countries have managed to develop and exhibit strong growth despite significant levels of corruption. Wade (1990) argued that Taiwan had strong growth despite a corrupt public sector, while Khan (1996) observed that substantial corruption by state officials was found in South Korea and the country still exhibited strong growth. Therefore, the presence of high growth does not indicate lack of corruption, and high levels of corruption do not necessarily imply low growth rates in developing countries. Furthermore, conventional models based on corruption fail to take into account the political context is unaccounted for not explicitly analysed. Khan (1996) showed that political settlements (and in particular the distribution of power between state and agents) are an important consideration when analysing the effects of corruption. Thus, presence of corruption is only part of the explanation of failed technology acquisition and growth efforts. Explanations of governance failures also suffer from the same shortcomings in terms of historical evidence showing that high growth economies had the appropriate governance capabilities to manage accelerated learning and technology acquisition efforts, but scored low on overall governance indicators.

Traditional explanations of failure of technology acquisition in Pakistan have also identified lack of physical infrastructure and low investment in education as two reasons. While no doubt important to some degree, these explanations are flawed in the sense that the resources required to provide adequate infrastructure are only possible with sustained economic growth, leading to a chicken and egg problem as indicated by Khan (2009). However, while infrastructure provision does affect productivity and competitiveness at the macro level, the constraint does not necessarily apply at the micro level. Individual firms in developing countries, as will be evident from the case studies that follow in Chapters 6 and 7, adapt to the lack of infrastructure and invest in independent provision of utilities such power and transport to maintain their competitiveness.

The development experience of numerous countries over the years has pointed to one notion, that for developing countries to converge towards advanced, developed countries, they need to transform their societies from agrarian to industrial/manufacturing economies and for domestic firms and industries to achieve competitiveness in global markets. This competitiveness can only be achieved if developing countries (and domestic firms) succeed in acquiring the requisite technological and organizational capabilities to produce goods in ways that achieve the global price and quality for the product they are attempting to break into.

To understand what is meant by technological and organizational capabilities and the implications for competitiveness and the catching up process of developing countries, we need to look at the origins of the terms. The theoretical underpinnings for the concept of technological and organizational capabilities lies in the analysis of the nature of a firm, where the firm is considered to be a cluster of inputs with specific characteristics that are organized in a particular fashion to provide a variety of productive services (see Coase (1937), Penrose (1959) and Andreoni (2011)). Moreover, the growth of the firm is contingent on the ability of the entrepreneur to capitalize on productive opportunities that result from conceptualizing consumer wants and needs (Penrose (1959) as quoted in Andreoni (2011)). Richardson (1972) first introduced the concept of capabilities in economics as the "appropriate knowledge, experience and skills" required by the firm to provide productive services focusing on successfully conceptualizing and bringing a product to market. Thus capabilities are essential to the survival and even growth of a typical firm, and as such their development is the key to improving the competitiveness of firms, the industry and even the country at large.

To produce a product requires knowledge which first and foremost must be gained, mastered and then applied by the firm. The creation of knowledge is a resource-intensive process involving innovative activity that countries within the global production frontier may be hard pressed to achieve given their limited resources and capabilities. Technology is the knowledge regarding productive operations that is used in the production of goods Rosenberg & Firschtak (1985), and as opposed to the creation of knowledge, the acquisition of technology from more advanced countries is an activity that is more affordable for developing countries. There are four variants of knowledge relevant for a knowledge-based economy; know-what, know-why, know-how and know-who (OECD (1996)). This categorization was developed for the OECD and developed countries, but it is possible to apply this categorization to late developers as well. Know-what and know-why can be classified as largely codified knowledge that is close to being a market commodity that can be measured and purchased in the market. Lundvall & Johnson (1994) viewed know-how and know-as referring to knowledge and skills about the organization of production and of experts that can be classified as tacit knowledge, which is difficult to measure and exchange. More precisely, know-what are the facts or information that can be easily codified and transmitted or exchanged, while know-why is the scientific information and R & D upon which technological change and new products and processes are based. The skills required to complete a task is the know-how, while the intricacies to manage and tap expertise of individuals falls under know-who. Codified knowledge (know-what and know-why) represented by manuals, publications and the like are just as important as tacit knowledge (know-how and know-who) that are more closely associated with learning-by-doing and learning-by-using.

The question is how do firms gain access to these different types of knowledge and use it to increase their competitiveness. Gaining mastery over the different forms of knowledge requires learning in a variety of forms. In the early conceptualization of capabilities by Richardson, it is evident that the focus is on capabilities involving know-how, which has been identified as being distinct from the know-what and know-why in a knowledge-based economy. Various researchers have characterized the acquisition of knowledge, especially know-how, as a learning process or learning-by-doing (Arrow (1962) and Andreoni (2010)) that is accumulated slowly over a period of time and involves a great deal of experimentation, trial and error and personal experience. Thus, it is a continuous learning process of accumulating the information related to what works and what does not, in organizing the production process and actually producing the product. On the other hand, know-what and know-why, the codified forms of knowledge are gained through formal education, while know-how is learned from an individual with greater mastery of a task (for example when an apprentice interns with a master of the trade) or through a process of trial and error, but typically involving both. Finally, know-who is the knowledge gained at the organizational level from interactions and relationship building with customers, suppliers and institutions with links to the productive process, and like know-how is not easily transferred in a codified manner, and should be considered as tacit in nature.

Firm level efforts to acquire capabilities for competitiveness are bound to lead to a degree of specialization within the firm since firms concentrate on acquiring only the "appropriate" knowledge and capabilities they need to bring the selected product to the market. As Andreoni (2011) has pointed out, this implies greater degree of specialization and division of labour in the operations of the firm. It can thus be inferred that as firms in developing countries, and by extension the countries themselves acquire more capabilities they will exhibit signs of division of labour and increased specialization leading to movements up the value chain that correspond with their capabilities development.

In attempting to account for the factors responsible for the better growth performance and the greater ability of the East Asian countries to catch up with the developed countries, Abramovitz (1986) observed that the potential for catch-up is contingent upon the following three factors:

(i) Channels of diffusion of know-how and knowledge in the economy
(ii) Conditions affecting structural change in the economy
(iii) Conditions affecting investment levels and effective demand in the economy.

Each of these factors relates to the diffusion of knowledge and information relating to the technology acquired, conditions prevalent in the domestic economy, and as such are considered to be focusing on diffusion capabilities of disseminating the knowledge within the economy and not technological or organizational capabilities at the firm level.

Ohkawa & Rosovsky (1973) and later Abramovitz (1986) refer to the characteristics and even deficiencies that account for a country's ability to achieve high productivity as “social capability”. The concept of social capability is a complex one to quantify and measure, but in a nutshell it refers to the experience of organizing and managing an enterprise, as well as the institutions to mobilize resources for firms. Improving social capabilities lowers the constraints on the successful assimilation of technology. However, the social capability of an economy will depend not just on the level of education, and the organizational experience of labour, but also on the role of vested interests, historically determined positions, inter-firm and labour market relations as well. Olson (1982) researched the catching up paradigm and suggested that a catastrophic event (usually negative), such as war and attendant upheavals may usher in new infrastructure and abilities and a new era of technological progress and growth. This relates to Schumpeter’s view of innovation as creative destruction driving technological change and hence growth.

Later the evolutionary view of the firm by Nelson & Winter (1982) which focused on path dependency led to the formulation of technological capability as routines, routinized patterns of behaviour which in turn are products of organizational learning and knowledge. According to Teece & Pisano (1994), organizational learning here is considered as a social and collective phenomenon that is cumulative and path dependent in nature and involves learning through problem solving.

The focus on science and technology led to the formulation of the concept in terms of the ability to drive technological change in developing countries. The stock of knowledge required to generate productive capacity and was taken to be comprised of three distinct elements (i) embodied/disembodied, (ii) codified/tacit and (iii) generated/diffused (see Bell & Pavitt (1997) and Lall (1990)).

There is no clear definition and description of technological and organizational capabilities in the literature; no one universal definition is accepted in the literature, the definition depends on the context, and according to Andreoni (2011) the reason for this is simply that technological capabilities are mostly industry specific, not to mention product and process specific. While it is true that a very basic level, one could argue that capabilities are generic or global and static in nature, but then, their development is a simple matter that seldom calls for intervention or pro-active actions.

3.2.3. MEASURES OF CAPABILITIES

Various attempts have been made, and a number of synthetic measures of technological capabilities constructed keeping in mind the characteristics highlighted above. Commonly used measures include the World Economic Forum (WEF) Technology Index (see for example World Economic Forum (2001), World Economic Forum (2002), World Economic Forum (2003)), the United Nations Development Program (UNDP) Technology Achievement Index (Desai & Sagasti (2002)), the United Nations Industrial Development Organization (UNIDO) Industrial Development Scoreboard (Lall & Albaladejo (2002) and UNIDO (2002)), RAND Corporation's Science and Technology Capacity Index and Archibugi and Coco's ArCo Index (in Archibugi & Coco (2004)); covered in an in-depth analysis by Archibugi & Coco (2005).

The WEF report presents medium and short term indices of competitiveness based on macro level (for the medium term) and micro level (for the short term) indicators representing the level of technology, the quality of government policies and various macroeconomic conditions on the one hand, and business environment, strategy and organization at the firm level on the other hand. The index of interest with regard to technological capabilities of course is the WEF Technology Index which in turn is comprised of three technology components; namely:

(i) Innovative capacity
(ii) ICT diffusion, and
(iii) Technology transfer

Innovative capacity is measured by the number of patents granted by the US Patent Office, tertiary enrolment ratio and survey data, while ICT diffusion is represented by online (telephone, PC and internet) connectivity and survey data, and technology transfer by non-primary exports and survey data. However, it is not clear how much telephone and internet usage (for example) as measured by this indicator will be of any relevance to understanding or even measuring the technical and organizational capabilities required for effective technology absorption and adaptation in developing countries.

The UNDP Technology Achievement Index (TAI) focuses on outcomes and achievements rather than the effort expended or inputs used, to assess how well a country ranks in creating and using technology. A total of eight indicators are used to calculate the TAI (as an average of the measures looking at four aspects of technology; namely:

(i) Technology creation
(ii) Diffusion of recent innovations
(iii) Diffusion of old innovations, and
(iv) Human skills.

The number of patents granted and royalty and license fees received per capita represent the creation of technology within the country, while the number of per capita internet hosts and the share of medium and high technology exports in total goods exports proxy for diffusion of recent innovations. Diffusion of old innovation is measured by number of telephone lines and electricity consumption per capita). Again, as in the case of the WEF Index described above, it is clearly an inadequate estimation of the experience developing countries have had in building competitive organizations), while human skills are represented by mean years of schooling and gross tertiary science enrolment ratios. The TAI is useful for policy formulation, but it does not represent a complete measure of domestic technological achievements. For one, the full range of technologies present in the economy, from agriculture to manufacturing to all the sub sectors in between, cannot be covered by the index, while the aspects of diffusion of innovations, both old and new, and the development of human capabilities and skills are hard to quantify and represent accurately (see Desai & Sagasti (2002) for further details).

Archibugi & Coco (2004)'s Technological Capabilities Index considers three characteristics of technology to cover a broader scope of countries using more reliable data sources; namely:

(i) Innovative activity
(ii) Technology infrastructure, and
(iii) Human capital

Due to lack of available data, the index uses R & D expenditures to represent technology creation and innovative activity, rather than patents and research publications, but it is uncertain how this would be a better measure of capabilities. In any case patents and research publications are more appropriate approximations of innovative activity in developed countries where the comparable data exists, rather than capabilities that represent ability to absorb foreign technology. Machinery and equipment is excluded from technology infrastructure in favour of internet and telephone connectivity and electricity to compensate for lack of comparable data. Technology infrastructure is more than just machinery and equipment too; it is the system supporting technology and that cannot be measured by telephone and electricity.

UNIDO's Industrial Development Scoreboard was based on the work done by Lall & Albaladejo (2002) and considers a host of components and drivers of industrial performance grouped into four categories, to represent technological capabilities; namely:

(i) Technological effort,
(ii) Industrial performance,
(iii) Technology imports, and
(iv) Skills and infrastructure

Indices are created for each category, but no attempt is made to synthesize a combined index since meaningful compiling of such a wide variety of indicators is problematic at best (as also pointed out by Archibugi & Coco (2005)). While the inclusion of technological imports and skills and infrastructure could represent level of capabilities in a country, technological effort is a subjective assessment and will vary with the perception of effort being undertaken, and inclusion of industrial performance is unclear; it is what one is expecting to explain.

From the discussion above and the analysis of commonly used indicators and indices of technological capabilities, the literature suggests that the main factors that determine technological capabilities include:

(i) Patents
(ii) R & D resources
(iii) Scientific publications
(iv) Royalties and license fees
(v) Infrastructure
(vi) Trade indicators
(vii) Human resources

(viii) Economic indicators

The relevance and applicability of these factors in the case of developing countries is unclear and given the lack of adequate data, problematic at best. While not an exhaustive list, one important factor is missing; the actual ownership of the technology being used, which is an important factor that can have an impact on development of capabilities in a developing country. The importance is even more so when one also considers the fact that industrialization progresses at a fairly rapid pace now and the advent of the WTO and IPRs impose constraints on how transferred technology can be utilized. As recalled from the earlier discussion, developing countries can opt for one two approaches to gain access to foreign technology and attempt to rapidly industrialize; late developers can either invite a foreign corporation to share only their technology (first path), or they can invite the foreign corporation to set up manufacturing (preferably) operations in the country (second path). Measures that include royalties and license fees can be indicative of foreign ownership to some extent but they do not represent any restrictions that are often placed on use of the acquired technology. The restrictions in place vary from case to case, and it would be a far greater challenge to devise a measure to represent this factor.

3.3. MARKET FAILURES IN TECHNOLOGY ACQUISITION

3.3.1. LEARNING RENTS AND RENT SEEKING

It is evident that the acquisition of technology and technological capabilities is crucial to the catching up strategies of developing countries. It is also clear that this acquisition is not a simple, clear-cut matter of acquiring codified knowledge, but also involves tacit knowledge that can only be gained by investing in the production process irrespective of any profit made and occurs with the passage of time. Furthermore, this period of learning by doing must be financed, and developing countries and developmental states opt to employ learning rents to provide domestic firms with the incentive to acquire tacit knowledge. The effective management of learning rents requires a great deal of capability and capacity on the part of the state to administer the learning rents and police their enforcement and ensure the rents achieve the intended goal of developing technological capabilities. Naturally, state failure in any of these aspects of rent management will lead to rent seeking activity. Rent seeking activity on the part of firms and economic agents intent on capturing the rents for other purposes can have an adverse impact on rent management efforts by the state. A deeper understanding of the role of the state in the development process; the enforcement of institutions will shed light on areas where state failure can occur and the impact it can have on the management of learning rents and their outcome.

Enforcement of institutions and rules in society is one of the key rules of the state in developing countries; including, but not limited to collection of taxes, redistribution of wealth and resources, enforcement of social cohesion, and the resolution of conflicts. This socially acceptable enforcement aids the state in maintaining a monopoly on legitimate violence that it can use to fulfil its responsibilities.

The core institutions of note that are enforced by the state are:

1. A system of property rights;
2. Interventions that change incentive structures in the economy, usually to address market failures and these inevitably create rents; and
3. Political institutions that allow the established rules to be changed.

In the case of developing countries, states are also tasked with an additional responsibility; namely:

4. Managing development and growth of the economy.

All states have the responsibility of management of development and growth of the economy, but historical accounts show that many developing country states are very remiss in doing anything about it.

Growth and development are complex processes that place great demands on the functioning of the state and increase the likelihood of failures occurring if capabilities are lacking or policies are not optimized for the task at hand. The capabilities of state agencies and institutions are different and not to be confused with the firm or even industry level organizational capabilities that are required for technology acquisition and achieving competitiveness. A necessary first step when dealing with state failures is an examination of the role of the state as it pertains to economic development and technology acquisition. It is appropriate to focus debate on role of the state along two distinct lines; one being the "Service Delivery Model" (SDM) and the other being the

"Social Transformation Model" (STM), as suggested by Khan (2002). The SDM lies at the heart of mainstream consensus view of the state, which appears to be a narrower view of the state that is better suited for looking at the case of developed countries where fundamental property right transformations have already occurred and the majority of firms have already attained a high capability level and become competitive, rather than developing countries where the state needs to play a range of 'transformative' roles in property rights and capability building to achieve sustainable growth and development.

The services typically considered in the SDM are law and order, provision of public goods and infrastructure, social security, and market regulation. Many of these are important services even in developing countries, but the degree to which developing country states can actually deliver these services is typically low. Apart from providing adequate infrastructure and ensuring that markets function efficiently, economic development is left in the hands of the private sector and free market; the expectation being that the private sector will provide the impetus necessary for sustaining economic development.

In this model, it is clear that the state only has a minimal role to play not only in economic development, but also in technology acquisition. Typical tasks the state focuses on include getting prices right, providing a level playing field to all economic agents, and letting the forces of supply and demand determine which industries are viable enough for firms in the domestic economy to specialize and compete in.

Effective service delivery defined in this way can be a viable state strategy if the social transformation to a broad-based productive economy is largely complete. If however the transformation is incomplete and most firms have low organizational and technological capabilities and so have low competitiveness, this state strategy will be insufficient to achieve rapid development (Khan (2002)).

More concretely, the SDM is based on the notion of efficient and well-functioning markets. It is a well-established perception that this is a fallacy in the context of developing countries; no such situation exists in the modern world, and attempting to achieve this stylized form of market takes precious resources away from other areas of interest with no real guarantee of success.

The key responsibilities of the state in the SDM are:

1. Protecting stable property rights with strong contact enforcement, low expropriation risk and low corruption;

2. Ensuring undistorted markets with low rents; and

3. Ensuring democratic accountability and civil society participation.

Even if we were to take the core assumption of the SDM as given and holding true, there is no evidence to support the claim that countries where the state has managed to, even partially, fulfil its service delivery obligations, have achieved a high and sustainable rate of growth. A more troubling assumption of the model concerns the role of the private sector; in the interest of pursuing their personal goals, which happen to coincide with the goals of society, entrepreneurs will automatically contribute to economic growth. The is no flexibility in the model to account for instances where individual and societal goals do not intersect or overlap, and no possibility of entrepreneurs being risk averse enough not to undertake the desired activities.

Building on the core assumption with three theoretical pillars, the SDM attempts to explain how liberal market economies function. The first pillar theorizes markets are efficient if they are rent-free and have stable property rights. The second pillar relates rent creation by rent-seeking activity which de-stabilizes property rights. Finally, the third pillar concerns weak or absent democracy and weak bureaucracy allowing rent-seeking to persist. Putting the three pillars together brings forth the interconnections as follows. Inefficient markets lead to rent-seeking and corruption when there is monopoly power over:

1. Information;
2. Right to supply a protected market;
3. Right to a subsidy; or
4. Access to, or ownership of, a natural resource income that is higher than their next-best earning opportunity which they are unable to get access to.

While efficient markets would remove any imperfections and welfare reducing rents, inefficient markets allow those rents to persist and thereby damage property rights by encouraging rent-seeking activity. Finally, lack of democracy, as pointed out by

North (1990), Olson (1997), and Olson (2000), allows rent-seeking activity to persist while a weak bureaucracy (World Bank (1997)) lowers the opportunity cost of this activity.

The East Asian Tigers were initially hailed as the poster-child of the consensus view and by extension the SDM. A number of studies emerged in support of the model; including Knack & Keefer (1995), Mauro (1995), Clague et al. (1997), World Bank (1997), Johnson, Kaufmann & Zoido-Lobatón (1998), Hall & Jones (1999) and Kaufmann, Kraay & Zoido-Lobatón (1999).

However there are several methodological issues with the evidence that call into question the validity of these results (Khan (2002)). Real world examples that support the three pillars are lacking for one, and there has been research done that contradicts the consensus view (Burkhart & Lewis-Beck (1994), Treisman (2000), Przeworski (2004) and Treisman (2007)). The East Asian Tigers have been shown to have followed a substantially different approach and model that took into account the specifics of their situation, while at the same time also incorporating key elements of the SDM.

The Social Transformation Model (STM) on the other hand suggests that the state has a much larger and much more crucial role to play in the economic development and growth of economies than that promoted by the SDM. Developing countries are in the process of transforming their societies at a greatly accelerated rate and the role played by the state in welding its power to guide the prices will determine whether the process ultimately succeeds or fails.

Several key differences between the political economy scene in developed and developing countries will highlight the reason why the SDM is ill-equipped to deal with the demands of a rapidly transforming society and where the STM comes in. The core dynamism of the economy of an advanced country is maintained by a political scene that revolves around a relatively narrow range of options, while differences are relegated to the fringe with regard to distribution. The capitalist sector is the source of the resources required to run the political system, and also the main source of livelihood and welfare for society.

In contrast, developing countries exhibit much greater variation in the political scene. The still evolving capitalist sector does not provide the resources necessary to run the political system, nor is it the main source of livelihood and welfare enhancement for society. As such, the state is an instrument for groups to channel resources for their own needs and steer social transformation in desirable directions.

Under the STM, the state is deemed to possess the requisite institutional structure to manage state interventions in the economy and guide the social transformation process of society. According to Khan (2002), the role of the transformation state in this regard ranges from intervening in the property rights systems, to creating, managing and destroying rents, and organizing transfers. Service delivery objectives are subsumed under the overarching goal of transformation and serve to reinforce the transformation process.

The notion of a transformation state is analogous to the idea of a developmental state first proposed by List (1909) and Gerschenkron (1962) to explain industrialization in Europe. Fritz & Menocal (2007) have argued that states and their political economy matter for development and it is political economy factors that explain how several states in East Asia were able to transform their societies from poor agrarian based in the 1960's to high-technology based in just 30 odd years. The widely acclaimed success of the East Asian Tigers has generated considerable debate and research (Haggard (1990), Bank (1993), Evans (1995) and Kohli (2004)). These countries are prime examples of a true developmental state, or a dynamic transformation state Khan (2002). On the other hand, the developing world is replete with examples of limited developmental states, such as Fritz & Menocal (2007), these include developing countries ranging from Brazil to India and even Mauritius (Evans (1996), Grindle (1996) and Menocal (2004)), South Africa and Pakistan. Khan (2002) provided a much more apt description for such examples (in the current context) of stagnating or failed transformation states.

At the same time, beginning with North (1990), the importance of institutions was also brought into the limelight, . It was argued that effective institutions are an essential pre-condition for sustained economic growth (Acemoglu, Johnson & Robinson (2001) and Rodrik, Subramanian & Trebbi (2002)). This line of research has influenced the debate on the role of the state, with researchers arguing that states that are too weak or too oppressive will stifle investment flows.

More recently, attention has shifted to developmental states being identified as possessing infrastructure powers and political commitment to control their territory, possessing a long-term vision and the capacity to design and deliver policies and being inclusive (Ghani, Lockhart & Callaghan (2005)). Based on Johnson (1982), Deyo (1987) and Evans (1995)'s interpretation, Fritz & Menocal (2007) has taken developmental state as being a successful example of a state that is able to use its vision, leadership and capacity to bring about a positive transformation in an accelerated time frame. This concept fails to explicitly incorporate the notion of social inclusion and public good. Moreover, while clearly of relevance to late developers, the acquisition of technology has not been addressed sufficiently in this literature.

Leftwich (2000), pp.167–8 has provided a much more concise and appropriate interpretation; a developmental state having the wherewithal in the present context and the means to stimulate, direct, shape and cooperate with domestic entrepreneurs while engaging with foreign investors to secure beneficial deals. Naturally the state will have a commitment to promoting growth and development while providing public goods to society. The goals of the state can be influenced by domestic as well as foreign influences and this suggests that developmental states require a degree of autonomy that does not alienate it from the society it is transforming and seeking assistance from, while avoiding undue or detrimental influences from de-railing or hijacking the process/goals.

The state elites in developmental states have the commitment to pursue the goal of development and the vision to persevere, often as a result of crisis; either perceived or real. According to Fritz & Menocal (2007), developmental states are identified with a specific set of capacities and capabilities, in addition to vision and ideologies. Capacity and capabilities by the developmental state to manage policies go hand in hand with the vision and ideology of development by the state elites. Leftwich (2000), Rotberg (2004) and Ghani, Lockhart & Callaghan (2005) have argued that successful developmental states also had the commitment which allowed them to give priority to national development over personal gain. When state elites are able to subvert state influence to further their own interests and/or extract rents away from other potentially more productive economic actors, and thus taint the developmental vision, "state capture" will occur (Fritz & Menocal (2006)).

Herbst (2000) and Lange & Rueschemeyer (2005) supported the notion of elites in South Korea designing an appropriate response to the perceived threat of Japanese antagonism to drive development. However, this move does not always succeed, as in the case of Pakistan, where the state elites have been able to use the threat of antagonism to secure resources for personal gain. Commitment to development by the state elites will not be effective unless society is engaged in the process as well; a shared "national project" Fritz & Menocal (2007), or a nation-wide public Ghani, Lockhart & Callaghan (2005).

3.3.2. STATE FAILURES

Against the backdrop of role of the state in enabling technology acquisition, and fostering economic development under the STM and developmental state paradigm, one can examine and identify reasons for state success and failures. This will shed light on the outcome of technology acquisition efforts that incorporate a learning-by-doing component to build up domestic technological capabilities that is financed through learning rents. In the context of the developmental role of the state, the effectiveness of such a role will be determined by the difference between impact on growth and development of institutions and policies/interventions favoured by the state and the cost of enforcing such a growth trajectory. If policies and institutions are growth enhancing, (and effectively so at a low cost of enforcement), this will naturally yield higher rates of growth for the domestic economy. Thus, state failure is likely to occur during the period of social transformation in one of the following:

1. policies and institutions in effect, or
2. effectiveness of enforcement, or
3. maintaining stability during the process of change, or
4. cost of enforcement.

Policies and Institutions to Manage Property Rights for Growth

To drive the social transformation process, states need to make massive interventions in property rights to encourage growth. Developing countries that are beginning the transformation process tend to lack a dynamic capitalist class to see the process to the end. To build this class, the state typically reassigns property rights from less or unproductive capitalists to more suitable candidates as and when the situation warrants. Such a reallocation is not possible if property rights are well defined or the reallocation is capable of being contested. Well defined property rights, as highlighted by the SDM will preclude the possibility of rapid transformation stemming from an efficient reallocation of rights. If the state has difficulty intervening from above and imposing the reallocation through any of the following mechanisms, it would amount to state failure:

1. legal and illegal transfer of resources with state support, or
2. nationalization or privatization, or
3. fiscal and price incentives such as subsidies, discounts.

When the resources are subverted by predatory economic agents, social waste will occur and the transformation process will be adversely affected and could stall.

High growth economies are unusual as they have exhibited a commitment not to maintaining stable property rights, but to development of the economy and growth. Capitalists in these countries had the reassurance that as long as they were dynamic and committed to growth, their property rights would not be harmed. Furthermore, these capitalists were kept in line and discouraged from challenging the state by the promise of higher expected payoffs in the future (from the expected economic growth) in exchange for present day compliance and cooperation in helping achieve the state's goal (Qian (2002) as quoted in Khan (2002)). By exerting greater control over property rights and thereby minimizing opposition to development plans, states in high growth economies have been able to push through development projects deemed necessary for national development.

Effectiveness of Enforcement

Encouraging and compelling capitalists to come forward and take part in productive economic activity is a necessary step towards generating competitiveness in an emerging dynamic capitalist society. To achieve this goal requires management of rents; creation and maintenance of growth-enhancing rents by the state along with removal of growth-retarding ones.

The intuition for using rents to influence economic activity stems from Stiglitz (1996)'s notion that a market system requires a whole range of information rents to function efficiently. Given the existence of these rents, a well-functioning market economy will play host to a number of institutions designed to effectively manage these rents. Given that developing countries are in the process of acquiring the technology and capability to become a capitalist economy; these countries will additionally require institutions to manage the rents for this purpose.

The key point here is that developed countries have evolved to incorporate various information rents into their markets without adversely affecting overall social good/return. Developing countries on the other hand do not have this luxury. Proto-capitalists in developing countries have to learn to compete while simultaneously acquiring the technology and also the required capabilities to learn and innovate, which is where Schumpeterian rents come in.

Simply put, state-created Schumpeterian/learning rents are designed to accelerate the learning of entrepreneurial skills and the acquisition of technology by providing a means of financing the loss making period on the one hand and the capital outlay on the other Amsden (1989), Wade (1990), World Bank (1993), Page (1994), Rodrik (1995), Lall & Teubal (1998), Aoki, Kim & Okuno-Fujiwara (1998). While such activities are invariably high risks with high probability of low returns, developing countries are especially susceptible to low (and in some extreme cases even negative) returns when other, directly unproductive activities such as rent-seeking, take place (Bhagwati (1982) and Krueger (1974)).

There are several issues related to learning rents that are of relevance to the case of developing countries and their quest to acquire technology: the duration for which the rents should be available, institutions and their capacities to choose between and manage various rents for the purpose of encouraging learning and thus generating growth, institutions and policies to ensure damaging rents and rent-seeking activity do not emerge.

Clearly effective rent management is a necessary requirement for there to be a beneficial impact of rents on the local economy. Moreover, the state must have the capacity to monitor performance by capitalists and withdraw support where necessary. East Asian high growth economies are classic example of situations where the state has effectively managed learning rents to reap their beneficial impact while minimizing the detrimental effects. That is not to say there were no drawbacks from the rent management efforts of the state, but in the balance the benefits far outweighed the costs. On the other hand, developing countries that are failing to take-off, or are stalling in their efforts to grow, are invariably characterized by states that lack the institutional capabilities and capacity to manage the learning rents.

(In)Effectiveness of Institutional Enforcement

The state is characterized by its monopoly of the legitimate use of physical force and the rules of the game to compel stakeholders to undertake certain actions deemed in the interest of the public good in developed countries (Khan (2002) and Leftwich (2007)). Developed countries tend to lack the monopoly power and have issues with enforcement, which further compounds the problem. In fact, according to Bardhan (2000), enforcing institutions is not possible in the vacuum of monopoly power.

North (1990) has argued that developing countries failing to enforce industrial policy but also any growth generating institutions, including property rights in the past can explain their lackluster performance. On the other hand, Stiglitz (1998), Bardhan (2000) and Bates (2001) believe that the effectiveness of enforcement is determined by the inability of the state to exhibit a credible commitment to subverting property rights and ex-post appropriation of the investment of capitalists in the pursuit of economic growth and development. The case of high growth economies of East Asia has demonstrated the fallacy of this notion in the context of property rights and rent management. The states in these economies were committed to disrupting property rights and creating and managing rents to foster economic development at an accelerated pace.

Local Conditions and Effective Enforcement

The policies used by states to enable transformation will not succeed if they are incompatible with the distribution of social groups and power within local society Khan (1999). In such cases there will be low compliance with the rules of the state caused by “state capture” (Hellman, Jones & Kaufmann (2000)), “pervasive patronage” (Kochanek (2003), pp.69–75 as cited in Leftwich (2007)), “neopatrimonialism" (Walle (2001), pp.50–55) and "shadow states" (Reno (1995), Harriss-White (1997), Duffy (2000) and Funke & Solomon (2002)). Different developing countries had different local conditions giving rise to different processes, which in turn led to ineffective enforcement. The situation was compounded by the fact that many developing countries, as colonial states, had imperialist based institutions grafted over existing traditional ones, which distorted their compressed evolution and complicated the state formation and capacity building process. This is in stark contrast to the historical record of gradual endogenous formation of states in developed countries (Hoogenboom (1959), Asbury (1927), Neild (2002), and Delay & Moran (2003)). In this context Leftwich (2007) has put forward the case that effective state building is a political process; however, it can instead be argued that it is a multi-faceted phenomenon that must take into account a myriad of factors. Failure to do so would undoubtedly lead to state failure in the social transformation process as history has shown.

State Organized Transfer for Political Stability

Patron-client networks have been proposed by anthropologists as a means to account for political action in Asia - particularly Southeast Asia - though they are also evident in other regions of the world, including Latin America, Africa and even in some areas of Europe. Clientelism can be defined as a political system at the heart of which is the exchange of goods and/or services for political support between patrons (who represent the political actors in the system) and clients. Patron-client transfers are used in developing countries in an attempt to maintain political stability while the goal of economic development is pursued. These transfers can have a harmful effect if any groups are focused on benefitting from the transfers by creating or capturing a large number of such value reducing rents.

Sundaram & Gomez (2000) have argued that it is possible for the state to organize a significant number of transfers to ensure a high rate of growth if the transfers are adequately sand-boxed so (for example) distributive conditions cannot capture the rents designed for industrial learners. In the case of the Indian sub-continent. Bardhan (1998), Khan (2000a) and Khan (2000b) have shown that ineffective sand-boxing led to or even encouraged sub-standard public goods provision and continued operation of ineffective sectors and firms when in fact those units should have been terminated and reabsorbed into the economy. It should be noted that if not all firms are inefficient in a sector, removal of learning rents will harm the more efficient firms. The threat of an impending removal or revocation of access to the rent will divert attention, effort and resources of firms away from more productive resources as they seek to secure the rent.

Stiglitz (1998) has argued against the pure liberal market view, while at the same time cautioning against government intervention in rent creation based on the poor performance of the majority of developing countries. Several of the propositions made by Stiglitz with regard to developing and enhancing the capabilities and capacities of governments appear fraught with issues that would severely hamper developmental efforts:

(i) Government interventions should be restricted in areas which are subject to a significant and systematic influence of special interest groups;
(ii) A crucial government role is to promote competition and to act as a referee in a market economy;
(iii) In order to improve government performance, political decision-making processes need to become more open and less subject to secrecy;
(iv) Governments need to encourage the provision of public goods by the private sector in order to discipline itself and to convey voice; and
(v) Political authorities should aim to achieve a balance between the technical expertise of policy making on the one hand and accountability and democratic representation on the other hand.

Discouraging government intervention in areas that are under the influence of interest groups to avoid potential "state capture" will not plug the leakage and will in fact send the wrong message to stake holders. The private sector will need to be regulated while being encouraged to provide certain public goods that are in the interest of the domestic economy. It is not clear how this will be a disciplining tool at the hands of the government. Rents are required for enabling an accelerated transformation and cannot exist or function as intended without government intervention, so clearly the capacities and capabilities of the state lie at the heart of the matter, and any deficiencies need to be identified and addressed.

Cost of Enforcement

Enforcement cost is the aggregate rent-seeking cost of operating particular institutions Khan (2002). Going back to the definition of rent-seeking, we note that there is a whole host of activities that are traditionally considered to be rent-seeking activities. These include all types of costs to secure access to and exert control over institutions; ranging from the cost of engaging in corruption, to policing costs of the states to even the cost of lobbying. Rent-seeking activity will be of importance to those economic agents in society who stand to benefit from it, and the transaction cost of rent-seeking will be significant in all economies (Samuels & Mercuro (1984)). However this cost is typically off-set by higher returns in developed countries, but not so much in developing countries, as shown by Wallis & North (1986) for developed countries, and Khan (2000b) in the case of developing countries.

Local Conditions and Enforcement Costs

The free-markets and pro-democracy views in the literature are bolstered with the argument that the institutional structure of democracy reduces the cost of enforcement (North (1990), pp.107–117) and of maintaining efficient institutions. On the other hand, the argument of the developmental state school of thought is that a state that is able to take authoritarian decisions according to a development vision is less likely to be influenced by damaging rent-seeking activities of economic agents (Chang (1994)). Similarly, as in the case of effectiveness of enforcement, the cost of enforcement will be determined in large part by the pre-existing local conditions, and imposing a system that ignores, or even worse counters the local distribution of power without the means to contain the fallout will result in higher enforcement costs.

Khan (2002) has shown that East Asian states enjoyed lower enforcement costs due to the presence of "atomized opposition", in comparison to the South Asian states that ended up facing significant contestation from "well-organized opposition" groups. The latter arose when attempts were made to impose development agendas on insulated states and enforce the institutions required for development. We would argue that the South Asian states also experienced significant changes in regimes; often oscillating between military rule and democracy, while at the same time witnessing sea changes at the policy regime level as well. These factors combined to make it easier for power groups to gain access to state and engage in rent-seeking activity.

We now have a clearer understanding of the potential for state failure in developing countries when it comes to management and enforcement of learning rents. We now turn to a closer look at the nature of learning rents in developing countries.

3.3.3. LEARNING RENTS

In their quest to achieve dynamic transformation of society, the state in developing countries needs to nurture and compel proto-capitalists in their productive endeavours. These capitalists need to be encouraged to take the leap and forego primitive, unskilled modes of production in favour of more modern, high skilled and high technology modes of production that while risky, will yield significantly higher rates of return in the long run. This will allow the capitalists to make effective use of technology that has been acquired from external sources and for society to reap the benefits of scale economies (among other benefits) and complete the transformation process.

As pointed out in the previous section, technology and the associated capabilities to use the technology productively in the market-consensus view, are exogenously derived and determined and with no costs associated with their acquisition. As such there is no need to account for the acquisition of technology and learning to make effective and productive use of it. More precisely, the early neoclassical model assumed there were no reasons for factor inputs not to enter any market or sector that could yield a profit and as such required no reward or incentive to encourage such activity. Whatever technology is required is freely and readily available for immediate and efficient use. Information is also freely available and symmetric, so no incentives are required to access and use necessary information. There are no conflicts in society and therefore no need to transfer any resources to maintain stability. Lastly, the classical model also assumes that as long as producers are paid the equivalent of the return from their next best activity, they will continue to produce what society demands.

Clearly then, any sort of payment over and above this return is considered a rent. These rents are considered to be inefficient, unnecessary and distortionary in a competitive and efficient market. However, the developmental state view acknowledges the presence of distortions in the economy and market failures that necessitate the need for the state to step in and guide the development process.

Innovation, or the discovery of new technologies at the global production frontier, is a long, uncertain and arduous process that requires a great deal of risk-taking and investment on the part of capitalists (Nelson & Winter (1982)). Developed countries having already gained mastery over established production technology, offset the risks and cost outlays involved with R & D of new technologies through patents (Davies (1991) and Stiglitz (1996)). Developing countries on the other hand need to learn how to use the existing technology first, let alone innovate new technologies, given imperfect credit and insurance markets (Chang, Cheema & Mises (2002)) that can hinder the process. In this context the capitalists in developing countries require an incentive, or rent, to undertake the desired activity of learning. Given the public good nature of technology, imperfections and presence of asymmetric information in the financial sector, the private sector is unable to self-regulate and incentivize the process. It therefore becomes the responsibility of the state to step in and institutionalize the incentive structure in the form of subsidies and that eligible firms can utilize appropriately.

Chang, Cheema & Mises (2002) have pointed out that property rights and patents are particularly weak, creating a disincentive for investment by capitalists. However, successful transformation requires state control over property rights to allocate and enforce patents effectively.

To make effective use of new technology that has been acquired requires learning and nurturing certain capabilities that capitalists will need to invest in. With dynamic transformation occurring across the economy, it follows that the learning and capabilities to be invested in are not specific to the firm and thus involve externalities. According to Abramovitz (1986), technological change requires complementary investments in a myriad of interlocked areas, so replacing the capital stock in one industry will necessitate upgrading of technology and capital in related industries to keep pace with the changes taking place in the lead industry. Thus technology acquisition in an industry requires investment in subsidiary and complementary industries, which the market-based view will undoubtedly have issues with. Taken together with the view that planned coordination is a prerequisite of technology acquisition efforts, we can assume that successful acquisition of technology requires a holistic view of the economy's development path as well as successful coordination of investments and incentives to pursue this; something which only the state is ideally equipped to do. Against this backdrop, it is important to understand the nature of political settlements in developing countries.

3.4. POLITICAL SETTLEMENTS

For a country that has embarked on a chosen path to development of the economy and transformation of society, the question remains as to how do we ensure that economic agents behave in a manner that is consistent with the ultimate goal of development and growth, especially when there are market failures present in the system? Left to themselves, firms and entrepreneurs will seek out opportunities that offer the highest return for their investment, and those do not necessarily include (among other initiatives) long term and high risk technology acquisition efforts that lead to building up of dynamic technological capabilities. On the other hand, with the proper guidance and motivation from a state with a holistic view of the development process, arrangements can be made to ensure such initiatives are undertaken and the goals achieved. The relationship that the state and its allied institutions forge with economic agents; and in particular with entrepreneurs and firms, will determine the success or lack thereof of its developmental efforts. The state manages to maintain social order while organizing a political compromise between itself and groups within society. This social order has been termed as a "political settlement" in the literature and the concept can be used as lens through which we can assess the performance of institutions in a developing country such as Pakistan, which in turn will assist in an analysis of growth challenges in such countries. Towards this end, a closer look at the political economy background of institutions, and of the concept of political settlements is required to allow us to link the two together (an overview of the different thematic areas, key definitions and focus of the literature is provided in Table 3.1).

There are a number of definitions of political settlement as the term has been used on the literature on political economy of development till now, and the variation observed depends on the focus of the research (see Box 1 for a selection highlighting the core themes present in the more prominent definitions). The term was first introduced by Melling (1991) to describe political processes and their impact on welfare policies during the time of 19th century British industrial capitalism and the welfare state. The development studies context was provided as a means of looking at institutional performance and was later refined to represent "distribution of organizational and political power between competing groups and classes" in society (Khan (1995), p.71 and Khan (2004), p.168). Fritz & Menocal (2007) considered political settlements in the context of a binding agreement between the state and society; however they focused on the vertical context of such agreements while glossing over class conflict that arises within various groups in society. Indeed, a typical society is comprised of diverse elements and will not be homogeneous in nature, and the stratification is more pronounced for the marginalized groups. Consider the gender stratification; till the emancipation of women, men tended to receive preferential treatment, and this trend continued till women challenged the status quo and won the right to vote. Overlooking the diversity present in society, especially in the case of developing countries where large swathes of society can be marginalized, seriously undermines the validity of any model based on this treatment of the concept. On the other hand, Khan (1995) and Khan (2004) recognized the importance of exclusion of groups and the conflict which arises from divisions in society, making their interpretation more relevant for developing countries.

Examples from developing countries around the world (in particular the case of South Africa as discussed in Laws (2012)) suggest that though sustainability of political settlements is important and requires that the settlements be responsive to the interests of society in general, the interactions between states and elites *and* their followers is also crucial. In other words the vertical as well as the horizontal context is relevant to the definition of political settlements. Whaites (2008) has looked at the horizontal interactions between elites in society and in addition has also considered

Table 3.1: Political Settlements Literature: Thematic Areas and Focus

Thematic Area	Key Definitions	Focus On
Role in defining state and society relations	Fritz & Menocal (2007): negotiated agreement binding state and society in an on-going process, and not a one-off event. John & Putzel (2009): the outcome of bargaining and negotiation between elites.	Explaining vertical relationships
As an outcome of elite negotiations	Menocal (2009): a common understanding between elites about how power should be organised and exercised; including formal institutions and informal agreements. DfID (2010a): ongoing formal and informal bargains between elites. DfID (2010b): a common understanding between elites about how power should be organized and exercised; including formal institutions and informal agreements. Parks & Cole (2010): arrangements elites agree to in order to end violent competition over power and resources. Settlements characterised by elite actors, pursuing their interests, thereby influencing the shape of institutions. Gleason et al. (2011): dynamic, on-going negotiations between elites. AusAID (2011): the formal and informal institutions, agreements, and understandings, between elites and between elites and the wider society, that underpin a political system.	Explaining horizontal relationships
Representing power structure (balance and distribution) in society	Khan (1995): the overall balance of power in society. Khan (2010) and Khan (2009): 'social order'; a compatible, viable, sustainable combination of power and institutions. DfID (2009): starts with a common understanding between elites then expands into a contract between state and society. An adaptable political process that is formalised through, or grounded upon one-off events like peace agreements.	Explaining institutional performance
Conduit for overcoming violence and political instability	Whaites (2008): informal, unarticulated understandings between elites. OECD/DAC (2008): The outcome of peace processes. Barnes (2009): a common understanding between elites about how power should be organized and exercised. The outcome of peace processes in war-to-peace transitions. Sharan (2011): a framework for ending hostilities amongst competing elites.	Explaining radical change

Source: Based on Laws (2012)

that elites have the ability to "organize, persuade, command or inspire" their social constituents; terming political settlements as a two-level game.

DfID (2009) associated the spatial distinction (vertical and horizontal relationships between the state and society and within society itself) with the notion of state responsiveness; characterizing states as belonging to one of two categories; (i) unresponsive, and (ii) responsive.

Political settlements in the former are characterized by informal rules, patronage, and friction between predatory elites. The latter on the other hand have progressed to the stage where there is little discord between groups and the state is responsible for providing basic needs that allow contract enforcement, such as security, rule of law and accountability. In this scenario, political settlements are taken to be adaptable in the responsive states, since these states are able to accommodate demands for political or even social change. However, it needs to be kept in mind that the adaptability and flexibility is not unrestricted in these states. Unresponsive states lack the flexibility and adaptability of responsive states and fundamental changes in political or social needs tend to shatter the existing political settlement and lead to the genesis of a new settlement, as seen in the recent Arab Spring.

Keeping in mind the fact that states in some developing countries tend not to have the power to organize compromises with society and within society due to conflicting demands on limited resources and capture by strong groups within society, we offer a characterization of states in developing countries that mirrors a distinction also found in the developmental state literature (i) weak, and (ii) strong. Strong states in developing countries such as the East Asian tigers will lean more towards DfID (2009)'s responsive state category, while the weak states of South Asia and Latin America will exhibit more traits of the unresponsive category.

John & Putzel (2009) propose the notion that there is bargaining between elites and between the state and society with conflicting interests; an argument that is in opposition to the understandings between elites that have been highlighted in earlier definitions. Though certainly valid, the extent of the misunderstanding being suggested by the authors is deemed to have been overstated, as the definitions do suggest that the understanding have to be reached a process of bargaining as suggested by Laws (2012).

The sustainable and viable compatibility of the distribution of economic benefits that are supported by institutions, both formal as well as informal, and are coupled with the distribution of power in society will lead to the emergence of political settlements according to Khan (2010). This definition of political settlements is well suited for an analysis of the performance (or lack thereof) of institutions in developing countries as they pursue their developmental agenda. The focus here is on the compatibility of institutions with the distribution of power and economic benefits among groups and elites in society. The spatial components (horizontal as well as vertical relationships) of earlier definitions are accounted for in this definition, as is the fact that a number of institutions in developing countries are informal, and not just formal institutions and agreements as typical in developed countries.

There are five key components of this particular definition of political settlements that bear mentioning. First, power refers to the holding power of elites in society, or the "capability of an individual or group to engage and survive in conflicts" (see Khan (2010), p.6). The distribution of this power is contingent on the presence of informal institutions, mainly patron-client networks that are employed for allocation of economic benefits rather than formal institutions that exemplify developed countries. Formal institutions that mirror the characteristics of those present in developed countries are unlikely to have much success at achieving their goals of accountability (for example) since the power of the elites is contingent not on formal institutions, as in developed countries, but on informal institutions, namely patron-client networks that characterize the majority of developing countries.

Second, sustainable political settlement is one that leads to the creation of what Khan (2010) refers to as the "minimum levels of economic performance and political stability" that ensure that the settlement endures over time and does not collapse in on itself. As long as sufficient economic benefits are accruing to the elites, there will be no incentive to challenge the status quo and existing political settlement in hopes of receiving a better payoff and hence the settlement will be sustainable over time.

Third, compatibility of the settlement is in the context of sufficient number of powerful groups and elites in society receiving an adequate share of the economic benefits that accrue to comply with the existing order and forego any contestation and conflict with other groups, elites and even the state.

Fourth, viability of the political settlement is in the context of being economically productive enough to forestall economic crisis, and politically stable enough that conflict and violence do not threaten to overthrow core institutional and political arrangements.

Finally, institutions and the distribution of power in developing countries share a symbiotic relationship: institutions create economic benefits for groups and elites in society, while powerful groups and elites will attempt to influence the working of institutions to deliver more favourable economic benefits. Political settlements must be flexible and sufficiently dynamic to accommodate changes in power relations.

Typically, holding power of a group in society is affected by two factors; the ability to impose costs on other groups, and the ability to absorb costs that have been imposed by the state and other groups in society. The greater or stronger these abilities, the more likely it is that the group will prevail in any conflict it engages in. A group with sufficient holding power will be able to contest the enforcement of benefits by an institution and thereby affect its (the institution's) effectiveness in influencing activity. The ability to absorb and inflict costs is in turn determined by economic power, on the extent of resources (wealth) that groups can draw on, for their survival. However, there is a trade-off in terms of greater expectations being associated with the higher level of resources being utilized, meaning that it is not certain that richer groups will prevail in every conflict. If poorer groups have a greater political ability to organize, mobilize a greater number of people for support, or a greater claim to legitimacy (for example) than more powerful groups it is conceivable for these groups to survive in conflict with richer groups. These latter abilities, in contrast to economic power, are harder to quantify and assess, and this uncertainty and lack of predictability is what creates conditions for conflicts to arise between groups in society.

When a social order emerges, the distribution of power is embedded in an institutional arrangement, formal as well as informal, that sustains it. Khan (2010) has argued that political settlements in developing countries can be characterized as "*clientelist political settlements*" where the informal productive sector rather than the formal productive sector dominates the economy.

Understanding and accounting for the fact that the informal sector in developing countries overshadows the formal sector is the key to understanding the role of formal institutions in technology acquisition efforts. Informal institutions and the mechanisms through which they sustain distributions of benefits and powers can significantly affect the operation of particular formal institutions. Thus formal institutions can be expected to operate in such countries in a manner that is distinctly different compared to what one would expect based on transaction cost analysis of New Institutional Economics (NIE).

3.5. PRICE MARK UP MODEL

Developing countries can find it a daunting task to catch up with developed countries in terms of industrial production, despite having significantly lower wages, and a labour force that often has an excess supply of workers with the required levels of formal education. The simple reason for this is inability to catch up is the level of productivity of labour, which depends not only on access to formal education (which developing countries are able to provide to a large extent) but also on tacit knowledge (based on learning by doing) and technological capabilities. If time is not available for acquiring this knowledge and capabilities, developing countries will be hard pressed to effectively compete with developed countries in the global market.

The measures of technological capability discussed in Section 3.2.3 have a number of shortcomings in the present context that are worth mentioning. One, the indices are primarily designed to assess capabilities at the national level and at most the industry level, and not the firm level. These measures aggregate levels of capabilities and do not necessarily represent capabilities that have emerged in developing countries at the micro level, where there will be certain firms that are performing well while others are struggling to acquire capabilities. The case studies that follow in Chapters 6 and 7 are examples of instances where technological capabilities exist at the micro (firm) level despite macro level indication of weak capabilities.

Two, the variables selected to represent capabilities development are more applicable for the case of developed countries where the process of learning has been learned and firms are now innovating at the frontier. This is in contrast to the case of firms in developing countries that are primarily concerned with learning how to learn and attempting to become competitive in already established products and technologies, rather than innovating new products.

Three, even if the variables considered to represent capabilities were assumed to apply in the case of developing countries, data at the national or even sector level, of manufacturing sector performance is not readily available for such countries, which necessitates the use of proxies that will naturally not be a true representation of the level of capabilities present in the country and the reality on the ground.

Given the limitations of various capabilities measures traditionally used to assess the level of technological capabilities in a country, especially in the context of developing country, and industries comprised of firms that are at various stages of technological development. Thus, applicability of these measures is constrained. On the other hand, a firm level price mark-up model (such as the one developed by Khan (2013a), detailed in Section 3.5 and applied to the two case studies in Chapters 6 and 7) allows for a more nuanced analysis of capabilities development at the firm level by looking at individual firm competitiveness. The model uses firm level pricing and cost data that is more readily available for firms in developing countries and for this reason is more appropriate.

Following Khan (2013b), we will use a simple price mark-up model to examine the variables that are instrumental in determining an economy's ability to produce competitive goods. This model allows us to focus on the 'competitiveness gap' that developing countries face in making goods of particular qualities, and therefore the implicit subsidy that is required to begin the learning-by-doing process. The political economy analysis then focuses on the factors that allow or prevent the subsidy being delivered with the appropriate incentives to maximize effort during the learning process. The hypothesis is that in the absence of sufficient compulsions the subsidy will be wasted and the institutional arrangements supporting learning will become unviable. This model is based on the following assumptions:

(i) A range of products and qualities exist

(ii) There is a positive relationship between price and quality of a product

(iii) There are no information asymmetries in the model

(iv) The economy produces higher quality products whenever possible to be able to benefit from the higher prices

(v) To make notation easy, the economy produces only a single product with its quality indexed by "*Q*"

(vi) "*i*" other inputs are used in the production process, traded globally with a price P_{Q_i}

(vii) The mark-up required for each product quality is the same in the developing country as it is in the global leader

Given these assumptions, the global price of product Q is set by the cost of production of the global production leader:

$$P_Q^{Global} = \left[\frac{W_Q^{Leader}}{\Pi_Q^{Leader}} + \sum_i \frac{P_{Q_i}}{\alpha_{Q_i}^{Leader}}\right](1 + m_Q) \quad \textbf{(1)}$$

Where:

P_Q^{Global}	=	Global price of the product of quality Q
W_Q^{Leader}	=	Wage level in the global production leader
Π_Q^{Leader}	=	Productivity of labour (output per person) in the global production leader
P_{Q_i}	=	Global price of input *i*
$\alpha_{Q_i}^{Leader}$	=	Productivity of input use (output per unit of input used) in the global production leader
m_Q	=	Mark-up associated with product of quality *Q*

The developing country catching up through imitation will attempt to imitate the highest possible quality that can be competitively produced. The domestic cost of production for the follower will then be:

$$C_Q^{Domestic} = \left[\frac{W_Q^{Domestic}}{\Pi_Q^{Domestic}} + \sum_i \frac{P_{Q_i}}{\alpha_{Q_i}^{Domestic}}\right](1 + m_Q) \quad \textbf{(2)}$$

Where:

$C_Q^{Domestic}$	=	Domestic cost of production of the product of quality Q in follower country
$W_Q^{Domestic}$	=	Wage level in the follower country
$\Pi_Q^{Domestic}$	=	Productivity of labour (output per person) in domestic/follower country
$\alpha_{Q_i}^{Domestic}$	=	Productivity of input use (output per unit of input used) in the domestic/follower country

The domestic economy will produce only if its cost of production is less than or equal to the global price of the product; i.e. $C_Q^{Domestic} \leq P_Q^{Global}$. This appears evident since developing countries by and large have lower wages; i.e. $W_Q^{Leader} > W_Q^{Domestic}$. However, output per worker is much lower in the domestic economy [$\Pi_Q^{Leader} > \Pi_Q^{Domestic}$], so much so that in theory it could offset any beneficial impact of lower wages.

In reality, the developing country also has a lower input productivity of input use, so if $\alpha_{Q_i}^{Leader} > \alpha_{Q_i}^{Domestic}$, while price of input is P_{Q_i}, then the developing country will have lower efficiency of each input use. When combined with lower output per worker, this suggests that wages may need to be non-existent for the developing country to even be able to begin to compete effectively with the developed country.

It is a well-known fact that productivity, or output per person, depends on both macro-economic (economy wide) and micro-economic (firm-level) factors. The productivity of a firm is determined by the availability of infrastructure, education, infrastructure and the quality of the available infrastructure. Firm productivity is also affected by firm-level factors such as the capital equipment used by labour, and the skill and experience of labour and management. All these factors affect the productivity of the firm or its technological capability. Naturally this also translates to the effectiveness of technology acquisition and implementation within the firm. The efficiency of input use within the firm also depends on these factors, and been identified in the literature as necessary to achieve productivity enhancements. A deeper understanding of the factors affecting this technological capability will shed light on the catching up problem facing developing countries.

Early development theory and practice put a great deal of emphasis on the purchase of appropriate capital equipment and provision of adequate infrastructure, but these have been shown to be inadequate to account for differences in productivity between developed and developing countries Clark & Wolcott (2002). According to Khan (2009), while infrastructure constraints are widely recognized, technological capabilities are more important in explaining variations in productivity for the following reasons:

(i) Tacit knowledge is an important part of the skills and organizational capabilities that are necessary for success of firms

(ii) Learning-by-doing is critically important for acquiring tacit knowledge

(iii) Learning-by-doing requires a period of loss financing and this is likely to be constrained by market failures

When the developing country faces a domestic cost of production for a good of quality Q that is higher than the global price of the product; i.e. $C_Q^{Domestic} > P_Q^{Global}$, to be able to compete effectively, a per unit subsidy, S_Q, will be required by the firm to bring domestic costs in line with the global price. This translates to a period of loss making for private investors and/or the state to allow the firm the space and time it needs to learn the production process sufficiently to innovate and adapt it to local conditions and bring costs in line with global prices. Without recourse to this subsidy and the financing it embodies, the firm will have less tacit knowledge at its disposal and hence lower productivity, thereby compromising its ability to compete globally. Given the earlier discussion on rents, we see that this qualifies as a "learning rent". Now the required rate of subsidy, S_Q , can be determined as follows:

$$C_Q^{Domestic}\left(1 - S_Q\right) = P_Q^{Global} \qquad \textbf{(3)}$$

Substituting the expression for $C_Q^{Domestic}$ from Equation (2) in Equation (3), we have an expression for the subsidy:

$$S_Q = 1 - \frac{P_Q^{Global}}{\left(1 + m_Q\right)}\left[\frac{W_Q^{Domestic}}{\Pi_{\mathrm{Q}}^{\mathrm{Domestic}}} + \sum \frac{P_{Q_i}}{\alpha_{Q_i}^{Domestic}}\right]^{-1} \qquad \textbf{(4)}$$

From where we see:

$$\frac{\delta S_Q}{\delta P_Q^{Global}}, \frac{\delta S_Q}{\delta \Pi_{\mathrm{Q}}^{\mathrm{Domestic}}}, \frac{\delta S_Q}{\delta \alpha_{Q_i}^{Domestic}} < 0$$

Naturally, the faster labour and/or input productivity rises, the sooner the subsidy can be withdrawn. Lower quality products are bound to require less subsidy and for less duration than higher quality products to achieve global competitiveness. Labour productivity and input productivity gaps are bound to be greater between higher and lower quality products as well as between developed and developing countries. Moreover, the cost of production is inversely proportional to the labour and input productivities, so the cost of production relative to global price will be greater for higher quality products as compared to lower quality products in the developing country and a higher subsidy will undoubtedly be required for a higher quality product as compared to a lower quality product:

$$\frac{P_{Q+1}^{Global}}{C_{Q+1}^{Domestic}} < \frac{P_{Q}^{Global}}{C_{Q}^{Domestic}} \qquad \textbf{(5)}$$

As opposed to traditional measures of competitiveness and technological capabilities, discussed earlier in Section 3.2.3, Khan (2013a)'s price mark-up model allows for an analysis of firm level competitiveness based on the efficiency of major input (raw material, labour and capital) use by the firm. Here competitiveness is a good indication of the level of technological capabilities possessed by the firm, since performance of the domestic firm is being compared to the global leader (usually a firm in a developed country) of that product as well as within the domestic industry (as in the case of the comparison between Millat Tractors and Al-Ghazi Tractors in Chapter 6). The case studies selected for the analysis are firms that have shown performance comparable to the global leaders of their products, and are performing well, despite domestic competitors and a variable economic environment.

3.6. CONCLUSION

Despite concerted efforts to the contrary, developing countries continue to lag behind the mature, developed countries of the world, and the gap between the two persists and in some cases is slowly expanding. The catching up model accounts for developing country efforts to close the gap, and acquisition of technology and learning by doing to increase competitiveness of firms is the key to catching up. How the state encourages the acquisition of technology and development of local technological capabilities determines the competitiveness of firms. State failures and the nature of political settlements in the domestic economy play a crucial role in determining the outcome of technology acquisition efforts in these countries.

The management of rents, and in particular learning rents, has profound implications for the efforts of developing countries to close the gap in growth with developed countries. The catching up strategies typically employed by developing countries hinge on acquisition of technology (not just the actual physical capital, but the know-how or learning by doing and the capability to be competitive in the global market) from developed countries. Procurement of the physical capital has generally not been problematic for developing countries in the past; in fact in many cases has been facilitated by MNCs from developed countries to further their own goals. Rather, building up the domestic technological capabilities to effectively use the technology and compete with developed countries on a near equal footing has been the challenge. The state in developing countries has historically opted to use learning rents to motivate and guide the development of capabilities and the learning-by-doing process. However, the effectiveness of these rents has been determined by the capability and capacity of the state to monitor and enforce the rents for their intended purpose on the one hand, and by the nature of the relationship between the state and various economic agents and stakeholders on the other. A closer look at the nature of political settlement in developing countries will yield more insight into the experience of these countries with allocation and impact of learning rents.

South Korea is a prime example of a developing country that used learning rents to drive its' efforts to successfully acquire technology from abroad and develop domestic technological capabilities that could easily surpass those of other developing countries and rival those of developed countries. The state offered domestic *chaebols* various incentives or rents in the form of preferential access to credit markets and financing (to name a few) in exchange for meeting export performance criteria. *Chaebols* were chosen at the discretion of the state planners and the nature of political settlements at the time meant that the *chaebols* that were disciplined for not meeting their performance criteria lacked the staying power to win against the state. The result was that South Korean *chaebols* were able to go the last mile and develop their technological capabilities and global competitiveness to be able to survive when the learning rent was withdrawn. India attempted a similar approach to develop its domestic technological capability, but the nature of political settlements meant that the state was not as universally effective in managing rents and enforcing compliance of domestic firms. In several instances firms were able to successfully pursue rent seeking activity that subverted the goals of the learning rents. However, in one well documented instance, the Indian state was able to manage learning rents to compel a foreign MNC, Suzuki, to successfully upgrade local suppliers to international standards in exchange for preferential access to the protected domestic market. Pakistan has not had even that measure of success when it comes to management of learning rents designed to develop local technological capability. As argued earlier in Chapter 2, to understand why Pakistan has not been able to go the extra mile and successfully develop industry-wide technological capabilities, requires a closer look at political settlements in the country. This political settlement discussion will be linked to two case studies of the manufacturing sector in Chapters 6 and 7.

CHAPTER 4. CHANGING GEARS: AUTOMOBILE INDUSTRY AND ECONOMIC DEVELOPMENT

4.1. INTRODUCTION

Since the time of Alfred Marshall and the dominance of neo-classical approach in economic thinking, economic analysis has relegated technology to a mere footnote; an exogenous, external factor to economic growth and development. However, history has shown that technology and technological change have played key roles in economic development and the transition of economies into dynamic capitalist societies.

Two major catalysts for the foundation of the British Empire were the First Industrial Revolution and the invention of the steam engine. In the aftermath of World War I, the United States economy benefitted immensely from a tremendous surge in the growth of manufacturing as well as agriculture, which was brought about by a surge in the demand for goods, and fulfilled by technological progress that allowed the economy to meet this demand. The technological progress was mechanization of the moving assembly line that was introduced by Eli Whitney and found its first successful adoption and implementation in the automobile industry at the hands of Charles Sorensen and Henry Ford. The assembly line was incorporated with a moving conveyor belt that allowed the production of a standardized model at low cost due to the high per worker productivity that resulted from specialization of production tasks. Japan was able to rise from the ashes of its previous empire after World War II with the introduction of 'just-in-time' production networks that allowed a significant increase in productivity while reducing production costs. The Asian Tigers, and in particular South Korea, were able to increase productivity and accelerate growth through the judicious use of foreign investment, and the acquisition, replication and adaptation of foreign technology. Whereas the first case cited is an ideal example of a pure technological innovation that transformed the society, the latter two are along the lines of organizational and operational innovations, and in fact the last one is generally characterised as a learning innovation. Based on the examples cited, it is clear that innovation is not simply the invention of new products, but also includes services, markets, processes, paradigms and positions as well and this will have implications for the impact of the transformations on society. Furthermore, in two instances, innovations made in the automobile industry not only helped shape the industry itself, but they also allowed those countries to break free of the shackles of underdevelopment and embark on their journey to achieving vibrant capitalist economies.

There are two crucial characteristics of the automobile industry that will prove most beneficial to developing countries. The first characteristic is the widespread linkages that the automobile industry has at all levels with the rest of the economy, linkages that were present since the beginning and are spreading further and further as technology and the industry evolves. These linkages are on account of the complexity of modern day automobiles, ranging from simple raw materials, to manufacturing processes, metallurgy, ceramics and glass, electronics, rubber, textiles, finance and even infrastructure. Spillovers from the automobile industry can be expected to spread to the rest of the economy and thus have a multiplier effect on economic activity. On the flip side of the coin, technology is an integral part of the industry, now more than ever, and its successful adoption and use will play a vital role in determining whether the industry reaches its full potential or not. Developing countries that are able to make effective use of technology and ensure the benefits indeed spill over to the rest of the economy will be ideally placed for a transformation into a dynamic capitalist society.

Against the backdrop of these two characteristics and the key role played by technology and innovation in growth and development of an economy, a closer look at the issues surrounding technology in the automobile industry and its development is warranted, in particular in the context of developing countries. The aim of this chapter is to take a closer look at the developments in the global automobile industry in the context of adoption and use of technology in production processes as the industry develops and matures and review policy side changes aimed at achieving this goal. Section 2 provides an overview of key developments in the global automobile industry, while Section 3 delves into the intricacies of technology and the industry supply chain. Policy developments in developing countries are explored further in Section 4, while Section 5 covers key trends and characteristics in the industry focussing on the developing countries.

4.2. KEY DEVELOPMENTS IN THE GLOBAL AUTOMOBILE INDUSTRY

4.2.1. HISTORY/EVOLUTION OF THE INDUSTRY OF ALL INDUSTRIES

The invention of the steam engine in the First Industrial Revolution led to the birth of the steam powered automobile in the eighteenth century. The subsequent introduction of the automobile powered by a gas fuelled internal combustion engine was achieved fairly rapidly in the early nineteenth century. The first gasoline powered automobile followed at the end of the nineteenth century, proof of the dynamic and constantly evolving nature of a nascent industry and potential for future growth. Innovations and developments maintained a brisk pace in the industry and in sectors related to the automobile as well. While the core mechanical technology at the heart of the automobile was primarily invented by the 1930s, countless refinements and innovations continued to be made in the design and manufacture of automobiles in the decades to come.

The automobile industry today is the largest manufacturing activity in the world and is credited with providing employment for one in eleven individuals. Not to mention the fact that on the supply side the automobile has advanced our knowledge of the most efficient methods of manufacturing complex pieces of technology. More specifically, three major transformations occurred in the history of the automobile industry that have shaped our understanding and impacted on manufacturing techniques in industries throughout the economy. On the demand side, automobiles are the second largest household expenditure item in developed countries.

The manufacture of “horseless carriages”, as automobiles were called in the late 1890s, was a craft initially, carried out in metal and machine shops by craftsmen. Automobiles at the time were considered to be novelty items on account of their relative scarcity and unique construction of each unit. This construction was at the hands of craftsmen who had a very firm grasp of the intricacies involved in building their automobiles and familiarity with the working of each part. Naturally this was a very labour and time intensive production process that was inefficient and had drastically limited options for expansion of output.

By the time the Ford Motor Company began successfully manufacturing automobiles in bulk in a factory in the early 20th century, the production process no longer required expert craftsmen to assemble each unit by hand and automobiles were much more common place and in higher demand. A push and move system was utilized where labourers would bring the parts required to the factory floor from the stock room. This method was less time consuming than simple craft production but was labour intensive, relatively inefficient and subject to a number of shortcomings. The bare frame of each automobile was hauled up on two wooden blocks and bands of workers moved from workstation to workstation completing their tasks. Over 100 part fetchers would hand deliver parts and components to each chassis assembly workstation; essentially bringing the stockroom to each and every chassis assembly point. This was still a labour and time intensive process, and due to the use of labour for moving parts, unreliable. In an effort to streamline the production process and boost productivity and output levels, Charles Sorensen, the production chief of Ford Motor Company experimented with various ideas. After much trial and error and learning by doing, Sorensen pioneered the moving assembly line featuring practical implementation of Adam Smith's idea of increasing productivity through specialization. The idea of an assembly line sped up the process by removing the role of fetchers and hence a major source of friction in the assembly process. The assembly process was divided into simple sequential action which would be performed by a single assembler at each stage.

Instead of bringing the man to the work, the work would be brought to the man. This process of experimentation and learning by doing led to the adoption of the ideal specification for operating the assembly line. These developments were initially met by scepticism by company management but their eventual implementation allowed Ford Motor Company to meet surging demand for their Model T automobile. The developments at the Ford Motor Company were also the successful outcome of learning-by-doing and resulted in spillovers to the rest of the industry and the economy eventually when manufacturers adopted the moving assembly line and best-use practices to boost productivity levels. On the heels of this development, General Motors adopted a different approach to Ford's single model not by producing cheaper cars but quality automobiles in greater variety to appeal to a wider demographic. Better quality in this case was determined by General Motor engineers to be improved performance and economy. The focus was not on innovating, but on offering better looking cars with more variety in the market. General Motors was able to pursue a strategy of following the leader to avoid the expense and unpredictability of innovation while capitalizing on aesthetic innovation which was cheaper and more predictable. General Motors rise to the top is an early example of how late comer firms can thrive in the market.

The moving assembly line was the first of three major transformations in the automobile industry that had a profound impact not just on the nature of competition within the industry but in the manufacturing sector at large (Jones & Womack (1985)). Mass production and the moving assembly line allowed the United States to dominate the global automobile market through enormous growth in productivity coupled with simplified assembly and low prices.

The second transformation in the automobile industry was European in origin that further advanced the use of technology in manufacturing and was borne of the desire to compete with, and eventually surpass the then world leaders in mass production of automobiles. After adoption of mass production, the top three US automobile manufacturers were able to dominate the market and did not fear competition from any other manufacturers, either domestic or foreign. Unable to compete with the US in terms of volume, the European manufacturers turned to the manufacture of small and unpretentious automobiles that stood in stark contrast to the gaudy, gargantuan sedans produced by the US Big Three (Ford, General Motors, Chrysler) as a way of challenging the status quo.

The third transformation had its roots in the skyrocketing oil prices in the first half of the 1970s and again at the tail end of the decade negatively impacted demand for the fuel inefficient automobiles manufactured by the Big Three in the US in favour of smaller, more efficient automobiles from Europe and Japan. Automobile manufacturers from Japan studied US production methods; in particular those of Ford, as well as Statistical Quality Control practices after World War II to help rebuild their economy. Faced with a number of constraints, Japanese manufacturers had a strong imperative to develop a more efficient manufacturing technique. Cheng & Podolsky (1996) pointed out that such a system would build on the society's strengths of a strong work ethic revolving around work and not leisure, desire for seeking continuous improvement, a life commitment to work, group conscious rather than individualism and striving to achieve a common goal.

With each transformation, the production process underwent changes and refinements that permeated not only the automobile industry but the manufacturing sector as a whole. Firms attempted to adopt the manufacturing processes that each transformation brought about and reap the benefits of the changes; though not always successfully. Compared with craft production, mass production offered a number of benefits:

1. Manufacture of several, standardized products simultaneously, allowing the factory to achieve economies of scale,
2. Use of inter-changeable parts,
3. Large buffers (stock) of parts to ensure uninterrupted production flows, and
4. Strong hierarchical control and coordination of all aspects of production, from design to assembly.

Japanese manufacturers, led by Toyota, recognized the inherent contradictions and shortcomings in the simple mass production system, while also acknowledging the central role played by workers and inventory. The deficiencies identified by Toyota included:

(i) Inventory problems
(ii) High rate of product defects
(iii) High costs
(iv) Large lot production
(v) Delivery delays

The Just-In-Time system designed by Ohno was based on the pull system used in US supermarkets to keep shelves stocked. Items that were pulled from the shelves to fill shopping carts created empty spaces on the shelf, which was used as a signal by the stocker to restock the item on the shelf. If quantities fell below a certain threshold, it was a signal to the store manager to order more units of the product(s) from their suppliers. Excess inventories were avoided and waste was minimized. This feature also appealed to the precise and efficient nature of the Japanese who were able to devise a pull system at each step of the assembly process; materials would be pulled through the factory by the usage of parts in the final assembly, and excessive inventories would be minimized.

On the labour side, as a result of the simplification and standardization of tasks and parts the demand for expert craftsmen declined, while there was a surge in demand for semi-skilled workers who could perform simple and repetitive tasks. Developing technological capabilities and innovating was taken out of the hands of factory workers and relegated to qualified engineers who were removed from the production process itself. While it is true that given the limited development of human capital in developing countries and stunted technological development that mass production would easier to implement than Just In Time, there is a limit to the productivity increase that can be achieved, while the technique would also place considerable pressure on the labour market (in the form of worker discontent) and create further disharmony in an already fragile system, as happened in the case of the US.

The mass production system of the US and developments subsequently were driven by the notion that labour was "the problem" to achieving higher productivity and therefore higher profits. Graves (1993) suggested that the production philosophy that evolved was designed to eliminate this "problem" throughout the system. In doing so, the mass production system created a dehumanizing effect on workers which would be unworkable in developing countries and such a view would be inconsistent with the goals of developing countries, where labour employment is a key concern of industrialization efforts. In contrast, Taichii Ohno and Shigeo Shingo at Toyota were of the view that workers could also contribute more to the production process than simply assembling the components, as believed by Ford. The strong Japanese work ethic encourages highly motivated workers to constantly improve tasks and processes. Quality circle implementation provides managers with feedback from the factory workers and could be used to streamline production processes at the shop floor level by helping solve work-related problems and thus improve productivity levels. Thus the Japanese model gives importance to labour by seeing them as "the solution" to problems and thus prioritize social context more, and take care to ensure the political and economic environment of the host country is conducive to a lean production system setup (fundamental differences between the two production systems are highlighted in Table 4.1). Given these facts, one can conclude that countries where Japanese automobile manufacturers have established Joint Ventures or production facilities are conducive to lean production setups.

Table 4.1: Fundamental Differences between Just-In-Time and Mass Production Systems

	Just In Time	Mass Production
1	Jidoka (workers are allowed to identify and correct defects as they occur) and just-in-time are two basic pillars of system driven by market and customer demand	Based on highly specialized division of tasks
2	Pull system based on products already sold	Push system based on ex ante anticipated sale
3	Production in small lots of differentiated products	Production on large scale of standardized product
4	Rapid retooling (up to roughly 10 minutes) for frequent changing of production batches	Shutdown of production line for major retooling with long production runs
5	Use Kanban and Just In Time principles to reduce intermediate input stocks to minimum or zero and production flows	Significant quantities of intermediate stocks at each workstation. Production is pushed, not flowing
6	Multifunctional workers	Specialized workers task by task
7	Every worker on the line has the right to stop the line to ensure proper quality	No worker can stop the line to ensure proper quality. Production continues even in presence of significant defects
8	Quantity produced is equal to quantity sold or demanded	Quantity produced is determined by production engineers based on future expected market demand
9	Information dissemination from markets to production lines using kanbans	Information dissemination is hierarchical

Source: based on Ohno & Mito (1992) and Dosi, Nelson & Winter (2002)

Ohno also made effective use of the Japanese focus on groups, teams and collective goals by creating manufacturing cells on the work floor, rather than an assembly line. Compared to the Ford assembly line, the manufacturing or work cells are significantly different in their organization and offer a number of benefits/advantages (see Table 4.2 for key differences between the two approaches).

Table 4.2: Key differences Between Assembly Line and Work Cell Organization

Assembly Line	Workcell
Profligate use of floor space	Optimized use of floor space
Operators are separated from each other	Operators work together
Production runs of large batch sizes	Production runs of small batch sizes
Work is spread out along the factory floor	Work is condensed
Non flexible crew size	Flexible crew size
Unskilled specialized operators	Multi-skilled operators

Source: AIDT (2006), p.33

Japanese manufacturers also acknowledged the benefit of having low priced product variety (not restricted to the aesthetic variety of General Motors) to satisfy customer demands following the example set by European manufacturers and as a consequence designed production systems to accommodate smaller lot production of different models. Effectively combining the best features of mass production and quality product variety within the existing domestic cultural framework allowed Japanese automobile manufacturers to upset the world order and surpass Europe and even the US as global leaders in the 1980s.

According to Jones & Womack (1985), the fourth major transformation in the automobile industry came with the diffusion of microelectronics in the industry. This particular transformation is noteworthy for the fact that in contrast to the first three transformations, there was a change brought about not just in the production methods used, but also in the design and manufacture of tooling equipment and more importantly, in the design of automobiles themselves. The nature of these changes is such that developing countries can also benefit immensely from the transformation (see Table 4.3 for a comparison of key characteristics of the major transformations).

In the wake of mass production techniques spreading across the globe and the move towards dedicated lines of machines with high volume output of a standardized product, this meant that there was limited flexibility in the production process for switching to a new model or new engine design. However, now owing to widespread use of microelectronics, production lines began to switch over to computer-control and robot assembly, meaning plants were able to accommodate model and design changes with more flexibility than before. Automation has also resulted in more rapid die changes for stamping allowing production runs to be much shorter than previously possible. Since automated machining and welding machines can be easily reprogrammed to accommodate new models, automobile production is becoming more flexible, and thus able to accommodate changes and advances in technology more readily. Production line robots can be replaced as and when needed, which is more cost effective than having to scrap and rebuild the entire production line. This flexible and modular approach to production means subsequent modules can be incorporated into the production line relatively easily. Theoretically speaking, it should be easier for firms to move up the value chain once they have incorporated this new flexible lean production process.

Table 4.3: Key Characteristics of Major Transformations

	Characteristic	Major Transformation		
		Lean Production	**Mass Production**	**Craft Production**
1.	Labour	Variable skilled	Unskilled and semi-skilled	Highly skilled
2.	Labour Tasks	Variable within cell	Limited, fixed	Variable
3.	Material Stock	Small	Large	Large
4.	Lot Size	Small	Large	N/A
5.	Hierarchy	Decentralized	Central, top down	N/A
6.	Capital Equipment	General purpose	General purpose	Specialized
7.	Product Design	Simple but customizable	Simplified and standardized	Complex and one of a kind
8.	Manufacturing Focus	Quality	Quantity	N/A

Source: Compiled by author from various sources

Production line automation and Just-In-Time manufacturing have reduced economies of scale for firms in the industry. No longer do firms have to produce a minimum of 2 million units output, meaning the fortunes of smaller sized producers (even those from developing countries) are more promising. Japanese firms have shown the ability to compete in the market with models that have an average age of 2 years (as opposed to the 4 years for US and European firms), and production runs (per model) of 500,000 vehicles (as opposed to the 2 million for US and European firms). Having smaller production runs lowers the cost of market entry for the firm, which naturally opens the doors for firms from developing countries to enter the global market and compete with larger producers such as GM, Ford and Volkswagen.

The next transformation that will come about in the industry as it matures will surely be the resurgence of green technologies, and in particular hybrid and electrical propulsion systems for all manner of automobiles. There has also been a trend in recent years of the acquisition of several niche-market developed country automobile manufacturers by developing country firms.

4.2.2. TECHNOLOGY AND THE AUTOMOBILE INDUSTRY SUPPLY CHAIN

It is clear that whereas focus of the mass manufacturing transformation was on integrating and streamlining the entire manufacturing process under one roof to gain more control over production and increase productivity per worker. On the other hand, the Japanese Just-In-Time transformation eschewed this in favour of establishing close-knit, mutually beneficial relationships with suppliers for minimizing waste and improving quality, while also affording labour a more central and positive role in the manufacturing process. Taken together, these three transformations represent significant changes in key characteristics related to production, labour, and organization, and in each instance enabled a profound transformation of society.

Decisions in the automobile industry surrounding current styles, reliability of the vehicle and performance, or R & D activity in the industry and manufacturing process innovations, or product modernization and design changes are determined by one of three factors. The demand for new cars and consumer preference is one of the major factors that determine firm activities and direction of industrial development; demand in the developed countries has been stagnant in recent years, while developing countries are experiencing growth. According to Veloso & Kumar (2002), Europe, United States and Japan have been registering barely 1 percent growth at the start of the 21st century, while sales growth in South America, India, China and Eastern Europe has exceeded 24 percent for the same period. In the post 2005 period, share of Europe in automobile sales exhibited a negative trend, dropping to -12 percent in 2010, and mirrored by the US (peaking at -17 percent in 2009). On the other hand, there was a general positive trend in growth rate of automobile sales in Central and South America, Asia and the Middle East and Africa regions. It is for this reason that these new markets are being targeted by OEMs now (see Table 4.4).

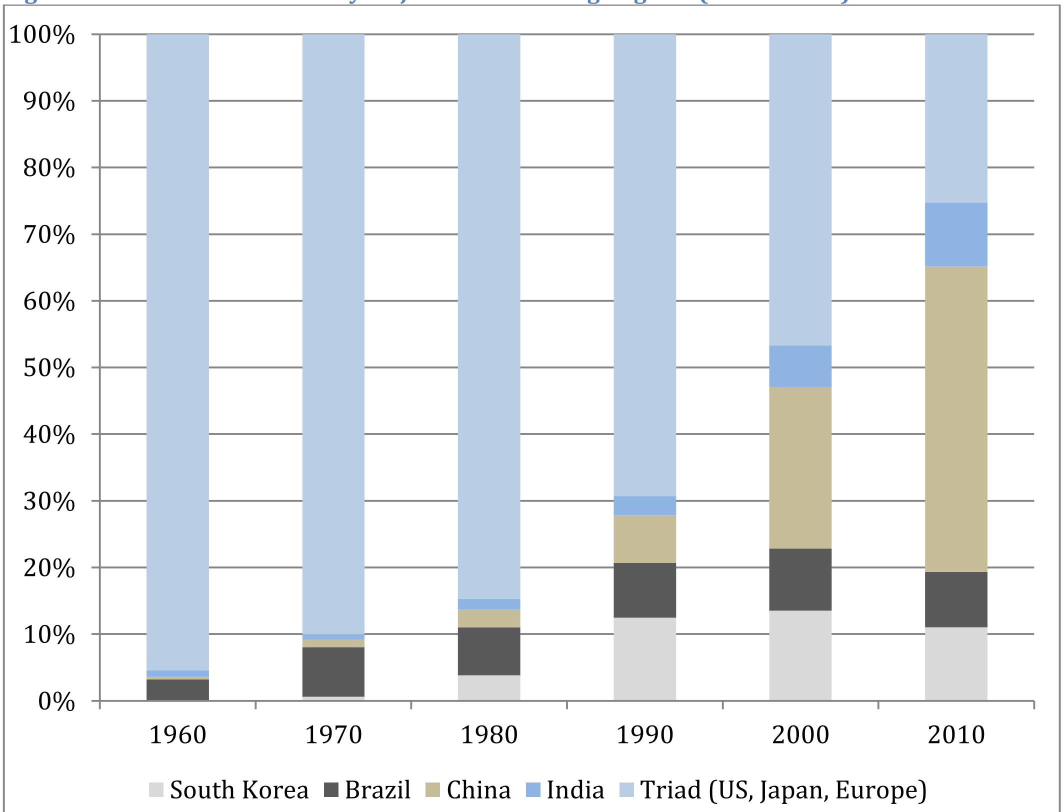
Decade-wise production shares also show a similar situation developing; with the declining trend in the share of the Triad region clearly visible and accelerating since the 1980s, as evident from Figure 4.1 below.

Table 4.4: Growth Rates of Regional Sales Shares of Automobile Industry (2006 – 2012)

Region	2006	2007	2008	2009	2010	2011	2012
Europe	0	0	-1	-11	-12	1	-10
Russia, Turkey and Other Europe	13	16	13	-44	12	24	0
America	-4	-3	-7	-13	-2	5	5
NAFTA	-5	-7	-12	-17	-3	5	7
Central and South America	8	20	14	4	3	4	-2
Asia/Oceania/Middle East	4	4	8	22	9	-3	3
Africa	13	-4	0	-4	-6	4	0

Source: Veloso & Kumar (2002)

Figure 4.1: Production Shares by Major Manufacturing Regions (1960 - 2010)



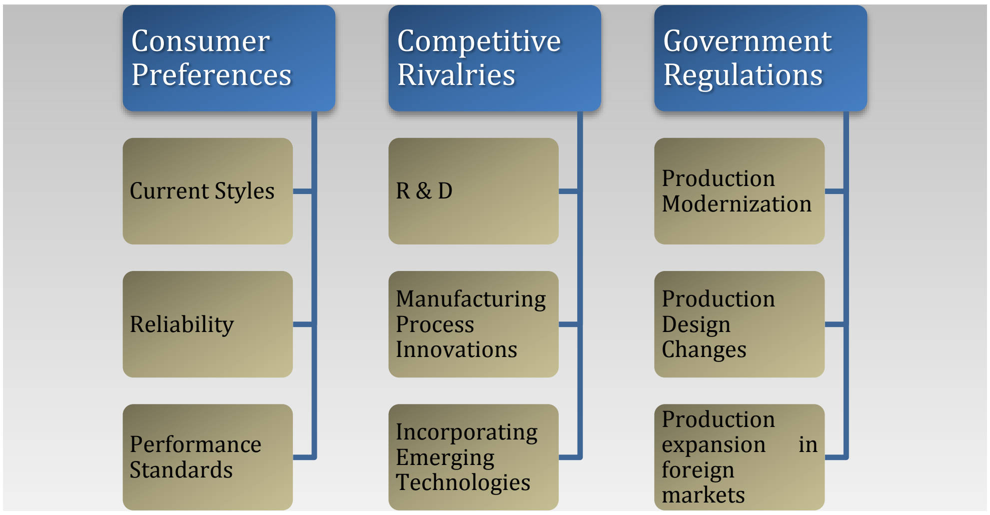
Source: OICA

The pattern of demand in developing countries is significantly different from that in the mature markets of developed countries. Households in developed countries are generally able to afford multiple vehicles and OEMs have capitalized on this feature by producing a large variety of vehicles that suited to different needs, thereby allowing them to maximise a slim market share. On the other hand, households in developing countries have lower income levels and tend to prefer vehicles that are cheap and can fulfil a variety of roles, such as pick-up trucks and mini vans or more fuel efficient vehicles. To capture this segment of a growing market, OEMs are focussing on producing more inexpensive, no-frills, fuel efficient vehicles. Again, developing countries with young automobile industries can capitalize on this development and use it to accelerate their development trajectories. Coupled with the fact that mass manufacturing techniques that are still prevalent in developed countries, especially the US, and are ill-suited to fast switching between different models, means there is a window of opportunity for developing countries to develop their capabilities from scratch, adopt lean production techniques and successfully enter the market.

Veloso & Kumar (2002) have argued that technology is a major factor in determining the course of evolution of the industry. The driving force behind technological advances in recent years has been efficiency, performance and reliability of vehicles (Figure 4.2). Ford pioneered the design of automobiles that could be easily repaired by the customer, while Toyota strove to be the first to improve the quality of the vehicle and so minimize the need for vehicles needing repair. Each of these improvements was part of the strategy to increase market penetration through introduction of technological innovations – the first mover advantage that firms covet for windfall gains. The structural design of automobiles has also evolved in response to the desire for safety, from full frame design initially to unibody construction after the 1970s, and subsequent introduction of spaceframe design and modular construction in recent years. Miniaturisation of electronics has allowed automobile design to incorporate complex sensors and systems that in turn contribute to the overall complexity and cost of the vehicle and strengthen the linkages across manufacturing sectors.

Along with Computer Aided Manufacture (CAM), Computer Aided Design (CAD) and Computer Aided Engineering (CAE) are finding more widespread application in the industry. Again, these developments mean that the established large firms are no longer assured dominance of the industry; as long as the new entrant can keep costs down, make effective use of new technologies and maintain a lean and flexible production system, they can provide credible competition to the market incumbents.

Figure 4.2: Determinants of major decisions in the automobile industry



Source: based on Veloso & Kumar (2002)

Research on transferability of lean production techniques by Krafcik (1988) opened the debate when he argued, based on his global quantitative analysis of plant productivity and management efficiency, that the existence of highly competitive leading producers in the US - both Japanese transplants and new US manufacturing facilities - attest to the transferability of Japanese methods of lean production outside of the cultural context in which they originated.

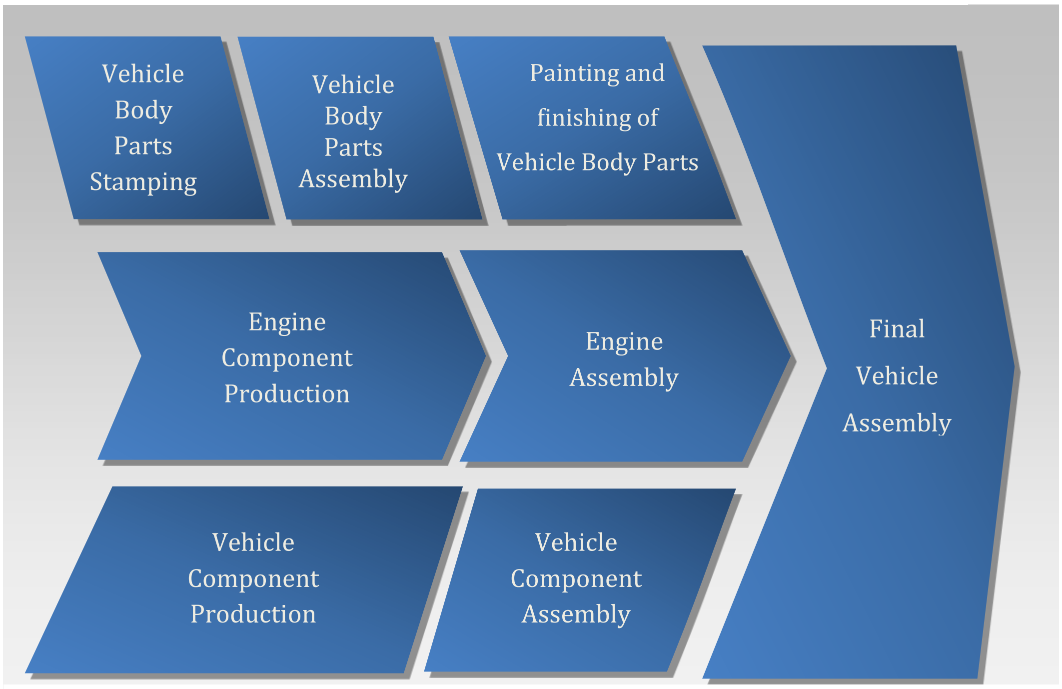
However, Dankbaar (1990) argues that in reality the situation is more complex and that Krafcik's isolated examples of success in the UK and US can be explained by the fact that they are greenfield sites, with hand-picked personnel and a unique management team aware of new procedures and how to implement them. Efforts to introduce the Japanese model into other countries will at best meet only limited success as long as management fails to take account of the social context in which the plants are operating. Dankbaar cites evidence of a range of factors in the Japanese case which cannot be reproduced easily in the European environment. These include: in-firm vocational training, reduced labour mobility and short-cycled, machine-paced labour on a continuously moving assembly line.

According to Graves (1993), Japanese firms have therefore created with their new investments their own special social contexts and, where successful, are often located in areas of high unemployment with specific economic and political incentives. However, once production gets fully established, and workers gain greater employment security then antagonisms with management (which have largely been suppressed) may well reappear.

With major transformations occurring in the automobile industry, and in particular the production technologies used, the industry supply chain has evolved alongside. Prior to an automobile's assembly, there are a number of stages that occur in a typical automobile manufacturer's production process (see Figure 4.3). Broadly speaking, there are three processes that run simultaneously; one is the preparation of the vehicle body, which involves stamping of body parts, then their assembly, and finally their painting and finishing. Another is the manufacture and assembly of the vehicle engine and the third is the manufacture of other vehicle components and their assembly. Though interlinked, these processes run simultaneously and led to a fair measure of vertical integration under craft and even mass production. To stay ahead of the competition, OEMs are pursuing tighter collaborations with their component manufacturers to bring innovations to the market that would help keep product prices in check.

At the time of craft production, the master craftsmen manufactured and assembled the unique parts and components required in-house. Due to the nature of this production process, output in the industry was low and the industry maintained this structure in the move to mass production under Ford. Manufacturers were heavy handed in their relentless pursuits for profits; holding down prices while imposing cost reductions that squeezed suppliers' margins. The moving assembly line allowed Ford to increase factory output by leaps and bounds. However, the ultimate goal of Ford was to attain total self-sufficiency of the production process by controlling (owning, operating and coordinating) all resources needed to produce automobiles. The massive River Rouge facility epitomized this goal of vertical integration of production within a firm. Japanese firms eschewed this form of integration in favour of forming closer ties with their suppliers and evolution of a tiered supply chain.

Figure 4.3: Modular Nature of Automotive Production



Source: Schmid & Grosche (2008)

The structure of the supply chain at the time was designed to allow OEM the greatest amount of control over the design and manufacture of components. Parts would be designed by OEMs and exact specifications or blueprints would be handed over component suppliers who were expected to follow the blueprints precisely. There was little need or even room for development of technological capabilities by suppliers for design changes to be adapted with production. There was little need for any transparency along the supply chain and component suppliers typically had little knowledge of what the final product they were producing components for, would be. In-house and external suppliers would bid against each other for award of contracts and the focus would be on meeting the demands of the OEMs and little margin for much else (see Figure 4.4).

Just-In-Time (Figure 4.5) brought about a change in this philosophy with OEMs forming closer, more enduring ties with their suppliers and calling on their design and technological capabilities to solve problems that arose during production.

Figure 4.4: Traditional Buffered Supply Chain

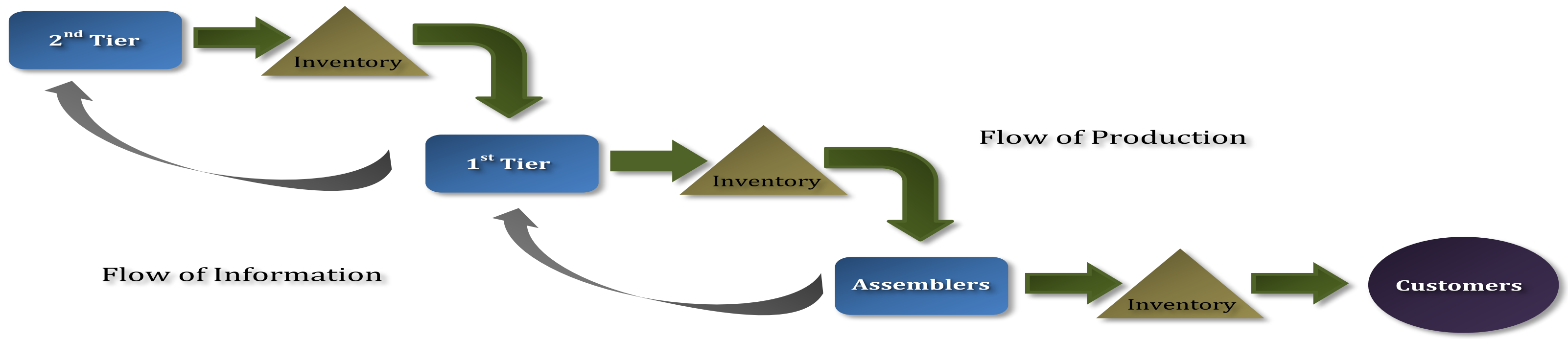
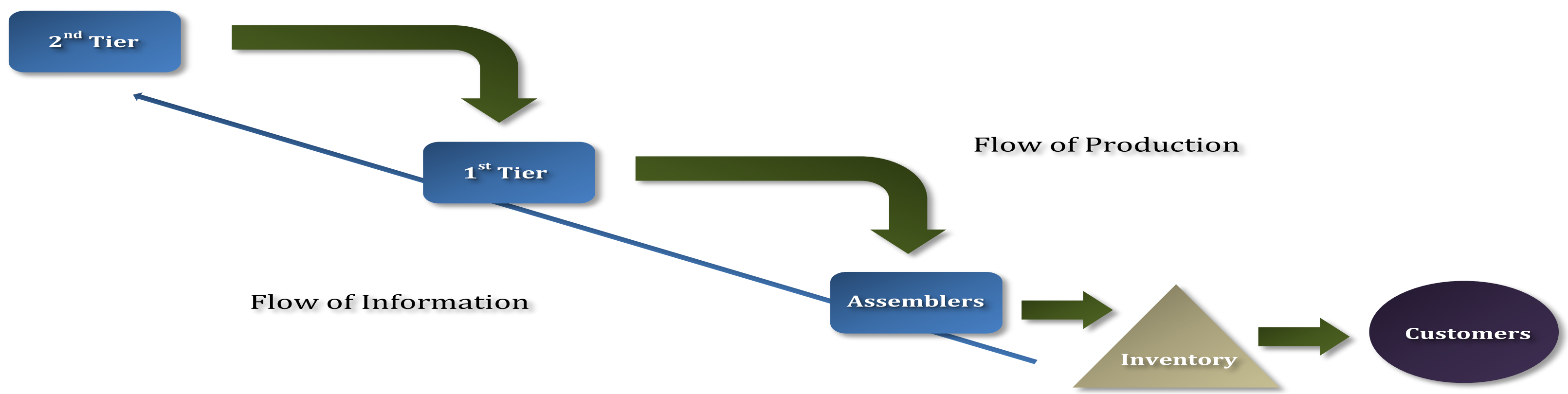


Figure 4.5: Just In Time Supply Chain



Source: Gutierrez (2003)

Bringing the final product to the market required the cooperation of all levels of supply chain and tied their fortunes together; requiring greater transparency and exchange of information along the supply chain.

To streamline the supply chain, a tiered structure evolved under JiT manufacturing, which has far greater scope of helping technological capabilities develop and diffuse in developing countries as compared to mass production (see Box 4.1 for details of the tiered supply chain in the automotive

Box 4.1: Automotive OEMs and the Three Tier Suppliers

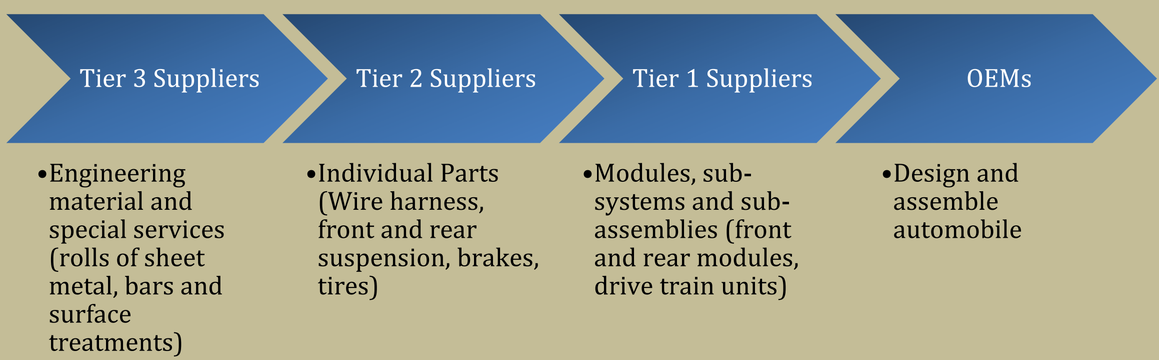
An automobile manufacturer such as Ford or Toyota is characterised as an Original Equipment Manufacturer (OEM) and focuses on manufacturing and/or final assembly of an automobile.

A vehicle is made of many different components, which have been produced by various companies specialised in the production of those components e.g. glass, tires, electronics, telematics. Suppliers then deliver the components to the OEM. The OEM is responsible for final assembly and sells the final vehicle under its brand name.

A first tier supplier is a component manufacturer delivering directly to final vehicle assemblers. First tier suppliers work hand-in-hand with automobile manufacturers to design, manufacture and deliver complex automobile systems and modules, such as significant interior, exterior or drive train units. First tier suppliers in turn purchase from second tier and third tier suppliers.

A second tier supplier produces value adding parts in the minor sub-assembly phase. Second tier suppliers buy from third tier and deliver to first tier.

A third tier supplier supplies engineered materials and special services, such as rolls of sheet steel, bars and heat and surface treatments. Third tier suppliers rank below second tier and first tier suppliers in terms of the complexity of the products that they provide.



Source: OECD (2009)

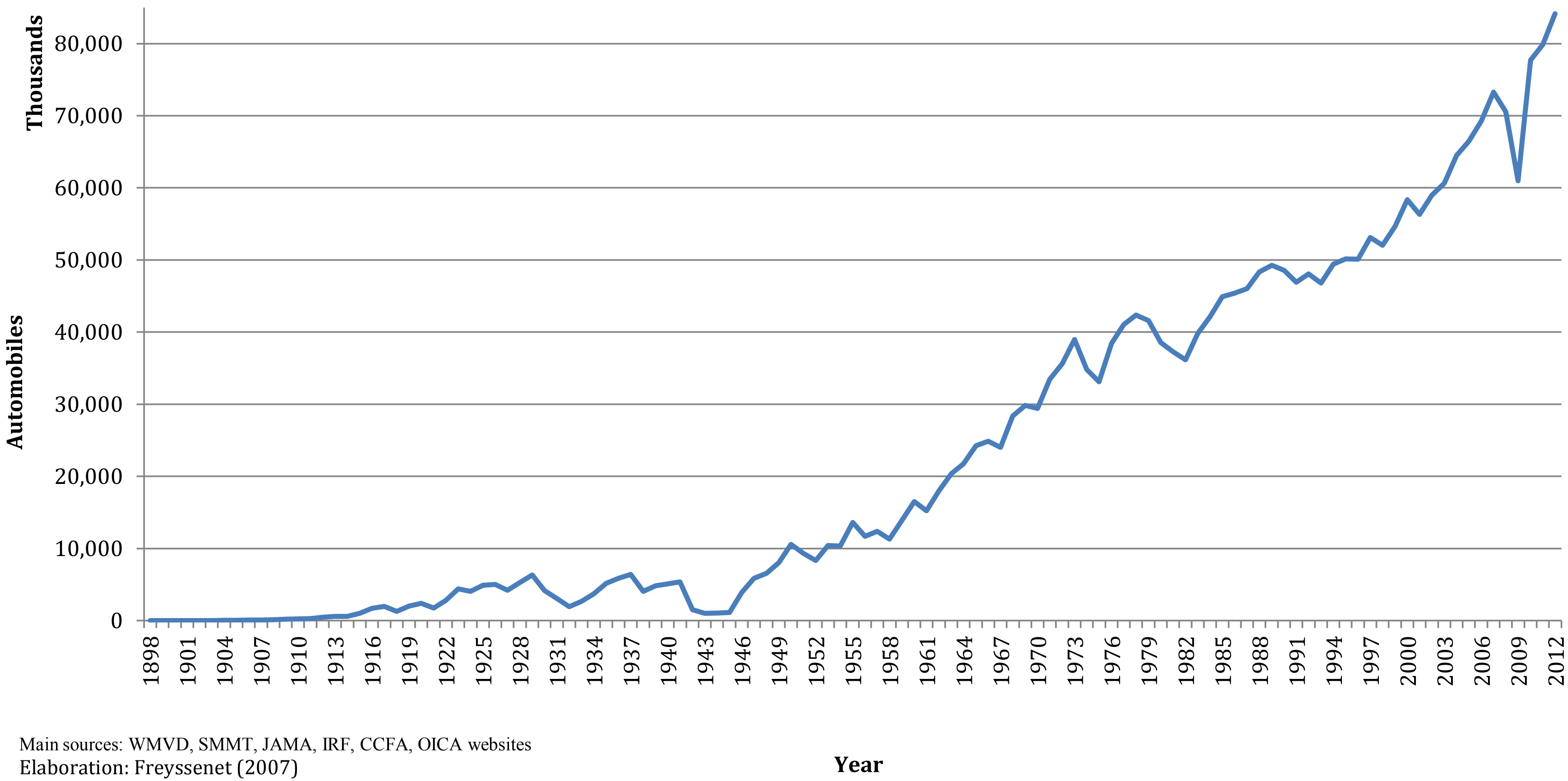
industry). Since mass production techniques are less firmly entrenched in developing countries than they are in the US or Europe, the potential reward from successful implementation of Just-In-Time production will be far greater for those countries.

4.3. TRENDS IN THE AUTOMOBILE INDUSTRY

Since its' humble beginnings in the late 1800s with craft production in US and Europe, the global automobile industry experienced substantial growth in later years. The industry has been transformed into a highly competitive market in recent years and become established as one of the leading subsectors contributing to manufacturing output, and providing employment to one in seven individuals (directly or indirectly) in developed countries. The first surge in production was the result of the first transformation in the industry; the introduction of mass production techniques by Ford in the early 1900s (see Figure 4.6). Post-war recovery efforts led to the second surge in the late 1940s, followed closely by growth in the 1950s and 1960s from sales of *"muscle car"* automobiles of Ford, GM and Chrysler and from low fuel prices. The oil price shocks of 1970s led to a declining share of the Big Three on the heels of the sale of fuel efficient cars from Japan and inability of US manufacturers to adapt adequately to the changing environment. Nag, Banerjee & Chatterjee (2007) have argued that coupled with the implementation of lean production technology, this allowed Japan to ease out the US as the market leader in the early 1980s.

Global automobile production surged between 2000 and 2007, and reached 73.3 million automobiles in 2007. Developing countries made their presence felt in the automobile industry in the 1970s; yet only managed to account for 17 percent of global production levels by 1980; however the share increased to 31 percent in the 2000s. New growth is being driven by firms in the Asia region now, and a number of developing countries have managed to leave a mark on global automobile production trends over the years. (see Figure 4.7- Figure 4.10 for production shares by country in key decades from 1900s to 2000s). Notable among these is the case of South Korea, that entered the US import car market with a single model, the Excel, that was "hot, and hard to find" according to Green (1992), within two months of its introduction in early 1986. In the span of one year, two additional South Korean firms successfully penetrated the US market and total South Korean car exports to the US rose to 346,582. By the end of 1988, Hyundai was the fourth leading exporter to the US, competing with established domestic and foreign firms. Also worthy of note are China and India, two developing countries that are fast emerging as powerhouses of automobile production. In 2009, India was ranked as the fourth (after Japan, South Korea and Thailand) largest exporter of automobiles in Asia, though lower growth rate in

Figure 4.6: World Automobile Production (1898-2012)



Main sources: WMVD, SMMT, JAMA, IRF, CCFA, OICA websites
Elaboration: Freyssenet (2007)

Figure 4.7: Automobile Production Shares by Country - 1900s

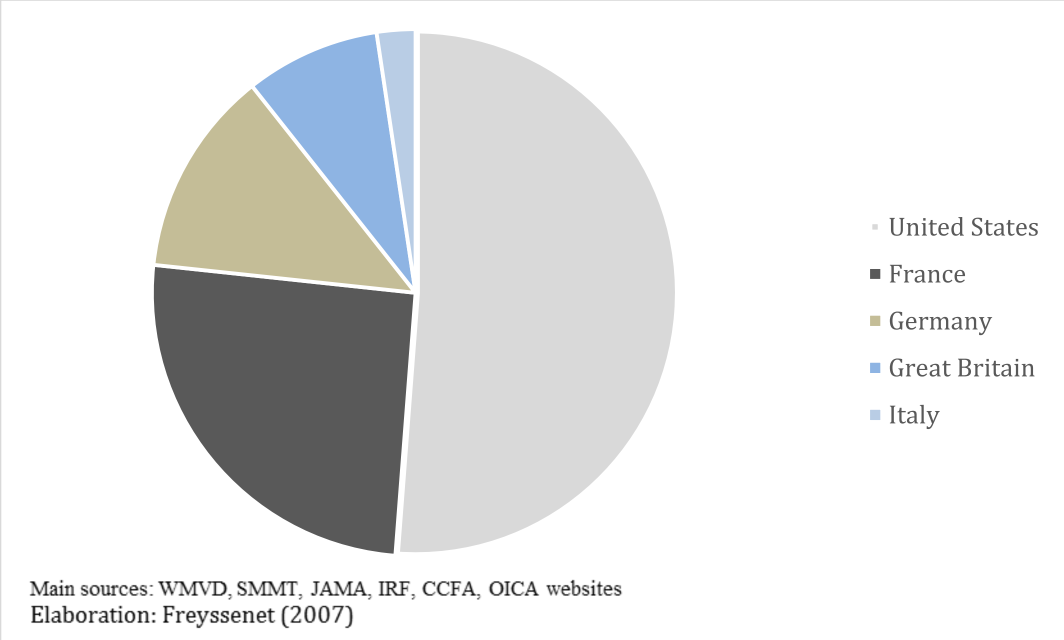


Figure 4.8: Automobile Production Shares by Country - 1940s

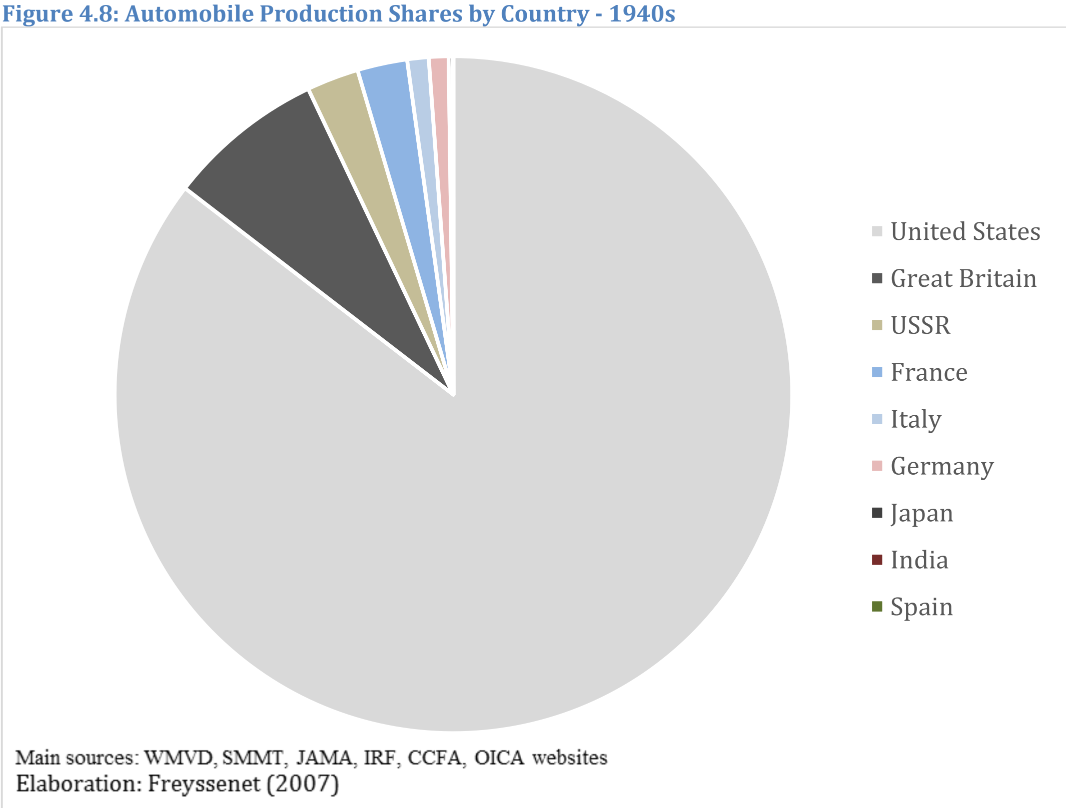
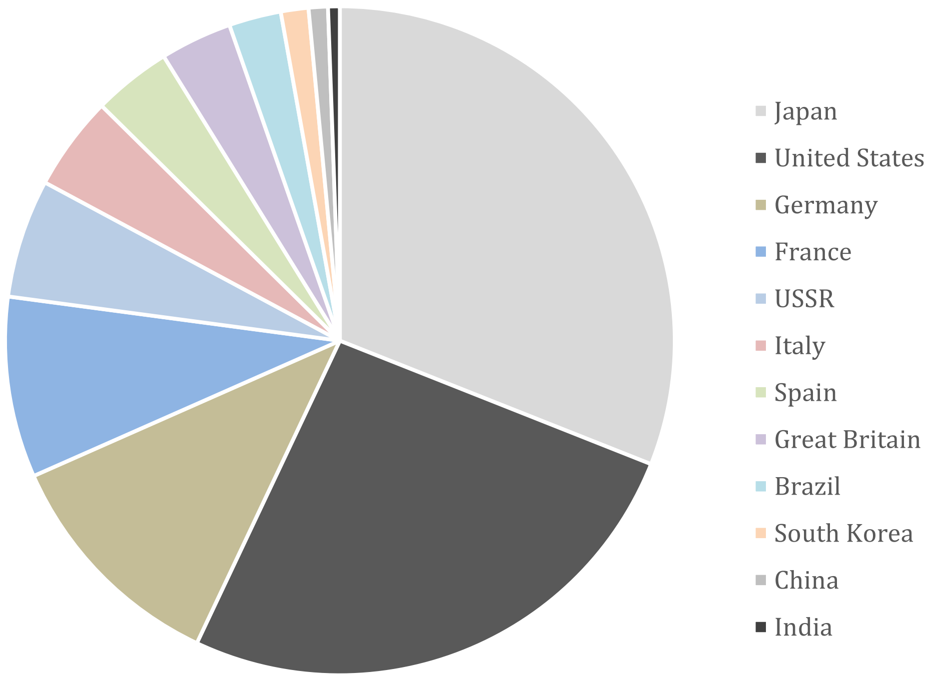
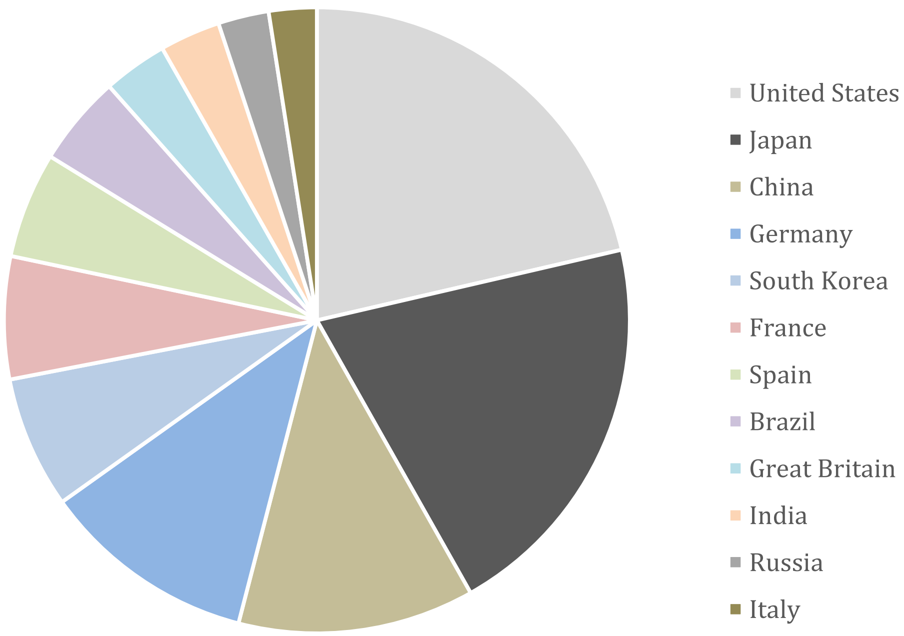


Figure.4.9: Automobile Production Shares by Country - 1980s



Main sources: WMVD, SMMT, JAMA, IRF, CCFA, OICA websites
Elaboration: Freyssenet (2007)

Figure 4.10: Automobile Production Shares by Country - 2000s



Main sources: WMVD, SMMT, JAMA, IRF, CCFA, OICA websites
Elaboration: Freyssenet (2007)

recent years have left the door open for other developing countries to gain a foothold in the global market. China recovered its market share in 2012 (4.6 percent growth) after lower growth (0.8 percent growth) the previous year.

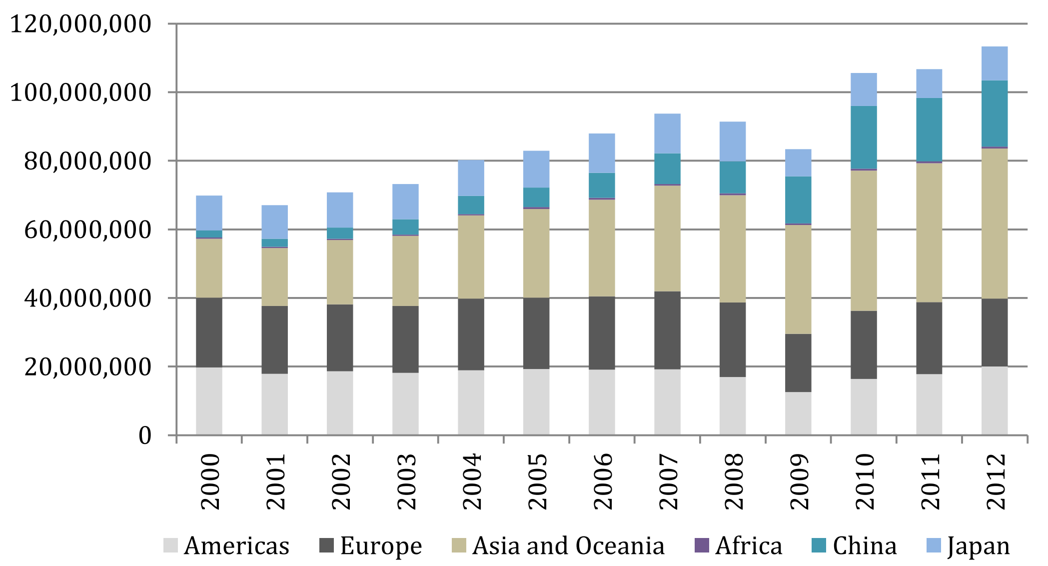
The US automobile industry has been dominated by the Big Three (Ford, General Motors and Chrysler) since the introduction of mass production technology. Ford Motor Corporation, General Motors Corporation and DaimlerChrysler experienced declining shares in the US market from mid-1990s to mid-2000s. Growth in the US market was tempered by union activity; domestic manufacturers in the US had to contend with a heavy burden of costs negotiated as part of the settlement with United Auto Workers (UAW) union and lost their lead in market shares to new entrants. Foreign manufacturers were unfettered by such arrangements with the UAW union and could undercut domestic manufacturers. According to McLaughlin (2006), the Big Three in the US were superseded by the New Six comprised of a mix of domestic and foreign manufacturers (Toyota, Honda, Nissan, Ford, GM and DC), and Toyota became the market leader in 2006 (see Ulrich (2006)).

The European Union industry on the other hand was dominated by German firms from early 1950s, followed by France and Spain, and though domestic demand was sluggish, export demand remained strong. The region accounted for a third of global production by the turn of the century, making way since then for the new rising stars; the developing countries.

In the Asian region, Japan accounted for 16.7 percent of global automobile production in 2004. China has now emerged as a major producer of automobiles rivalling Germany by providing companies with a cost effective export base with which to penetrate the Asian market. China accounted for 3 percent of global automobile production in 1988, and this share increased to 7 percent in 2004, fuelled by growth of domestic manufacturers that were successfully able to dominate the local market. Since 2004, India has been considered another emerging producer of automobiles with a Japanese owned (majority ownership) subsidiary dominating the domestic market. In both cases, the domestic industry is backed by sound domestic technological capabilities that have been developed by the state as part of its development agenda, in the form of national companies, champions that produce locally designed and manufactured automobiles. Pakistan has the potential to be another emerging producer, however, the local industry has not been able to successfully design and produce automobiles.

The new emerging player is China, with vehicle production levels of 7.9 million in 2009 as compared to 4.1 million for Japan (see Figure 4.11 for regional trends in automobile production from 2000 to 2012). This downturn of activity has resulted in Japanese firms curtailing foreign investment levels for market expansion. The Chinese expansion (doubling of production levels between 2003 and 2008 while US levels decreased by half) in the automobile industry is the result of government focus on developing the local industry through infrastructure provision and subsidy allocation. Automobile manufacturing growth and demand is expected to be generated in the Asia Pacific region (China and India mostly) with static demand in the developed regions of EU and the US due to market saturation and rising unemployment levels.

Figure 4.11: Regional Trends in Automobile Production (2000-12)



Main sources: WMVD, SMMT, JAMA, IRF, CCFA, OICA websites
Elaboration: Freyssenet (2007)

In the ASEAN region, Thailand and Vietnam experienced staggering growth of 280 and 202 percent during this time, while Malaysia and Indonesia grew at a comparatively sedate pace of 45 and 43 percent respectively. Production share of passenger cars declined in Malaysia, Thailand and Indonesia, but the slack appears to have been taken by The Philippines and Vietnam. Doner, Noble & Ravenhill (2006) found that Thailand has managed to successfully specialize in the production of 1 ton pickup trucks produced by foreign OEMs and become the top hub for their production outside the US. In the Philippines, production declined in 2004, while sales rose, and import of second-hand cars exceeded local production in 2000-02 according to Ofreneo (2008), p.74.

The recent global economic slowdown in recent years has had a profound effect on automobile industry production levels and firm operations. In particular, of the Big Three firms in the US (Ford, GM and Chrysler) representing over half the automobile production in the US, two collapsed, opening the door for existing and new emerging firms to establish themselves in the vacuum created. The Asia-Pacific region is making its presence felt and becoming the new hub for automobile production, with Japanese firms again surpassing US firms as world leaders in automobile production in 2008.

Hybrid vehicles are the new area of growth in automobile technology, but there is limited volume production and an absence of standardized technology means that the core components of these new vehicles are not outsourced to component manufacturers. To tap into this new area, component and vehicle manufacturers need to have appropriate grasp of the requirements involved, and the technological capabilities required to operationalize the knowledge acquired. Till such capabilities are acquired there is likely to be a trend towards captive, in-house parts manufacturing operations much as in the early days of the industry.

The emerging markets of Asia and the Middle East are ideally suited for low cost-no frills automobiles that would be within the grasp of population of those countries to purchase, not to mention requiring a certain level of technological capabilities development that developing countries can realistically access. According to IMAP (2010), though per unit profit margins on these vehicles would naturally be razor thin, the volume potential of production is very significant (see Kearney (2008)). Interestingly, with disposable incomes rising in China demand for this segment has fallen in recent years, so growth for these vehicles will be generated in other Asian countries.

In terms of the structure of the industry, until the 1970s, the global automobile industry was dominated by a limited number of massive Multi-National Corporations (MNCs) with a significant degree of vertical integration within these firms. As such the industry was classified as having a producer-driven global value chain[32]. In the 1990s, the global automobile industry underwent significant consolidation for the first time since the 1920s. A wave of mergers and acquisitions saw Saab, Volvo, Jaguar, Rolls Royce, Land Rover, Audi, Skoda, companies that were once hailed as national champions, merged with industry leaders from the US or Germany, General Motors, Ford and VW. With these mergers and acquisitions, the supply chain has also undergone a metamorphosis into a supplier-driven value chain (for details see Barnes & Morris (2008); Dicken (2007); Sturgeon, Biesebroeck & Gereffi (2008); Wad (2009), (2008)). Developing countries are using industrial policy to guide and nurture the development of the industry to avoid stagnation and more quickly achieve the economies of scale and spillover benefits associated with automobile production.

4.4. AUTOMOBILE INDUSTRY DEVELOPMENT POLICIES

The automobile industry has undergone a wave of concentration in recent years and automobile OEMs are also collaborating on a number of Joint Ventures for vehicle development, production, distribution, financing etc. – all levels of automobile production. Thanks to the advent of lean production technologies and rapid die-cast changes, the key to having a successful automobile industry is now considered to be offering of a desirable choice of vehicles in as many markets as possible. Automobile markets are still primarily regional rather than global, so production activities prior to distribution are mostly located in the region, if not the country, where the final assembly takes place. The assembly process itself represents only a small part of the value added in the supply chain so sourcing of automobile components is important. Plant location and sourcing of components is determined by a host of factors; including exchange rate, investment incentives, government policies and regulations, and domestic wage levels.

The structure of the automobile industry has also undergone a transformation since its early days. Till the 1970s, the industry was classified as having a Producer or OEM Driven Global Value Chain, but the absence of industry-wide standards, parts and sub-component specifications by vehicle models has brought about a significant shift in the structure; becoming a Supplier Driven Global Value Chain (as numerous authors including Dicken (2007), Barnes & Morris (2008), Sturgeon, Biesebroeck & Gereffi

[32] See Wad (2009)

(2008), Wad (2008), Wad (2009) have pointed out). OEMs are now leaning more towards forming lasting and significant relationships with key component and parts suppliers which limits their production economies of scale possibilities and also limiting design economies of scope (Sturgeon et al. (2009)). A defining characteristic of the industry is the high degree of capital and R & D intensity, which has led to the perception by researchers (including Humphrey & Salerno (2000) and Humphrey & Memedovic (2003)) subscribing to the Global Value Chain literature maintaining that national automobile projects in Asia will fail due to the lack of, and underdeveloped nature of, domestic capital and R & D. These researchers have gone so far as to characterize such endeavours as futile and a waste of precious resources which these countries can ill-afford to spend so wastefully. However, these views are limited as they do not account for the role of intervention by state policy that is geared towards helping the local industry develop indigenous technological capabilities and cope with pressures of international competition.

In their quest to transform and develop, a number of developing countries have used the national manufacturing sector as a conduit for this purpose; designing and implementing a variety of policies aimed at supporting the sector. The automobile industry in particular has been pegged as a strategic industry and singled out for preferential treatment on a number of occasions, despite the fact that academic support for such endeavours has generally not been positive or optimistic of the outcome. Automobile industry policies of the domestic government provide the institutional environment automobile business operate in and suitably crafted policies can nurture and guide the industry in the desired direction.

The ability of developing countries to succeed in their industrial development efforts depends critically on the mastery, adaptation and adjustments made to existing production technologies by firms in these countries. Simply using the technology does not translate to an immediate and costless mastery of such technology; rather it is an uncertain and arduous endeavour. A number of externalities can affect the process, and additional inputs are required at various levels to ensure the process has a measure of success. Development of this capability is naturally fraught with market failures, and as such, requires support – functional as well as selective. Clearly, it needs to be recognized first that firms are at the heart of any industrial development process Thun (2006), though there are a number of economic agents involved in this process, ranging from international institutions, governments, industry associations, but their actions revolve around operations of firms and the ability of these firms to compete in the global marketplace.

Developing countries have used a variety of approaches to boost growth in specific sectors and different policies have been used to achieve these goals. Import substitution and export promotion are two such approaches, and sector/industry specific policies such as Automobile Industry Promotion Policy (South Korea), MIDP and APDP (South Africa), and deletion policy and AIDP (Pakistan) are some of the sector specific strategies and policies pursued by developing countries that met with varying levels of success. Since the efficacy and outcomes of the policies used have varied across countries and time periods, it makes sense to review some of the more visible cases that pertain to the automobile industry.

4.4.1. BRAZIL

Brazil has had a weak industrialization experience when the automobile industry was selected as a core industry by President Jucelino Kubitschek in 1956. A policy mix of import tariffs, exchange rate adjustments and various protectionist policies, coupled with a number of FDI incentives, were used to attract the necessary foreign resources (both financial and technological) . By the 1970s, when the oil price shock hit, large scale operations had been established and the government undertook measures to further protect the local industry by opting for export promotion and import restrictions. Exports were subsidized to the tune of 26-36 percent and further supported by preferential loans, while exporting firms could import items valued at up to a third of their exports.

The local industry was suffering from a small domestic market size, poor industrial development and lack of resources, and foreign automobile firms were afforded tax exemptions and given preferential loans, and more importantly, allowed to retain complete ownership of companies established, to attract FDI. Lai (2001) observed that local content requirements were imposed on these foreign firms, starting with 35 to 50 percent and rising to 90 percent over a period of three years. Failure to comply with these content requirements meant the firm would be barred from further operations. Imports were to be restricted and capital for plant expansion was to be locally produced when the firm was able to achieve scale economies of production. Though government policies in Brazil have succeeded in rapid industrial development, local technological development is still lagging behind. Majority of automobiles in the domestic market are produced using foreign technology and indigenous manufacturers are struggling to cope with limited production using dated technology and as a result are lacking in capabilities to compete at a global level. According to Luo (2006), control of virtually all assets (95 percent) of the industry resides with foreign firm, and though the industrialization process is considered to have been successful, the fact that ownership is essentially foreign does not bode well for domestic technological capability and would limit the spillovers from the industry.

4.4.2. MALAYSIA AND THAILAND

Among the East Asian countries, Malaysia followed a state-driven national automobile industry development initiative much like South Korea and Japan, while Thailand opted for an MNC-driven initiative. Malaysia remained dedicated to a National Auto Programme, which was aimed at developing a domestic automobile industry manufacturing a full range of automobiles and components, and the dedication paid off with national automakers holding 90 percent of the market share. However, lack of enforcement of any performance criteria, as opposed to the South Korean case, meant that Malaysian manufacturers were unprepared to compete in the global market. To achieve the almost universal market share, Malaysian firms were provided assembly licenses with no regard to localizing production of parts and components. Lacking the necessary capability and financing to achieve scale economies in automobile production, a Joint Venture (Proton) was formed with Mitsubishi Motors (Jomo (1994) and Machado (1994)) in the 1980s. The government was able to position Proton as the market leader by the end of the 1980s through the use of subsidies, but was unable to compel the Joint Venture partner, Mitsubishi, to upgrade production facilities and exports based on Malaysian designs and brands, forcing Proton to turn to Lotus Corporation and pay high royalty fees for engine design capabilities. By the end of the 1990s Proton was able to launch a locally designed model and a few years later incorporated its own engine design into the technology. According to Chee (1994), Proton was able to achieve a measure of success despite the high cost of the project.

The Malaysian government chose to exclude existing Chinese entrepreneurs in favour of new Malaysian industrialists. This decision seems questionable considering how limited the pool of capable entrepreneurs was, when compared to the case of Korea and its *chaebols*. Furthermore, South Korea focused on imitation, learning and innovation virtually across the board to foster automobile industry development, while Kim & Ma (1997) and Rasiah (1999) found that Malaysia did not have a similar system.

Thailand's government underwent a change in 2001 and an over-arching industrial plan was launched in that same year to turn Thailand's automobile industry into the *"Detroit of the East"*[33] .Abdulsomad (1999) observed that the new plan included several initiatives specifically targeting the automobile industry for MNC led growth; the Thailand Automotive Institute was established to encourage public private cooperation in the industry, and also link industry support to export performance. Overall, foreign multinational enterprise (MNE) auto suppliers have taken over the auto supplier market of Thailand, increasing their numbers from around 30 companies in 1971–1985 and adding 300 foreign suppliers over the following period of 1987–2005. Thailand is now considered to have some of the most highly competitive and advanced automotive clusters in Southeast Asia.

Hewison (1997) pointed out that Thai elites had economic strongholds in agro-industrial complex and areas such as tourism (among others). As opposed to Malaysia, Thailand did not pursue *"ethno-economic nationalism"*[34] or accord the industry a higher priority over others in its development agenda, rather opted for a liberal, market oriented and MNC-driven strategy to develop the industry. It was not until the financial crisis of 1997 that MNCs were provided with a sufficiently appealing catalyst to exploit Thailand's comparative advantage with favourable exchange rates, liberal trade policy and non-confrontational trade unions, and develop the commercial vehicle production component of the local industry. Though the Thai government launched a plan to make the local industry the Detroit of the East, due to a conflict of interest between the government's desires and the MNCs goals, the plan met with only limited success. Still, Intarakumnerd (2006) contends

[33] Busser (2005), p.33
[34] Wad (2009)

that the Thaksin government did partly succeed transforming a *'weak, fragmented and slow-learning'* innovation system *'into one that can become stronger, more coherent and faster-learning'*[35], but a military coup overturned the Thaksin government in 2006. Kohpaiboon (2008) observed that over time the niche production of pickup trucks delivered volume and a platform for the whole industry to grow and the concentration on pickup trucks decreased over time (see Table 4.5 for key highlights of the automotive development policies of Thailand and Malaysia). The price to be paid was the relegation of Thai suppliers to lower tier status, while foreign MNC suppliers entered the Thai market and gained first tier status. The autoworkers unions have been fragmented and unable to effectively coordinate their efforts to collectively bargain and pursue common goals (see Wad (2004a) and Wad (2004b)).

Table 4.5: Automotive Development Policy in Thailand and Malaysia

Thailand	Malaysia
Open door policy	State-driven national automobile development policy
Exporting after East Asian financial crisis of 1997 met with success though domestic-owned parts and components companies were marginalized	National champions formed in JVs with Japanese OEMs were built up behind wall of protection and not led to success due to weak technological capabilities and targeting wrong markets

Source: Compiled by author

4.4.3. SOUTH AFRICA

Recognizing the importance of the automobile industry in enhancing the country's global economic standing, the South African government expended considerable resources and revenue to bolster the sector. Decades of protection allowed the South African automobile industry to significantly expand and diversify till the 1980s. Assembled vehicles were afforded prohibitive rates of protection while development of the components sector was encouraged through a local content requirement (60 percent of the mass of the automobile was to be locally produced). This initial support resulted in an inefficient and inward oriented production set up with a large number of makes and models produced in low volume at high cost. Poor quality, outdated design specifications, and inefficient supplier chains plagued performance of the sector, and there was limited effort to switch locally made parts for imported

[35] p.117

components (Black & Mitchell (2002) and Bronkhorst (2010)) while on the demand side, consumers were limited to high prices and limited choices.

Industrial policy in South Africa was subsequently altered to address the issue of shortage of foreign exchange by imposition of local content programme phases (Table 4.6 details the implementation of various phases since the early 1960s).. To compel local firms to develop the domestic vendor industry, a penalty for non-compliance of local content requirements was imposed of exorbitant import tariffs on components.

Table 4.6: Implementation Phases for South Africa Local Content Programme

Local Content Programme Phase	Years
Phase I	1961 – 1969
Phase II	1970 – 1975
Phase III	1976 – 1977
Phase V	1978 – 1988
Phase VI	1989 -

Source: Bronkhorst (2010)

4.4.4. PAKISTAN

Due to the lack of the necessary skilled people Pakistan has initiated the process of developing the capital-goods industries through vehicle assembly in the early Eighties by encouraging assembly of automobiles, consumer durables and capital-goods industries. These industries were encouraged by allowing concessional rates of duty ranging between zero and 60 percent on the import of components as compared to an average rate of about 100 percent import duties on the finished goods. The incentives had been provided in the hope that over a period of five years almost three-fourths of the components would be produced in the country.

The objective of the deletion policy was to encourage local assembly and progressive manufacture of consumer goods to aid in reduction of the country's import bill. The programme was designed in terms of percentage of Completely Built Units (CBU), rather than Completely Knocked-down Units (CKD), which led to exaggeration of indigenization of components that were relatively easy to produce with the given technology and capabilities present in the country. Firms were found to concentrate production on the lower end of the manufacturing tier, with no incentive to make progress up the value chain.

In the policy framework at the time, where the duty on the finished product is about 100 percent, and the concessional import duties on components are 20 percent, huge profit margins were created at the assembly stage. Kemal (1988) found that these profits tended to decline with progressive parts manufacture; clearly a system which envisages the declining profit rates with indigenization does not have much prospect of success. Though producers were threatened with penalties to force indigenization, failure to carry through on the threats on the part of the government led to weak performance by the deletion programme.

It was also observed that measuring the deletion rates in terms of CBU rather than CKD exaggerated the rates/levels realised by firms. Neither would crucial and relatively complex components that could contribute to technological capability development be produced locally, nor were they included in the list of components scheduled for deletion. Moreover, coverage of indigenization programmes was restricted to manufacturing of components for the industry; severely compromising the backward linkages of the industry with the rest of the economy.

These failures led to review of the policy in late 1980s. Penalties were increased through withdrawal of total/partial concession in import duties of components rather than through capacity constraints. No rewards for indigenization were given, only penalties imposed for not meeting targets. Defaulters were always able to find an excuse for failure to meet targets and in fact, according to Kemal (1988), past experience suggested sponsors were always successful in extending deadline for deletion targets without any penalty.

Of the four firms manufacturing trucks in the economy, none achieved the targeted rate of deletion/localization; but the firms manufacturing buses locally fared slightly better and achieved higher deletion rates (Table 4.7).

Table 4.7: Deletion Policy Targets and Achievements in the Truck and Bus Segments

Market Segment		Targets		Achievements
I	**Trucks**	**1988**	**1991**	**1988**
	Firm 1	40.9	81.2	17.3
	Firm 2	38.2	82.0	27.0
	Firm 3	36.7	81.3	18.2
	Firm 4	71.5	74.2	53.9
II	**Buses**	**1988**	**1991**	**1988**
	Firm 1	40.9	81.2	17.3
	Firm 2	28.2	82.0	23.4
	Firm 3	51.4	74.9	32.0
	Firm 4	37.7	75.1	22.9

Source: Kemal (1988)

Passenger vehicles firms (cars, LCVs, pickups, jeeps) achievement also lagged far behind their intended targets for the year, though the progress was better for jeeps than cars and pickups while least amount of progress was made by van manufacturers (Table 4.8).

Table 4.8: Deletion Targets and Achievement in the Passenger Car Segment

Market Segment		Targets		Achievements
III	**Passenger Vehicles**	**1987**	**1989**	**1987**
	Cars	53.5	80.8	31.2
	Vans	55.3	73.9	23.4
	Pickups	57.4	82.9	31.1
	Jeep	55.0	81.0	45.8

Source: Kemal (1988)

The most promising progress was made in the tractors segment of the industry. Two tractor manufacturers made significant progress in their attempts to localize the production process and achieve the deletion targets that had been set. The remaining three did not achieve the targets set, but still made some headway (Table 4.9).

The motorcycle segment also made progress in achieving the deletion targets; in particular the scooter rickshaw manufacturers performed really well (Table 4.10).

Table 4.9: Deletion Targets and Achievement in the Tractor Segment

Segment		Targets		Achievements
IV	Tractors	1985	1987-88	1986
	Firm 1, Model A	64.7	81.8	66.3
	Firm 1, Model B	19.9	53.6	20.0
	Firm 2, Model A	59.9	82.4	47.3
	Firm 2, Model B	25.2	60.8	36.1
	Firm 3	60.8	87.1	48.5
	Firm 4	52.6	72.0	46.4
	Firm 5, Model A	64.9	85.6	49.8
	Firm 5, Model B	62.9	85.6	47.8

Source: Kemal (1988)

Table 4.10: Deletion Targets and Achievement in the Two Wheeler Segment

Segment		Targets		Achievements
V	Two and Three Wheelers	1985	1989	1987
	Motorcycles	73.6	73.6	50.6
	Scooters	75	75	57.6
	Scooter Rickshaws	52.8	62	58.9

Source: Kemal (1988)

The industry switched over to Trade Related Investment Measures (TRIMs) compliant Tariff Based System (TBS) in 2006. Preliminary analysis suggests that assemblers are adjusting to the new system with relatively more ease than component manufacturers with outdated production technologies and poor capabilities development. The government has shifted focus now towards facilitating the local industry through infrastructure provision, human resource development, technology acquisition, investment in productive assets, cluster development and development of standards on safety, quality and environment through a well-structured and deliberate approach as embodied in the Automobile Industry Development Program (AIDP). The AIDP was originally designed to help the industry achieve a critical mass of production, double the contribution of auto industry to GDP from the existing 2.8 percent, by the year 2011-12 with high focus on investment, technology up gradation, increasing its exports to USD 650 million, enhancement in jobs alongside the development of critical components to further increase the competitiveness of domestically produced vehicles. However, based on the weak global economic environment in recent years and limited export base, local manufacturers are in the process of revising the AIDP targets and goals.

4.5. CONCLUSION

The automobile industry has been hailed as the mother of all industries, on account of its intricate backward and forward linkages with the rest of the manufacturing sector and the economy at large. This chapter highlights the major advances that have been made in the automobile industry, their relevance for developing countries, the recent trends in the industry and the policies that have been used to shape and direct the development of the industry.

Advances and developments in the automobile industry have wrought changes in society for various countries and been transferred to the rest of the world over time. As the discussion above has shown, there is every reason to assume that any future transformation in the industry will also bring about changes in countries, and developing countries are now ideally poised to benefit from such a transformation and bootstrap their development process. The supply chain of the automobile industry has evolved alongside the transformations taking place, allowing countries to realise the full benefit of the advances being made. The structure of the industry has also undergone change, and is now marked by a rising number of mergers and acquisitions and growing dominance of developing countries in emerging technologies.

Developing countries have used policies to shape and guide the development of their automobile industries with varying levels of success. A comparative look at the main characteristics of these policies yields valuable lessons for developing countries.

Much as Pakistan began with a weak industrial base, so too did Brazil, but the policies that evolved in the latter favoured the MNC-led approach to development and research suggests that the result has been limited development of domestic industry technological capabilities and spillovers. Malaysia on the hand, opted for the domestic industry led approach under the umbrella of a national industry development plan and have managed to achieve limited success with their domestic brands. Again, Thailand opted for an MNC-led approach and while achieving some success, now have a domestic parts industry that is underdeveloped with weak technological capabilities, which suggests that the domestic industry will face difficulty in the absence of MNC presence. The South African automotive industry in the early years was plagued by a number of inefficiencies that were rectified in later years, however, the industry did not achieve sufficient capacity or a critical mass till the 2008 Global Financial Crisis and remained vulnerable.

The discussion that follows will look at the experience of Pakistan's automotive industry in the context of the evolution and developments that have taken place in the industry as a whole (as covered in Section 4.2 above). The case studies will bring to light the changes that particular firms have been able to benefit from as they themselves have evolved.

CHAPTER 5. PAKISTAN'S AUTOMOBILE INDUSTRY: A CASE OF STALLED DEVELOPMENT

5.1. INTRODUCTION

Since the first time mass production was successfully introduced in the automobile factories of the US and the invention revolutionized 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. The key characteristics of the industry highlighted earlier make it ideally suited to this task. 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 (locally designed and produced components and parts).

Against this backdrop, the aim of this chapter is to review the current state of affairs of the automotive industry in Pakistan. Towards that end, 5.2 assess where the industry stands at present, the key developments that have taken place are reviewed in Section 5.3. Section 5.4 recounts the major historical developments in the industry since independence, while institutional framework is covered in Section 5.5 and the policy framework is discussed in Section 5.6. The trends in Pakistan's automotive industry are explored in Section 5.7, 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 5.8, while Section 5.9 recounts the technological capabilities development of the component manufacturers backed by the major automobile OEMs. The financing of technology acquisition efforts is covered in Section 5.10 and Section 5.11 concludes the discussion on the state of the automotive industry in Pakistan.

5.2. STRUCTURE OF THE INDUSTRY

The automobile industry of Pakistan does not have a major share in total value added in the manufacturing sector (see Table 5.1); 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 5.1: Component Ratio of Value Added in Manufacturing (2009-10)

(%)

Manufacturing Group	Ratio
Textile & Apparel	35.16
Food, Beverage & Tobacco	19.11
Petroleum	6.96
Pharmaceutical	6.69
Non-Metallic Minerals	5.58
Automobile	**5.27**
Fertilizers	4.50
Chemicals	3.84
Electronic	3.31
Leather	3.02
Paper & Paper Board	0.79
Engineering	0.59
Tyres & 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 5.2). 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 categorized 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 5.2: 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**
Organized and Tier One	450
Tier Two	425
Unorganized 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 program (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 autorickshaws) and there is a high degree of concentration in the remaining segments of the industry, as shown in Table 5.3.

Table 5.3: 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 5.4 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 capitalize on by setting up industrial parks or clusters in those cities to support the component manufacturing industry under the AIDP.

Table 5.4: 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.	Sajawal	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 5.5). 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 5.5: 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)

This trend is reflected in the market share of the companies in the domestic economy. 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 5.6).

Among the four-wheel vehicle Japanese OEMs, Pak Suzuki Co. has secured 40 percent of the market (Table 5.7) 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 5.6: 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)

Table 5.7: 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 5.8). 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 Skeikhpura 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 5.8: 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 Yahama	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 5.9).

Table 5.9: 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 5.10).

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 5.11, 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.

Table 5.10: 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)

Table 5.11: 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 realized since the policy was first implemented (see Table 5.12) and as a result the planned contribution to GDP has also not been achieved.

Table 5.12: 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

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.

5.3. 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.

5.3.1. 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.

5.3.2. 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.

5.3.3. 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.

5.4. HISTORY OF THE DOMESTIC AUTOMOTIVE INDUSTRY

To overcome the initial difficulties faced by the country in first setting up a manufacturing sector, the government focused its efforts on developing infrastructural facilities and establishing the Pakistan Industrial Development Corporation (PIDC) in 1950. The main objective of PIDC was to play the pioneering role of establishing such industries which the private enterprise was unable to undertake either because they were technologically complex, needed large capital or were less profitable. Genesis of the domestic automobile industry can be traced to the early 1950s, when PIDC helped establish National Motors in collaboration with

General Motors (US) Overseas Distribution Company for the assembly of Bedford trucks. Subsequently buses, light trucks and cars were assembled in the same plant and the industry has matured with time (as evident from the timeline of manufacturing operations evolution by decade given in Table 5.13).

Table 5.13: Period-wise Manufacturing Operations Breakdown in the Automotive Industry

Sector	Period	Manufacturing Operations	Vehicles Produced
Private	1950's	SKD Assembly	Trucks Buses
Private	1960's	SKD/CKD Assembly with indigenization in: i) Bedford trucks / buses: ~ 40% ii)Cars: 20%	Trucks Buses Ford vans Vauxhall, Ford Prefect, Ford Cortina and Dodge Dart cars
Public	1970's	SKD/CKD Assembly Indigenization process accelerated and achieved 80% deletion in Bedford trucks/buses by 1976.	Trucks Buses cars (up to 1972)
Private	1980 - 2005	Progressive manufacturing of automobiles under Deletion Programme	Suzuki, Toyota, Honda, Hyundai, Santro, Kia, Cuore, Revo and Chevrolet cars.
Private	2006 onwards	Progressive manufacturing of automobiles under Tariff Based System	(as above)

Source: Compiled by author

The push towards achieving a degree of independence in automobile production began in earnest in the mid-1960s, with National Motors, being taken over by a local entrepreneur and now known as Ghandhara Industries, and Mack Trucks began local manufacturing of simple and non-functional parts and allowed for the phased addition of more and more complicated parts. According to 100% local manufacture or "deletion"[36] was expected to be achieved in the relatively short span of seven to ten

[36] Kemal (1988)

years, but this proved to be overly optimistic, and the program failed to achieve its targets; achieving only 40% indigenization for trucks and a mere 20% for cars.

In early 1972 under Martial Law Regulation, the Government took over the control of 32 industrial units, including eight automobile plants, under the officially appointed Board of Industrial Management with the Minister for Production as its Chairman. Initially, the management of these industries was taken over by the government itself, but in August 1973, the President promulgated the Economic Reforms (Amendment) Ordinance after which the Federal Government acquired majority ownership of shares of these industrial units. After nationalization, these units were renamed (see Table 5.14 for a list of automotive industry units that were taken over by the state), their functions were redefined and Pakistan Automobile Corporation (PACO) was created in 1973 as a holding corporation under the administrative control of the federal Ministry of Production.

Table 5.14: Nationalization of Automotive OEMs in 1970s

Pre 1973 Title	Post Nationalized Title
Wazir Ali Engineering	Sindh Engineering
Ali Autos	Awami Autos
Haroon Autos / Karachi Autos	Republic Motors
Gandhara Industries	National Motors
Hyesons	Mack Trucks
Rana Tractors	Millat Tractors
Jaffer	Trailer Development Corporation
Kandawala Industries	Naya Daur

Source: Compiled by Author

PACO was a major public industrial conglomerate of 15 companies including four joint ventures. Emphasis was on developing the nationalized units of local manufacturing units in an organized manner and a system of standardization, regulations and monitoring was established. This required the industry to assemble Complete Knock-Down (CKD) kits and then proceed to manufacture components and also achieve a local content of 75 percent over a five year period. A number of small and large industrial units that were mostly functioning in the unorganized sector were thus organized into a more formal pattern of production management under control of PACO. The direction for achieving quality standards as laid down by the

"Principals" (another term for the foreign Joint Venture partner used by EDB officials) was also established. The Ministry of Industries in conjunction with the Central Board of Revenue (CBR) was entrusted with the responsibility of allowing any waiver for non-performance.

The distinctive feature of this nationalization period was the assembly of Suzuki range of vehicles and Isuzu Trucks and Buses in the public sector. Awami Autos signed a Joint Venture Agreement with Suzuki Motor Co. of Japan and a new company by the name of Pak Suzuki Motor Co. Ltd was established in 1982 to produce Suzuki range of vehicles at the existing facilities of Awami Autos.

In the late 1980s, nationalization of key sectors of the economy was reversed as the government sought to liberalize in the aftermath of lukewarm performance by nationalized industries. Control of industries was relinquished to the private sector and a number of new joint ventures were encouraged to develop the industry further; most notable among these being Atlas Motors with Honda, Japan and Indus Motor with Toyota, Japan.

5.4.1. THE POST-INDEPENDENCE PERIOD (1947 - 1972)

The first automobile plant in the country was set up in May 1949 by General Motor & Sales Co. and commenced production on an experimental basis, but it rapidly grew into an assembly plant for Bedford trucks and Vauxhall cars. Witnessing this progress, three leading US auto-makers also started collaboration with Pakistani entrepreneurs to set up:

1. Ali Automobiles to assemble Ford products in 1955,
2. Haroon Industries to assemble Chrysler's Dodge cars in 1956, and
3. Kandawalla Industries to assemble American Motor products in 1962.
4. In addition, Hyesons established the Mack Trucks plant in 1963.

All the plants were restricted to semi-knocked down (SKD) assembly operations only. In 1963 the General Motors plant was sold to Ghandhara Industries Limited and in 1966 it was granted permission to undertake the progressive manufacture of Bedford trucks and buses. This is generally accepted as the beginning of the automotive sector in Pakistan.

The absence of organised components' manufacturing facilities, lack of technical know-how and non-existence of proper ancillary facilities for the design and development of tools, jigs and fixtures retarded the pace of indigenization at this stage, while only half-hearted efforts appear to have been made for technology acquisition and the training and development of personnel in the industry.

5.4.2. PERIOD OF PROGRESSIVE MANUFACTURING (1964-72)

The promising potential of industry and high demand of the products attracted new entrants was evident in the first half of the 1960s, whereas existing manufacturers started producing in mass quantities. The mass production that started in 1964 resulted in the first ever period of progressive manufacturing in the history of Pakistan. The idea of progressive manufacturing was first mooted by the Ghandhara Industries and Mack Trucks. The idea was to start local manufacturing with simple and non-functional parts and to add more and more complicated parts in small steps. According to planning at the time, 100 percent local manufacturing was to be achieved in seven to ten years. However, this period did not last long as the projects undertaken proved to be over ambitious and eventually failed without achieving their goals.

Clearly the concept of progressive manufacturing did not add much to technology, self-reliance or economy. For example, as against the targets set of manufacturing 100 percent of local content in 10 years (maximum), actually achieved deletion in 18 years was 45.78 percent for trucks and buses, 43.17 percent for trucks & buses engines, 16.50 percent for 4x4 jeeps and 0 percent for cars. Furthermore, no new units for manufacturing passenger cars, 4x4 vehicles, LCVs, buses and trucks were established under this concept, but still few new units for producing tractors, jeeps and specialized vehicle were established. New units established were Atlas Honda, Khawaja Autos, Rana Tractors, Jaffar Industries, and Bela Engineers. A more market oriented approach was observed by Honda motorcycles and Vespa scooters during this period, as they introduced light motorcycles for the first time in a market dominated by heavy motor bikes like BSA, Triumph and Lamberetta scooters.

5.4.3. NATIONALIZATION OF INDUSTRIES (1973-87)

The nationalisation of key industries, including automobile manufacturing units, through the Economic Reform Order of 1972 is stated to have brought about some rationalisation in the role of the then existing automobile companies. The units were renamed and their functions redefined: A Board of Industrial Management was constituted to formulate a national policy for industrialisation and also to oversee and coordinate the functions of the newly-nationalised units. This was a gigantic task and later various corporations were established to look after each major industrial sector, such as, automobiles, cement, fertilisers and engineering.

From accounts of the time, the step to formulate a national policy on industrialisation demonstrated lack of the required conviction. The objective of the corporations appeared to show that the public sector could run industries better only if it earned higher profits, however the desired national approach was missing and the targets remained undefined or obscure. Strategies and future plans were not made during the whole decade of the 70s and even the early part of the 80s.

This coincided with model changes by the principals and also shifting of consumers' preference towards updated and more reliable products as well as a time when the Japanese manufacturing industry gained a sure and significant foothold in the global market. Finally, it was realised that the integration of the public and the private sectors was absolutely necessary to achieve national objectives and that without healthy competition consumers and the national economy would continue to suffer. This realisation led to the reorganisation of several existing units along with the addition of a few new undertakings in the public and private sectors. Awami Autos was turned into Pak-Suzuki Motor Company Ltd. and commenced progressive manufacture of Suzuki vehicles, including 800 cc passenger cars. Progressive manufacturing of Fiat tractors was assigned to a new joint venture company, "Al-Ghazi Tractors Ltd.," under the management of the Habib Group. Republic Motors Co. was renamed as Hino-Pak and became a joint venture company under private sector management. One more plant, Ghandhara-Nissan, was sanctioned in the private sector to undertake the progressive manufacture of trucks. Three new tractor plants were also set up in the private sector. Side by side, two units were established under PACO to manufacture automotive castings and wheels.

The requirement for another car manufacturing plant was also felt in the mid-eighties, but the Government was not able to take a firm decision until April 1989 when a sanction was granted to the House of Habib and the Toyota Motor Corporation of Japan to set up a modern plant to progressively manufacture Toyota's best-selling automobile, the Corolla passenger cars, as well as other popular vehicles.

5.4.4. PRIVATIZATION OF INDUSTRIES (1987-95)

The policy of de-nationalizing public sector units was adopted once the change in government took place. Privatization brings in foreign companies. This results in a number of joint ventures. Due to these ventures, Pakistan auto industry entered into assembly/progressive manufacture of passenger cars, commercial vehicles and motorcycles. Once the new management of cars and motorcycle assemblers took over the control they entered into joint ventures with foreign companies, mostly Japanese, for further development. The most significant joint ventures at the time were those of Atlas with Honda and Indus Motor with Toyota.

Subsequent to the discontinuation of the AMC-Jeep franchise, the Naya Daur Company, which become a mere vendor to Pak Suzuki (assembling Suzuki Jeeps), was sold to Tawakal group. Under the Government de-nationalization policy, Naya Daur entered into a joint venture with Kia Motors of Korea and started assembling Kia Ceres Pickups and Kia Pride Cars. The government has persisted with the privatisation of companies, but the process is far from transparent, riddled with short-comings and the benefits unsure.

5.5. INSTITUTIONAL FRAMEWORK

The institutional framework surrounding the 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.

5.5.1. 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 organized 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/localization 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.

5.5.2. 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 nationalization 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 industrialization of the economy. A total of eighteen organizations fall under the purview of the MoIP (core functions for nine organizations most relevant to the automotive industry are given in Table 5.15 below,[37]). It is clear that combined the organizations 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 organizations 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.

[37] The list of other attached organizations is presented in Appendix A

Table 5.15: Organizations of MoIP and their Core Functions

	Name of Organization	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 Organization (NPO)	Promote improvement of productivity and competition in industrial sector
5	Pakistan Industrial Technical Assistance Center (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 & 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 across the country, and has yet to yield any tangible benefits to the automotive industry.

Pakistan Industrial Technical Assistance Center (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)

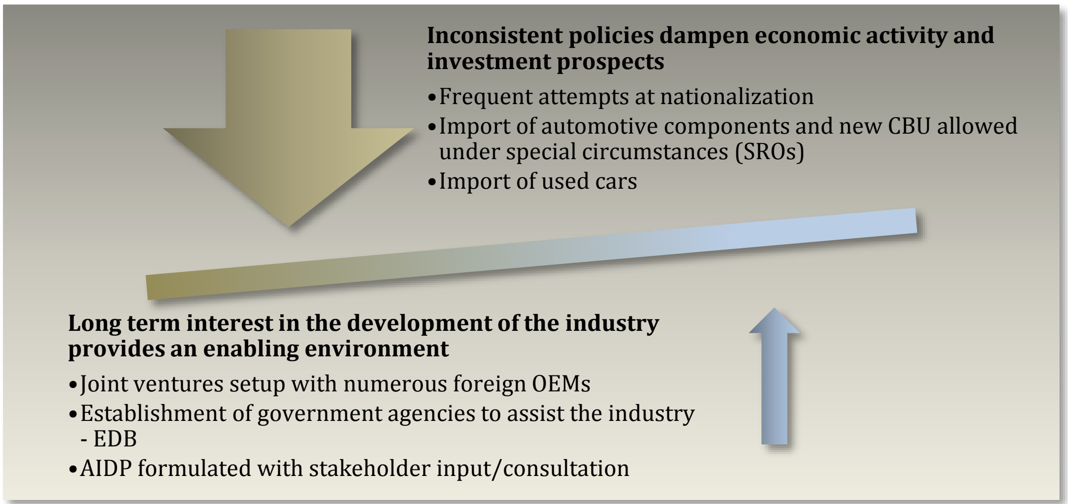
TUSDEC was established in 2005 for the express purpose of assisting key industries in upgrading their production technology and has completed a number of projects to accomplish this goal in various industries, some of which naturally have links with the automotive industry. Again, the major automotive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

5.6. 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 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 nationalization 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 privatization 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 localization of parts under deletion/localization 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 Program (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 Figure 5.1 for the trade-offs between impact of state policies and interests on industrial performance).

Figure 5.1: Impact of State Policies and Interests on Industrial Performance



Source: JICA (2011), author

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 5.16 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.

The policy of 2005 (see Box 5.1) 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 the interested parties were considerable and conflicting and it was unable to allocate the resources effectively to achieve policy objectives.

Table 5.16: 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 5.1: 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 5.2: 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 5.3: 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)

Source: JICA (2011)

5.7. TRENDS IN THE AUTOMOTIVE INDUSTRY

Over the decades, the automobile industry has exhibited mediocre performance in terms of sustainable and persistent growth (see Table 5.17). 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% 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.

Table 5.17: 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.

Since 2001-02, the automobile market has grown by over 40 per cent per annum and if an average growth of 30 per cent 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.

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 per cent 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 per cent. 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 per cent 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.

5.8. STATE OF AUTOMOTIVE PARTS MANUFACTURERS IN PAKISTAN

In Chapter 4 we discussed the changing nature of the automotive industry 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 unorganized 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 unorganized 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 organized 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 privatization and LCP was accorded priority in the 1990s. In 1995, the state launched Product Specific Deletion Program (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 organized 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 5.18, 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 5.18: 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

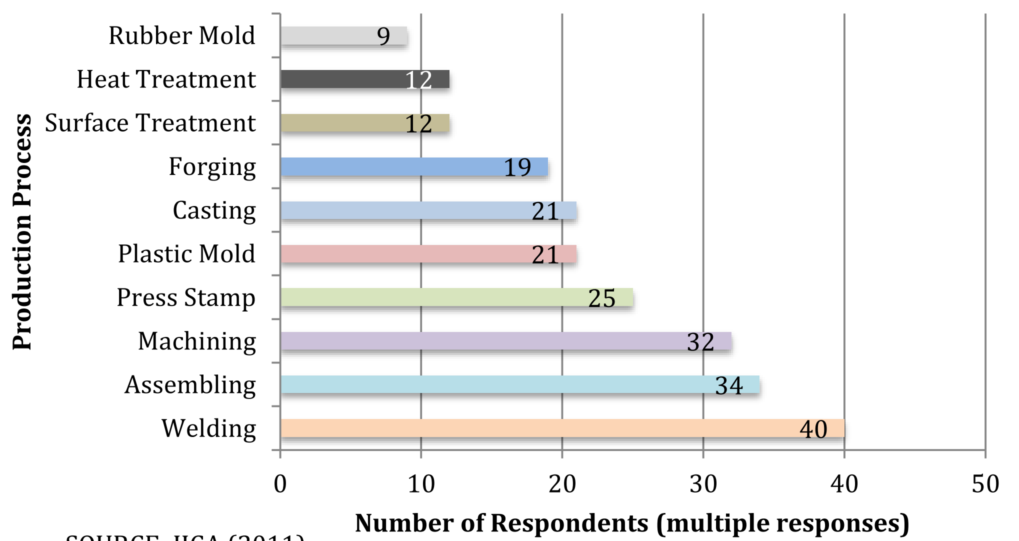
Source: JICA (2011)

The majority of the manufacturers cater to the domestic market, though it was found that of a total of 31 manufacturers[38] 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?

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

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 Figure 5.2). In fact, processes requiring specialized 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 internalize production of the component or procure it from abroad at higher cost.

Figure 5.2: Production Processes Employed by Component Manufacturers



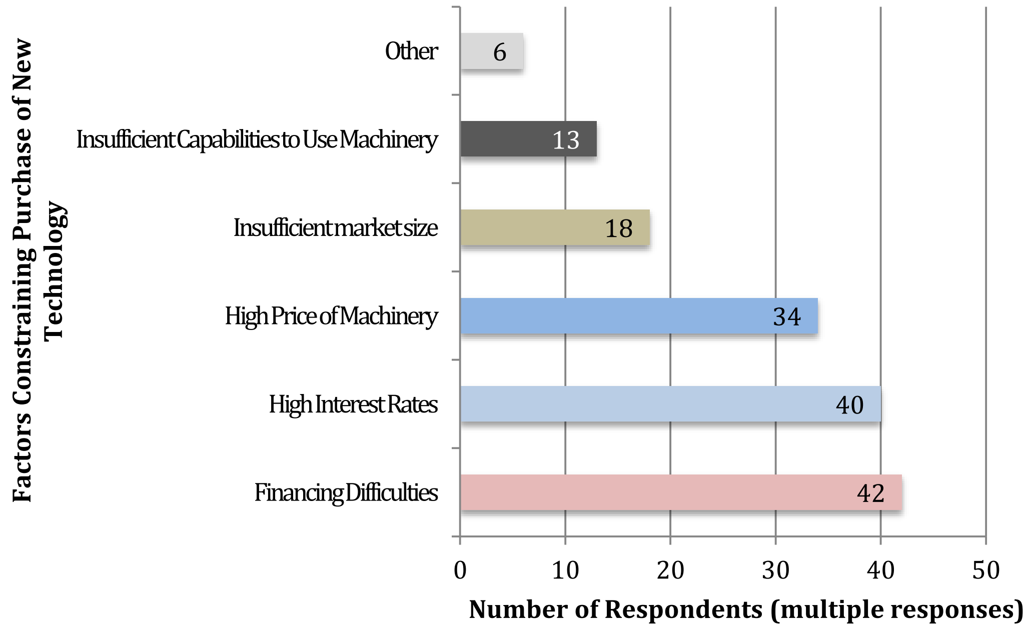
SOURCE: JICA (2011)

Furthermore, a large number of manufacturers use more than one production process on the shop floor and have not yet specialized 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 standardization 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 Figure 5.3). 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.

Figure 5.3: Factors Constraining Purchase of New Technology

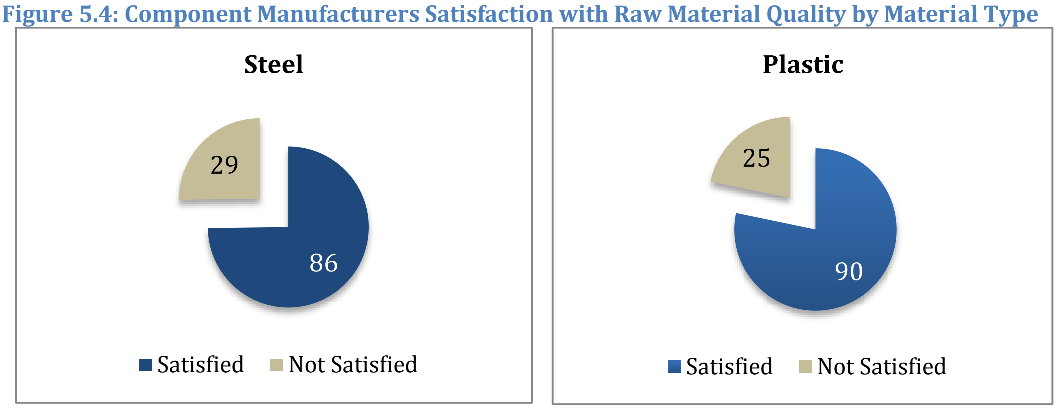


Source: JICA (2011)

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, as discussed earlier in Chapter 4, 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 Figure 5.4). 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 Figure 5.4).

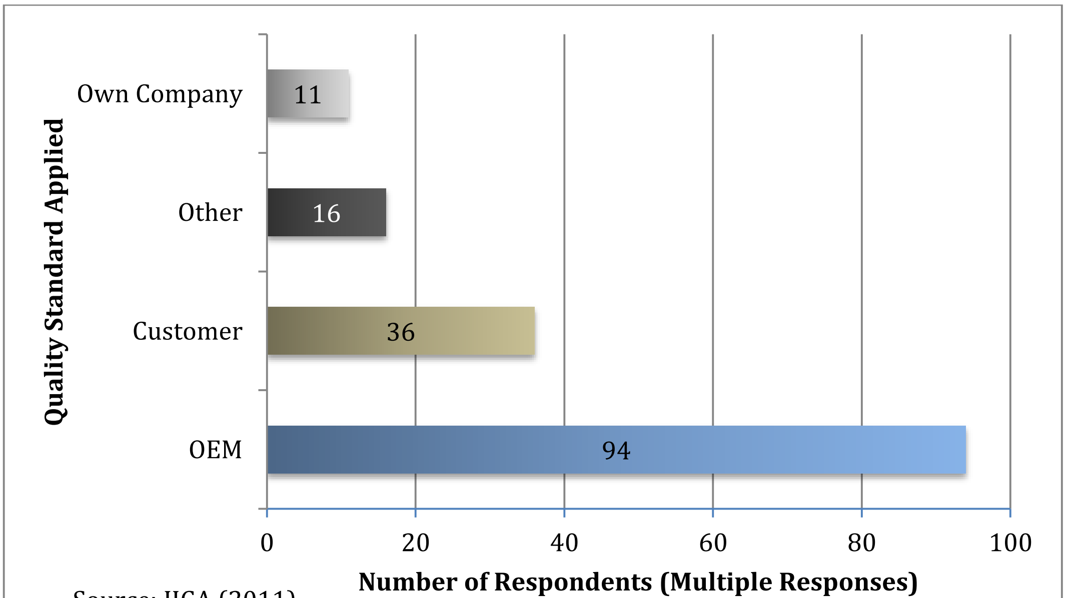
Component manufacturers themselves have to comply with different sets of quality standards for their products (see Figure 5.5). Some firms opt to simply follow the standards set by customers and OEMs, while others have their own internal standards in addition to those of the customer and OEMs. The majority of manufacturers (94) report following the standards set by OEMs, then the customer (36), while only 11 have established their own quality standards.

Figure 5.4: Component Manufacturers Satisfaction with Raw Material Quality by Material Type



Source: JICA (2011)

Figure 5.5: Quality Standards Followed in Component Manufacturing Firms

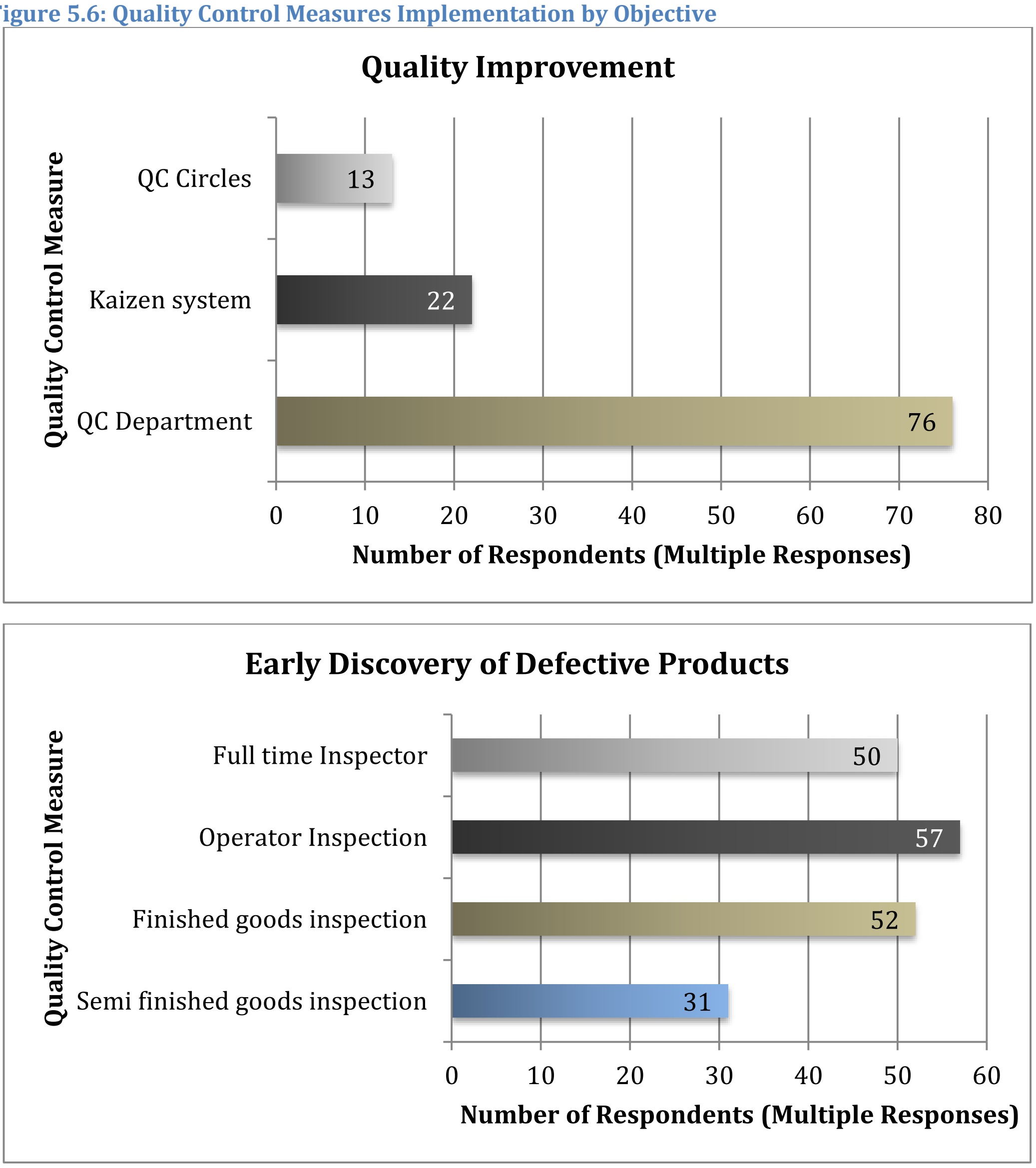


Source: JICA (2011)

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 Figure 5.6 for the distribution of firms).

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 Figure 5.6.

Figure 5.6: Quality Control Measures Implementation by Objective



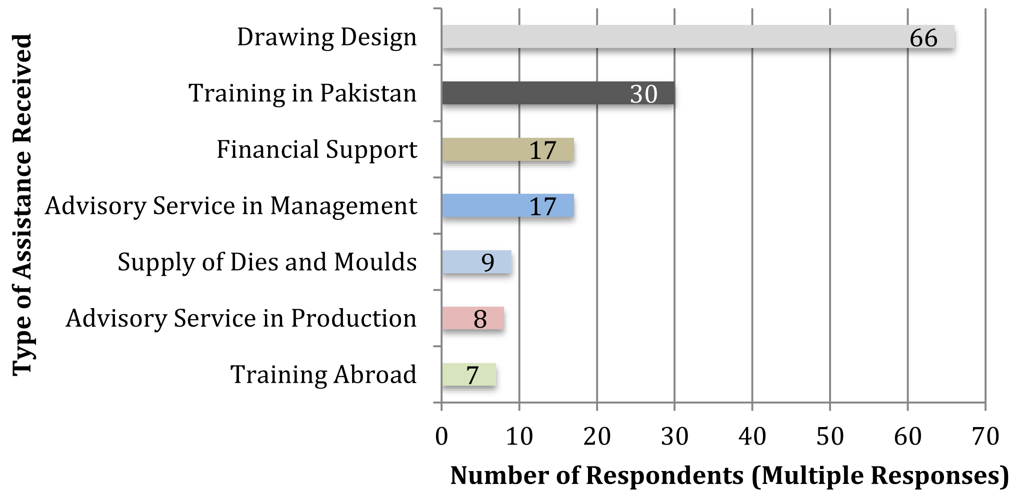
Source: JICA (2011)

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.

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 Figure 5.7 for the distribution of type of assistance rendered by OEMs to component manufacturers in recent years).

Figure 5.7: Assistance Received From OEMs by Type

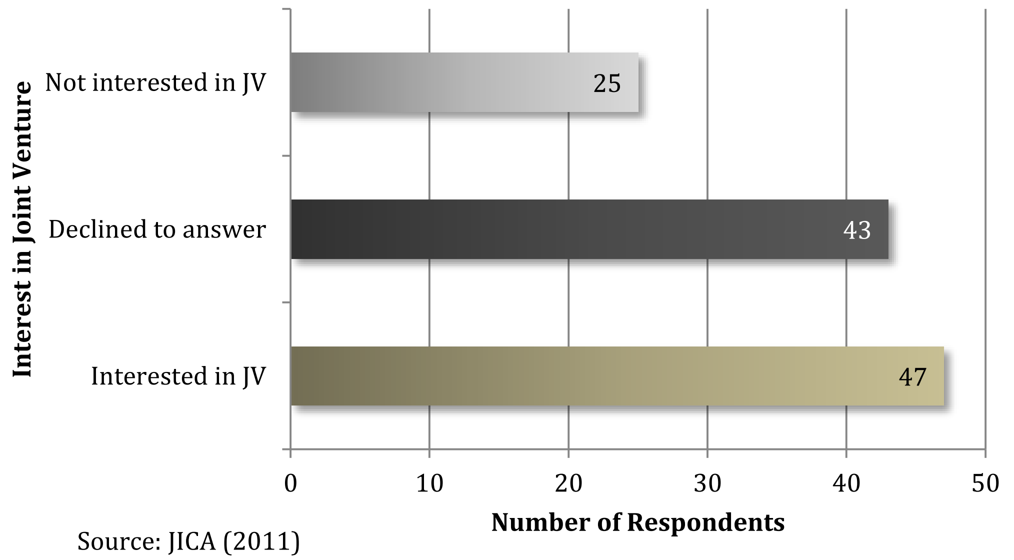


Source: JICA (2011)

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.

Figure 5.8: Component Manufacturer Interest in Joint Ventures

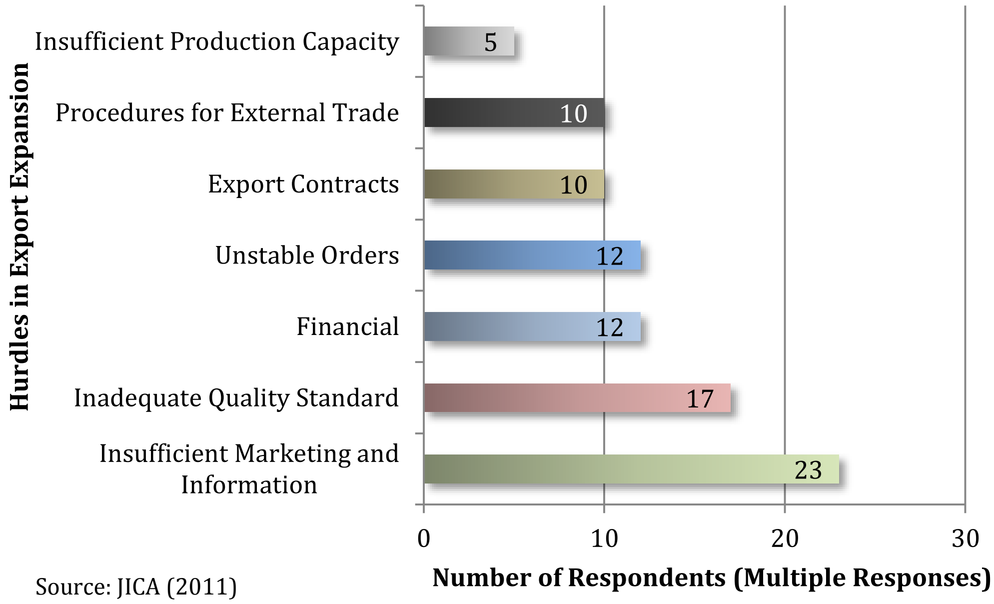


Source: JICA (2011)

Quality of the products is of a concern to 12 manufacturers (see Figure 5.9) wishing to export; we believe these manufacturers realize 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.

The Automobile Industry Development Programme (Ministry of Industries & 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 5.4).

Figure 5.9: Factors Impeding Export Expansion by Component Manufacturers



Source: JICA (2011)

Box 5.4: 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 mindset. 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.

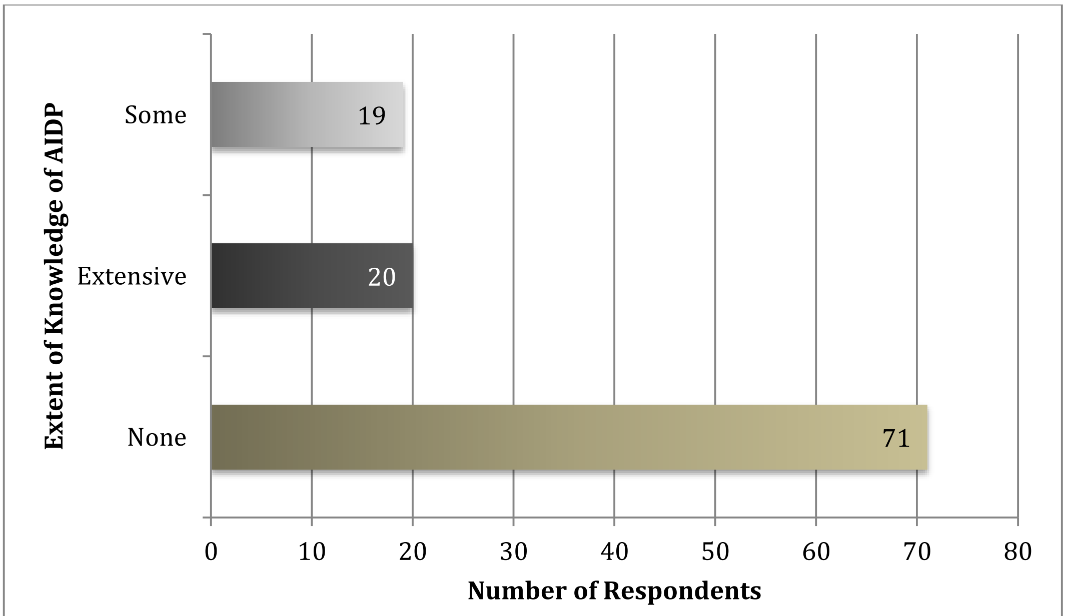
Auto Industry Investment Policy (AIIP) component covers the rules and procedures applicable to new foreign investors entering the automotive sector focusing on production of high technology products catering to current consumer demands. The policy allows import of complete CKD kits for a period of three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

Source: Ministry of Industries & Production (2008)

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.

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 5.10). 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.

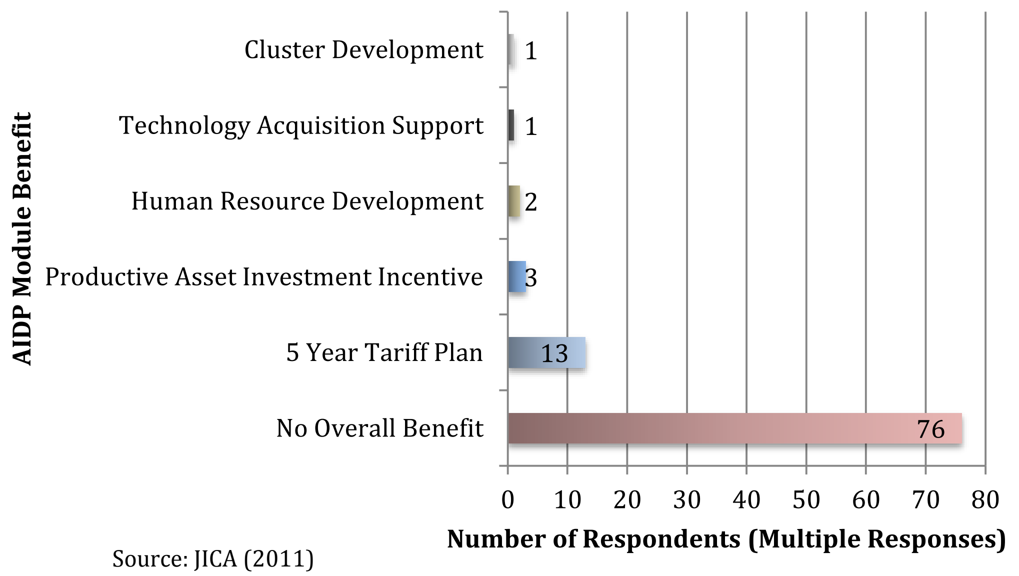
Figure 5.10: Component Manufacturers Extent of Knowledge of AIDP



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 5.11). 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.

Figure 5.11: Perceived Benefit of AIDP to Component Manufacturers - By Module



Source: JICA (2011)

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 specialize 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 utilized 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.

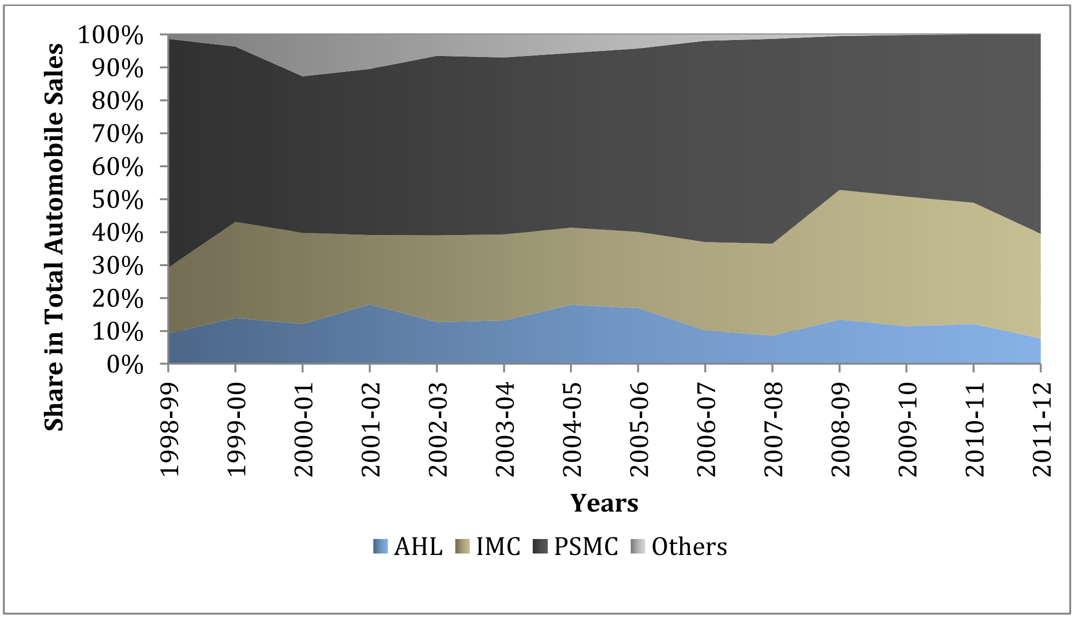
The level of precision required in the manufacture of transmissions and parts for motorcycles and tractors is less than that required for passenger cars since the latter have an added requirement of comfort. Component manufacturers are under the mistaken impression that by successfully manufacturing 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.

5.9. TECHNOLOGICAL CAPABILITIES DEVELOPMENT OF AUTOMOTIVE 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 5.12. 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 0000 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.

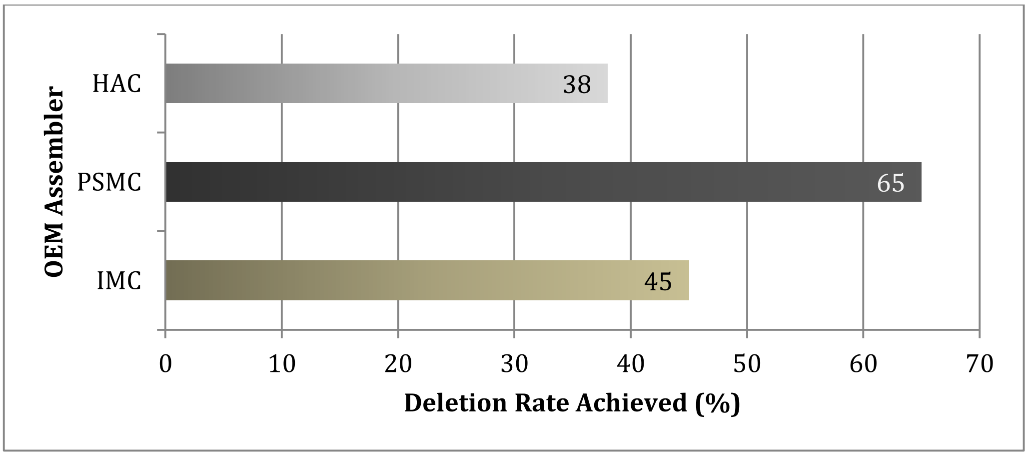
Figure 5.12: Breakdown of Passenger Car Sales by OEM (1998-2012)



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 5.13 for a comparison of indigenization 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.

Figure 5.13: Deletion (Indigenization) 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.

5.10. 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.

5.11. CONCLUSION

The aim of this chapter was to provide an introduction to the state of the automotive industry in Pakistan; the genesis of the industry since the time of independence and the current status. The major stakeholders in the industry have been identified and the current level of capabilities of component manufacturers has been assessed based on recent survey data. The industry was set up with the assistance of foreign firms by forming Joint Venture agreements to facilitate the transfer of technology and know-how for manufacturing automotive vehicles of all types. The homegrown, domestic industry has yet to take off and the foreign affiliated firms continue to command the market share in virtually every sector. Income levels in the country have influenced growth of the sectors of the industry; the motorcycle and small automobiles have become the workhorses of the low and lower-middle income groups of the economy, while high powered luxury sedans are the preferred choice for the higher income bracket in the economy. In the motorcycle industry, the established OEMs are facing stiff competition from the new incumbents from China, but recent trends indicate they are managing to hold their own, no doubt capitalizing on brand name, quality and after sale service while the Chinese brands are focusing on undercutting the price.

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. Recognizing 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 way behind in achieving the targets set for achieving production as well as localization of parts.

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. A number of possible reasons have been identified to account for this inability to upgrade technology and improve production levels including but not limited to an inability to secure the financing required to complete the upgrade process and lack of information on current state of the global automotive components industry and export opportunities. The worrying trends that have emerged are centred on one hand on the uphill task associated with securing funding which serves as a major deterrent to acquire 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 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.

This chapter 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 formed under AIDP. The AIDC is the decision making body for determining entry of new assemblers/manufacturers in the industry. 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 timeline for achieving localization 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 the state policy for some time at least.

CHAPTER 6. TECHNOLOGICAL PROGRESS AND MATURITY WITH GROWTH – THE CASE OF MILLAT TRACTORS

6.1. INTRODUCTION

Our earlier discussion has established that industrial growth and the economic development of nations was driven by technical change and progress, and technical change and progress were key determinants in this respect. As first movers, developed countries were faced with the prospect of innovating to retain competitiveness. In the case of late developer countries, effective acquisition of technology and the capabilities to benefit from such technology are the means to achieve industrialization and attain competitiveness in mature product markets In Chapter 2 it was established that ownership of technology and role of the state are determine the success of efforts to acquire and absorb technology in late developer countries. In the context of developing countries, industrialization as a means to achieve economic development is an intensive process involving technology acquisition, learning and the development of technological capabilities for the purpose of gaining competitiveness in the face of ever changing and evolving technological change in the global market. Technology acquisition itself is a two-step process, first involving learning to absorb the technology and second assimilating and adapting the acquired technological capabilities to develop competitiveness in mature markets by bringing differentiated products to market. The question to ask is what factors could be responsible for enhancing or slowing down the pace of technology acquisition at the firm or microeconomic level, which would impact on the firm's competitiveness in the global economy. Developing countries, save for a few have had only limited success in their technology acquisition and learning efforts. The latter appear to be the exception to the rule, as exemplified by the meteoric rise of the East Asian Tigers in recent years have managed to move beyond pure *"learning by doing"* to what Kim (1999) has termed as *"learning by research"* to expand their technological frontier. That is not to say that there have not been successful instances of technology acquisition in the former countries such as in Pakistan, despite the general perception that such countries are hovering on the brink of disaster, but those examples are unique. A better understanding of the issues involved based on the circumstances surrounding these success stories at the microeconomic (firm) level will yield valuable lessons to be learned and applied for the future.

Against the backdrop of the ultimate goal of developing countries to accelerate their development, the aim of this chapter is to shed light on the microeconomic issues surrounding efforts of a domestic firm (in this case Millat Tractors Limited, a competitive tractor manufacturing firm in Pakistan's automotive industry)[39]. This particular firm used strategies both to acquire foreign technology and to develop their indigenous technological capabilities to become globally competitive. Towards this end, this chapter presents a viable model of learning by a manufacturing firm in Pakistan. Section 6.2 presents a review of the conditions surrounding the foundation of the firm, as well as technology acquisition efforts at three key stages to implement, assimilate and improve the foreign technology acquired. Section 0 focuses on growth trends and the current status of the firm. Section 0 deals with the constraints faced by the firm in acquiring and developing its technological capabilities, while Section 0 assesses the domestic and international competitiveness of the firm based on a price mark-up model and indicators of firm performance. Lastly, Section 6.6 presents the conclusions of the preceding discussion and analysis.

6.2. FIRM LEVEL TECHNOLOGICAL DEVELOPMENT AND LEARNING AT MILLAT TRACTORS

To gain a fresh perspective on firm level technological development and learning in manufacturing firms in Pakistan, we follow Kim (1980) who adopted a slightly different approach to traditional studies. Kim (1980) researched firm level efforts at technology acquisition; how the firms acquire, assimilate and improve on imported technology to remain competitive in an increasingly globalized world. The methodology of firm level performance explores the evolution of industrial technology in a developing country; focussing on the process of assimilation and improvement of foreign technology that has been acquired, but also looking at factors affecting firm level technological change. Kim (1980) categorized previous studies looking at the role of science and technology in economic development into two groups. One group looks at science and technology and their role in development of

[39] The analysis in this chapter and the one that follows is based on a series of interviews with key industry stakeholders conducted in Pakistan; details of which are provided in Appendix C

LDCs, focussing on scientific community, education, and S & T policies. The second group looks at role of international technology transfer to LDCs, focussing on role of MNCs and local R & D efforts. What has not been covered in sufficient detail in these two groups is the rationale behind acquisition of technology and the efforts to assimilate and improve technology that has been acquired at a firm level. What has also not been considered in detail has been the role and impact of state initiatives and other factors affecting the process of technology acquisition. Keeping these shortcomings of traditional studies in mind, Kim (1980)'s methodology has been adopted here.

More specifically in the present context this methodology provides a framework for a comprehensive overview of the evolution of a firm and its acquisition of technology for the purpose of attaining competitiveness as the environment changes. The benefit of this approach is many fold; on the one hand a focus at the firm level and the implications that a deeper understanding of the technology acquisition experience at the firm level will have for policy formulation at the macroeconomic level. This methodology accounts for the fact that developing countries have used numerous initiatives within their general industrial policies to nurture and guide technological change in domestic firms. On the other hand this methodology also allows for firm behaviour and performance being affected by efforts of not just domestic stakeholders, but multinational corporations to facilitate the acquisition process. We now turn to the experience of Millat Tractors Limited (MTL) in technology acquisition and the development of technological capabilities for the purpose of enhancing competitiveness.

6.2.1. FOUNDATION

As brought out in Chapter 4, Pakistan lacked a viable industrial base at the time of independence and over the years the state took the initiative to gain access to foreign technology required to develop the necessary base. Technical agreements were signed with various foreign multinational corporations to set up manufacturing concerns in key industries and subsequently turn over operations to private businessmen. One such manufacturing concern was Rana Tractors and Equipment Limited (RTEL), set up in 1964 to initially import CBU tractors for sale in Pakistan, and eventually assemble and manufacture tractors from Semi Knock Down (SKD) kits to meet local demand. The eventual goal of this endeavour was to introduce a measure of self-sufficiency in the domestic industry and also reduce the drain on precious foreign currency reserves. Majority shares in RTEL were owned by the Rana Khudadad family, although the company was listed on the stock exchange. RTEL operations were the result of a technical collaboration agreement initiated by the state in Pakistan and a leading foreign multinational corporation engaged in agricultural machinery manufacture at the time, Massey Ferguson (MF) based in UK. Under the terms of the agreement, MF had a zero equity share in the local manufacturing concern, and was only responsible for providing technical know-how, including all drawings and standards requirements to RTEL for the purpose of assembly and maintenance of MF tractors in Pakistan, with no obligation to provide RTEL with financial support of any kind. The only incentive provided by MF was lower annual prices for imported kits based on higher volumes.

The province of Punjab accounts for roughly 80 percent of the market for potential of tractors in Pakistan, and the city of Lahore was chosen as the site for the main production plant. In the interim till the main plant in Lahore was brought online, an assembly plant was set up in Karachi in 1965 to start the assembly process of tractors from SKD kits. RTEL had a value of paid-up capital of PKR 2.25 million by the early 1970s, which included plant/assets in East Pakistan, but when East Pakistan gained independence from Pakistan in 1971, RTEL's East Pakistani plant/assets in Dhaka worth PKR 2.26 million were lost. RTEL ended up accumulating losses amounting to PKR 1.5 million by 1972 which had to be written off as a loss. RTEL, along with a significant number of other private sector enterprises, were nationalized by the Government of Zulfiqar Ali Bhutto under the Economic Reforms Order of 1972. RTEL was rebranded as Millat Tractors Limited (MTL) and manufacturing operations were taken over by Pakistan Tractor Corporation (PTC), an entity set up by the state for the purpose of promoting indigenization and local manufacture of tractors in Pakistan from Completely Knocked Down (CKD) kits. The following year a licensing and technology transfer agreement was signed with MF which would allow progressive manufacturing of tractors, while another licensing and technology transfer agreement was signed with Massey Ferguson's subsidiary, Perkins Engines, UK for progressive manufacturing of diesel engines.

Following a regime change in 1991, the state reversed Bhutto's earlier decision to nationalize key industries and formulated the Privatization Policy 1991 under which State Owned Enterprises were auctioned off. The majority of MTL employees formed a group, the Millat Group and bid for ownership of the company through a leveraged employee buyout. Funding for the buyout costing PKR 306 million came from a number of sources: 15 percent was personal equity of employees, 85 percent loans from MTL and financial institutions (including Muslim Commercial Bank). The employees contributing to the 15 percent equity were allocated shares and a splinter group of employees opposed to the buyout opted for golden handshake. Under the terms of the buyout, ownership of the company was transferred from the state to Millat Employee Trust of the Millat Group in 1992 and management of the firm, which had earlier been under the state bureaucracy, was handed over to MTL employees, primarily engineers by profession and training. In addition, workers benefits were partially linked to MTL's profitability, meaning rather than bureaucrats, professionals (engineers) with practical knowledge and experience of products and production processes were responsible for determining the firm's future direction and growth. Moreover, worker benefits were partially linked to firm performance, resulting in a strong incentive that resulted in concerted worker effort to reduce costs and improve efficiency in the organization, thus ensuring that the firm would become competitive as it grew.

In the years since being privatized, MTL has time and again taken active steps to diversify its product portfolio, both vertically as well as horizontally. The first initiative involved acquisition of a 51 percent stake in a local foundry, Bolan Casting Limited (BCL) specializing in the production of castings, when the company was divested by the state in 1993. Millat Equipment Limited (MEL) was incorporated in 1993 for the purpose of manufacturing high quality gears, and more recently, in 2002, MTL acquired battery manufacturing firm Rex Baren Batteries Limited (RBBL) as a subsidiary incorporated as Millat Industrial Products Limited (MIPL). MTL has also undertaken technology transfer arrangements with foreign firms in an attempt to diversify into other automotive products, notably Light Commercial Vehicles (LCVs) in collaboration with Samsung Commercial Vehicles (now defunct) and forklifts in collaboration with Anhui-Heli Co. Limited, China.

MTL's own tractor product portfolio till 1992 was limited to two MF tractor models, the MF 240 (50 HP) and MF 375 (75 HP). Subsequently, in over 20 years MTL has managed to achieve a very high level of indigenization in tractor manufacturing, which has allowed it to expand the range of tractor models it manufactures and offers for sale from 2 to 8 different models. The product portfolio (Box 6.1 and Box 6.2 provide a comparison of the limited portfolio in the early years versus the range of products offered now) of MTL has now expanded to include a range of agricultural implements, and different firm acquisitions have opened up the markets for batteries, automotive components, generators and prime movers as well. This growth of productive capability of the firm is an indication of the growing technological capabilities that are being acquired and used to increase the competitiveness of the firm.

Box 6.1: MTL Product Portfolio – Early Years

Tractor Models

- MF 240
- MF 385

Source: MTL interviews

In comparison, MTL's competitor Al-Ghazi Tractors Limited (AGTL) in the domestic market is offering a comparable product mix (in terms of product specifications) of various tractors, agricultural implements and generators, but focusing more on the niche market of smart irrigation systems as opposed to MTL's multiproduct and component focus (see Box 6.3 for details of AGTL's product portfolio). Tractor models manufactured by both MTL and AGTL are adapted for use in the domestic market and suit the demands of domestic customers, and the two companies have a virtual monopoly on tractor supplied in Pakistan.

MTL and its primary competitor in the domestic market, AGTL use production techniques based on the concept of mass production rather than Just In Time, which is in contrast to how passenger and commercial vehicles are manufactured by companies, in particular Japanese firms currently (as detailed in Chapter 4). However, both companies have the capability to manufacture slightly differentiated product models, rather than a mass produced unique model, evidence that Just-In-Time techniques have been adapted to help optimize production techniques, and the firms have acquired the organizational capabilities to adapt modern production techniques to suit their needs.

Box 6.2: MTL Product Portfolio – Recent Years

Tractor Models	Agricultural Implements	Multi Products
• MF 240 • MF 385 • MF 260 • MF 350 + • MF 360 • MF 375 • MF 385 4WD • MF 455	• Mould Board Plough • Chisel Plough • Disc Plough • Tine Tiller • Disc Harrow • Rigger • Lawn Mower • Post Hole Digger • Front End Loader • Multi-purpose Rear Blade • Farm Trailer • Hydraulic Tipping Trailer • Adjustable Pintle Hook • Jib Crane	• Millat Forklift Truck • Millat Generator • Millat Prime Mover

Source: MTL Annual Reports, various issues

On the international front, MTL faces competition from various regional companies in the market for basic tractors, but MTL is of the opinion that it is placed to compete effectively with these rivals. To facilitate international sales, MTL has recently established an offshore subsidiary to act as a trading company and boost sales and successfully negotiated with MF for access to export markets for MF branded tractors manufactured in Pakistan.

Box 6.3: AGTL Product Portfolio – Current Years

Tractor Models

- 480s
- NH 5556
- Ghazi
- NH 6056
- 640
- 640S
- NH 7056

Agricultural Implements

- Cultivator
- Disk Harrow
- Rotavator Cum Bed Former
- Articulated Aerial Platform
- Potato Digger
- Boom Sprayer
- Mould Board Plough
- Tractor Mounted Back Hoe
- Road Sweeper
- Front-End Loader
- Lawn Mower
- Maize Sheller
- Disc Plough
- Front Mounted Fork Lifter
- Tractor Operated Flour Mill
- Safari Cabin
- Hydraulic Tipping Trolley

Multi Products

- AGTL Generator
- Smart Irrigation Systems

Source: AGTL Annual Reports, Various Issues

6.2.2. STAGE I – IMPLEMENTATION

Indigenization of tractor production was given priority by the state in 1980 and PTC was tasked with carrying out this process, while MTL was selected for carrying out this task by PTC. Tractor assembly indigenization efforts at MTL took off in earnest in 1981 and as part of this effort, an engine assembly plant was set up for the progressive in-house manufacture of diesel engines for MF tractors. Of the two major tractor manufacturers operating in Pakistan, MTL has an in-house engine manufacturing plant designed specifically for its products, while AGTL purchases engines manufactured by another domestic firm. MTL's engine plant has a production capacity of 95 engines of different specifications (3 and 4 cylinder engines), and production levels can be adjusted to meet demand. Various components of the engine are procured from MTL vendors, but all machining requirements are handled by an in-house machining division to ensure MF quality and precision standards are met.

The in-house machining plant was inaugurated in 1984 to ensure a supply of high quality parts and ensure production levels at the factory could be maintained in the event of disruption of parts supply from vendors. Production capacity in the machining division has been increased with the passage of time with the addition of extensions to production lines and the installation of new ones, (see Table 6.1 below for details). The expansion of production facilities has yielded the expected productivity benefits, for instance the new cylinder block line is less labour intensive (on average employing 15 workers on the new line versus 38 on the old line) and the productivity is orders of magnitude higher than that of the old cylinder block line (5 sets per shift versus 1.26). It is also worth noting that manufacturing components for the newer 4 cylinder engine is a more complex task requiring more effort from workers and therefore having a lower worker productivity level.

Table 6.1: Production Capacity and Productivity Levels for MTL In-house Machining Plant

Component Line	Year of Installation	Production Capacity (sets) Per Shift	No. of Workers	Productivity Per Worker Per Shift
Axle Housing (right and left)	1985	56	21	2.67
Cylinder Block (old)	1984	48	38	1.26
Cylinder Block (extension)	1999	75	15	5.00
Cylinder Head (extension)	1999	90	15	6.00
Center Housing (Gearbox)	1987	55	33	1.67
Lubrication Oil Sump (MF 240)	1984	59	12	4.92
Lubrication Oil Sump (MF 385)	1999	19	12	1.58
Transmission Case	1985	48	33	1.45

Source: MTL interviews

According to Akhlaque (1999), the indigenization effort at MTL was supported externally by a favourable stance of the then Minister of Production who took office in 1981, and encouraged direct interaction with MTL management through an *"open door"* policy to resolve issues and bypass the bureaucratic hurdles in the public sector. Realizing the weak managerial and technical capabilities in the public sector, the Minister entrusted the running of the company to chairman of MTL, who had full authority to act without needing approval from or receiving any interference from the state. The Ministry also made investments in the domestic industry by enabling vendors and firms to raise the level of their technical knowledge through conferences and collaborations. MTL was given clear targets for cost reduction, and the indigenization efforts were supported internally by a competent management team and technical support from MF in developing their capabilities. MTL provided vendors with financial and technical support to help meet their requirements and in turn guaranteed a market for vendor products.

Engineers from MF assisted in setting up the manufacturing/assembly plant in Pakistan to ensure manufacturing quality standards were met. Ten engineers from MTL were sent abroad to train and learn from MF operations on-site on the factory floor. The value of each component required for the manufacture of MF Tractors was determined from Day 1, and at the insistence of the MoIP, the technology (royalty and licensing) fee charged by MF was linked to the level of indigenization achieved by MTL. In exchange for the technical assistance provided, MTL was obliged to pay MF a royalty and licensing fee (over PKR 51 million in 1995, down to slightly over PKR 30 million in 1996 and virtually nil in recent years), and was one of the areas that MTL management targeted in their efforts to reduce costs as per the directives of the state. In contrast, MTL's competitor in Pakistan, AGTL has managed to achieve an average indigenization rate of 80 percent for the various agricultural tractors it offers, but royalty and technical fees are still a major component for its annual cost of manufacturing. The early pressure at MTL to reduce costs, and being provided a channel to do so through the indigenization process which would allow royalty payments to be reduced, providing the stimulus necessary in the early 1980s for MTL to achieve or even surpass the indigenization targets set, as evident in Table 6.2 below.

Table 6.2: Decade-wise Indigenization Rates Achieved for MF Tractors (1980 - 2010)

(%)

Decade	MF 240	MF 385
1980	46.43	24.38
1990	79.35	48.07
2000	89.70	68.99
2010	92.60	80.19

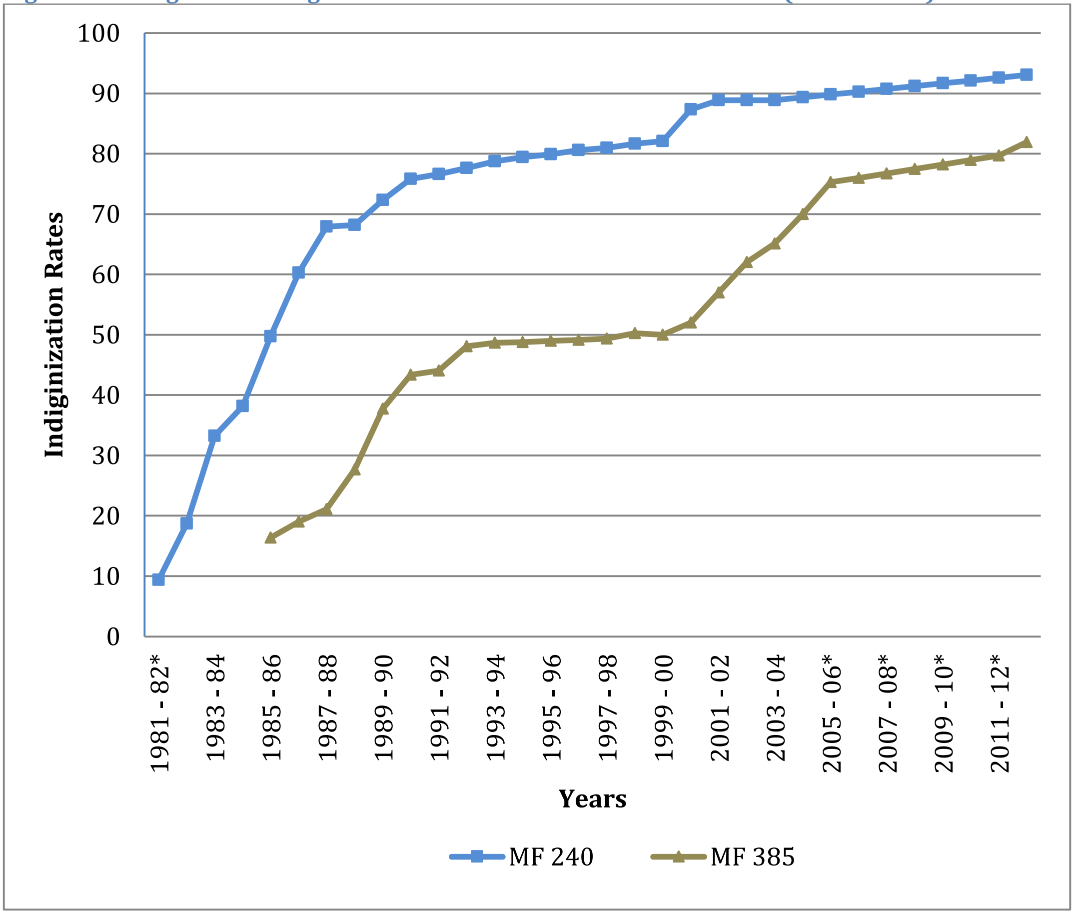
Source: Data provided by MTL

Note:

Rates for 1980s and 2010 are based on computations made for missing annual rates from data available. See Appendix D for source data

Due to the complexity of parts involved in the manufacture of the larger MF 385 tractor, higher indigenization rates were achieved for the smaller MF 280 tractor every year, as evident from the trends in Figure 6.1, starting with 10 percent in 1981-82 and rising sharply to 70 percent within a decade. Subsequently the rate slowed down but has still shown a progressive upward trend, suggesting MTL is gaining proficiency and experience in the manufacture of intricate machined parts in its in-house machining plant. The impressive achievement in the early years is on account of the engine assembly plant coming online and MTL switching to locally produced components as it gained the experience and developed production capability in an effort to reduce costs.

Figure 6.1: Progressive Indigenization Rates: MF 240 and 385 Tractors (1981 - 2013)



Source: Data provided by MTL

Quality of components produced at MTL and by the vendor industry was an area of concern for MF when the assembly plant in Pakistan was initially set up and for this reason a MF quality assurance inspector was based at the MTL factory for the sole purpose of inspecting and approving all locally produced components to ensure MF quality standards were met. Whereas Japanese OEM affiliated firms had to send the components to Japan for testing and quality assurance, MTL had the advantage of having a testing lab set up on site early on, enabling MTL engineers and workers to benefit from more direct and timely feedback. MTL was free to produce as many or as few components as it determined save for those components and assemblies that are proprietary in design and specification to MF. There was no restriction placed on the source of any components as long as the specifications matched and the quality level was maintained. The only two restrictions on MTL were an export market cap (limit) wherein the company was restricted from exporting any MF components of parts abroad to any region. The second restriction naturally was on the manufacture of proprietary components, with MTL barred from reverse engineering those components and obligated to acquire them from MF. In later years this restriction was eased to allow MTL to acquire the components of matching specifications from other sources as long as MF quality standard was maintained.

6.2.3. STAGE II – ASSIMILATION

Assimilation of the foreign technology acquired from MF was focused along two lines; developing the local vendor base to meet MTL requirements, and developing in-house capabilities that would allow the expansion of the firm's product line as well as branching out into allied fields when the capabilities had been acquired. We first turn to development of the local vendor base that serves the firm. After initial production commenced at the Lahore factory, MTL management came to the realization that locally manufactured parts and components would be required for the firm to remain profitable while also satisfying the requirement of the MoIP to reduce costs; however, the parts and components being supplied to MTL were not of sufficiently high quality to meet MF standards.

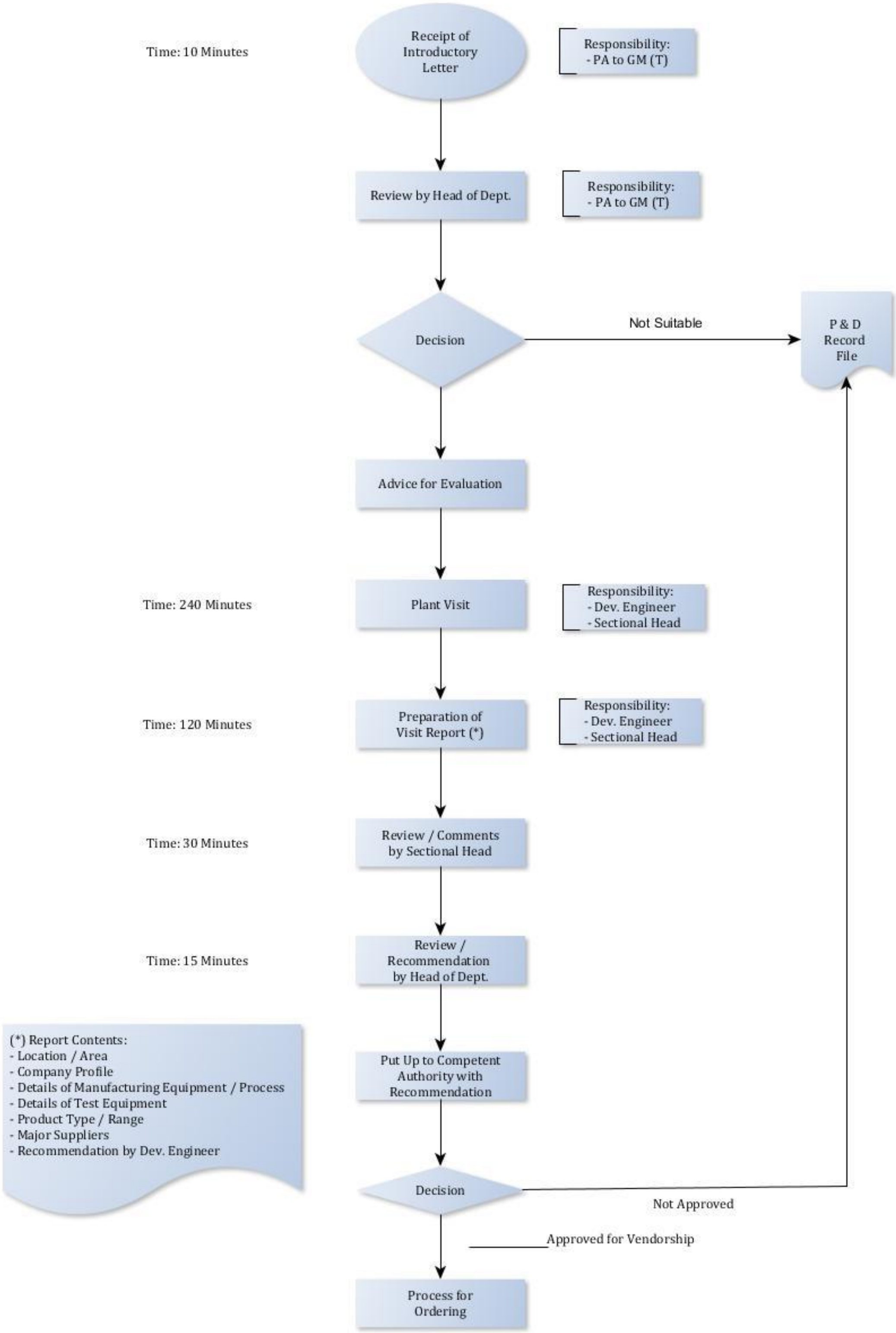
When the automotive industry was first set up in Pakistan, the vendor base was very limited and facing many challenges in terms of quality and quantity of production, and only two firms, Pak Suzuki Motor Co (PSMC) - for Suzuki branded passenger cars, and MTL – for MF branded tractors, were their main customers in the industry. Both firms had different requirements and specifications for parts required, not to mention the fact that demand levels for each were different. On the one hand PSMC required a higher volume of parts supply to ensure profitability while MTL required lower volumes but was more concerned with ensuring quality levels were met.

MTL's vendor base today has been developed by the pro-active efforts of the company on its own initiative. In the pursuit of lowering costs to ensure survival of the company, vendors were visited by MTL and convinced to bring production lines up to MF quality standards. MTL provided a great deal of assistance to the vendors willing to meet their requirements by educating them about MF production processes, providing them with the technical know-how and support, and even soft financing on easy terms to enable them to carry out the upgrading process successfully. MTL approached the IFC (International Finance Corporation) for a loan of USD 5 million[40] in 1988 to finance this development of the local vendor industry associated with MTL. The financing component for vendor development was in the form of advances given for the developing of tooling required for producing MTL specific components on order as well as for the procurement of raw materials needed for production. These advances were secured through bank/insurance guarantees and instalments were deducted on a pro-rata basis from bills against supplies provided to MTL. The outcome of this investment in vendor development has in general been positive in the eyes of MTL, and though admittedly not perfect, has gone a long way to ensuring the firm has an adequate supply of quality components for its products. In-house capabilities and productive capacity have also been built up (through horizontal and vertical expansion) to ensure any shortfall in critical component supply can be compensated for.

Vendors for parts and components to be used in the production process are also subject to a rigorous screening and selection process to ensure MF quality standards are met, which includes an initial review by GM of Technical operations at MTL, followed by a visit to the vendor's manufacturing plant and subsequent review for approval of vendor-ship if all MTL standards are met [see Figure 6.2 for details of vendor evaluation process]. This clearly defined and well documented process means MTL is able to select vendors that have the requisite technological capabilities and expertise to provide the components required and precludes vendors without the

[40] The loan was arranged by MTL with a mark-up of 3.25 percent and carried an exchange risk cover of 3 percent.

Figure 6.2: Approval Process for New Vendor Selection

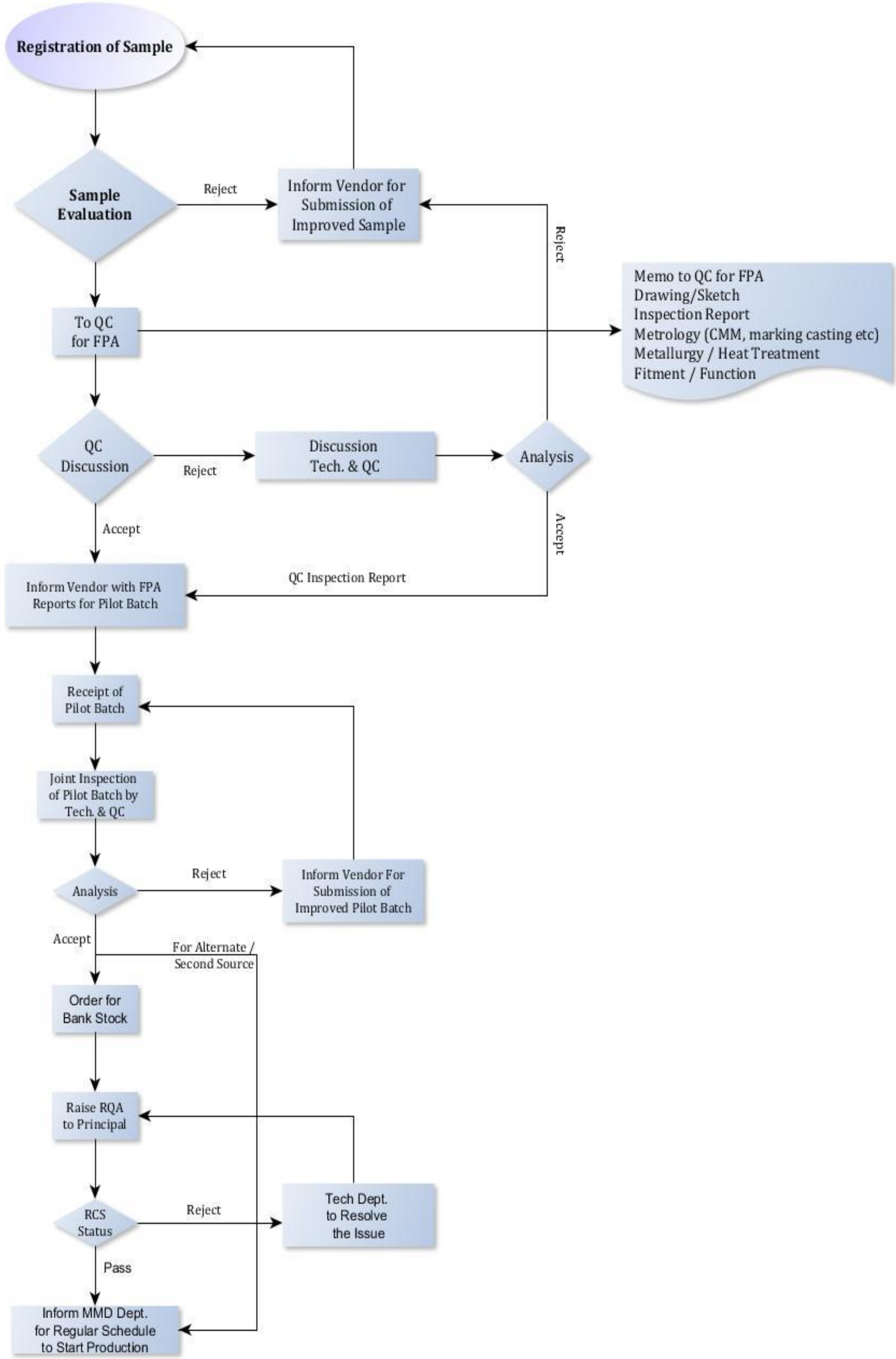


Source: MTL Interviews

necessary qualifications from easily subverting the selection process. Discussion with a number of small scale vendors brought to light the general perception of these firms that the more connected firms resort to using what political connections they have to influence state policy and actions. The implications are that this allows the connected firms to profit from business activities in other areas instead since MTL has a very strict quality level to adhere to, and the vendors are obligated to meet this quality level to keep MTL as a customer. As pointed out earlier, MTL provides technical and financial assistance to vendors, in exchange offering a guaranteed market for their products as long as quality levels are maintained. This suggests that MTL locks in vendors it has helped develop thereby ensuring continuity of its components supply. While MF does not provide any input in vendor selection, the approval process for parts supplied by chosen vendors (see Figure 6.3) involves input from MF in the final stages before the component production commences. Again, this suggests that the approval process is not easily compromised by firms that do not have the requisite capabilities.

MTL management was forward thinking and aware that future growth of the firm would depend on the ability of the firm to expand its product portfolio, both horizontally and vertically, which in turn would require the necessary capabilities to be acquired by its employees. Based on marketing and customer feedback, MTL began work on developing several components and products on its own, drawing on domestic R & D capabilities, namely in the form of local university research teams. Changes in the preparation of sheet metal components were proposed, as was relocation of various components. Significant investment was made in initially setting up the production line for the manufacture of tractors, and MTL management decided to forego investing in retooling the production line and switching to lean production till such time as it was deemed necessary and the company ready for the transition. MTL has therefore concentrated on optimizing the production line that had already set up, rather than investing in a totally new production technology which would require substantial effort and time (learning period) to learn and optimize and with no guarantee that it would yield a rate of return as high as that currently enjoyed by the firm. This learning period would again be protracted, not to mention the fact that it would also need to be financed, which would adversely impact the profitability and earnings of the firm, and thus was something MTL management was not keen on.

Figure 6.3: Process for Vendor First Piece Approval



Source: MTL Interviews

Major improvement to the product line have centered on upgrading the engine and making it more powerful to meet the needs of MTL customers in Pakistan's rural areas. Subsequent improvements have been made to the engine to meet Euro emission standards (I and II). Due to limited development of domestic capabilities in R & D, it was decided to outsource research efforts to meet the first stage of emission standards compliance (Euro I) to an international engineering consulting firm, Ricardo plc. In an effort to develop in-house capabilities, the compliance effort was completed in collaboration with MTL engineers, so it is evident that there was a concerted effort to encourage learning by doing in the firm, which extended beyond the initial joint venture with MF. For meeting Euro II emission standards, it was decided to build on the capabilities developed during the previous collaboration and interact with a local R & D institute. MTL funded and sponsored the project to develop tractor engines for local application.

As far as assembly and manufacture of the foreign designed engine is concerned, except for the fuel injection system and a handful of proprietary components, the remaining components are all manufactured and assembled in Pakistan. According to MTL executives, the firm is the only one in Pakistan to manufacture and assemble the engine in the country, which suggests that the firm has indeed managed to develop a fair amount of technological capabilities that extend beyond simple assembly of a product.

The Joint Venture agreement signed with MF has been revised over the years to allow MTL access to global markets for sourcing of inputs while MF has preferential right to match the global price and conditions. The next phase of revisions is being negotiated for gaining export market access that had been restricted earlier.

For continued development of its human capital, MTL currently operates an automobile industry related scholarship programme for its employees with the government of Japan, and which has no involvement from the government. The technical collaboration with MF included regular visits by MTL employees to MF factories to learn the preferred production process and techniques which have been incorporated into MTL operations and contributed to the development and growth of employee capabilities.

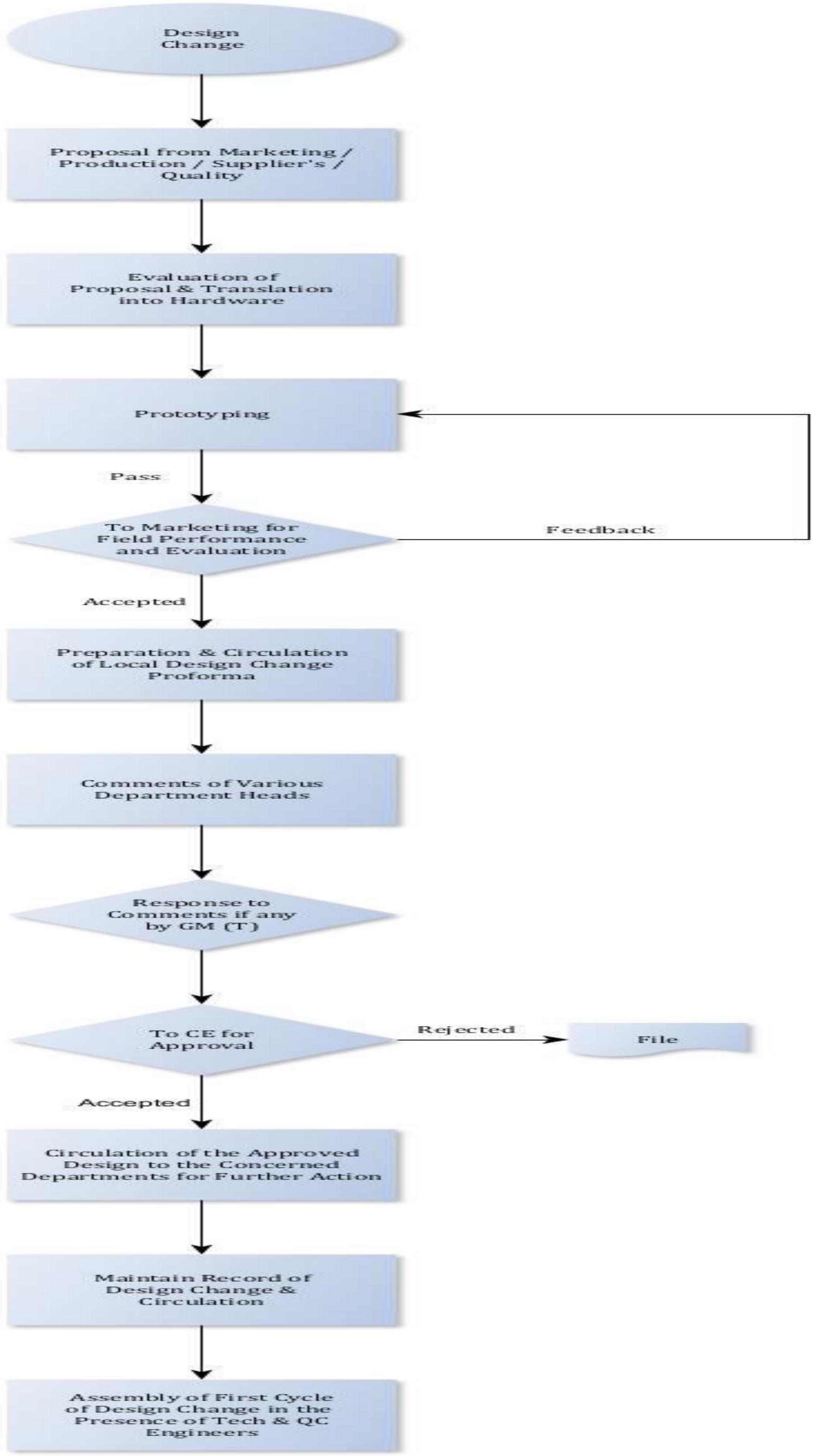
6.2.4. STAGE III - IMPROVEMENT

The indigenization program initially implemented by the state was deemed to have beneficial impact on the firm's performance and was later incorporated into operations at the firm. However, rather than being externally designed and monitored, the program was managed within the firm. MTL management also realized that quality control was crucial to achieving competitiveness in not just the domestic market, but the global market as well.

Towards that end, well-defined processes were developed and put in place for making any changes to the design of the MTL products or introducing newly designed products. Feedback from customers is evaluated based not just on the basis of economic viability, but taking into account vendor capabilities and government requirements as regards the indigenization program as well in the initial prototyping phase. The prototype is then finalized based on identification, sourcing and procurement of all required subcomponents and parts. Based on performance evaluation and feedback from the field, the prototype product is either developed further or processed for final approval. The process involves finalizing the production procedure and preparation and approval of deletion program, procurement of parts and production of 1st cycle of product in collaboration with MTL engineers (see Figure 6.4 for details of the process for design changes and Figure 6.5 for new product design approval). Clearly this suggests that MTL has absorbed the technology it acquired from its Joint Venture partner, and has started to make progress on improving the firm's products and production processes using the experience it has gained.

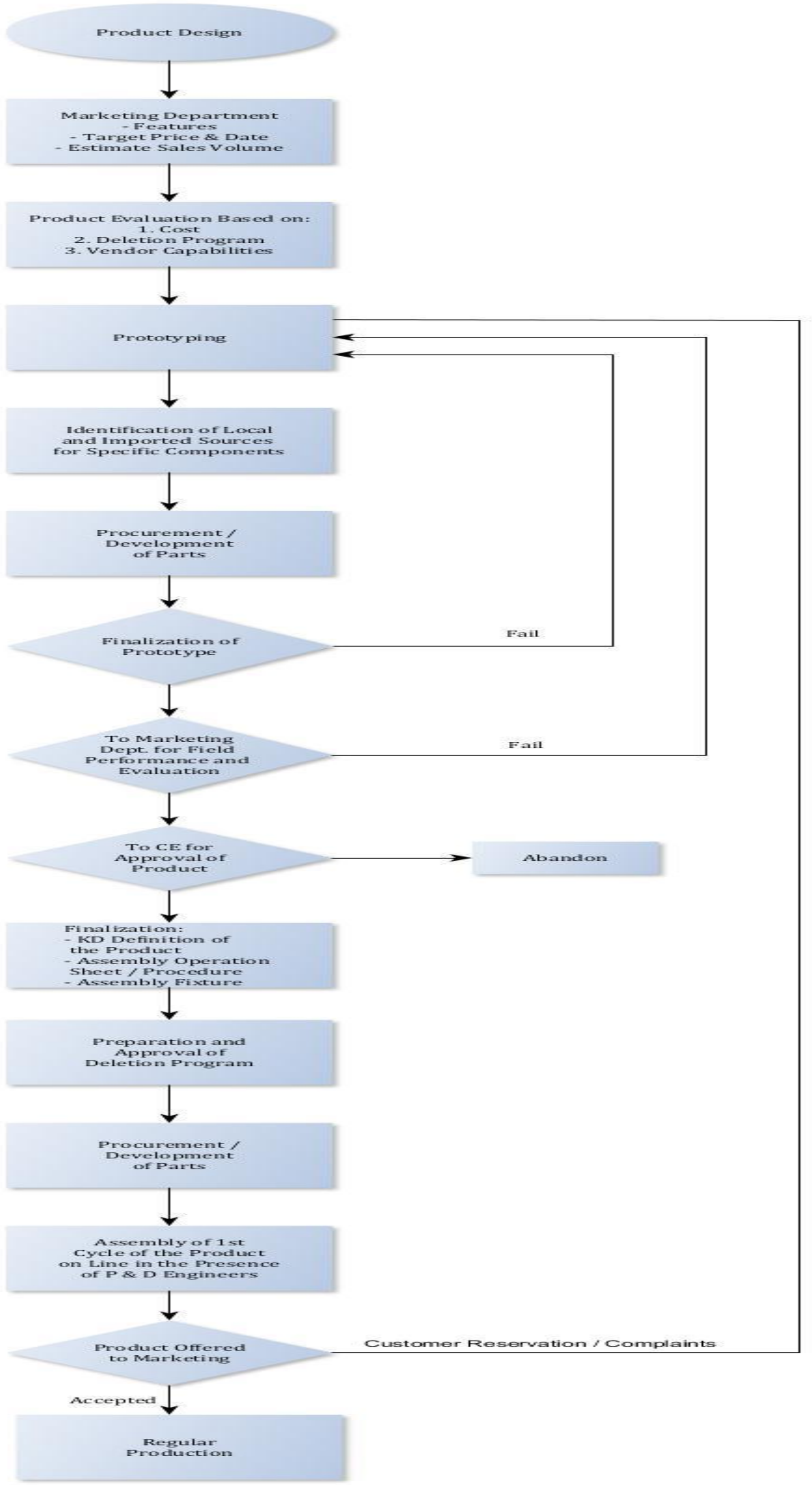
The decision to expand the firm's product portfolio was made in the early years after the firm was first established. As part of that effort, automotive batteries were chosen an area for expansion, and a local battery manufacturer was taken over. Rex Barren Batteries Ltd (RBBL) was incorporated in 1986 under technical collaboration with Jungfer Battery Technology, Austria with production commencing in 1992. However, due to numerous technical and financial reasons the firm was closed down while still in the trial production phase. Rather than trying to develop an arms-length relationship with the battery manufacturer and provide the technical and financial assistance that would be required, a takeover was deemed to be in the long term interests of MTL. On successful takeover by MTL in 2002 as a subsidiary, the RBBL was rebranded as Millat Industrial Products Ltd (MIPL). Senior management

Figure 6.4: Process Established for Product Design Changes



Source: MTL Interviews

Figure 6.5: Process Established for New Product Design



Source: MTL Interviews

personnel from MTL were sent on deputation to MIPL to redevelop a range of products for the OEM market and the after-market, with assured buying by MTL.

The acquisition of Bolan Castings Limited (BCL) was driven by the desire to expand MTL's product portfolio as well as safeguard MTL's in-house machining division while ensuring quality of key tractor and engine parts. BCL was incorporated in 1982 by PACO as a specialist automotive foundry manned by qualified engineers and technicians, and managed by MoP. The foundry was set up in 1986 in collaboration with Foundry Management and Design Company, UK, and commenced production the same year. BCL was selected as one of the firms to be privatized in 1992, much as RTEL had been and MTL joined with employees to buyout management control of the company. In exchange for management control by MTL, BCL employees were given incentives in the form of 10 percent shareholding in the post-privatized company, and performance bonuses were linked to production and profitability of the firm. Business volume of BCL received a boost with increased demand by MTL which allowed utilization of available capacity.

Though MIPL and BCL have turned out to be profitable investments for MTL, the firm has also suffered losses over the years. Most notably, a combine harvester was designed and developed by MTL engineers for the domestic market, but the concept turned out to be less effective than envisioned and production was halted. MTL is currently conducting trials of a smaller version with multicrop capability for the local market. MTL also attempted to branch out in the automotive market by signing a Technical Assistance Agreement with Samsung Commercial Vehicles Ltd (SCVL) for the progressive manufacture of LCVs. However, the expenses incurred had to be written off when SCVL declared bankruptcy and closed in 2000. A timeline of major events at MTL is presented in below.

Table 6.3: Timeline of Major Events at MTL

Year	Achievement
1964	Company incorporated as Rana Tractors and Equipment Limited
1964	CBU Tractors imported and sold in Pakistan
1965	Plant to assemble SKD kits set up in Karachi
1967	Assembly plant shifted from Karachi to Lahore
1972	Accumulated PKR 1.5 million in losses
1972	Company nationalized and renamed Millat Tractors Limited
1973	Licensing and transfer of technology agreement with Massey Ferguson, UK
1973	Licensing and transfer of technology agreement with Perkins, UK
1981	Indigenization of tractor assembly started
1982	Inauguration of engine assembly plant
1984	Inauguration of machining plant for manufacturing intricate components
1990	Perkins distributor agreement
1991	Millat Group formed to acquire 51% shares of Millat Tractors Ltd.
1992	Management control of company handed over to Millat Group
1992	Inauguration of new tractor assembly plant - capacity increased from 8,000 to 15,000 units per annum
1993	Bolan Casting Limited divested by Pakistani state - buy-out with 51% shares in collaboration with employees
1994	Millat Equipment Limited established
1994	Mass production of generating sets
1998	ISO 9002 certification achieved
2000	Licensing agreement with Anhui-Heli Co. Ltd., China
2002	Quality management system upgraded to ISO 9001:2000
2002	Millat Industrial Products Limited established

Source: M. T. Limited Annual Reports, various years

6.3. GROWTH TRENDS AND CURRENT STATUS

There has been a growing trend of farm mechanization across the globe, and in the developed countries, a scarcity of agricultural labour, availability of credit and government subsidies encouraging mechanization are driving demand for farm tractors. In developing countries, rising population levels are pressuring growth of agricultural products, and farm mechanization is considered as the route to higher agricultural productivity and output. The global demand for agricultural tractors has come to be dominated by the Asia-Pacific region, primarily driven by demand in China and India. While large, high-powered tractors are in demand for the large farmers in the US, medium power in Europe and Latin America, the Asia-Pacific region is seeming demand for low power tractors. Innovations in tractor design prevailing in the developed countries center around technologies such as suspension, lighting, automated steering and modern interfaces, and in developing countries the focus is on low cost and reliability. As a result of these factors, the market for agricultural machinery, and tractors has come to be dominated by a limited number of global players; Deere & Company, Kioti Tractor Division Daedong-USA, Escorts Group and AGCO.

Global tractor sales data reveals that in 2008, United States, China and India accounted for the bulk (13, 13 and 26 percent respectively) of global tractor sales (Table 6.4), and this trend has persisted till 2013 (with 9, 21 and 29 percent respectively). Moreover sales by Indian firms far exceeded those of the United States and even China, reflecting the aggressive promotion of farm mechanization by the Indian state and successful entry of Indian tractor manufacturers into foreign markets. On the other hand, Pakistan accounted for 4 percent of sales (59,968 units) in 2008, but due to the unfavourable economic climate, accounted for slightly over 2 percent sales (50,593 units) in 2013, and has had limited success in entering foreign markets.

Table 6.4: Global Tractor Sales by Major Market (2008-2013)

Country	2008	2009	2010	2011	2012	2013
Canada	28,865	23,167	22,834	24,117	25,449	27,483
United States	197,752	155,262	164,894	168,013	185,333	201,851
Brazil	43,414	45,437	56,420	52,296	55,810	65,115
Japan	15,629	15,318	16,363	17,222	19,001	24,721
China	200,000	280,000	320,000	350,000	390,000	445,000
Korea	15,179	14,717	15,280	14,291	13,471	12,853
India	392,000	403,903	520,073	564,699	534,079	619,000
Russian Federation	38,794	13,292	21,085	36,997	41,827	40,000
Turkey	27,022	13,758	36,072	60,466	50,320	51,000
France	40,716	36,800	29,123	35,409	38,754	42,609
Germany	31,250	29,464	28,587	35,977	36,264	36,248
Italy	27,261	27,057	23,323	23,431	19,343	19,017
United Kingdom	18,564	16,326	14,486	15,217	14,964	13,490
Pakistan	59,968	71,607	70,770	48,120	50,859	50,593
World	1,500,000	1,450,000	1,700,000	1,900,000	1,950,000	2,150,000

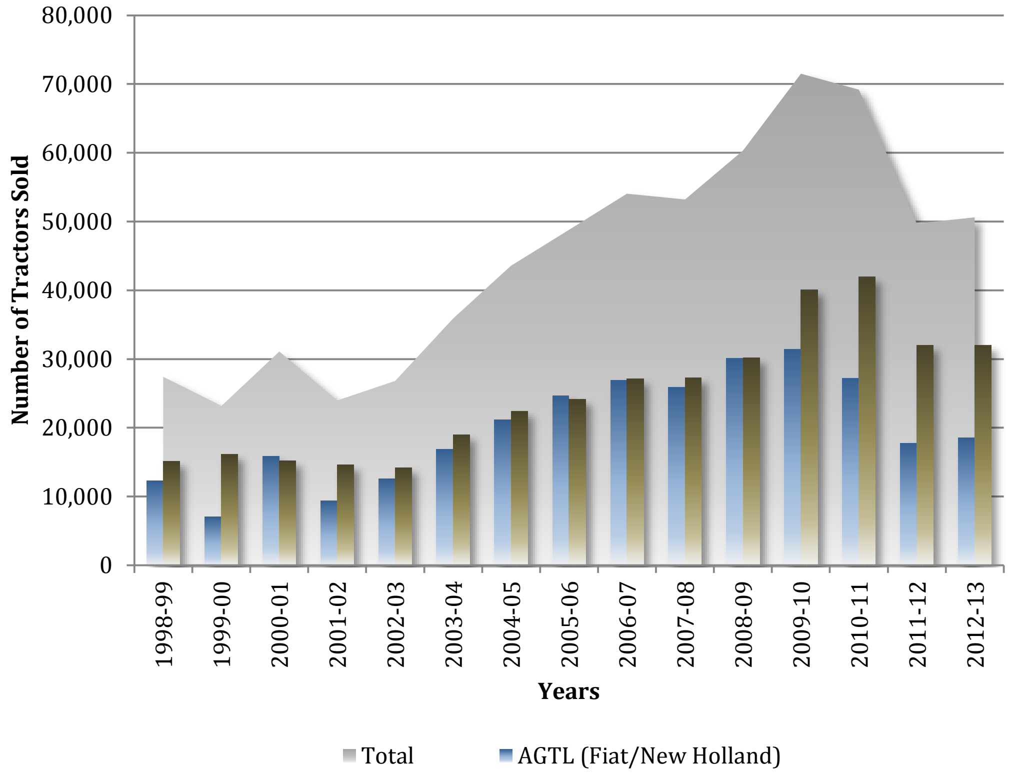
Source: Agrievolution, VDMA, PAMA

The global tractor and agricultural equipment manufacturer market is dominated by a handful of multinational corporations specializing in the production, sale and repair of agricultural and construction machinery, and formed by various mergers and acquisitions of smaller manufacturers. The products manufactured range from engines, generators, tractors, combines and harvesters and agricultural implements. At the top of the list is a US multinational corporation, John Deere & Company (JD), followed by Case-New Holland (CNH), 90 percent owned by Fiat, Italy and another US corporation, Allis-Gleaner Corporation (AGCO).

The tractor market in India is comprised of 16 national manufacturers and production operations by 4 multinational corporations, led by Mahindra and Mahindra Ltd (MML) with a market share in excess of 40 percent. MML was formed as International Tractor Company (ITC) in a joint venture between International Harvester Inc (IHC) and Voltas Limited (VL) that began in 1963 and ended in 1971. IHC was taken over by MML in 1977 and by 1982 had introduced its own branded tractor, established a foothold in the US market in 2004 and bought a controlling stake in a Chinese tractor manufacturing company, Jiangling Tractor Company (JTC).

There are a total of 4 assembler/suppliers of Tractors in Pakistan (according to PAAPAM). The lion's share of Tractors produced in the country comes from only two of these; MTL and AGTL assembling Massey Ferguson and New Holland Tractors respectively. MTL was established in the early days of the domestic automobile industry's establishment and pioneered the domestic production and assembly of tractors, with an initial installed capacity of 15,000 tractors per annum (with the plant operating a single shift) and currently having doubled its capacity to 30,000 tractors per annum (operating on a double shift) to meet the increased demand for tractors. AGTL on the other hand was incorporated in 1983, commenced assembly operations in 1984, but was taken over by a foreign company, Al-Futtaim in 1991, and has an installed capacity of 30,000 tractors per annum (operating on a single shift). Each company has an installed capacity of 30,000 units per annum, but due to low income of farmers and lack of availability of finance on easy terms, domestic demand has been suppressed and the companies have operated at below optimum capacity. Since 2006, tractor sales by MTL have consistently outpaced AGTL (this trend is evident in Figure 6.6 below), despite having an older production plant with lower single shift capacity (15,000 versus 30,000), suggesting the firm has managed to establish the MF/MTL brand successfully, and operate competitively. Tractor sales peaked in 2011 in response to a reduction in sales tax on tractors for two years from 16 percent to 5 percent (2012) and 10 percent (2013), before falling again in following year.

Figure 6.6: Annual Sale of Tractors in Pakistan (1989-2013)



Source: Based on data collected from PAMA Website

To remedy the situation of operating below capacity due to an adverse economic outlook in the domestic market, MTL has been actively pursuing two strategies. One is the design and production of a lower priced variant with more efficient diesel engines, and the second is negotiating with their JV partners for greater access to export markets. Given that the production technology in use is based on mass production techniques that are best suited to producing in large batches, continued profitability of the company hinges on keeping costs down and securing access to export markets. The company's business strategy also involves horizontal and vertical diversification; the former to reduce dependence on a single product line for profits, and the latter to ensure timely access to high quality components that is also essential for meeting the quality standards of their JV partner. The primary market for MTL is the province of Punjab, and MTL has established a spare parts dealer network that is concentrated in Punjab to support its primary customer base, while no dealers are in operation in Baluchistan and less than a handful in Sindh and KPK (as shown in Table 6.5 below). On the other hand, there has been a significant growth in the number of authorized workshops (see Table 6.6 for trends) dedicated to servicing and maintaining MTL manufactured tractors in all provinces.

Table 6.5: Distribution of Spare Parts Dealers by Province with Changes over Time

Province	Number of Dealers			
	1996	2000	2010	2013
Baluchistan	0	0	0	0
NWFP (Khyber Pakhtoonkhwa - KPK)	3	3	3	3
Punjab	41	41	41	41
Sindh	1	1	1	1
Total	45	45	45	45

Source: MTL Annual Report, Various Issues

Table 6.6: Distribution of Authorized Workshops by Province and Changes over Time

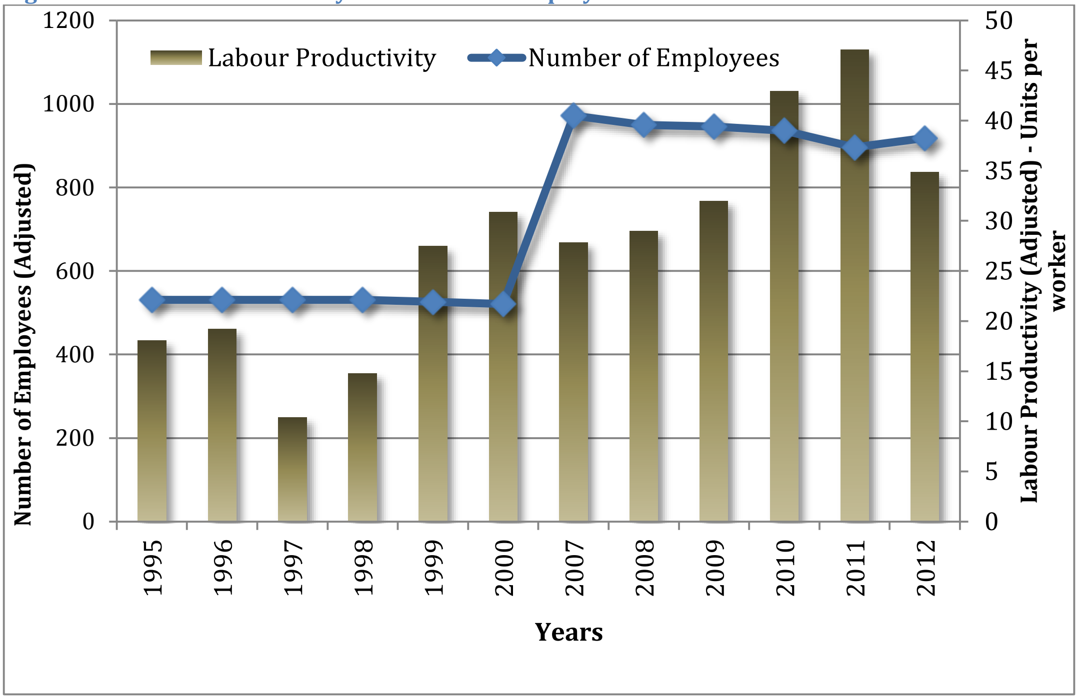
Province	Number of Cities	Number of Workshops			
		1996	2000	2010	2011
Baluchistan	5	8	11	30	31
NWFP (Khyber Pakhtoonkhwa - KPK)	8	28	23	18	18
Punjab	41	171	206	332	334
Sindh	13	31	30	74	74
Other	2	2	1	5	5
Total	69	240	271	459	462

Source: MTL Annual Report, Various Issues

Labour productivity at MTL has increased from 18 units per worker in 1995 to 34 units in 2012, and peaking at 47 units in 2011 when the firm was operating double shifts and overtime to accommodate increased demand for tractors (as shown in Figure 6.7).

It is evident from the prices of tractors available at local dealers in Pakistan (see Box 6.4) that the MTL brand is competitively priced, though individual tractor models tend to be priced on the higher side, on account of after sale services provided by MTL to its customers.

Figure 6.7: Labour Productivity and Trends in Employment at MTL



Source: Author's calculations based on data from MTL Annual Reports, various issues

Box 6.4: Tractor Prices in Pakistan by Brand and Model

Brand and Model	Price (USD)
Massey Ferguson Tractors:	
MF 240 (50 HP):	8,954
MF 260 (60 HP):	9,873
MF 350 (50 HP):	9,490
MF 360 (60 HP):	10,166
MF 375 (75 HP):	12,718
MF 385 2WD (85 HP)	14,122
MF 385 4WD (85 HP)	21,076
New Holland Tractors:	
NH 480 Special (50 HP)	8,852
NH Ghazi (65 HP)	9,772
NH 640 (75 HP)	12,246
NH 640 Special (85 HP)	13,599
NH 55-56 (50 HP)	9,439
NH 60-56 (60 HP)	10,421
NH 70-56 4wd (85 HP)	17,184
Ursus Tractors:	
Ursus 2812 (50 HP)	8,635
Ursus 3512 (60 HP)	9,735

Source: World Trade Inc. (Tractor Dealer based in Lahore

Note: All prices are fob Karachi, Pakistan based on container load.

6.4. CONSTRAINTS FACED

The major constraints faced by MTL in the company's growth over the years have been the royalty and associated fee payments to MF for use of their proprietary technology and the accompanying export market limitation that has been in effect till recent years. Table 6.7 shows that royalty payments have been determined by net sales, peaking at 1.82 percent of net sales in 1999, before falling to only 0.40 percent the following year before they were discontinued after 2000. Exports of CBU to Africa have started after protracted negotiations by MTL with MF, and numerous quality assurance and plant visits by MF engineers. On the policy front, MTL was fortunate enough to have had preferential access to government departments in the formative/ early years which led to swift resolution of any problems or issues faced by the company, but since the time of liberalization, MTL has had to deal with frequent changes in government policy, which the company management asserts have adversely affected firm operations and hindered it's growth.

Table 6.7: Royalty Payments and Share in Net Sales of MTL (1995-2000)

('000 PKR)

Year	Net sales ('000)	Royalty Payments	
		Total	Share in Net Sales (%)
1995	3,003,924	51,405	1.71
1996	3,330,334	30,029	0.90
1999	5,365,143	97,769	1.82
2000	22,199,909	87,975	0.40

Source: Millat Tractors Limited Annual Reports, Various Issues

The vendor base was found to be lacking in terms of the ability to meet MF quality assurance levels, and it is for that reason that the decision was made to expand operations horizontally in the industry and acquire Bolan Casting foundry to assure that costs were minimized and quality levels could be assured while maintaining supply levels.

There were no hurdles placed in factory operations by MF; save for the strict adherence to quality assurance work. In fact, it was the opinion of MTL management that the decision to source the technology transfer from the UK afforded the company the flexibility to survive and continue production even in the most difficult of times.

On the other hand, the government department and agencies were viewed with suspicion (and negativity). The role of the EDB in recent years is not looked upon favourably by MTL employees; considered to be very bureaucratic and monitoring and regulation oriented interaction only while providing no meaningful assistance or guidance in terms of investments or projects to undertake. Considering the fact that the EDB is officially tasked with strengthening the engineering base of the country and hence developing local technological capability, this perception is unsettling. Visits by EDB staff to the factory were viewed as waste of valuable resources and time and involved disrupting daily factory operations. One MTL General Manager (GM) related a very interesting case regarding the workings of the EDB. A statement was issued by an official of the EDB in August 2012 to the effect that tractor manufacturers in Pakistan were using outdated (1950s) technology. However, according to a senior MTL GM, the company is in fact using state of the art technology which is international standards compliant, and the reason for this statement being issued was to justify the government's decision to allow the import of competing Belarus (Russian) tractors from abroad. It was the considered view of this GM that the Belarus tractor in fact was based on old technology and more expensive than the competing MF tractor model, and that the EDB statement was based on their (EDB's) reading that the differing model numbers used by MF (No. 415) versus MTL (No. 350) for the same tractor design represented outdated technology.

Upon further questioning it also emerged that there was little to no direct interaction with the Ministry of Industries and Production as regards operations of the firm. Furthermore, according to MTL management, any loss making period is financed by the company's own resources with no assistance or involvement from the government. In interviews with state officials at MoIP and EDB, it became apparent that the focus of the state had shifted from a more "hands–on" approach and direct involvement in the operations of firms to one of simply monitoring the activities of firms and providing a "level playing field". MoIP actions were hamstrung by countervailing political directives from higher political authorities and conflicts of interest between different institutions, which has translated into a lack of coordination and information sharing between these entities. This suggests that even if the state were not following the Washington Consensus approach of enabling liberalization and open markets, the fragmentation in the political system and the lack of coordination between institutions will make it exceedingly difficult to promote a particular industry or sector and successfully coordinate activities across sectors.

6.5. FIRM COMPETITIVENESS

According to the catching up model that was introduced in Chapter 3, we know that in today's globalized world, developing countries are competing with developed countries and their success or failure depends on the level of competitiveness achieved by their domestic manufacturers. In economic theory product competitiveness depends on its price and quality, and manufacturing firms in developing countries require subsidies to compete effectively with firms in other countries till such time as they acquire the capabilities required to compete. According to Khan (2013b)'s mark-up pricing model the competitiveness and performance of MTL can be assessed in relation to a global leader firm in tractor production, in terms of the total unit cost of production plus a mark-up. In other words, the unit price of a product is the sum of unit prices of labour, capital and inputs times the mark-up. In the case of MTL, the breakdown of costs can be computed as follows.

First of all, on the supply side, cost of manufacturing a product plays a key role in determining how competitive a firm's production process is in comparison with other firms in the industry. As evident from the cost break-up detailed in Table 6.8, raw materials and stores consumed account for the bulk of the value between 2009 and 2013. The high degree of localization achieved by the firm is reflected in the fact that royalty payments for use of proprietary technology are not a major component of the cost break-up at MTL.

Unit labour cost is the ratio of wage level to level of labour productivity (output per hour of labour input) in the firm. Labour productivity is a measure of how effectively labour is being used in the production process by the firm and is affected by a number of factors of which we are interested in three; the rate of capacity utilization at the firm, the improved skills of workers and improved managerial skills. MTL plant capacity remained fixed at 15,000 tractors per year (single shift initially, but by 2007 doubled to 30,000 tractors per year (double shift) to accommodate the increased demand and spending power of its customers (see Table 6.9 for trends in labour

Table 6.8: Cost Breakup of Tractors Manufactured at MTL (2009-13)

('000 PKR)

Cost Component	2009		2010		2012		2013	
	Value	Share	Value	Share	Value	Share	Value	Share
TOTAL	13,427,101	100.00	18,019,082	100.00	16,574,686	100.00	18,477,597	100.00
Components & Stores Consumed	12,921,526	96.23	17,387,146	96.49	15,999,144	96.53	17,825,744	96.47
Remunerations	336,552	2.51	405,389	2.25	367380	2.22	432,950	2.34
Fuel and power	59,647	0.44	83,457	0.46	67,535	0.41	82,810	0.45
Repairs and maintenance	48,498	0.36	61,250	0.34	70,722	0.43	79,063	0.43
Depreciation	30,912	0.23	35,141	0.20	30,791	0.19	32,709	0.18
Other	29,966	0.22	46,699	0.26	39,114	0.24	24,321	0.13

Source: MTL Annual Reports, various issues productivity and annual firm output). Interestingly, between 1995 and 1997, there was under-utilization of capacity at MTL, and the number of tractors manufactured was well below the rated capacity, which reflected the drop in sales due to suppressed demand in the agricultural sector, and the restriction on exports did not allow the firm to take advantage of its export potential. The number of employees has been showing a downward trend since the late 1990s, from 531 in 1998 to 468 in 2010, while number of tractors manufactured has been increasing from 14,453 in 1999 to 40,178 in 2010, by which time the firm has been operating on a double shift basis and employees have been putting in overtime which has allowed plant capacity to be doubled and the increased demand to be met. Excluding the years when the firm was operating at below capacity due to the downturn in the local economy, labour productivity has been steadily increasing, evidence that the firm has been successful in gaining capabilities (technological and organizational) for operating competitively.

Table 6.9: Labour Productivity Trends at MTL (1995 - 2012)

Year	Number of employees	Plant Capacity	Tractors Manufactured	Labour productivity
1995**	531	15,000	9,591	18.06
1996**	531	15,000	10,199	19.21
1997**	531	15,000	5,523	**10.40**
1998*	531	15,000	7,854	14.79
1999	526	15,000	14,453	27.48
2000	521	15,000	16,084	30.87
2007	486	30,000	27,081	55.72
2008	475	30,000	27,506	57.91
2009	473	30,000	30,244	63.94
2010	468	30,000	40,178	85.85
2011	448	30,000	42,188	94.17
2012	459	30,000	32,004	**69.73**

Source: Millat Tractors Limited Annual Report, various issues

Notes:

* : Production shortfall due to decreased demand
** : Data on number of employees for 1995-1997 unavailable and assumed to be static, and production shortfall due to drop in sales
Labour productivity is the ratio of tractors manufactured annually to number of employees

Unit input cost is the ratio of price of inputs to the productivity of inputs, where the global price of steel is used as a proxy for the price of inputs used at MTL. To determine the productivity of input use in the manufacturing process, an estimate of the total units of input used in the manufacturing process is required, which can be used in turn to calculate the productivity of input used as the ratio of manufactured output to total units of input used. However, due to lack of available data on input use in the industry, a proxy is used as represented by the ratio of total input expenditure (in PKR) to number of tractors manufactured in a year.

The third component in the cost structure of the firm is the unit capital cost; the ratio of price of capital to the output-capital ratio. Again, due to unavailability of an actual estimate for capital price, a proxy is calculated as the ratio of depreciation charge on land, buildings, machinery and equipment to the number of tractors manufactured in a year plus royalty payments (if any) for the use of proprietary technology.

Taken together the three components of the price markup model are expected to indicate the source(s) of non-competitiveness of the late developer firm in relation to the global leader. Unit labour costs are showing a downward trend (line L1 in Table 6.10), suggesting that remuneration expenditures relative to number of tractors manufactured is decreasing, while labour productivity is increasing. Unit input costs are showing an upward trend (line I1 in Table 6.10), which is not surprising since the company has been increasing annual purchases of stores and consumables required for the production of tractors every year, however, the unit costs of inputs has also been increasing with time. Finally, we note that the unit capital costs are decreasing (line K1 in Table 6.10). For a competitive firm, one would expect unit costs to decrease for the same quality product being produced every year and the firm gains mastery of its production technology, so the trend exhibited here is indicating MTL is becoming more efficient with the passage of time.

However, it should be noted that these expenditures are in nominal terms (current PKR) and it would be more informative to see if these trends persist when the expenditure figures for all three inputs are deflated to account for inflation. Ideally one would deflate the expenditure figures by an index of manufacturing prices, but lacking a consistent index for Pakistan, we use a proxy; specifically GDP deflator. The downward trend for remuneration expenditures, in real terms, (line L21 in Table 6.11) suggests that the company has been successful in keeping labour costs down as number of employees has been streamlined and labour productivity has been increased (line L3 in Table 6.11). Performance based rewards for labour have been increased by the firm to compensate for rising prices and costs, while number of employees have decreased (line G2 in Table 6.11). Input expenditures have increased in real terms as well, but when coupled with the increase in capacity and production output that has been achieved over the years, this suggests the firm is gaining capabilities and becoming more competitive with the passage of time. Capital expenditures, comprised of depreciation charges[41] for land, buildings and equipment and royalty payments to MF for use of their technology, show a downward trend which accelerated when the latter (royalty payments) were discontinued after 2000 (line K3 in Table 6.11). Thus, despite the increased depreciation charge for machinery and equipment at MTL, unit capital costs while already low, have fallen even further in recent years. Taken together, these trends do suggest that the company has made progress in developing capabilities to compete successfully.

In contrast to the experience of MTL, AGTL on average has a higher cost of production, possibly reflecting the royalty payments still being made for use of proprietary technology (as evident from Table 6.12 below), while labour productivity is lower (number of tractors produced per worker per year as reported in Table 6.13), despite having a higher plant capacity (30,000 tractors per year on a single shift basis) and employing fewer employees.

[41] Depreciation charges by MTL are calculated by applying diminishing balance method for property, plant and equipment, and on straight line basis for leasehold office buildings.

Table 6.10: Price Markup Model for MTL (1995-2011)

(PKR)

Code	Category	2013	2012	2011	2010	2009	2000	1999	1996	1995
G1	**Product Price**									
G11	**MTL MF 240 ('000 PKR)**	**698**	**635**	**592**	**540**	**498**	**313**	**313**	**346**	**291**
G2	Number of employees	451	433	448	468	473	521	526	531	531
G3	Product units manufactured	32,016	32,004	42,188	40,178	30,244	16,084	14,453	9,591	10,199
G31	Production Capacity	30,000	30,000	30,000	30,000	30,000	15,000	15,000	15,000	15,000
G32	Product Units Sold	32,046	32,005	42,016	40,080	30,234	16,205	15,151	9,628	10,318
G33	Capacity Utilization	6.72	6.68	40.63	33.93	0.81	7.23	-3.65	-36.06	-32.01
G4	Exchange Rate (PKR to USD)	105.68	97.14	89.97	85.71	84.26	58.03	51.78	40.12	34.25
G5	Net sales ('000)	24,258,396	21,295,832	24,863,264	21,643,036	15,068,226	5,755,886	5,365,143	3,330,334	3,003,924
L1	**Unit Labour Cost [L2/G3]**	**7.82**	**7.28**	**5.73**	**9.74**	**10.79**	**8.40**	**7.65**	**15.43**	**10.88**
L2	Remuneration expenditures	250,314	232,847	241,832	391,481	326,471	135,029	110,570	147,994	110,918
L3	Labour productivity [G3/G2]	70.99	73.91	94.17	85.85	63.94	30.87	27.48	18.06	19.21
I1	**Unit Input Cost [I2/G3]**	**556.78**	**499.91**	**462.86**	**436.26**	**424.86**	**279.21**	**295.32**	**270.18**	**239.31**
I2	Total Input Expenditure	17,825,744	15,999,144	19,527,148	17,527,950	12,849,564	4,490,858	4,268,324	2,591,322	2,440,759
K1	**Unit Capital Cost [K2/G3]**	**0.78**	**0.70**	**0.55**	**0.54**	**0.72**	**6.61**	**8.01**	**5.25**	**5.04**
K2	Depreciation Charge and Royalty Payments	24,931	22,382	23,213	21,763	21,739	106,346	115,764	50,388	51,405
K21	Land (Lease + Freehold)	0	0	0	0	0	0	0	0	0
K22	Buildings (Lease + Freehold)	3,662	3,195	3,841	4,086	4,239	6,372	6,554	8,545	
K23	Machinery and Equipment	21,269	19,187	19,372	17,677	17,500	11,999	11,441	11,814	
K24	Royalty Payments	0	0	0	0	0	87,975	97,769	30,029	51,405
C1	**Total Cost [L1 + I1 + K1]**	**565.37**	**507.89**	**469.14**	**446.54**	**436.38**	**294.22**	**310.98**	**290.87**	**255.23**
C2	**Total Cost (USD)**	**5.35**	**5.23**	**5.21**	**5.21**	**5.18**	**5.07**	**6.01**	**7.25**	**7.45**
M1	1+m [G11/C1]	1.23	1.25	1.26	1.21	1.14	1.06	1.01	1.19	1.14
M2	m [M1-1]	0.23	0.25	0.26	0.21	0.14	0.06	0.01	0.19	0.14

Source: Author's calculations

Table 6.11: MTL Unit Cost Components in Real Terms (1995-2013)

(PKR)

Code	Category	2013	2012	2011	2010	2009	2000	1999	1996	1995
G2	Number of employees	451	433	448	468	473	521	526	531	531
G3	Product units manufactured	32,016	32,004	42,188	40,178	30,244	16,084	14,453	9,591	10,199
G31	Product Units Sold	32,046	32,005	42,016	40,080	30,234	16,205	15,151	9,628	10,318
G4	Net sales ('000)	24,258,396	21,295,832	24,863,264	21,643,036	15,068,226	5,755,886	5,365,143	3,330,334	3,003,924
G5	Price Deflator (GDP)	221	205	194	162	147	63	51	39	36
G6	Adjusted Net Sales ('000) [G5/G6]	109,906	103,722	127,921	133,241	102,830	91,236	106,211	85,090	83,177
L1	**Unit Labour Cost [L21/G3]**	**0.04**	**0.04**	**0.03**	**0.06**	**0.07**	**0.13**	**0.15**	**0.39**	**0.30**
L2	Remuneration expenditures	250,314	232,847	241,832	391,481	326,471	135,029	110,570	147,994	110,918
L21	Adjusted Remuneration Expenditures ('0000) [L2/G5]	1,134	1,134	1,244	2,410	2,228	2,140	2,189	3,781	3,071
I1	**Unit Input Cost [I21/G3]**	**2.52**	**2.43**	**2.38**	**2.69**	**2.90**	**4.43**	**5.85**	**6.90**	**6.63**
I2	Total Input Expenditure	17,825,744	15,999,144	19,527,148	17,527,950	12,849,564	4,490,858	4,268,324	2,591,322	2,440,759
I21	Adjusted Total Input Expenditure [I2/G5]	80,761.80	77,924.47	100,466.88	107,907.12	87,688.78	71,184.54	84,497.80	66,208.57	67,583.60
K1	**Unit Capital Cost [K4/G3]**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.10**	**0.16**	**0.13**	**0.14**
K2	Depreciation Charge and Royalty Payments: Combined [K21 + K22 + K23+K3]	24,931	22,382	23,213	21,763	21,739	106,346	115,764	50,388	51,405
K21	Land (Lease + Freehold)	0	0	0	0	0	0	0	0	0
K22	Buildings (Lease + Freehold)	3,662	3,195	3,841	4,086	4,239	6,372	6,554	8,545	
K23	Machinery and Equipment	21,269	19,187	19,372	17,677	17,500	11,999	11,441	11,814	
K3	Royalty Payments	0	0	0	0	0	87,975	97,769	30,029	51,405
K4	Adjusted Depreciation Charge and Royalty Payments [K2/G5]]	113	109	119	134	148	1,686	2,292	1,287	1,423
C1	**Total Cost [L1 + I1 + K1]**	**2.56**	**2.47**	**2.41**	**2.75**	**2.98**	**4.66**	**6.16**	**7.43**	**7.07**

Source: Author's calculations

Table 6.12: Cost of Production for AGTL (2010-2013)

('000 PKR)

Component	2010		2011		2012		2013	
	Value	Share	Value	Share	Value	Share	Value	Share
Total	11,886,521	100.00	8,908,586	100.00	11,211,823	100.00	7,143,200	100.00
Raw materials and components	11,220,970	94.40	8,349,894	93.73	10,503,891	93.69	6,584,131	92.17
Remunerations	190,253	1.60	180,444	2.03	209,991	1.87	204,829	2.87
Stores and supplies	190,753	1.60	177,521	1.99	230,495	2.06	143,360	2.01
Royalty	143,985	1.21	97,936	1.10	143,075	1.28	91,183	1.28
Fuel and power	33,593	0.28	30,735	0.35	47,138	0.42	43,774	0.61
Depreciation	23,574	0.20	25,732	0.29	27,513	0.25	29,035	0.41
Repairs and maintenance	23,334	0.20	29,686	0.33	28,882	0.26	26,960	0.38
Travel	3,413	0.03	4,969	0.06	6,755	0.06	7,238	0.10
Others	2,087	0.02	2,361	0.03	6,076	0.05	3,559	0.05

Source: AGTL Annual Reports, Various Issues

Table 6.13: Labour Productivity Trends at AGTL (Various Years)

Year	Tractors Manufactured	Number of Employees	Labour Productivity
1999	12,200	498	24.5
2000	18,425	498	37.0
2006	26,076	422	61.8
2007	26,380	436	60.5
2008	27,550	423	65.1
2009	30,351	413	73.5
2010	29,020	404	71.8
2011	19,936	377	52.9
2012	23,820	370	64.4

Source: AGTL Annual Reports, Various Issues

6.6. CONCLUSION

Building on the discussion in the preceding chapters and the case study presented above, we can infer a number of important findings regarding Pakistan's initial state-led industrial development, the evolution of political settlements in the country and their impact on technology acquisition efforts by the automotive industry. As evident from Chapter 5, the early phase of technology acquisition and capabilities development in the industry under state sponsored direction and control led to the development of substantial capacity of production by the state run enterprises, but only limited competitiveness was achieved, naturally leading to losses being sustained by individual enterprises, such as RTEL. The lack of competitiveness is likely on account of the weak technological capabilities that developed in response to overly ambitious goals and targets that were divorced from the situation that was actually developing, and weak enforcement by the state (as represented by a weak developmental state and detailed in the discussion on political settlements and Pakistan's history in Chapters 2 and 3) that led to circumvention of these targets.

Recalling the characteristics of political settlements as they evolved in Pakistan discussed in Chapter 2, the authoritarian regime in was vulnerable to excluded factions, which meant policies were ineffectively implemented. Despite these shortcomings, the fact that the priorities of the state were aligned with the efforts of MTL employees to establish the recently privatised company meant that political settlements worked in favour of the company. However, the evidence points to Chibber (2003)'s hypothesis holding water in the case of Pakistan as well. In contrast to the case of Korea, but mirroring developments in India, it appears that by and large entrepreneurs were able to resist enforcement which undermined state capacity and prevent the formation of a strong developmental state. The fragmented state of political settlements in the country led to frequent changes in leadership and shifts in policy formulation and implementation, further exacerbating the situation.

This case study has brought to light an exception to the general trend, a tractor manufacturing company MTL, that was encouraged to pursue a viable localization process and development of technological capabilities (technical as well as organizational) that were not impeded by foreign ownership of the production technology. Learning and a high level of effort to absorb the technology was induced through the state directive to lower costs and indigenize production of tractors. The perceived benefit to MTL was access to a vast domestic market unchallenged and higher profits through lower costs. The export market restriction imposed by MF in exchange for use of proprietary technology meant that the company was limited to offering products for the domestic market that used simpler technology than the corresponding global level; designed to suit the needs of domestic consumers (simple, sturdy tractors that farmers with rudimentary education could operate and maintain, as opposed to large, high technology tractors with GPS satellite guidance and cabin amenities) and this allowed the company to develop its capabilities and competitiveness in those products to the point where it is now competitively placed in the domestic as well as regional market. Therefore this restriction had implications for the industrialization strategy adopted by MTL. Late developers typically pursue either an “□” or “□” strategy in their technology acquisition efforts, with the former relating to competitiveness achieved through learning to produce high quality products and the latter to competitiveness in lower quality products using the capabilities that have been developed. In pursuing this “β-strategy” (see Khan (2009)), MTL has focused on successfully developing improvements to the initial design of its product, building up the capabilities of its component supplier network, and expanding its product portfolio through horizontal and vertical expansion and acquisition using private financing on commercial terms.

An examination of the competitiveness of the company using labour productivity trends and Khan (2013b)’s markup pricing model suggest that the company has achieved a measure of success in its efforts to build up capabilities and compete effectively with other firms. However, the analysis is constrained by the lack of availability of in-depth data on firm operations and performance.

CHAPTER 7. ATLAS HONDA MOTORCYCLES: ORGANIZATION DEVELOPMENT THROUGH SELF DEVELOPMENT

7.1. INTRODUCTION

Of the various sectors in the automotive industry, the motorcycle industry is notable for a number of characteristics that can benefit developing countries in their goal to industrialize and develop at a rapid pace. Typically, the motorcycle industry is characterized by a high level of competitiveness and rivalry among the incumbent firms. Each firm tends to have a specific niche market with a variety of incentives and innovations that are offered to customers that end up encouraging competition among the firms. The price differential between different brands in the market tends to be low and thus the firms compete in terms of the features they offer and the services they provide. In the past consumers used to supplement their main modes of transportation, the passenger car, with the motorcycle. However, now due to the higher fuel efficiency and greater manoeuvrability, not to mention the significantly cheaper price, the demand for motorcycles is rising and the expectation is that the motorcycle industry will continue to grow. Companies use product segmentation strategy to market their product to customers, providing a motorcycle for any type of rider. This makes the motorcycle industry ideally suited to operation in developing countries and able to take advantage of the ability of technologically capable local firms to competitively manufacture slightly differentiated products for the market.

Though compared to automobiles a motorcycle is a simpler machine, there are still a substantial number of components that go into the manufacture of one machine. The complexity of the parts used in the manufacture of motorcycles is less than that of automobiles naturally, but substantial technological and organizational capabilities are still required to competitively manufacture them. Therefore it can be expected that firms will face significantly less difficulty in acquiring these capabilities, both in terms of cost of financing the loss making period of learning-by-doing and also the actual amount of time required before competitiveness is achieved . Once economies of scale are achieved and the firm is competitively placed in the market with its own brand, the firm is expected to take the next step of expansion into production of more complex automotive models such as passenger cars. Hyundai of Korea and later Tata Engineering and Locomotive Company (Tata Motors) of India are two examples of companies from developing countries that successfully designed and produced passenger vehicles based on capabilities that were built up over the years. The expectation is that firms will build on the capabilities gained in the manufacture of simpler products to gain a competitive edge against other established firms and move up the quality ladder into the production of more complex and sophisticated motorcycles. Vertical integration (not necessarily in terms of ownership, but in terms of control over quality and dense interactions between assemblers and suppliers) also takes place in the industry stemming from motorcycle companies preference to manufacture certain components of their product in-house; to better control the flow of critical supplies and to also ensure that quality is maintained.

Since 2000, Pakistan's motorcycle manufacturing industry has exhibited strong growth performance, averaging 30 percent annual increase between 2000 and 2010. The demand for affordable and reliable motorcycles is present and growing in the domestic market as evident from the proliferation of Chinese brand motorcycles in the local market in recent years. A handful of domestic firms have managed to develop their domestic technological capabilities to the degree that majority of the manufacturing process has been localized and allowed the firms to enter into the export market. If this trend is indeed sustainable, the domestic industry should be able to successfully compete in the global market. Against this backdrop, the question arises whether firms in developing countries are developing the capabilities required to successfully compete in this highly competitive global market and are they making the transition to producing their own brands and higher value added products such as passenger cars. This chapter will look at the case of the oldest motorcycle manufacturing firm in Pakistan to assess the firm's level of technological capabilities development, the competitiveness of the firm and the future prospects for product expansion in the context of trends in global motorcycle manufacturing.

7.2. FIRM LEVEL TECHNOLOGICAL CAPABILITIES DEVELOPMENT AT ATLAS HONDA LIMITED

The motorcycle manufacturing industry in Pakistan is dominated by three companies; Atlas Honda Limited (ATLH) is a joint venture between the Atlas Group and Honda

Motor Co. Ltd. (HMCL), Japan for the progressive assembly and manufacture of Honda Motor brand motorcycles in Pakistan. Honda is the largest selling brand of motorcycles in the country and is marketed as having an unmatched reputation for high quality, reliability and after-sales-service to differentiate the brand from Chinese clones that have started making their presence felt in recent years. The preceding discussion and analysis of recent trends in the industry have brought forward the fact that the motorcycle manufacturing industry has grown in recent years and the potential to become a regional player in the medium term. Domestic manufacturers need to focus on better utilization of the productive capacity that has been built up and achieve competitiveness in the domestic and export markets. ATLH in particular has invested heavily in building up its capacity and made efforts to improve the quality standard both within the firm and in domestic component suppliers as well. ATLH has focused on promoting domestic production of components and development of vendor capabilities. The discussion that follows will shed light on the technology acquisition efforts by ATLH since the time the company was first set up and assess the competitiveness of the company based on several indicators of performance.

7.2.1. FOUNDATION

As part of the effort to establish a presence in the motorcycle manufacturing industry, Atlas Group of companies established a total of three motorcycle manufacturing concerns; namely Atlas Epak Ltd., Panjdarya Limited, and Atlas Autos Ltd. Atlas Epak Ltd. was taken over by the Government of Bangladesh after the separation of Bangladesh as an independent state in 1971, while Panjdarya Limited and Atlas Autos Limited were merged in 1988 to form a single motorcycle manufacturing concern – Atlas Honda Limited (ATLH). In addition to the manufacture and marketing of Honda motorcycles in collaboration with HMCL, ATLH also manufactures a number of hi-technology components in-house in collaboration with several leading parts manufacturers from Japan. Joint venture agreements have been signed with Showa Atsumitech, and just recently with the Denso Corporation.

ATLH operates two production facilities in Pakistan; one in Karachi, Sindh and the second in Sheikhupura, Punjab. The Karachi “mother” plant was set up in 1964 after a technical agreement was signed between the Atlas Group of companies and Honda

Motorcycles Japan. Initially the plant averaged a daily production rate of seven motorcycles, which has increased to 300 motorcycles as the workers have gained proficiency in the production technology and plant operations have become established. The Karachi plant is ideally located to take advantage of the burgeoning component manufacturers industry established in the city. The newer production facilities operated by ATLH are located in Sheikhupura, and were established in 1981 for the manufacture of newer product varieties and currently manufactures all four locally built models; the popular CD 70, Pridor, CG 125 and CG 125 Deluxe.

7.2.2. IMPLEMENTATION, ASSIMILATION, AND IMPROVEMENT

ATLH has undertaken to develop local manufacturing capabilities to the highest, economically feasible level. While a major role in localization has been assigned to vendor industries, Atlas has the country's largest in-house manufacturing capability at its Karachi and Sheikhupura plants. To support the production facilities, the company has established an R&D wing and tool making facilities through CAD/CAM which are growing rapidly in size and function as the company expands. Atlas has managed to execute 12 Joint Venture/Technical Assistance Agreements between local vendors and foreign manufacturers for transfer of technology. Besides, Atlas has directly executed 9 Joint Venture/Technical Assistance Agreements other than Honda.

ATLH management is striving to modernize company operations by adapting applicable aspects of research and theory and more specifically, Honda's unique philosophy of hard/soft technologies to the realities of Pakistani conditions. Company management structure, systems and processes are changed according to the demands of the customer, growth and new technology. Efforts are being made to develop participation at all levels of personnel in decision-making and a substantial and effective delegation has been established at levels where applicable. Various participation programs such as Ala Mayar Quality Circles movement, launched in 1985, are strongly encouraged to allow constructive self-expression and teamwork. The Company training and development programs encourage all members to develop themselves and contribute to their full potential.

ATLH is playing a pioneering role in creating conditions for easy use of motorcycles all over the country. A vast and growing network of over 1600 sales service and spare parts dealers has been established. In order to back up this system, Atlas has set up Warranty & Training Centers (WTC) in Karachi and Lahore which provide several courses of varying duration and complexity for motorcycle mechanics and users each year. Mobile training facilities take the latest know-how, technology and maintenance of motorcycles to major rural and urban centers around the country.

ATLH has managed to expand its operations to meet local demand on a rolling basis since it was first established, and along the way has contributed to the growth of the domestic industry. Production capacity was first expanded in 1976, when the Honda motorcycle was well received by local consumers. A second plant commenced operations in 1981 after a Joint Venture agreement was signed with Honda Motor Company, Japan. The company achieved a major breakthrough in its operations when CBU motorcycles were first exported to Nepal. The export potential of the company being realized, ATLH signed a formal agreement with its Joint Venture partner for the export of motorcycles to countries in the South Asia region (Bangladesh and Sri Lanka in addition to Nepal), the Middle East and Central Asia.

ATLH management has realized the long term benefits and gains from lower costs of localized production of components and taken steps to promote such local manufacturing. The steps undertaken include setting up of specialized engine manufacturing plants; for the CD70 engine at Karachi in 1987, and for the CD125 engine at Skeihupura in 1991. ATLH has managed to improve machining and level of quality of components manufactured in-house and by component suppliers through improved quality control. ATLH has reached sufficient level of expertise in the manufacture of the brand being offered for sale in the local market that it is expanding the product line offered in the domestic market, and as expected of a leading motion motorcycle manufacturing firm it is participating in, and encouraging local R & D efforts to bring to market a differentiated product that appeals to local consumers. This includes work to ensure the new products are compliant with foreign emissions standards (Euro I and Euro II), which ensures that the product will be competitive with foreign brands in the global market (see Table 7.1 for a timeline of major events at ATLH.

Table 7.1: Timeline of Major Events at ATLH

Year	Event
1962	Technical Assistance Agreement signed with Honda Motor Company Limited Japan
1964	Commercial Production started
1976	Production capacity expansion I
1981	Commercial Production started at Panjdarya Limited as Joint Venture with Honda Motor Company Limited
1981	Production capacity expansion II
1987	CD70 Engine Project started at Karachi
1988	Merger of Panjdarya Limited and Atlas Autos Limited
1988	Production capacity expansion III
1988	Joint Venture agreement signed with Honda Motor Company Limited
1989	Export of CBU motorcycles to Nepal
1991	CG125 Engine Project established at Sheikhupura
1995	Export Agreement signed with Honda Motor Company Limited Japan
1995	Exports of CBU motorcycles to Bangladesh, Nepal, Sri Lanka, Middle East and Central Asia
1998	New CD 70 and CG 125 models launched
1999	Sheikhupura and Karachi factories receive ISO 9002 certification
2000	Crankshaft Project started
2002	Deletion level reached to 87 percent (CD70) and 80 percent (CG125)
2002	Local R & D Wing established
2006	Established DCC (Delivery Control Center) at Sheikhupura Plant
2006	Annual Production reaches 360,000
2007	Successfully implemented SAP ERP to its business process, all over Pakistan
2008	Established DCC at Karachi Plant
2009	Launched New Model of CD 100 – Euro II
2009	ISO 14001-2004 Environment Certificate acquisition
2010	Launched New Model of CG 125 Deluxe – Euro II
2012	Launched New Model Honda "Pridor"
2012	All motorcycle models comply with EURO II (PAK-II) emissions standards

Source: A. H. Limited Annual Reports, various years

There are six departments at ATLH that handle: (i) Production Planning and Control, (ii) Stores, (iii) Casting (plant), (iv) Engine Manufacture (plant), (v) Manufacturing (plant), and (vi) Assembly (plant). The Production Planning and Control department issues work orders based on aggregate production planning, a master production schedule and material resource planning. There a total of three shops or work areas in the casting plant for low pressure die casting, high pressure die casting and gravity die casting. The engine manufacturing plant is comprised of a gear manufacturing shop, camshaft machining shop, cylinder-head machining shop, crankshaft machining shop and a crankcase machining shop. The manufacturing plant currently manufactures and paints fuel tanks for all models assembled in the plant. Finally, the assembly plant has four shops that weld the frame, paint, assemble the engine and assemble the frame. According to ATLH, the latest foreign production technology is used to yield an annual capacity rate of 600,000 motorcycles of various models, which ensures the firm will remain competitive in the global market. The Karachi plant has an average motorcycle assembly time of 4 minutes and is now capable of producing 250 motorcycles per day.

7.3. TRENDS IN THE MOTORCYCLE INDUSTRY

The global leader of motorcycle manufacturing in the Asian region is China, exporting close to half of the 17 million units it produces, followed by India. Pakistan has managed to marginally penetrate the export market in the region; however it is currently exporting only 1 percent of its total output (see Table 7.2). The industry is operating at well below the installed capacity of the sector (as shown in Table 7.3), suggesting that the industry has the potential to grow and become a regional leader in motorcycle manufacturing if it is able to break through the barriers that the sector currently faces.

Table 7.2: Regional Players in Motorcycle Production and Export

(000's)

Country	Production	Exports	Exports Share in Production (%)
1 China	17,000	6,971	41.00
2 Thailand	3,000	800	28.00
3 India	7,700	513	7.00
4 Vietnam	2,000	100	5.00
5 Pakistan	751	7	1.00

Source: Competitiveness Support Fund (2006)

The motorcycle manufacturing industry in Pakistan is facing stiff competition from other countries in the region. According to industry stakeholders, the competition is exacerbated by the preferential policy stance of numerous foreign governments vis-à-vis their own motorcycle manufacturing concerns, which is not mirrored by the state in Pakistan. The difference in policy perspectives may be gauged by the duty rates and tax rates applicable in the industry, as detailed in Table 7.4. A closer look at the price and duty rates for CBU, CKD and parts reveals that the price of a motorcycle is lowest in China, as are the duty rates, while Thailand is at the other end of the spectrum in applicable import duty rates.

Table 7.3: Installed Capacity and Motorcycle Manufacture by Main Association

Year	Manufacturer Association		
	APMA	PAMA	Imported CBU from China
Total Installed Capacity (2010)	1,147,000	1,000,000	n/a
2000	10,319	108,850	
2001	36,923	120,627	1,560
2002	48,208	156,961	9,700
2003	102,059	268,948	22,692
2004	185,527	385,179	11,300
2005	299,430	451,949	3,300
2006	424,629	415,221	156
2007	503,278	550,824	
2008	487,321	430,307	
2009	758,038	622,366	
2010	904,797	705,884	

Source: APMA (2014)

Table 7.4: Regional Comparison of Duty and Tax Rates

(%)

Duty Rate		Country				
		China	India	Vietnam	Thailand	Pakistan
Price (USD, C & F)		344.0	530.0	533.0	501.0	595.0
Total Import Duty	CBU	30.0	90.0	100.0	116.0	90.0
	CKD	10.0	12.5	30.0	33.0	30.0
	Parts	18.0	46.0	50.0	40-105	35-50
Share of Total Revenue	Direct Tax	54.0	44.0	55.0	51.0	5.5
	Indirect Tax	46.0	56.0	45.0	49.0	94.5
No of OEMs	Local	144	9	12	5	43
	Foreign	56				3
Exporters		67	7	3	5	1
Exports per OEM (units)		104,054	73,322	33,333	166,200	7,082

Source: ACMA (2014),
SIAM (2014)

More specifically, there is a very strong domestic demand for motorcycles in China. Japanese firms have invested heavily in the industry while the Chinese state has subsidized provision and cost of infrastructure such as utilities and land procurement, while assistance in general is provided to exporting firms (almost 40 percent of all OEMs in the country). China has the added benefit of having a market presence in over 200 countries worldwide and local availability of many raw materials required for manufacture of the final product. China has to import iron and steel and many raw materials, and the state in China gives priority to local development of products and hence technological capabilities. A requirement for setting up a Joint Venture in China is production of components for sale in China, and globally in developed countries. Foreign ownership of automotive plants is also prohibited in an effort to encourage the transfer of technology Holweg, Luo & Oliver (2009). However, Chinese firms at this stage are unable to truly compete with Japanese and other established firms in terms of quality and substantial technological innovations and focus on bringing to market similar products at a significantly cheaper price.

Indian consumers represent a very strong domestic demand for locally manufactured motorcycles, where the component manufacturing industry has successful managed to develop enough technological and organizational capabilities to deliver quality components at competitive prices for a range of domestically produced qualities of motorcycles. Components used in the production of motorcycles are locally available, and Indian manufacturers have a strong manufacturing presence in regional and African markets. In the post liberalization era, a number of Joint Ventures have been established with local companies.

Thailand's Detroit of Asia policy aims to make the country a regional assembly hub with strong infrastructure support by the state that includes a number of initiatives such as automotive manufacturing clusters, training and component development. Thai OEMs are dominated by Japanese manufacturers and have a very strong export presence, especially with the rest of the ASEAN economies.

Vietnam experienced a significant downturn in recent years in terms of the number of OEMs in operation, which fell from 60 to only 12. Vietnamese OEMs prefer to export to the ASEAN region to benefit from more favourable terms of trade but have also managed to export to the African market. Vietnam itself has strong domestic demand for motorcycles and has the benefit of low costs, suggesting it is gaining traction and competitiveness in the global market for motorcycles.

The motorcycle manufacturing industry in Pakistan began with the technical collaboration signed between Honda Motorcycles, Japan and the Atlas Group of

Companies in 1964. Since then two other major motorcycle manufacturers from Japan; namely Suzuki and Yamaha have also established assembly and manufacturing plants in the country. DYL Motorcycles signed a technical collaboration agreement with Yamaha for the progressive manufacture of their brands in Pakistan commencing in 1976, while Suzuki entered the market in 2007. More recently, several Chinese companies have entered the market by assembling clones of the Honda CD70 motorcycle; however, their individual production capacity is limited compared to the incumbent firms.

Currently there are 43 OEM in the motorcycle manufacturing sector of Pakistan's automotive industry, of which only 6 are members of Pakistan Automotive Manufacturers Association (PAMA), while 37 have instead formed an independent body, the Association of Pakistan Motorcycle Assemblers (APMA) that is not officially recognized by the state as a trade body at this time. In addition, there are roughly 50,000 workers employed by 2,000 parts and component manufacturers meeting the supply needs of these OEMs.

The three major players (Atlas Honda, Suzuki and DYL Motorcycles) in the local industry account for 47.8 percent of all motorcycles production capacity in the country, manufacturing the top Japanese brands of motorcycles. 65 small and medium scale manufacturers (members of APMA) combined account for the remaining 52.2 percent capacity. Capacity utilization rates for the years 2009-10 and 2010-11 (as reported in Table 7.5) reveal that the industry as a whole is operating at a very high utilization level, and the rates have shown an improvement over the reporting period. More specifically, total utilization in the sector witnessed an increase of 11.4 percent in the span of one year; and the increase in utilization was greater (from 66.17 to 77.55 percent) for the smaller firms in the sector (represented by APMA), though the three larger firms also managed to increase their rates by 7.9 percent over the same period (see Table 7.5).

A closer examination of the trends indicates that Honda Atlas has made marked improvements in realizing their production potential, and Suzuki to a lesser extent, while DYL motorcycles has witnessed a decline. As evident from Table 7.6, Atlas Honda has been steadily increasing the production of motorcycles since 2003 (from 190,679 to 636,420 in 10 years). Pak Suzuki on the other hand has witnessed a general decline in the number of motorcycles produced annually; in particular since reaching a peak of 33,779 units in 2007 down to 20,178 in 2013, suggesting the company is facing stiff competition in the domestic market. In the case of DYL Motorcycles, the company has the installed capacity to manufacture 200,000 units annually, yet it has only managed to operate at over half capacity for only two years between 2003 and 2013. This suggests that the domestic motorcycle manufacturing industry not only has the capacity to become a more visible regional exporter, but the ability as well.

Table 7.5: Installed Capacity and Utilization Rates (2009-10 and 2010-11)

OEMs	Installed Capacity (units)	Capacity Utilization Rate (%)	
		2009-10	2010-11
Total	**2,197,000**	**62.87**	**72.62**
PAMA	1,050,000	59.27	67.23
APMA	1,147,000	66.17	77.55

Source: Author's calculations based on data obtained from PAMA and APMA

Table 7.6: Production of Motorcycles by PAMA and Largest Members (2003-2013)

(Units)

Manufacturer / Assemblers	PAMA Total	Atlas Honda Ltd.	Pak Suzuki Motor Co. Ltd.	DYL Motorcycles Ltd.	Total
Number of Models Offered		4	4	4	**12**
Installed Capacity		**800,000**	**50,000**	**200,000**	**1,050,000**
2003-04	303,383	190,679	27,862	50,407	268,948
2004-05	416,189	287,291	26,308	71,580	385,179
2005-06	520,124	360,561	16,965	74,423	451,949
2006-07	467,267	331,621	27,309	56,291	415,221
2007-08	660,593	452,791	33,779	64,254	550,824
2008-09	509,054	349,525	14,592	66,190	430,307
2009-10	736,861	483,028	18,550	120,788	622,366
2010-11	838,665	570,777	20,259	114,845	705,881
2011-12	828,576	588,106	21,389	85,913	695,408
2012-13	819,556	636,420	20,178	56,223	712,821

Source: PAMA n.d.

The majority of motorcycle assemblers are concentrated in the cities of Lahore and Karachi, followed by Hyderabad and Gujranwala (see Table 7.7) and ideally located to benefit from the growing component manufacturer industry in those cities. As mentioned earlier, the motorcycle manufacturing industry operated along with the rest of the automobile sector under the Ministry of Industries and Production's Deletion Policy that concluded in 2006. Between 2001 and 2006 when the policy terminated, the industry made substantial progress in progressive use of locally manufactured parts (as shown in Table 7.8).

Table 7.7: Motorcycle Manufacturer by Location and Capacity

Location	Firms	Capacity
Lahore	19	490,000
Karachi	16	308,000
Hyderabad	10	370,000
Gujranwala	6	88,000
Mirpur	2	815,000
Bhalwalpur	1	10,000
Faisalabad	1	10,000
Multan	1	6,000
Muredke	1	10,000
Sadiqabad	1	13,000
Swat	1	6,000
Total	**59**	**2,126,000**

Source: APMA (2014),
PAMA n.d.

Table 7.8: Deletion Targets in the Motorcycle Industry (1999 - 2005)

(%)

Model	Deletion Target						
	1999	2000	2001	2002	2003	2004	2005
Upto 70 cc	76.50	79.00	83.00	85.00	86.50	88.00	90.00
70 - 100 cc			82.00	83.00	85.00	85.50	86.00
100 - 175 cc	73.88	75.00	74.00	81.00	82.00	83.00	84.00

Source: Engineering Development Board (EDB) and Atlas Honda Limited (ATLH) interviews

The Deletion Policy was formulated for the purpose of encouraging growth of local industry keeping in mind the existing level of capabilities in the components industry, and applied to all manufacturers in the industry, be they old or new. At the time of the late entry of non-Japanese OEMs, the Honda CD-70 was immensely popular in the country, and a fairly high level of localization had already been achieved, which prompted the non-Japanese OEMs to clone the Honda CD-70 to take advantage of the state of the industry.

By becoming part of the WTO, Pakistan committed to phasing out the Deletion Policy. In July 2005, the industry switched to the Tariff Based System (TBS) which afforded protection to the local industry through tariffs (the applicable rates are shown in Table 7.9). Import of CBU is now allowed under the TBS (albeit at 90 percent duty rate) which affords manufacturers the option of importing a model to gauge market response before undertaking production runs.

Table 7.9: Tariff Rates Applicable to the Motorcycle Industry under TBS

(%)

Product	Duty Rate
CBU	90
CKD Kit - Non Localized Parts	35
CKD Kit - Localized Parts	50

Source: Engineering Development Board (EDB) interviews
Note:
CBU: Completely Built Up
CKD: Completely Knocked Down
TBS: Tariff Based System

The duty rates applicable under the TBS are clearly designed to encourage the production of motorcycles ideally using localized parts since import of parts already being produced domestically are charged a higher rate (50 percent) than the comparable rate (35 percent) for parts that have not yet been localized and produced domestically. Finally, the import of completely built up units is discouraged by the 90 percent duty rate applied. Clearly the incentive structure is designed to protect the domestic manufacturers of components first, and second to encourage production of parts that are components that were previously being imported, while protecting the local manufacturers from imported products of a comparable price. The production and sale of motorcycles is subject to a fairly high level of taxation; including custom duty, sales tax and other taxes, with direct taxes only accounting for 5.6 percent of total tax paid, while indirect taxes account for the remaining 94.5 percent of total tax paid (see Table 7.4). The high incidence of indirect taxes is an indication of the level of protection afforded to local manufacturers, however, a weak monitoring and enforcement system dampens the effect of such protection since individuals can profit by evading the indirect payments. The general consensus in the industry is that direct taxation would be preferable to indirect taxes.

7.4. CONSTRAINTS FACED

To facilitate the establishment of the domestic motorcycle manufacturing industry, the state initially pursued an import substitution policy to promote local content (production) of goods. Local content is only one of a number of strategies that the old industrial policy regime used, but the most significant one. The Local Content

Program (as detailed in Chapter 5) was an integral part of this policy, which was designed to encourage firms to switch to local sources for product components they required by offering attractive tariffs on the selected components. Firm specific LCP targets were formulated by the MoIP, and the perception of industry stakeholders is that firms with the necessary connections and financing were able to get LCP targets approved that provided them a hefty profit margin for several years to come. The political settlement that evolved in Pakistan in the post Zia democracy period allowed firms to use their connections and holding power to resist attempts by the state to discipline them. Clearly the LCP was a well-intentioned policy instruments but weak implementation by the state meant firms more interested in short term windfall gains were able to work the system to their advantage.

Erratic government policy is also perceived by industry stakeholders as a major stumbling block in the development of the industry. In July 2000, the restrictions on inter-bank market were removed, and there was devaluation of the rupee (in relation to the US dollar), and domestic costs of production rose and exports became uncompetitive, while investment levels did not improve in the country, nor did productivity, value addition or growth in production volumes. There was also a general grinding down of old industrial policy instruments, tariffs were either coming down or were easy to bypass for smugglers, localization policies were being abandoned slowly etc. So just like in India, new methods of financing learning and the achievement of competitiveness began to emerge. For instance, ATLH responded to the policy change by shifting focus to accelerating localization of components and higher capacity utilization of the plant to reach economies of scale and thus benefit from cost reductions and competitiveness in the export market. To improve competitiveness and quality of its products, capital equipment to allow in-house forging of the crankshaft at Sheikhupura factory was brought online in April 2000, and commercial production commenced just two months later. Furthermore, ATLH has also set up a Research and Development Wing to explore product development for the local market. This suggests that the company was actively financing the process of learning on its own and used its connection with the Joint Venture partner towards that end.

ATLH continued to be actively engaged with its vendors (175 in 2005) to bring vendor production volumes in line with firm's production schedule. Local as well as foreign training and development opportunities provided to vendors. Eight vendors were selected in 2005 for a study tour of sheet metal vendor in Thailand based on an assessment of their productive capacity made by ATLH engineers. 19 employees were sent abroad for training, while 13 were sent for local courses.

7.5. FIRM COMPETITIVENESS

The cost of producing a product of a given quality determines the competitiveness of a firm. Data on cost of production has been taken from various issues of ATLH Annual Reports. The point to be noted is that raw materials account for the bulk of costs, followed by royalty payments, which have increased between 2004 and 2011-12, possibly on account of the new production plant being installed. A major source of expenditure for ATLH (see Table 7.10) has remained royalty payments (5.92 percent) for use of proprietary technology in the production process, second only to raw materials and components consumed (84.05 percent). HMCL is involved in the application of technology being used at ATLH, as evident from the fact that the major management positions that deal with production technology are filled by HMCL employees from abroad and not local ATLH employees.

The cost components that determine competitiveness in a catching-up firm such as ATLH can be studied by applying Khan (2013a)'s markup pricing model, where the unit price of a product may be estimated as the total unit cost of production plus a markup. As evident from the limited data presently available and the discussion that follows, a precise breakdown of costs is not possible at this time and makes it difficult to ascertain the source of low competitiveness in the company. However, it is hoped that this preliminary analysis will give an indication of where the problem may lie and guide future research when more detailed data becomes available. More specifically, the unit price of a product can be broken down as the sum of the unit

Table 7.10: Cost of Motorcycle Production at ATLH (2004-2012)

('000 PKR)

Expenditure	2004		2005		2011		2012	
	Value	Share	Value	Share	Value	Share	Value	Share
Total	**8,622,301**	**100**	**12,643,440**	**100**	**28,656,279**	**100**	**33,376,296**	**100**
Raw materials and components consumed	7,310,958	84.79	10,451,061	82.66	24,069,713	83.99	28,052,870	84.05
Royalty	345,833	4.01	613,402	4.85	1,692,153	5.90	1,976,443	5.92
Wages etc.	239,280	2.78	388,547	3.07	1,092,701	3.97	1,187,017	3.56
Fuel and power	67,782	0.79	98,665	0.78	375,161	1.31	578,047	1.73
Stores consumed	146,207	1.70	232,153	1.84	430,334	1.50	521,807	1.56
Depreciation	253,784	2.94	410,569	3.25	438,264	1.53	466,905	1.40
Repair and maintenance	31,495	0.37	84,817	0.67	166,175	0.58	186,347	0.56

Source: A. H. Limited Annual Report (various years) prices of labour, inputs and capital times a markup. In the case of ATLH, the breakdown of costs can be computed as follows.

Unit labour cost is the ratio of wage level to level of labour productivity in the firm. Labour productivity at ATLH has increased dramatically in recent years due to investment in new production technology by the Atlas Group. Between 2009 and 2011, labour productivity increased from almost 131 motorcycles per worker per year to 160 (as shown in Table 7.11 below)[42].

Table 7.11: ATLH Labour Productivity Levels (2009-11)

Year	Number of Employees	Motorcycles Produced	Labour Productivity
2009	3,689	483,028	130.94
2010	3,689	570,777	154.72
2011	3,689	588,106	159.42

Source: Author calculations

Note:

$$\text{Labour Productivity} = \frac{\text{Number of Motorcycles Produced}}{\text{Number of Employees}}$$

Unit input cost is the ratio of price of inputs to the productivity of inputs, where the global price of steel is used as a proxy for the price of inputs at ATLH. To determine the productivity of input use in the manufacturing process, an estimate is first derived of the total units of input used in the manufacturing process (ratio of total expenditure on raw materials and components to input price). This estimate is used to calculate the productivity of input used as the ratio of manufactured output to total units of input used. The third component in the cost structure of the firm is the unit capital cost; the ratio of price of capital to the output-capital ratio. Due to unavailability of the figure for capital stock, a proxy of the total plant capacity is used for the price of capital, while output-capital ratio is calculated as the manufactured output divided by capital used (where capital used is expenditure on depreciation and rent divided by price of capital). The prices used and estimates for the productivities of the various inputs for 2011 are reported in Table 7.12. According to the estimates, the markup for ATLH was 1.02 in 2011.

[42] Data on employment rates for earlier years is not available at this time and is required.

Table 7.12: Markup Pricing Model for ATLH (2011)

(PKR)

CODE		2011
G1	**PRODUCT PRICE**	**85000**
G2	Number of employees	3689
G3	Product units manufactured	588106
G4	Exchange Rate (USD to PKR)	85.66
L1	**UNIT LABOUR COST (L3/L4)**	**928.76**
L2	Renumeration expenditures ('000)	546,212
L3	Labour wage level (L2/G2)	148065.06
L4	Labour productivity (G3/G2)	159.42
I1	**UNIT INPUT COST (I3/I6)**	**40927.51**
I4	Total input expenditure	24069713000
K1	**UNIT CAPITAL COST**	**203.90**
K3	Total capital expenditure (Depreciation + rent)	466959000
C1	**TOTAL COST (L1 + I1 + K1)**	**42060.17**
C2	**TOTAL COST (L1 + I1 + K1) (USD)**	**491.01**
M1	1+m	2.02
M2	m (M1-1)	1.02

Source: Author's calculations

The corresponding calculations for a global leader motorcycle manufacturing firm are given in Table 7.13. A comparison of the cost breakup reveals that the major component of cost for ATLH is unit input cost, whereas in the case of the global leader, it is unit labour cost instead. This finding conforms with the traditional expectation that labour wages and costs in developing countries are lower in developing countries. According to the markup pricing model, the catching-up firm or follower will achieve competitiveness if $C_Q^{Domestic} \leq P_Q^{Global}$. The estimated domestic cost is PKR 42,060.17 or USD 491.01 (Table 7.12), for a motorcycle of comparable quality and specifications produced by the global leader and is less than the corresponding cost for the global leader of USD 881.70 (Table 7.13). This suggests that ATLH is globally competitive, and the recent expansion of production for export purposes supports this finding.[43] According to ATLH, the company has become globally competitive and is not worried about the increased competition from Chinese brands that have entered the market both in Pakistan and abroad.

[43] However, due to limited availability of detailed data plant operations in both ATLH and the global leader, these estimates should be taken to be indicative of the competitiveness potential and not an estimation of the actual level of competitiveness the company has achieved.

Table 7.13: Markup Pricing Model for Global Leader in Motorcycle Manufacturing (2011)

(USD)

CODE		2011
G1	**PRODUCT PRICE**	**1,000.00**
G2	Number of employees	25,000.00
G3	Product units manufactured	550,000.00
G4	Exchange Rate (USD to JPY)	86.00
L1	**UNIT LABOUR COST (L3/L4)**	**881.64**
L2	Remuneration expenditures	484,900,000
L3	Labour wage level (L2/G2)	19,396.00
L4	Labour productivity (G3/G2)	22.00
I1	**UNIT INPUT COST (I3/I6)**	**0.02**
I2	Input price (Steel price USD/tonne)	761.92
I3	Total input expenditure (Inventory value in Yen)	899,813
I4	Total input expenditure (Inventory value in USD)	10,462.94
I5	Total input used (I4/I3)	13.73
I6	Input productivity (G3/I5)	40,051.28
K1	**UNIT CAPITAL COST**	**0.04**
K2	Capital price (Capacity)	600,000
K3	Total capital expenditure (Depreciation + rent)	24,011
K4	Total capital used (K3/K2)	0.04
K5	Output-capital ratio (G3/K4)	13,743,700.80
C1	**TOTAL COST (L1 + I1 + K1)**	**881.70**
M1	1+m	1.13
M2	m (M1-1)	0.13

Source: Author's calculations

7.6. CONCLUSION

The link between the changing nature of political settlements in Pakistan after independence and its implications for the stalled industrialization process have been highlighted and examined. In particular, in Chapter 2 the clientelist political settlement that emerged in the country in the post liberalization period was found to have resulted in a state that was too weak to effectively monitor and enforce an industrial policy geared towards development of local manufacturing capability through the Local Content Policy (LCP). On the one hand, the targets established by the Ministry of Industries and Production (MoIP) were rarely met and the state was ineffective in penalizing transgressing firms and on the other hand foreign firms were able to enforce restrictions on local firms that restricted their ability to export products and achieve economies of scale. Thus, the efforts of the state in Pakistan to direct development of the automotive industry in the context of a clientelist political settlement, a weak state and foreign ownership of technology meant that the industry has been unable to realize its full potential, and transition from simple assembly operation to true manufacturing of locally designed brands (as discussed in Chapter 5). However, that is not to say that there are no exceptions to this trend in the domestic industry. The case studies of the automotive component manufacturers experience with technology acquisition, MTL's efforts to establish itself in the tractor market and experience of ATLH in motorcycle manufacturing have highlighted this feature of the domestic industry.

As a catching up firm in a developing country striving towards economic development, ATLH has made considerable progress in developing the local capabilities in-house and of its vendors, and managed to achieve a high degree of localization of parts that suggest it has improved competitiveness as result. ATLH has adapted to the economic conditions in the domestic economy and the evolving clientelist political settlement and used these external stimuli to drive growth and competitiveness of the firm. Opening up of the domestic motorcycle market to Chinese manufacturers has been used as an opportunity to improve relations with customers and offer better after sale service. In the absence of state financing for further learning in the industry, ATLH has turned to other sources, including internal financing. The internal financing of learning at the company, which focused on assessing the actual gains and progress made by component suppliers and employees as a result of the capability development initiatives, has been successful. ATLH has pursued greater level of interaction with local component suppliers and facilitated collaboration with foreign technology providers to enhance the productive capacity of its suppliers in an effort to boost productivity levels and realize the full potential of the firm. The firm has also achieved global competitiveness as indicated by a preliminary analysis of the unit production costs in the markup pricing model.

Finally, the analysis of experience of ATLH and the review of automotive component manufacturers in Chapter 4 suggests that from a more technical point of view of supply chain and production process management, firms in developing countries face a significant challenge in moving up the value chain. Production of more complex products will need to account for the different technological interfaces of the domestic suppliers in product systems integration. Industrial policy design and implementation in developing countries must take this factor into account if the domestic industry is to progress from simple assembly operations towards more complex production processes.

CHAPTER 8. CONCLUSION

8.1. INTRODUCTION

This dissertation has examined the nexus of social distribution of power which is evolving and affecting the practical enforcement of particular instruments of financing learning, capabilities development and technology acquisition in developing countries. Developing countries by and large are lagging behind the developed countries in terms of competitiveness; a worrisome trend as it severely compromises their ability to match the growth trajectory of developed countries. The divergence between countries has increased to such an extent that a number of developing countries are in danger of being classified as failed states due to faltering social and development trends. Pakistan's economic growth has been erratic since the time of independence, and efforts to acquire technology and develop capabilities and competitiveness have largely failed to yield the beneficial results observed in other developing countries pursuing similar strategies. There have, however, been successful instances of technology acquisition in Pakistan yielding promising results that warrant further investigation and analysis.

The existing literature on the experience of developing countries in this area has focused on the case of the East Asian tigers (Amsden (1989); Kim (1997) to name a few) and countries such as India and Bangladesh Khan (2009). Earlier explanations did not give much weight to the role of technology and technological capabilities, their acquisition and development, in determining competitiveness of firms and thus growth of the economy. Instead, openness, free markets and a minimal role of the state were showcased as the driving force of the success stories of development in early mainstream explanations. Later explanations drew inspiration from the work on evolutionary theory to argue convincingly for the key role played by technological change and capabilities in driving competitiveness and growth. Research in this area, and in particular on the political economy reasons that can explain and account for the varied experience of developing countries in improving their competitiveness and successfully driving growth is still at a nascent stage. This thesis seeks to contribute to this important area of research by examining the experience of a developing country in acquiring and absorbing foreign technology to develop its industry and competitiveness in the global market. In particular, the focus is on the experience of Pakistan, as this has not been analysed in great detail yet.

Thus the focus of this dissertation is on exploring the emergence of two competitive manufacturing firms in the automotive industry in Pakistan, Millat Tractors Limited and Atlas Honda Limited. The two firms were established in the 1960s to reduce dependence on foreign import of agricultural tractors and motorcycles and facing similar constraints were able to position themselves in a competitive position in the domestic market. The main findings of the research are summarized in Section 2, and policy implications of the research are presented in Section 3, while Section 4 covers areas of future research.

8.2. MAIN FINDINGS

To begin with, it has been established that the divergence of industrial development and by extension, overall economic growth trends between developed and developing countries, and even among various groups of developing countries is a disturbing trend. The expectation had been that when late developers would accelerate their growth efforts the growth trajectories of all countries would converge. However, this has not turned out to be the case; several developing countries have managed to close the gap while the majority languished behind, and this has rekindled interest in trying to identify the reason for this gap.

Chapters 6 and 7 case studies have related successful technology acquisition by two manufacturing firms in a developing country to changes in manufacturing production processes that arose from the transformations taken place in the automotive industry across the globe (as detailed in Chapter 4). For example, these developments include changes in the work ethic of employees (see Cheng & Podolsky (1996)) as highlighted in Section 4.2.1.

Much as the Ford Motor Company took steps towards streamlining its production processes and maximizing productivity by bringing in component manufacturing under one roof at the River Rouge facility (see Section 4.2.2.), so too have ATLH and to a lesser extent, MTL in the modern age, and other companies as well in similar industries.

Chapter 4 discussed the benefits afforded by implementing automation in the production line and adoption of Just-In-Time techniques by manufacturing firms. The primary benefit resulted from the reduced economies of scale required to become competitive – output of 500,000 units being required for JiT as opposed to the far higher output of 2 million required by mass production. Chapter 6 showed how MTL has adopted key aspects of Just-In-Time production techniques to its existing mass production system to achieve competitiveness with limited output. Thus, companies from developing countries can successfully adopt technology and processes that can prove useful in achieving competitiveness despite smaller scales of production when the next transformation comes about (as the analysis of developments in the industry in Chapter 4 suggests). On the other hand, the analysis of ATLH in Chapter 7 has revealed how firms in developing countries are able to implement competitive production technologies and techniques to dominate the domestic market and be poised to compete on an international level.

Industrial development has been a matter of concern for the state in Pakistan, and technology acquisition has been used as a conduit for establishing industries and developing capabilities and competitiveness required. The state has utilized numerous financing instruments over time to guide economic activity and encourage learning and capability and competitiveness development in the industrial sector in general and the automotive industry in particular. The experience of various industries and firms in the country has not been as expected and the level of competitiveness aimed for has not emerged. Analysis of the reasons for this failure has tended to focus on the more traditional explanations, including the impact of corruption, weak rule of law, inadequate R & D and science and technology policies, weak capability of the bureaucracy and the state of the country's educational and technical institutions. While these factors are important and certainly relevant, what is also important but has not been given much attention is the political settlement discussed in Chapter 2. In the context of foreign ownership of technology and a weak developmental state, the research suggests the nexus of social distribution of power between different groups, which is changing over time affects enforcement of particular instruments of financing as shown by the experience of two successful firms in Pakistan's automotive industry covered in Chapters 6 and 7 respectively.

The discussion of Pakistan's economic performance and key political developments since independence have revealed that Pakistan had a very colourful history, managing significant growth of the economy at various points in time, only to lose the momentum that had been gained, shortly thereafter with a change in political leadership and economic policies. The demands of a growing number of groups that the leadership felt compelled to satisfy in order to ensure its own position and survivability drained already limited resources and weakened the ability of the state to effectively direct development efforts that would have led to growth down the line. The political landscape in Pakistan has become increasingly fragmented and unstable with frequent changes in power leading to extensive political clientelism and state policies had to be implemented in this unfavourable environment. Resources and opportunities were limited in Pakistan, and the distribution of power between various stakeholders affected by the development policies in the industry, has led to contests over potentially growth-enhancing learning rents. Proliferation of clientelist groups has compromised the ability of the state to forsake long term economic growth and development in favour of actions to ensure its own short term sustainability.

The development of political settlement in two periods in Pakistan's history is key to the level of industrial development that has now been achieved. One is the growth take-off during Ayub Khan's rule when substantial capability was developed under state guidance and the second is the post-Zia ul-Haq democracy period when a number of private sector initiatives to develop capabilities and competitiveness yielded promising results. Fragmentation of the political settlement began under Ayub Khan's regime when the entrepreneurs gained sufficient holding power to resist state control and the Basic Democracy system was introduced and continued in later years when Zia-ul-Haq supported previously marginalized religious parties to legitimize his rule. Despite having built up substantial productive capacity in the early stages of the industrialization effort, only limited and fairly weak technological capabilities developed and proved insufficient to translate into competitiveness for firms and as a result growth slowed down in Ayub Khan's period. Incentives and compulsions to ensure capabilities developed could not be enforced effectively since doing so would mean alienating and losing support for staying in power. In the post-Zia period firms with access to sufficient resources had the flexibility to further develop their limited capabilities and achieve a measure of competitiveness.

The discussion in Chapter 4 has shed light on a number of important characteristics of the automotive industry which are of relevance to developing countries; in particular the deep linkages of the industry with the rest of the manufacturing sector and the economy at large. Also, advances and developments in the automobile industry have wrought changes in society for various countries and been transferred to the rest of the world over time. The supply chain of the automobile industry has also evolved alongside the transformations taking place, allowing countries with the appropriate supply chains to realise the full benefit of the advances being made. Moreover, the structure of the industry has also changed, now marked by a rising number of mergers and acquisitions and growing presence of developing countries in emerging technologies. This suggests that the industry can play a role in the future transformation and growth of developing countries that are in a position to benefit from such a transformation and accelerate their development. Developing countries have used policies to shape and guide the development of their automobile industries with varying levels of success. A comparative look at the main characteristics of these policies yields valuable lessons for developing countries. A case in point is the role of foreign ownership of technology and the open access to markets by foreign firms has resulted in domestic technological capabilities in several countries (for example Brazil) being less than countries that limited the role of foreign firms (such as South Africa and South Korea). Improper implementation of protection policies designed to allow domestic industries to grow led to development of weak technological capabilities (such as in Malaysia and Pakistan).

Pakistan has also experienced difficulty in breaking into the global automotive value chains that symbolize the industry now. The domestic industry has yet to take off and foreign affiliated assembly-cum-manufacturing firms command the market share of virtually every segment of the industry. Attempts to nurture the industry have met with limited success, as evidenced by the lukewarm performance of the recent Automobile Industry Development Policy (AIDP). Towards that end, the research has identified key stakeholders that are involved in the automotive industry and an assessment of the current level of capabilities of domestic component manufacturers has been made based on recent firm level survey data. The component manufacturing industry has been established in clusters based primarily on small and medium enterprises, but performance has been tempered by low levels of productivity and quality and thus competitiveness. There are a number of interest groups in the industry (such as PAMA and PAAPAM) that compete with and impose often times conflicting demands on the state that can account for the weak performance of the sector.

However, as the two case studies of relatively successful attempts at technology acquisition have shown, intervention even in an unfavourable policy environment can lead to capability development. Millat Tractors was encouraged to pursue a viable localization program and develop its capabilities to indigenize production of tractors, and was not hampered by the foreign ownership of its production technology. High levels of effort for learning and capability development were initially induced by the state and the company was able to follow a "β"[44] strategy in technology acquisition efforts and establish itself in the domestic market. Since withdrawal of state support and direction, the company has continued to build on the capabilities it managed to build up and has entered the export market in recent years to compete with foreign firms in the region.

As detailed in Chapter 7, Atlas Honda has made considerable progress in developing capabilities in-house and of its vendors, from simple assembly in the early years to manufacturing over 90 percent of components locally (in-house and in collaboration with component suppliers). Technology upgradation and skill development of vendors has been promoted with firms from East Asia (including Thailand and Japan). The reduced costs have allowed it to increase its competitiveness in the local market by focusing on quality control and providing value added services to customers.

8.3. POLICY IMPLICATIONS

The research presented contributes to the existing literature on development of capabilities and competitiveness in developing countries through acquisition of foreign technology but focuses on the nexus of changing social distribution of power that has affected how particular instruments of financing are enforced. We find that as in the case of developing countries such as Bangladesh and India, competitiveness emerges in industries where the initial capabilities have already been established. The research suggests opting for traditional ex ante conditions to direct industrial

[44] see Khan (2009)

development in new sectors will likely not work in the case of developing countries such as Pakistan. Policy instruments will be required that account for the level of capabilities that already exist in industries and policy formulation will be required that pushes these industries towards the global frontier, rather than targeting industries where the capabilities do not exist in the first place.

8.4. AREAS FOR FUTURE RESEARCH

This thesis is a first attempt at analysing the development of capabilities and competitiveness at the firm level in two automotive industry firms in Pakistan. The focus has been on changing political settlements which have affected how particular financing instruments have been enforced previously. A deeper more detailed analysis of firm level performance is required before such a process can be fully understood and lessons drawn with implications for other industries and countries. It is important to frame such research in the context of the political settlements that exist at the time. In particular more detailed information is required of firm level operations and performance of domestic firms in Pakistan as well as the global leader for the industry segment in question.

Moreover, it needs to be highlighted that this research has not considered the role of Research & Development, Science and Technology Policies, the institutional capabilities of the state and other approaches to competitiveness such as the World Bank cost of doing business approach. Other studies have considered these factors and as such the current research seeks to complement these studies by focusing on analysing the impact of social distribution of power on financing instruments rather than the impact of better rule of law, quality of the bureaucracy, corruption, quality level of technical learning institutions on financing, which are also important. Furthermore, the research aims to give an overview of key aspects of industrial development and policy in Pakistan rather than providing a comprehensive, in-depth analysis.

BIBLIOGRAPHY

Abdulsomad, K 1999, “Industrial Technology Development in Malaysia: Industry and Firm Studies,” in JK Sundaram, G Felker, & R Rasiah (eds), Routledge, London, pp. 274–300.

Abramovitz, M 1986, “Catching Up, Forging Ahead, and Falling Behind,” *The Journal of Economic History*, vol. 46, no. 2, pp. 385–406, accessed from <http://www.jstor.org/stable/2122171>.

Acemoglu, D, Johnson, S & Robinson, JA 2001, “The Colonial Origins of Comparative Development: An Empirical Investigation,” *The American Economic Review*, vol. 91, no. 5, pp. 1369–1401.

ACMA 2014, “Auto Components Manufacturers Association (ACMA) India Website,”.

AIDT 2006, “Just-In-Time Manufacturing,”.

Akhlaque, A 1999, “A Political Economy of Industrial Policy and Development: A Comparative Study of Pakistan and Malaysia,”.

Alavi, H 1973, “Imperialism and Revolution in South Asia,” in K Gough & HP Sharma (eds), Monthly Review Press, New York, p. 470.

Alavi, H 1983, “Pakistan, The Roots of Dictatorship: The Political Economy of a Praetorian State,” in H Gardezi & J Rashid (eds), Zed Press, pp. 40–93.

Amjad, R 1982, *Private Industrial Investment in Pakistan: 1960-1970*, Cambridge University Press, Cambridge.

Amsden, AH 1989, *Asia’s Next Giant: South Korea and Late Industrialization*, Oxford University Press, 198 Madison Avenue, New York, New York 10016-4314, USA.

Amsden, AH 1990, “Third World Industrialization:’Global Fordism’ or a New Model?,” *New Left Review*, vol. 182, pp. 5–31.

Andreoni, A 2010, *A Capability Theory of Production: Learning in Time, Complementarities and Proximities*, S. Anna Laboratory of Economic Management, Pisa.

Andreoni, A 2011, *Productive Capabilities Indicators for Indiustrial Policy Design*, Development Policy, Statistics and Research Branch UNIDO, Vienna.

Aoki, M, Kim, H-K & Okuno-Fujiwara, M (eds) 1998, *The Role of Government in East Asian Economic Development: Comparative Institutional Analysis* 1st edn, Oxford University Press, Oxford New York, accessed from <http://ideas.repec.org/b/oxp/obooks/9780198294917.html>.

APMA 2014, “Association of Pakistan Motorcycle Assemblers (APMA) Website,”.

Archibugi, D & Coco, A 2004, "A New Indicator of Technological Capabilities for Developed and Developing Countries (ArCo)," *World Development*, vol. 32, no. 4, pp. 629–654.

Archibugi, D & Coco, A 2005, "Measuring Technological Capabilities at the Country Level: A Survey and a Menu for Choice," *Research Policy*, vol. 34, no. 2, pp. 175–194.

Arrow, K 1962, "Economic Welfare and the Allocation of Resources for Innovation," in RR Nelson (ed), *The Rate and Direction of Inventive Activity*, Princeton University Press, Princeton, NJ, pp. 609–626.

Asbury, H 1927, *The Gangs of New York: An Informal History of the Underworld (1927/2002)*, Arrow Books, London.

AusAID 2011, *Framework for working in fragile and conflict-affected states: Guidance for staff*, Australian Angency for International Development, Canberra, accessed from <http://aid.dfat.gov.au/Publications/Documents/aid-fragile-conflict-affected-states-staff-guidance.pdf>.

Bank, W 1989, *Sub-Saharan Africa: From Crisis to Sustainable Growth: A Long-Term Perspective Study*, World Bank, Washington D.C.

Bank, W 1993, *The East Asian Miracle : Economic Growth and Public Policy*, World Bank, Washington D.C.

Bank, W 1997, *World Development Report 1997: The State In A Changing World* A Chhibber, S Commander, A Evans, H Fuhr, C Kane, C Leechor, B Levy, S Pradhan, & B Weder (eds), Oxford University Press, Washington D.C.

Bank, W 2014, "World Development Indicators,".

Bardhan, P 1998, *The Political Economy of Development in India*, Oxford University Press, India.

Bardhan, P 2000, "A Not-so-Dismal Science: A Broader View of Economies and Societies," in M Olson & S Kahkonen (eds), Oxford University Press, pp. 245–268.

Barnes, C 2009, *Renegotiating the Political Settlement in War-to-Peace Transitions*, Conciliation Resources, London, accessed from <http://www.c-r.org/resources/renegotiating-political-settlement-war-peace-transitions>.

Barnes, J & Morris, M 2008, "Staying Alive In the Global Automotive Industry: What Can Developing Countries Learn from South Africa about Linking Into Global Automotive Value Chains?," *European Journal of Development Research*, vol. 20, no. 1, pp. 31–55.

Bates, RH 2001, *Prosperity and Violence: The Political Economy of Development*, W.W. Norton, New York.

Baxter, C (ed.) 1985, *Zia's Pakistan: Politics and Stability in A Frontline State*, Westview Press, Boulder, Colorado.

Bell, M & Pavitt, K 1997, "Technology, Globalisation and Economic Performance," in D Archibugi & J Michie (eds), Cambridge University Press, Cambridge, pp. 83–137.

Bhagwati, JN 1982, "Directly Unproductive, Profit-Seeking (DUP) Activities," *The Journal of Political Economy*, vol. 90, no. 5, pp. 988–1002, accessed from <http://www.jstor.org/stable/1837129>.

Black, A & Mitchell, S 2002, "Policy in the South African Motor Industry: Goals, Incentives, and Outcomes,".

Boltho, A 1996, "The Assessment: International Competitiveness," *Oxford Review of Economic Policy*, vol. 12, no. 3, pp. 1–16.

Bronkhorst, E 2010, "The Review of the Motor Industry Development Programme,".

Bruton, HJ 1989, "Handbook of Development Economics," in H Chenery & TN Srinivasan (eds), North Holland, Amsterdam, New York, Oxford, and Tokyo.

Buchanan, J 1980, "Towards A Theory of the Rent-Seeking Society," in J Buchanan, RD Tollison, & G Tullock (eds), Texas A & M University Press.

Buchanan, JM & Tullock, G 1962, *The Calculus of Consent: Logical Foundations of Constitutional Democracy*, University of Michigan Press, Ann Arbor.

Burkhart, RE & Lewis-Beck, MS 1994, "Comparative Democracy: The Economic Development Thesis," *The American Political Science Review*, vol. 88, no. 4, pp. 903–910, accessed from <http://www.jstor.org/stable/2082715>.

Chang, H-J 1993, "The Political Economy of Industrial Policy in Korea," *Cambridge Journal of Economics*, vol. 17, no. 2, pp. 131–157, accessed from <http://cje.oxfordjournals.org; http://cje.oxfordjournals.org/cgi/reprint/17/2/131.pdf>.

Chang, H-J 1994, *The Political Economy of Industrial Policy*, Palgrave Macmillan, London.

Chang, H-J, Cheema, A & Mises, L 2002, "Conditions for Successful Technology Policy in Developing Countries - Learning Rents, StateStructures, and Institutions," *Economics of Innovation and New Technology*, vol. 11, no. 4, pp. 369–398.

Chee, PL 1994, "Japan and Malaysian Development : In The Shadow of The Rising Sun," in KS Jomo (ed), Routledge, London, pp. 244–262.

Cheng, TCE & Podolsky, S 1996, *Just In Time Manufacturing: An Introduction* 2nd edn, Chapman and Hall.

Chibber, V 2002, "Bureaucratic Rationality and the Developmental State," *The American Journal of Sociology*, vol. 107, no. 4, pp. 951–989, accessed from <http://www.jstor.org/stable/3081251>.

Chibber, V 2003, *Locked in Place: State-Building and Late Industrialization in India*, Princeton University Press, Princeton.

Child, FC 1968, "Liberalization of the Foreign Exchange Market," *The Pakistan Development Review*, vol. VIII, no. 2.

Clague, C, Keefer, P, Knack, S & Olson, M 1997, "Institutions and Economic Development: Growth and Governance in Less-Developed and Post-Socialist Countries," in C Clague (ed), The John Hopkins Studies In Development, The John Hopkins University Press, Baltimore and London, pp. 91–120.

Clark, G & Wolcott, S 2002, "Institutions, Integration, and Geography: In Search of the Deep Determinants of Economic Growth," in D Rodrik (ed), Princeton University Press.

Coase, RH 1937, "The Nature of the Firm," *Economica*, vol. 4, pp. 386–405.

Congleton, R 1980, "Towards A Theory of the Rent-Seeking Society," in J Buchanan, RD Tollison, & G Tullock (eds), Texas A & M University Press.

Dahlman, C 2007, "Industrial Development for the 21st Century: Sustainable Development Perspectives," in UND of Economic & S Affairs (eds), United Nations Publications, pp. 29–83.

Dankbaar, B 1990, *Prospects of Anthropocentric Production Systems in the Netherlands*, Commission of the European Communities, Brussels.

Davies, S 1991, "Economics of Industrial Organisation," in S Davies & B Lyons (eds), Surveys in Economics, Longman, London, p. 256.

Delay, S & Moran, D 2003, "UK Civil Service Reform in the Nineteenth Century and the Lessons for Future Reforms in Developing and Transitional Countries,".

Desai, SF-PCJM & Sagasti, F 2002, *Measuring Technology Achievement of Nations and the Capacity to Participate in the Network Age*, Human Development Report Office (HDRO), United Nations Development Programme (UNDP), accessed from <http://ideas.repec.org/p/hdr/hdocpa/hdocpa-2002-22.html>.

Deyo, FC 1987, *The Political Economy of the New Asian Industrialism*, Cornell University Press, Ithica, NY.

DfID 2009, *Building the State and Securing the Peace*, DfID, London.

DfID 2010a, *The Politics of Poverty: Elites, Citizens and States: Findings from ten years of DfID funded research on Governance and Fragile States 2001-2010*, Department for International Development, London, accessed from <http://r4d.dfid.gov.uk/Output/183356/>.

DfID 2010b, *Building Peaceful States and Societies: A DfID Practice Paper*, DfID.

Dicken, P 2007, *Global Shift: Mapping the Changing Contour of the World Economy*, Sage, London.

Dollar, D & Kraay, A 2003, "Institutions, Trade, and Growth," *Journal of Monetary Economics*, vol. 50, no. 1, pp. 133–162, accessed from

<http://www.sciencedirect.com/science/article/B6VBW-47GYC60-4/2/0faba3eb88ebd4c1394597f79af271c7>.

Doner, R, Noble, GW & Ravenhill, J 2006, "Politics, Institutions, and Innovation in East Asia: National Performance in the Global Auto Industry,".

Dosi, G, Nelson, RR & Winter, SG 2002, *The Nature and Dynamics of Organizational Capabilities*, Oxford University Press, Oxford.

Duffy, R 2000, "Shadow Players: Ecotourism Development, Corruption and State Politics in Belize," *Third World Quarterly*, vol. 21, no. 3, pp. 549–565.

Easterly, W & Levine, R 2003, "Tropics, Germs, and Crops: How Endowments Influence Economic Development," *Journal of Monetary Economics*, vol. 50, no. 1, pp. 3–39, accessed from <http://www.sciencedirect.com/science/article/B6VBW-47HKC9S-1/2/815912bd142c4988f71f2cc6358f1de9>.

Evans, PB 1995, *Embedded Autonomy: States and Industrial Transformation* 1st edn, Princeton University Press, Princeton N.J.

Evans, PB 1996, "Introduction: Development Strategies Across the Public-Private Divide," *World Development*, vol. 24, no. 6, pp. 1033–1037.

Fleming, JM 1955, "External Economies and the Doctrine of Balanced Growth," *Economic Journal*, vol. 65, pp. 241–56.

Forum, WE 2001, *The Global Competitiveness Report 2001-2002* K Schwab, ME Porter, & JD Sachs (eds), World Economic Forum in collaboration with Center for International Development, Harvard University, New York.

Forum, WE 2002, *The Global Competitiveness Report 2002-2003* P Cornelius & K Schwab (eds), World Economic Forum in collaboration with Center for International Development, Harvard University, New York.

Forum, WE 2003, *The Global Competitiveness Report 2003-2004* ME Porter, K Schwab, X Sala-i-Martin, & A Lopez-Claros (eds), World Economic Forum in collaboration with Center for International Development, Harvard University, New York.

Fritz, V & Menocal, RA 2006, *(Re)Building Developmental States: From Theory to Practice*, Overseas Development Institute, London.

Fritz, V & Menocal, RA 2007, "Developmental States in the New Millennium: Concepts and Challenges for a New Aid Agenda," *Development Policy Review*, vol. 25, no. 5, pp. 531–552, accessed from <http://dx.doi.org/10.1111/j.1467-7679.2007.00384.x>.

Fund, CS 2006, *Policy Analysis on the Competitive Advantage of the Motorcycle Industry in Pakistan*, Competitiveness Support Fund, Islamabad, Pakistan.

Funke, N & Solomon, H 2002, *The Shadow State in Africa: A Discussion*, Development Policy Management Forum, Addis Ababa.

Gardezi, HN & Rashid, J 1983, *Pakistan, The Roots of Dictatorship: The Political Economy of a Praetorian State* HN Gardezi & J Rashid (eds), Zed Press, London.

Gerschenkron, A 1962, *Economic Backwardness in Historical Perspective: A Collection of Essay*, The Belknap Press of Harvard University Press, Cambridge, Massachusetts.

Ghani, A, Lockhart, C & Callaghan, M 2005, *Closing the Sovereignty Gap: How to Turn Failed States into Capable Ones*, ODI Opinion, Overseas Development Institute.

Gleason, M, Jones, B, Sherman, J & Wilhelm, C 2011, *Statebuilding in Situations of Fragility and Conflict: Relevance for US policy and programs*, United States Agency for International Development, Washington, accessed from <http://pdf.usaid.gov/pdf_docs/Pnadx385.pdf>.

Graves, AP 1993, "Global Competition and the European Automobile Industry: Opportunities and Challenges,".

Green, AE 1992, "South Korea's Automobile Industry: Development and Prospects," *Asian Survey*, vol. 32, no. 5, pp. 411–428.

Grindle, M 1996, *Challenging the State: Crisis and Innovation in Latin America and Africa*, Cambridge University Press, Cambridge.

Grossman, G 1988, "Strategic Trade Policy and the New International Economic," in P Krugman (ed), The M, Cambridge, Massachuesetts, pp. 47–68.

Growth, C on & Development 2008, *The Growth Report: Strategies for Sustained Growth and Inclusive Development*, Commission on Growth and Development, 1818 H Street NW, Washington, DC 20433, accessed from <http://www.growthcommission.org>.

Gutierrez, GJ 2003, "The Toyota Production System: A Transition from Mass Production to Lean Manufacturing and Supply Chain Management,".

Haggard, S 1990, *Pathways from the Periphery: The Politics of Growth in the Newly Industrializing Countries*, Cornell University Press, New York.

Hall, RE & Jones, CI 1999, "Why Do Some Countries Produce So Much More Output Per Worker Than Others?," *Quarterly Journal of Economics*, vol. 114, no. 1, pp. 83–116, accessed from <http://dx.doi.org/10.1162/003355399555954>.

Hamilton, A 1790, "State Papers and Speeches on the Tariff 1892," in FW Taussig (ed), Augustus M. Kelley.

Harriss-White, B 1997, *Informal Economic Order: Shadow States, Private Status States, States of Last Resort and Spinning States: A Speculative Discussion Based on S. Asian Case Material*, Queen Elizabeth House, Oxford.

Hecox, WE 1970, "The Export-Performance Licensing Scheme," *The Pakistan Development Review*, vol. 10, no. 1, pp. 24–49.

Hellman, JS, Jones, G & Kaufmann, D 2000, *Seize the State, Seize the Day" State Capture, Corruption, and Influence in Transition*, World Bank, Washington D.C.

Herbst, J 2000, *States and Power in Africa: Comparative Lessons in Authority and Control* 1st edn, Prin, New Jersey.

Hewison, K 1997, "The Political Economy of South-East Asia: An Introduction," in G Rodan, K Hewison, & R Robison (eds), Oxford University Press, Melbourne, pp. 93–120.

Hirsch, S 1965, "The US Electronics Industry and International Trade," *National Institute Economic Review*, no. 34, pp. 92–94.

Hirschman, AO 1958, *The Strategy of Economic Development*, Yale University Press, New Haven, Connecticut.

Holweg, M, Luo, J & Oliver, N 2009, "The Past, Present and Future of China's Automotive Industry: A Value Chain Perspective," *International Journal of Technological Learning, Innovation and Development*, vol. 2, no. 1, pp. 76–118.

Hoogenboom, A 1959, "The Pendleton Act and the Civil Service," *The American Historical Review*, vol. 64, no. 2, pp. 301–318.

Humphrey, J & Memedovic, O 2003, *The Global Automotive Value Chain: What Prospects for Upgrading By Developing Countries*, UNIDO, Vienna.

Humphrey, J & Salerno, MS 2000, "Global Strategies and Local Realities: The Auto Industry in Emerging Markets," in J Humphrey, Y Lecler, & MS Salerno (eds), Macmillan and GERPISA, London, pp. 149–175.

Hussain, Z 2008, *Frontline Pakistan: The Struggle with Militant Islam*, Columbia University Press.

Ikram, K 1970, "The Export Bonus Scheme and the Primary Commodities," *The Punjab University Economist*, vol. 8, no. 2, pp. 75–82.

Ikram, K 1972, "The Export Performance Licensing Scheme Export Incentives and Net Value Added," *Pakistan Economic and Social Review*, vol. 10, no. 1, pp. 109–114.

IMAP 2010, *Automotive and Components Global Report 2010*, IMAP.

Industries, M of & Production 2008, *Auto Industry Development Programme*, Government of Pakistan.

Intarakumnerd, P 2006, "Asia's Innovation Systems in Transition," in BA Lundvall, P Intarakumnerd, & JV Lauridsen (eds), Edward Elgar, Cheltenham, UK, pp. 100–122.

Islam, R 1976, "Factor Intensity and Labour Absorption in Manufacturing Industries: The Case of Bangladesh,".

Jalal, A 1990, *The State of Martial Rule: The Origins of Pakistan's Political Economy of Defense*, Cambridge University Press.

JICA 2011, *Project for Automobile Industry Development Policy in the Islamic Republic of Pakistan: Main Report*, Engineering Development Board.

John, JD & Putzel, J 2009, *Political Settlements: Issues Paper*, Governance and Social Development Resource Centre.

Johnson, C 1982, *MITI and the Japanese Miracle: the Growth of Industrial Policy: 1925-1975*, Stanford University Press, Stanford.

Johnson, HG 1962, "Money, Trade and Economic Growth," in HG Johnson (ed), George Allen and Unwin, London.

Johnson, S, Kaufmann, D & Zoido-Lobatón, P 1998, "Regulatory Discretion and the Unofficial Economy," *The American Economic Review*, vol. 88, no. 2, pp. 387–392, accessed from <http://www.jstor.org/stable/116953>.

Jomo, KS 1994, "Japan and Malaysian Development: In the Shadow of the Rising Sun," in KS Jomo (ed), Routledge, London, pp. 263–290.

Jones, DT & Womack, JP 1985, "Developing Countries and the Future of the Automobile Industry," *World Development*, vol. 13, no. 3, pp. 393–407.

Kaufmann, D, Kraay, A & Zoido-Lobatón, P 1999, *Governance Matters*, World Bank, Washington D.C.

Kearney, AT 2008, "Mega Market for Ultra-Low-Cost Cars,".

Kemal, AR 1988, "Pakistan's Experience with Manufacturing Components for Consumer Durables," *The Pakistan Development Review*, vol. 27, no. 4, pp. 863–873.

Kemal, AR, Din, M & Qadir, U 2002, *Pakistan Country Report*, Pakistan Institute of Development Economics, PIDE, Islamabad.

Khan, AR 1970, "Capital-Intensity and the Efficiency of Factor Use: A Comparative Study of the Observed Capital-Labour Ratios of Pakistani Industries," *Pakistan Development Review*, vol. 10, no. 2, pp. 232–263.

Khan, MH 1995, "The New Institutional Economics and Third World Development," in J Harris, J Hunter, & CM Lewis (eds), Routledge, London, pp. 71–86.

Khan, MH 1996, "A Typology of Corrupt Transactions in Developing Countries," *IDS Bulletin*, vol. 27, no. 2, pp. 12–21, accessed from <http://onlinelibrary.wiley.com/doi/10.1111/j.1759-5436.1996.mp27002003.x/abstract>.

Khan, MH 1999, *Political Economy of Industrial Policy In Pakistan 1947 - 71*, Department of Economics, School of Oriental and African Studies, Thornhaugh Street, Russell Square, London WC1H 0XG, accessed from

<http://mercury.soas.ac.uk/users/mk17/Docs/Industrial Policy in Pakistan.pdf>.

Khan, MH 2000a, "Rents, Rent-Seeking and Economic Development: Theory and Evidence in Asia," in MH Khan & KS Jomo (eds), Cambridge University Press, pp. 21–69.

Khan, MH 2000b, "Rents, Rent-Seeking and Economic Development: Theory and Evidence in Asia," in MH Khan & KS Jomo (eds), Cambridge University Press, pp. 70–144.

Khan, MH 2002, "State Failure In Developing Countries and Strategies for Institutional Reform," in *Annual World Bank Conference on Development Economics*, World Bank, Oslo.

Khan, MH 2004, "Strategies For State-Led Social Transformation: Rent Management, Technology Acquisition and Long-Term Growth."

Khan, MH 2007, *Governance and Growth: A Preliminary Report*, Department of Economics, School of Oriental and African Studies, School of Oriental and African Studies, London, accessed from <http://mercury.soas.ac.uk/users/mk17/Docs/Preliminary Report.pdf>.

Khan, MH 2009, *Learning, Technology Acquisition and Governance Challenges in Developing Countries*, School of Oriental and African Studies, London, School of Oriental and African Studies, accessed from <http://mercury.soas.ac.uk/users/mk17/Docs/Learning and Technology Acquisition internet.pdf>.

Khan, MH 2010, *Political Settlements and the Governance of Growth-Enhancing Institutions*, School of Oriental and African Studies, London.

Khan, MH 2013a, "The Industrial Policy Revolution II: Africa in the Twenty-First Century," in JE Stiglitz, JY Lin, & E Patel (eds), Palgrave Macmillan, London, pp. 243–80.

Khan, MH 2013b, "The Industrial Policy Revolution I: The Role of Government Beyond Ideology," in JE Stiglitz & JY Lin (eds), Palgrave Macmillan, London, pp. 79–115.

Kim, H-K & Ma, J 1997, "The Role of Government in East Asian Economic Development: Comparative Institutional Analysis," in M Aoki, H-K Kim, & M Okuno-Fujiwara (eds), Clarendon Press, Oxford, pp. 101–133.

Kim, L 1980, "Stages of Development of Industrial Technology in a Developing Country: A Model," *Research Policy*, pp. 254–277.

Kim, L 1997, *Imitation to Innovation: The Dynamics of Korea's Technological Learning*, Harvard Business School Press, Boston, USA.

Kim, L 1999, *Learning and Innovation in Economic Development*, Edward Elgar Publishing Inc., Cheltenham, UK.

Kim, L 2001, “The Dynamics of Technological Learning in Industrialization,” *International Social Science Journal*, vol. 53, no. 168, pp. 297–308.

Knack, S & Keefer, P 1995, “Institutions and Economic Performance: Cross Country Tests Using Alternative Institutional Measures,” *Economics and Politics*, vol. 7, no. 3, pp. 207–227.

Kochanek, S 2003, *Policy Process In Bangladesh*, DFID, Dhaka, Bangladesh.

Kochanek, SA 1983, *Interest groups and development: business and politics in Pakistan*, Oxford University Press, Oxford.

Kohli, A 2004, *State-Directed Development: Political Power and Industrialization in the Global Periphery* 1st edn, Cambridge University Press, Cambridge.

Kohpaiboon, A 2008, *Thai Automotive Industry: Multinational Enterprises and Global Integration*, Faculty of Economics, Thammasat University.

Krafcik, JF 1988, “Triumph of the Lean Production System,” *Sloan Management Review*, vol. 30, no. 1, pp. 41–52.

Krueger, AO 1974, “The Political Economy of the Rent-Seeking Society,” *The American Economic Review*, vol. 64, no. 3, pp. 291–303, accessed from <http://www.jstor.org/stable/1808883>.

Kuznets, S 1971, *Economic Growth of Nations: Total Output and Production Structure*, Harvard University Press, Massacheusetts.

Lai, Y 2001, “Investigation of the Role of Government in the Automotive Industry Development in Brazil,” *Study of Latin America*, vol. 6, pp. 22–25.

Lall, S 1990, *Building Industrial Competitiveness in Developing Countries*, Development Centre of the Organisation for Economic Co-operation and Development, accessed from <http://books.google.co.uk/books?id=fKH0tGDmykYC>.

Lall, S 1992, “Technological Capabilities and Industrialization,” *World Development*, vol. 20, no. 2, pp. 165–186, accessed from <http://www.sciencedirect.com/science/article/B6VC6-45DHVS2-G7/2/80ad728bea00a4fabc09785edee0b2f5>.

Lall, S 1993a, “Understanding Technology Development,” *Development and Change*, vol. 24, no. 4, pp. 719–753, accessed from <http://dx.doi.org/10.1111/j.1467-7660.1993.tb00502.x>.

Lall, S 1993b, “Promoting Technology Development: The Role of Technology Transfer and Indigenous Effort,” *Third World Quarterly*, vol. 14, no. 1, pp. 95–108.

Lall, S 1998, “Technological Capabilities in Emerging Asia,” *Oxford Development Studies*, vol. 26, no. 2, pp. 213–243.

Lall, S 2000, *Harnessing Technology for Human Development*, United Nations.

Lall, S 2004, “Industrial Success and Failure in a Globalizing World,” *International Journal of Technology Management & Sustainable Development*, vol. 3, no. 3, pp. 189–213, accessed from <http://search.ebscohost.com/login.aspx?direct=true&AuthType=cookie,ip,url,shib&db=aph&AN=15445551&site=ehost-live>.

Lall, S & Albaladejo, M 2002, *Indicators of the Relative Importance of IPRs In Developing Countries*, University of Oxford, Queen Elizabeth House, University of Oxford.

Lall, S & Teubal, M 1998, “Market-Stimulating" Technology Policies in Developing Countries: A Framework with Examples from East Asia,” *World Development*, vol. 26, no. 8, pp. 1369–1385, accessed from <http://www.sciencedirect.com/science/article/B6VC6-3V79KR8-1/2/71866248e98cb30377517e3564f355db>.

Lange, M & Rueschemeyer, D 2005, *States and Development: Historical Antecedents of Stagnation and Advance* 1st Edition., Palgrave Macmillan, New York NY.

Laws, E 2012, *Political Settlements, Elite Pacts, and Government of National Unity: A Conceptual Study*, Developmental Leadership Program.

Leftwich, A 2000, *States of Development: On the Primacy of Politics in Development*, Polity Press, Cambridge.

Leftwich, A 2007, *The Political Approach to Institutional Formation, Maintenance and Change*, Research Programme Consortium on Improving Institutions for Pro-Poor Growth (IPPG), Manchester.

Limited, AH *Atlas Honda Limited Annual Report*, ATHL, Sheikhupura.

Limited, MT *Millat Tractors Limited*, MTL, Lahore.

List, F 1909, *The National System of Political Economy*, Longman, Green and Co., London.

Lundvall, B & Johnson, B 1994, “The Learning Economy,” *Journal of Industry Studies*, vol. 1, no. 2.

Luo, J 2006, “The Impact of Government Policies on Industrial Evolution: The Case of China’s Automotive Industry,”.

Machado, KG 1994, “Japan and Malaysian Development: In the Shadow of the Rising Sun,” in KS Jomo (ed), Routledge, London, pp. 291–325.

Mauro, P 1995, “Corruption and Growth,” *The Quarterly Journal of Economics*, vol. 110, no. 3, pp. 681–712, accessed from <http://www.jstor.org/stable/2946696>.

McLaughlin, K 2006, “The Big Squeeze,” *Stamping Journal*, accessed from <http://www.thefabricator.com/ShopManagement/ShopManagement_Article.cfm?ID=1265>.

Melling, J 1991, "Industrial Capitalism and the Welfare of the State: The Role of Employers in the Comparative Development of The Welfare State. A Review of Recent Research," *Sociology*, vol. 91, no. 2, pp. 219–239.

Menocal, RA 2004, "And If There Was No State? Critical Reflections on Bates, Polanyi and Evans on the Role of the State in Promoting Development," *Third World Quarterly*, vol. 25, no. 4, pp. 765–77.

Menocal, RA 2009, *State-building for Peace: Navigating an Arena of Contradictions*, Overseas Development Institute, London.

Milgrom, P & Roberts, J 1992, *Economics, organization and management*, Prentice-Hall, Englewood Cliffs, NJ.

Montesquieu, CS 1752, *The Spirit of Laws*, McMaster University Archive for the History of Economic Thought.

Nag, B, Banerjee, S & Chatterjee, R 2007, *Changing Features of the Automobile Industry in Asia: Comparison of Production, Trade and Market Structure in Selected Countries*, Asia-Pacific Research and Training Network on Trade, Bangkok.

Neild, R 2002, *Public Corruption: The Dark Side of Social Evolution* 1st edn, Anthem Press, London.

Nelson, R 1987, "Technology Generation in Latin American Manufacturing Industries," in J Katz (ed), Macmillan, London, pp. 78–93.

Nelson, RR & Winter, SG 1982, *An Evolutionary Theory of Economic Change*, Harvard University Press.

North, DC 1981, *Structure and Change in Economic History*, WW Norton: New York.

North, DC 1990, *Institutions, Institutional Change, and Economic Performance*, Cambridge University Press, The Edinburgh Building, Cambridge CB2 2RU, UK.

North, DC & Thomas, RP 1973, *The Rise of the Western World: A New Economic History*, Cambridge University Press.

Nurkse, R 1953, *Problems of Capital Formation in Underdeveloped Countries*, Oxford University Press, New York.

OECD 1996, *The Knowledge Based Economy*, Organization for Economic Cooperation and Development, Paris.

OECD/DAC 2008, *Concepts and Dilemmas of State Building in Fragile Situations*, Organisation for Economic Cooperation and Development/DAC, Paris, accessed from <http://www.oecd.org/development/incaf/41100930.pdf>.

Ofreneo, R 2008, "Arrested Development: Multinationals, Trims and the Philippinesrq Automotive Industry," *Asia Pacific Business Review*, vol. 14, no. 1, pp. 65–84.

Ohkawa, K & Rosovsky, H 1973, *Japanese Economic Growth: Trend Acceleration in the Twentieth Century*, Stanford University Press, Stanford.

Ohno, T & Mito, S 1992, *Present et Avenir du Toyotisme*, Masson, Paris.

Olson, M 1982, *The Rise and Fall of Nations: Economic Growth, Stagflation and Social Rigidities*, Yale University, New Haven.

Olson, M 1997, "Institutions and Economic Development: Growth and Governance in Less-Developed and Post-Socialist Countries," in C Clague (ed), The Johns Hopkins Studies in Development, John Hopkins University Press, Baltimore and London, pp. 37–65.

Olson, M 2000, "A Not-so-dismal Science: A Broader View of Economies and Societies," in M Olson & S Kahkonen (eds), Oxford University Press, Oxford, pp. 119–137.

PAAPAM 2014, "Pakistan Association of Automotive Parts Accessories Manufacturers website,".

Pack, H & Westphal, LE 1986, "Industrial Strategy and Technological Change: Theory versus Reality," *Journal of Development Economics*, vol. 22, no. 1, pp. 87–128, accessed from <http://www.sciencedirect.com/science/article/B6VBV-474XW94-6/2/cac51e802efea0fc1ae45dc4883d1345>.

Page, J 1994, "The East Asian Miracle: Four Lessons for Development Policy," in *NBER Macroeconomics Annual*, NBER Chapters, National Bureau of Economic Research, Inc, pp. 219–282, accessed from <http://ideas.repec.org/h/nbr/nberch/11011.html>.

Pakistan, G of 1987, *Economic Survey of Pakistan 1987-88*, Ministry of Finance, Islamabad.

Pakistan, G of 1999a, *50 Years of Pakistan: Volume I - Summary*, Federal Bureau of Statistics, Islamabad.

Pakistan, G of 1999b, *Economic Survey of Pakistan 1999-2000: Statistical Supplement*, Ministry of Finance.

Pakistan, G of 2000, *Economic Survey of Pakistan: 2000-01*, Ministry of Finance, Islamabad.

Pakistan, G of *Economic Survey of Pakistan: Various Years*, Ministry of Finance, Islamabad.

PAMA "Pakistan Automotive Manufacturers Association Website,".

Parks, T & Cole, W 2010, *Political Settlements: Implications for International Development Policy and Practice*, The Asia Foundation, accessed from <http://asiafoundation.org/resources/pdfs/PoliticalSettlementsFINAL.pdf>.

Penrose, ET 1959, *The Theory of the Growth of the Firm*, Oxford University Press, Oxford.

Posner, MV 1961, "International Trade and Technical Change," *Oxford economic papers*, vol. 13, no. 3, pp. 323–341.

Posner, RA 1975, "The Social Costs of Monopoly and Regulation," *The Journal of Political Economy*, vol. 83, no. 4, pp. 807–827, accessed from <http://www.jstor.org/stable/1830401>.

Przeworski, A 2004, "Political Science and the Public Interest," in ED Mansfield & R Sisson (eds), Ohio State University Press, Columbus.

Qian, Y 2002, *How Reform Worked In China*, William Davidson Institute, University of Michigan Business School.

Rasiah, R 1999, "Technology, Competitiveness and the State," in JK Sundaram & G Felker (eds), Routledge, London, pp. 180–198.

Redding, S 1999, "Dynamic Comparative Advantage and the Welfare Effects of Trade," *Oxford Economic Papers*, vol. 51, no. 1, pp. 15–39.

Reno, W 1995, *Corruption and State Politics in Sierra Leone*, Cambridge University Press, Cambridge.

Richardson, GB 1972, "The Organization of Industry," *Economic Journal*, vol. 82, pp. 883–896.

Rodrik, D 1995, *Trade Strategy, Investment, and Exports: Another Look at East Asia*, National Bureau of Economic Research, accessed from <http://www.nber.org/papers/w5339>.

Rodrik, DA, Subramanian, A & Trebbi, F 2002, *Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development*, National Bureau of Economic Research, National Bureau of Economic Research.

Rogerson, WP 1982, "The Social Costs of Monopoly and Regulation: A Game-Theoretic Analysis," *The Bell Journal of Economics*, vol. 13, no. 2, pp. 391–401, accessed from <http://www.jstor.org/stable/3003462>.

Rosenberg, N & Firschtak, C 1985, *International Technology Transfer: Concepts, Measures, and Comparisons*, Praeger, New York.

Rosenstein-Rodan, PN 1943, "Problems of Industrialisation of Eastern and South-Eastern Europe," *The Economic Journal*, vol. 53, no. 210/211, pp. 202–211, accessed from <http://www.jstor.org/stable/2226317>.

Rotberg, RI 2004, "Strengthening African Leadership: There Is Another Way," *Foreign Affairs*, vol. 83, no. 4, pp. 14–18, accessed from <http://www.jstor.org/stable/20034043>.

Samuels, WJ & Mercuro, N 1984, "Neoclassical Political Economy: The Analysis of Rent-Seeking and DUP Activities," in DC Colander (ed), Ballinger Publishing Company, Cambridge, Massachusetts, pp. 55–70.

Sayeed, AU 1995, “Political Alignments, the State and Industrial Policy in Pakistan: A Comparison of Performance in the 1960s and 1980s,”.

Scitovsky, T 1954, “Two Concepts of External Economies,” *Journal of Political Economy*, vol. 62, pp. 143–51.

Sharan, T 2011, “The Dynamics of Elite Networks and Patron–Client Relations in Afghanistan,” *Europe-Asia Studies*, vol. 63, no. 6, pp. 1109–1127.

SIAM 2014, “Society of Indian Automotive Manufacturers (SIAM) website,”.

Smith, A 1776, *An Inquiry into the Nature and Causes of the Wealth of Nations* R Campbell & A Skinner (eds), Oxford: Clarendon Press.

Statistics, PB of *Pakistan Statistical Yearbook: Various Issues*, Government of Pakistan, Islamabad.

Stiglitz, JE 1996, *Whither Socialism?*, The MIT Press.

Stiglitz, JE 1998, “Redefining the Role of the State: What Should It Do? How Should It Do It? And How Should These Decisions be Made?,” in *Paper Presented on Tenth Anniversary of the MITI Research Institute*, Tokyo.

Stokey, N 1991, “Human Capital, Product Quality, and Growth,” *Quarterly Journal of Economics*, vol. 106, pp. 587–616.

Sturgeon, T, Biesebroeck, JV & Gereffi, G 2008, “Value Chains, Networks and Clusters: Reframing the Global Automotive Industry,” *Journal of Economic Geography*, vol. 8, pp. 297–321.

Sturgeon, T, Memedovic, O, Biesebroeck, J van & Gereffi, G 2009, “Globalisation of the Automotive Industry: Main Features and Trends,” *International Journal of Technological Learning, Innovation and Development*, vol. 2, no. 1/2, pp. 7–24.

Suehiro, A 2008, *Catch-Up Industrialization: The Trajectory and Prospects of East Asian Economies, Translated by Tom Gill*, NUS Press in Association with the Kyoto University Press.

Sundaram, JK & Gomez, ET 2000, “Rents, Rent-seeking and Economic Development: Theory and Evidence in Asia,” in MH Khan & JK Sundaram (eds), Cambridge University Press, Cambridge and New York, pp. 274–303.

Sutton, J 2005, *Competing in Capabilities: An Informal Overview*, London School of Economics, London School of Economics, accessed from <http://info.worldbank.org/etools/docs/library/139596/Sutton.pdf>.

Teece, D & Pisano, G 1994, “The Dynamic Capabilities of Firms: An Introduction,” *Industrial and Corporate Change*, vol. 3, no. 3, pp. 537–556.

Thun, E 2006, *Changing Lanes in China. Foreign Direct Investment,Llocal Governments, and Auto Sector Development*, Cambridge University Press, New York.

Treisman, D 2000, “The Causes of Corruption: A Cross-National Study,” *Journal of Public Economics*, vol. 76, no. 3, pp. 399–457.

Treisman, D 2007, *The Architecture of Government: Rethinking Political Decentralization*, Cambridge University Press, New York.

Tullock, G 1980, “Towards A Theory of the Rent-Seeking Society,” in J Buchanan, RD Tollison, & G Tullock (eds), Texas A & M University Press.

Ulrich, L 2006, “The Inside Track,” *Money*, vol. 35, no. 3, p. 104.

UNIDO 2002, *Industrial Development Report 2002-2003: Competing through Innovation and Learning*, United Nations Industrial Development Organization, Vienna, accessed from <http://www.unido.org>.

Veloso, F & Kumar, R 2002, *The Automotive Supply Chain: Global Trends and Asian Perspectives*, Department of Engineering and Public Policy, Carnegie Mellon University.

Vernon, R 1966, “International Investment and International Trade in the Product Cycle,” *Quarterly Journal of Economics*, vol. 80, no. 2, pp. 190–207.

Wad, P 2004a, “Automobile Workers and Industry in Globalising Asia,” in D-O p Chang & E Shepherd (eds), AMRC and CEC, Hong Kong, pp. 3–27.

Wad, P 2004b, “Labour In Southeast Asia: Local Processes In A Globalised World,” in R Elmhirst & R Saptari (eds), RoutledgeCurzon, London, pp. 235–264.

Wad, P 2008, “The Development of Automotive Parts Suppliers in Korea and Malaysia: A Global Value Chain Perspective,” *Asia Pacific Business Review*, vol. 14, no. 1, pp. 47–64.

Wad, P 2009, “The Automobile Industry of Southeast Asia: Malaysia and Thailand,” *Journal of the Asia Pacific Economy*, vol. 14, no. 2, pp. 172–193.

Wade, R 1990, *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization*, Princeton University Press, Princeton.

Walle, NV de 2001, *African Economies and the Politics of Permanent Crisis 1979-1999*, Cambridge University Press, Cambridge.

Wallis, JJ & North, DC 1986, “Measuring the Transaction Sector in the American Economy, 1870-1970,” in *Long-Term Factors in American Economic Growth*, National Bureau of Economic Research Studies in Income and Wealth, National Bureau of Economic Research, Inc, pp. 95–162.

Whaites, A 2008, *States in Development: Understanding State-Building*, DfID, London.

Zaidi, AS 2005, *Issues in Pakistan’s Economy* Second., Oxford University Press, Karachi.

APPENDICES

APPENDIX A

Additional list of MoIP organizations:

	Name of Organization
1	Department of Explosives (DoE)
2	National Fertilizer Corporation (NFC)
3	Pakistan Gem and Jewellery Development Company (PGJDC)
4	Pakistan Hunting and Sporting Arms Development Company (PHSADC)
5	Pakistan Steel (PS)
6	Pakistan Stone Development Company (PSDC)
7	State Engineering Corporation (SEC)
8	Enar Petro-tech Services (EPS)
9	Utility Stores Corporation (USC)

APPENDIX B

AIDP - FIVE YEAR TARIFF PLAN - PRIME MOVERS

S NO.	DESCRIPTION	RATE OF DUTY				
		2007-08	2008-09	2009-10	2010-11	2011-12
Prime Movers falling under HS Code 8701						
1.	CBU (below 280 HP)	30%	30%	30%	30%	30%
2.	Components for assembly of prime movers (below 280HP) other than those at Sr. No 3 below	10%	10%	10%	10%	10%
3.	Components for assembly of prime movers (below 280 HP) as are listed in SRO 693(I)/2006 dated 01-07-2006	35%	35%	35%	35%	35%
4.	CBU (above 280 HP)	15%	15%	15%	15%	15%
5.	Components for assembly of prime movers (above 280HP) other than those at Sr. No 6 below	0%	0%	0%	0%	0%
6.	Components for assembly of prime movers (above 280 HP) as are listed in SRO 693(I)/2006 dated 01-07-2006	35%	35%	35%	35%	35%

Source: Ministry of Industries & Production (2008)

APPENDIX B (contd.)

AIDP - FIVE YEAR TARIFF PLAN - TRACTORS

S NO.	DESCRIPTION	RATE OF DUTY				
		2007-08	2008-09	2009-10	2010-11	2011-12
Agriculture Tractors falling under HS Code 8701						
7.	CBU	0%	10%	10%	10%	10%
8.	Components for assembly of agriculture tractors other than those at Sr. No 9 below	0%	0%	0%	0%	0%
9.	Components for assembly of agriculture tractors as are listed in SRO 693(I)/2006 dated 01-07-2006	35%	35%	35%	35%	35%

Source: Ministry of Industries & Production (2008)

APPENDIX B (Contd.)

AIDP - FIVE YEAR TARIFF PLAN - BUSES, TRUCKS AND TRAILERS

S NO.	DESCRIPTION	RATE OF DUTY				
		2007-08	2008-09	2009-10	2010-11	2011-12
Buses falling under HS Code 8702						
10.	CBU (Non-CNG)	20%	20%	20%	20%	20%
11.	Components for assembly of buses (Non–CNG) other than those at Sr. No 12 below	5%	5%	5%	5%	5%
12.	Components for assembly of buses (Non-CNG) as are listed in SRO 693(I)/2006 dated 01-07-2006	35%	35%	35%	35%	35%
13.	CBU (CNG / LPG dedicated)	15%	15%	15%	15%	15%
14.	Components for assembly of buses (CNG / LPG dedicated) other than those at Sr. No 15 below	0%	0%	0%	0%	0%
15.	Components for assembly of buses (CNG / LPG dedicated) as are listed in SRO 693(I)/2006 dated 01-07-2006	35%	35%	35%	35%	35%

Source: Ministry of Industries & Production (2008)

APPENDIX B (Contd.)

AIDP - FIVE YEAR TARIFF PLAN - BUSES, TRUCKS AND TRAILERS

S NO.	DESCRIPTION	RATE OF DUTY				
		2007-08	2008-09	2009-10	2010-11	2011-12
Rigid Trucks falling under HS Code 8704						
28.	CBU	30%	30%	30%	30%	30%
29.	Components for assembly of rigid trucks other than those at Sr. No 30 below	10%	10%	10%	10%	10%
30.	Components for assembly of rigid trucks as are listed in SRO 693(I)/2006 dated 01-07-2006	35%	35%	35%	35%	35%
Trailers falling under HS Code 8716						
37.	CBU	15%	15%	15%	15%	15%
38.	Components for assembly of trailers	5%	5%	5%	5%	5%

Source: Ministry of Industries & Production (2008)

APPENDIX B (Contd.)

AIDP - FIVE YEAR TARIFF PLAN - AUTOMOBILES, JEEPS AND LCVs

S NO.	DESCRIPTION	RATE OF DUTY				
		2007-08	**2008-09**	**2009-10**	**2010-11**	**2011-12**
Cars /Jeeps falling under HS Code 8703						
16.	CBU of a cylinder capacity not exceeding 800 cc	50%	50%	50%	50%	50%
17.	CBU of cylinder capacity exceeding 800 cc but not exceeding 1000 cc	55%	55%	55%	55%	55%
18.	CBU of cylinder capacity exceeding 1000 cc but not exceeding 1500 cc	60%	60%	55%	55%	55%
19.	CBU of cylinder capacity exceeding 1500 cc but not exceeding 1800 cc	75%	75%	70%	70%	70%
20.	CBU of cylinder capacity exceeding 1800 cc	90%	90%	85%	85%	85%
21.	Components for assembly of cars other than those at Sr. No 22 below	35%	32.5%	32.5%	30%	30%
22.	Components for assembly of cars as are listed in SRO 693(I)/2006 dated 01-07-2006	50%	50%	47.5%	45%	45%

Source: Ministry of Industries & Production (2008)

APPENDIX B (Contd.)

AIDP - FIVE YEAR TARIFF PLAN - AUTOMOBILES, JEEPS AND LCVs

S NO.	DESCRIPTION	RATE OF DUTY				
		2007-08	**2008-09**	**2009-10**	**2010-11**	**2011-12**
Assemblies for the Manufacture of Cars 8703 / LCVs 8704						
23.	Alternator, Starter Motor, Water Pump, Fuel Pump, Fuel Filter, Seat Recliner, Air Cleaner Assembly	35%	35%	50%	50%	50%
24.	Power Steering, Engines, Transmissions	35%	35%	35%	50%	50%
LCVs (up to 5 Tons) falling under HS Code 8704						
25.	CBU (up to 5 tons)	60%	60%	60%	60%	60%
26.	Components for assembly of LCVs (up to 5 tons) other than those at Sr. No 27 below	20%	20%	20%	20%	20%
27.	Components for assembly of LCVs (up to 5 tons) as are listed in SRO 693(I)/2006 dated 01-07-2006	50%	50%	47.5%	45%	45%

Source: Ministry of Industries & Production (2008)

APPENDIX B (Contd.)

AIDP - FIVE YEAR TARIFF PLAN - MOTORCYCLES

S NO.	DESCRIPTION	RATE OF DUTY				
		2007-08	**2008-09**	**2009-10**	**2010-11**	**2011-12**
Motorcycles falling under HS Code 8711						
31.	CBU	80%	70%	65%	60%	60%
32.	Components for assembly of Motorcycles other than those at Sr. No 33 below	25%	20%	15%	12.5%	10%
33.	Components for assembly of Motorcycles as are listed in SRO 693(I)/2006 dated 01-07-2006	50%	50%	47.5%	45%	45%
Components and Assemblies for the Manufacture of Motorcycles 8711						
34.	Regulator Rectifier, Ignition Coil	25%	50%	47.5%	45%	45%
35.	Piston, Fuel Cock, Clutch Assembly, Sprocket Cam	25%	20%	47.5%	45%	45%
36.	Drum Gear Shift, Magneto, Oil Pump	25%	20%	15%	45%	45%

Source: Ministry of Industries & Production (2008)

APPENDIX C

Details of Interviews Taken during Fieldwork in Pakistan

Key stakeholders in the automotive industry in Pakistan were identified in consultation with a senior government official. Based on the information gathered, in depth interviews were conducted with a number of senior government officials in the Ministry of Commerce, Ministry of Industries and Production and the Engineering Development Board Board:

- Joint Secretary - MoIP
- Section Officer 1 - MoIP
- Section Officer 2 - MoIP
- Additional Secretary – Ministry of Commerce
- EDB official

Several interviews were arranged with officials at PAMA, and through them, with PAPAAM officials and several component manufacturers as well as representatives from Pak Suzuki and Toyota Indus Motors. Officials from Honda Atlas were unavailable for interviews at the time.

- Director General - PAMA
- Section Officer 1 – PAMA
- Section Officer 2 - PAMA
- Ex Chairman 1 - PAPAAM
- Ex Chairman 2 - PAPAAM
- Manager - Pak Suzuki
- Manager 1 - Toyota Indus
- Manager 2 - Toyota Indus

Several interviews were held with managers at MTL head office and factory in Lahore:

- Senior board member
- GM Engineering
- GM Quality Control
- GM Supplier Relations

Several interviews were conducted with managers at Atlas Honda Limited - Panjdarya site.

The CEO of Rubatech provided valuable insight into the operations of component manufacturers in Pakistan.

Component manufacturer CEOs provided insight into state-private sector interactions in the automotive industry and confirmed details given.

Open-ended interviews were guided by questionnaire designed to assess state of technology acquisition by domestic firms in the industry and relations with the state. Firms were not willing to share detailed information regarding plant operations at this time which would be required to assess state of firm competitiveness.

Questionnaire based on the same questions was sent to all listed members of PAPAAM, but the response rate was very low and quality of responses was not sufficient to be used for analysis and comparison with JICA study data.

APPENDIX D

Annual Deletion Rates at MTL

(%)

Year	MF 240	MF 385
1981 - 82*	9.34	
1982 - 83	18.69	
1983 - 84	33.21	
1984 - 85	38.17	
1985 - 86	49.72	16.37
1986 - 87	60.29	18.99
1987 - 88	67.92	21.09
1988 - 89	68.20	27.68
1989 - 90	72.32	37.76
1990 - 91	75.83	43.36
1991 - 92	76.65	44.06
1992 - 93	77.63	48.09
1993 - 94	78.75	48.66
1994 - 95	79.42	48.76
1995 - 96	79.91	49.01
1996 - 97	80.62	49.14
1997 - 98	80.98	49.37
1998 - 99	81.64	50.28
1999 - 00	82.11	50.01
2000 - 01	87.35	52.01
2001 - 02	88.87	57.01
2002 - 03	88.87	62.01
2003 - 04	88.87	65.12
2004 - 05*	89.34	70.00
2005 - 06*	89.80	75.27
2006 - 07*	90.27	76.01
2007 - 08*	90.73	76.75
2008 - 09*	91.20	77.49
2009 - 10*	91.66	78.22
2010 - 11*	92.13	78.96
2011 - 12*	92.60	79.70
2013	93.06	81.92

Source: Data provided by MTL

Note:

* : Computed from data available