

# **The Influence of Industrial Policy and National Systems of Innovation on Emerging Economy Suppliers' Learning Capability**

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## **Abstract**

This paper links the industrial policy and national systems of innovation literature to the investigation of learning capabilities of suppliers in the context of the automotive parts industry of Pakistan. Drawing data from 50 Pakistani auto parts suppliers, the findings suggest that industrial policy has been helpful in creating a local parts supply base and facilitating the entry of Japanese assemblers in the market. However, the implementation of the policy has been weak, and it is an arduous journey for the local suppliers to develop ambidextrous (exploratory and exploitative) learning capabilities. The findings also indicate that where local training and support from R&D institutions are weak, networking alone with foreign multinationals is not sufficient on its own to develop exploratory learning capabilities of local suppliers. This paper shows the importance of creating national-provincial institutions offering learning and skills development aimed towards innovation.

**Keywords:** industrial policy, national systems of innovation, institutions, knowledge transfer, learning capability, emerging economy, automotive industry

## **1. Introduction**

Many scholars have described the positive role of national industrial policies in promoting economic development (Bell et al. 1984; Amsden 2001; Chang 1993; Chu 2011; Wade 1990). Lall (2001) argues that the Asian growth experience went well beyond neutral, ‘market-friendly’ intervention and rested instead on the concept of selectivity involved in different levels of policy making. For instance, Westphal (1990) documents the positive role of the industrial policy driven by Korean government in promoting exports and economic growth. Similarly, Barnes et al. (2004) suggest that the industrial policy has played a positive role in the South African automotive industry’s insertion into the global value chain. However, others have questioned the role of government driven industrial policy in promoting economic growth. The latter view is equated with government failures and argues that the industrial policies themselves hinder economic development (Krueger 1995).

To the best of our knowledge, this line of research has not fully examined the role of national industrial policy on MNEs market presence and local firms’ learning capability development in emerging economies (Lazzarini 2015). So far, very few studies have explored the role of industrial policies by adopting detailed, industry-level and firm level analysis (Thun 2006). There is another stream of literature in the global value chain field looking at local firms’ upgrading into the global economy (e.g. Schmitz 2004; Humphrey and Schmitz 2002; Gereffi et al. 2005). However, this line of literature has not fully explained how and whether national systems of innovation (NSI), including local institutions provide support for local firms to learn and upgrade.

Based on the above problems, this article seeks to examine the role of national industry policy in the development of local suppliers’ learning capabilities in the context of Pakistan’s automotive parts industry. This research context is unique in that Pakistan’s automotive industrial policy has played a central role in the development of the local automobile industry

by attracting leading assemblers – Japanese multinational enterprises (MNEs) in particular – to invest in Pakistan. Three Japanese MNEs have entered the Pakistan market, forming international joint ventures (IJVs) with local partners, and hold a 98% local market share. This context is also interesting as Pakistan is rarely examined from a capabilities development point of view in the mainstream innovation and management related field. Thus, we investigate the following research question: What roles do industrial policy and NSI play in the development of local firms' learning capabilities? In this paper we consider national, inter-organizational, and local firm-level aspects in order to comprehensively investigate the role of national policy and NSI in the development of learning capabilities in different product segments (*i.e.* low, medium, and high-tech component segments) at the supplier end. As for conceptual underpinnings, we build our arguments from the literature on industrial policy and NSI. This paper is based on an in-depth study of the top 50 Pakistani tier 1 parts suppliers who supply directly to the three IJVs established in Pakistan's automotive industry, and have extensive business linkages with the IJVs.

We find that Pakistan's automotive industrial policy has contributed to the development of a local supply base and the creation of a market presence for Japanese MNEs through foreign direct investment (FDI) and employment creation. However, limited exploitative incremental innovations have taken place in the low- and medium-technology parts segments, such as door beams, seating, instrument panels, wire harnessing, and bearings, *etc.* The automotive industrial policy in Pakistan has not paid as much attention to building the national-provincial institutions' supports and a coherent innovation policy necessary for knowledge creation and diffusion, learning, and skills upgrades of local firms. Also, weak institutions have not constrained Japanese MNEs' advanced technology transfer to the host country suppliers. In other words, the policy has not contributed to the development of

exploratory learning capabilities among local suppliers for the high value-added component segments—known as product innovations headroom.

Our work contributes to extending the existing literature on industry policy and local firms' capability development (Lazzarini 2015; Lorentzen 2005). It explains how institutional supports for local firms at the national-provincial level facilitate firm-level learning and the absorptive capacity of the firms. In addition, at the inter-organizational level, it explains that knowledge transfer from MNEs to local suppliers improves the local suppliers' ability to develop low- to medium-tech components for incremental innovations. This offers insights into the benefits of local suppliers (*e.g.* learning, upgrading value chain position) in the emerging economy could gain through networking with foreign MNEs based on the strong governmental supports on local innovation supports system..

The rest of the paper is organized as follows. In the second section, we discuss the conceptual background related to industrial policy and NSI. The next section provides a brief history of the automotive industry in Pakistan and explores the country's national automotive policy. The fourth section deals with the research approach taken in this study. In the fifth section, the findings of the study are presented. The following section discusses our findings with implications and limitations and future research.

## **2. Conceptual Background**

### ***2.1 Role of Industrial Policies***

The theoretical debate on the role of industrial policies is extensive (Rodrik 2008). The thesis of market failures, market imperfections, and the resulting need to correct those market failures with a set of policy interventions is well documented in the development economics literature. The East-Asian economic growth model is best viewed through its proactive industrial policies (Amsden 1989, 2001; Lall and Teuball 1998). South Korea and Taiwan all

developed industrial policies that overcame the market imperfections their investors faced in modern tradable industries (Rodrik 1995; 1996). The governments of latecomer economies adopted local content and export performance requirements as the main strategies for fostering industrial growth (Amsden 2001). For instance, South African automotive policy has played an important role in integrating the domestic industry into the global value chain (Barnes and Morris 2008; Lorentzen 2005). Scholars have focused their attention on the role of the host countries' liberalization policies, including offering tax incentives, export processing zones, dedicated infrastructures for foreign investors, *etc.*, aimed at attracting FDI, and how these policies can generate a spillover effect for domestic firms, allowing them to upgrade to higher value-added products (Giuliani et al. 2005). In the context of Indonesia, Blalock and Gertler (2004) note that, through backward linkages, MNEs play a beneficial role for domestic suppliers by improving their quality-related practices and enabling upgrades. Scholars have studied the 'market imperfections' hypothesis in a variety of contexts. For example, Foster and Rosenzweig (1995) suggest that learning-by-doing and spillovers affected the trend for growing high-yielding varieties in the Indian agricultural sector. Similarly, Javorcik (2004) provides evidence that MNEs' investment in Lithuania has led to knowledge spillovers in the form of productivity gains among their Lithuanian suppliers. These studies view market incentives and industrial policies as having a positive effect on host country firms.

However, some scholars have recently cast doubt on the benefits of market liberalization policies and have documented varying impacts of these policies on domestic firms' innovative capabilities (Moran et al. 2005). In a similar vein, the World Bank (1993, p.6) reports, "*our judgment is that in a few economies, mainly in Northeast Asia, in some instances, government interventions resulted in higher and more equal growth than otherwise would have occurred. However, the prerequisites for success were so rigorous that*

*policymakers seeking to follow similar paths in other developing countries have often met with failure*". This view is also shared by Pack (2000), who provide a cautious message on the application of benchmarking industrial policies such as Japan and Korea. Pack (2000, p.64) states: "*Countries attempting to extract the benefits from an industrial policy that Japan and Korea obtained have to possess not only an exceptionally capable bureaucracy but also the political ability to withdraw benefits from non-performing firms. [Thus, developing] countries should be exceptionally cautious before embarking on such policies*". Therefore, characters of innovation systems could be nation-specific, thus the importance of government policies on NSI could play an enabling role for the development of local firms capabilities.

## ***2.2 National Systems of Innovation***

Extant studies on industrial policy do not provide a detailed analysis of the role of such policy, and the resultant innovative capabilities among local firms in different industrial contexts. Arguably, the role of NSI is important in understanding the development of innovations and firm-level capabilities. For instance, the success of South Korea and Taiwan can be attributed to the building of NSI along with national industrial policies. A number of scholars have defined the concept of NSI in terms of a network of public and private institutions within a country that fund and perform R&D, commercialize the resulting innovations, and help to diffuse technology (Freeman 1987; Nelson 1992, 1990). Innovation is an interactive and accumulative process (Lundvall 1985; Kline and Rosenberg 1986), and public-private R&D efforts and networks play an important role in emerging market firms' upgrading of their innovative capabilities (McDermott et al. 2009). McEvily and Zaheer (1999) also suggest that involvement with public-private regional support institutions can improve the competitive capabilities of firms.

Differences in economic and technological development and performance across nations are due to the collective involvement and combinations of institutions and their resultant interactions, which determine the process of capital and technology accumulation (Freeman 1995; Lundvall 1992; Nelson 1992). Freeman (1995, p.20) points out that variations in national innovative capability development and performance depend on “*institutional differences in the mode of importing, improving, developing, and diffusing new technologies, products and processes*”. This argument says that, along with industrial policy, the NSI has played an important role in the development of capabilities at the firm level in Japan, Korea, Taiwan, and Singapore. Countries have experienced intensive technological learning and upgrading and are rapidly closing the gap with developed countries (Kim and Nelson 2000; Lee and von Tunzelmann 2005). Small firms in particular have been able to take advantage of NSI and overcome the liability of smallness (Kleinknecht and Reijnen 1992).

Surrounded by a supportive NSI, local firms can enhance their absorptive capacity by accessing a wide range of outside knowledge (Cohen and Levinthal 1990; Lorentzen 2005). Scholars have also documented the role of NSI in encouraging emerging economy firms to enter global production networks and shift their focus from ‘catch up’ to driving new innovations (Kim 1997; Dodgson 2000; Lundvall et al. 2006; Mathews 2002). In particular, Lundvall (1992) suggests that the relationships between firms operating within NSI are the primary driver for innovation. Institutions such as the government, universities, R&D centers, and firms provide both impetus and constraints within NSI (Nelson 1992). However, this line of literature has paid insufficient attention to the role of individual firms’ experiences and their relationships with outside organizations and institutions in the development of learning capabilities (Meyer and Peng 2005). Scholars have noted that institutions are significantly important, especially in the context of the developing and emerging economies (Lall 2000;



Dutrénit 2007; Choung et al. 2014; Dodgson 2009). For example, Dutrénit (2007) suggests the need for national governments to develop and promote the national institutional infrastructure for the development of innovation capacity of local firms. Similarly, it has been documented that NSI and learning are the enablers behind the development of firm-level absorptive capacity (Lorentzen and Barnes 2004; Lorentzen 2005; Criscuolo and Narula 2008). However, scholars point out problems with the existing NSI studies, calling them rather descriptive and general in nature (Lorentzen 2009), and their hindsight-based analysis on the developed countries (Fagerberg and Srholec 2008). Unlike the previous studies on NSI, in this research we connect the industrial policy and NSI literature with the investigation of indigenous local suppliers' learning capabilities in the Pakistani automotive parts industry context.

### **3. Research context: the Pakistani Automotive Industry**

The automotive industry has played a vital role in the development of local economies in many countries as a valuable source of revenue generation, human resource development and, moreover, technology transfer through vertical supplier relationships. In Pakistan, the automotive industry is considered as one of the major industrial sector for job creations and technology transfer to local auto components sub sector.

Pakistan is an attractive location for the automotive industry and has one of the lowest labor and production cost in the region. Pakistan offers a strategic location to the automotive industry due to its spatial proximity to China, South & Central Asia, and Middle East. Pakistan has three leading Japanese car manufacturers, namely Honda, Suzuki and Toyota. The three Japanese assemblers have played an important facilitating role for the development of the local parts industry through their local sourcing behavior. Currently, there are around 800 suppliers operating in the auto parts industry that are directly linked with these three

assemblers. Due to its location, the development of the auto parts industry through the help of these three assemblers could become a key low-cost auto parts suppliers' regional hub.

The industry was highly regulated until the early 1990s, when it began to be liberalized. The three phases are summarized in Figure 1. Pakistan has developed several auto industry specific policies to promote the industry, and specifically the allied auto parts industry through the creation of linkages with the Japanese-led automotive value chains. Due to the modularization and the tier structured that is pervasive in the global automotive industry, the development of capabilities of the local suppliers that are often confined to lower tiers of suppliers networks is one of the important policy issue for the emerging economies. Below, we document the auto industry related policies of Pakistan.

*Insert Figure 1 about here*

### ***3.1 Local Content Policies of the 1980s and Liberalization***

Pakistan implemented a deletion/localization program for the automotive industry, starting in 1983, and with a revised policy announced in 1987. Under this plan, assemblers who wanted to set up assembly units in Pakistan were required to replace imported components with locally sourced ones. In 1995, Pakistan's government initiated the Product-Specific Deletion/Localization Program (PSDP), which assemblers had to follow for the initial localization of components. Between 1996 and 2001, this program was replaced with the Industry-Specific Deletion Program (ISDP), which was phased out in 2005. The ISDP stipulated that the assemblers must use a certain percentage of locally manufactured components. When it joined the World Trade Organization (WTO) in 2006, Pakistan moved

away from the deletion policy and implemented a tariff-based system (TBS)<sup>1</sup> instead. The TBS provides protection to local component suppliers through tariffs and is part of a comprehensive automotive policy.

### ***3.1.2 Automotive Policy in 2000s***

To develop the industry further, the government introduced a major initiative for its development, the Auto Industry Development Program (AIDP)<sup>2</sup>, which was approved in 2007. This was a five-year plan for the automotive sector, aiming to increase production in the country to 500,000 vehicles per year by 2012. It also allows new entrants to enter the market and import completely knocked-down (CKD) kits (paying import duty of 32.5%) for three years without using any locally made components.

This plan has had the effect of increasing FDI in the automotive industry, but domestically very little progress has been made, possibly due to other priorities that have taken over since 2007, and the severe challenges faced by the country's industrial sector such as access to raw materials and frequent power outage. Industry level production data suggest that the plan's ambitious production targets will not be met. For example, in 2009-10 total car production stood at 122,000 units, while total sales were 124,000. The market size was estimated to be 145,000 new units in that year, but buyers often have to wait months to

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<sup>1</sup> The TBS was developed with the following objectives: to make the automotive industry TRIMs-compliant (Trade related Investment measures of the WTO); to encourage the indigenization of parts and components; to discourage roll back through a transparent and predictable system; to preserve and promote developed technologies; to protect the present job structures in the auto industry; to promote job creation; to protect existing and planned investment by original equipment manufacturers (OEMs) and component suppliers; to promote new investment; and to expand the consumer base in order to benefit from economies of scale.

<sup>2</sup> The main objectives of the AIDP were as follows: to encourage investment in the automotive industry; to encourage growth; to promote domestic competition; to enhance competitiveness; to stimulate innovation; to encourage local sourcing of components; to facilitate the automotive industry's integration into the global value chain; to regulate the used vehicles import policy to avoid impeding the growth of the local industry whilst protecting consumer interests; human resource development through focused and dedicated training institutions training workers for the auto sector; promoting close collaborations between already-established institutions such as TUSDEC, TEVTAs, etc.; to create an auto industry skills development company for the development of human resources on a sustainable basis through centers of excellence; and to create a technology acquisition support scheme for local suppliers.

receive new cars, and late delivery along with the high premiums charged for locally assembled cars remain major causes of dissatisfaction among Pakistani buyers. Assemblers have confirmed their commitment to on-going investment and expansion projects aimed at raising production levels but the official production target of 500,000 units per year by 2012 were not achieved. Figure 2 shows vehicle production from 2004 to 2010 *vis-à-vis* capacity and demonstrates that passenger car and light commercial vehicle production has increased since 2003-04.

*Insert Figure 2 about here*

The three major assemblers have different levels of annual plant capacity and all have announced plans to increase their production volumes over the next few years, keeping in mind demand in the country. However, these plans have yet to come to fruition. Table 1 shows the annual plant capacities of these three assemblers and how they have increased over the years. Pak Suzuki<sup>3</sup> has the greatest annual plant capacity and is the market leader in the smaller car segment, followed by Indus Motors and Honda Atlas. Table 2 shows the five-year AIDP tariff rates for the automotive industry that were approved by the government during the 2007-2008 budget (AIDP 2008).

Table 2 shows that, if an assembler wanted to import localized components up until 2005, they would pay import duty of 50% of the imported price, whereas if the component was not localized, they would pay 32.5% import duty. Over time, until 2012, these tariff rates would gradually come down. The aim of these tariffs was to help develop the local parts

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<sup>3</sup> The market share of Pak Suzuki has increased by almost 12% over the seven-year period from 2001 to 2008, and it is the market leader in Pakistan – over 60% market share in 2008. Indus Motors, the makers of Toyota vehicles in Pakistan, has seen its market share increase by 7% over the same period. Honda Atlas has the lowest market share of the three and has seen its share decline by around 10% since 2001.

suppliers market segment and to facilitate technology transfer from the assemblers to the local suppliers. The AIDP offers encouragement and strategic direction to the industry. Instead of local content regulations, the TBS promotes the development of technologies and the sourcing of components locally on the basis of competitive prices and quality. However, it is important to assess the impact of these policies on the learning capabilities of the local suppliers, to find out whether they have actually helped the local suppliers and thus determine whether further policy interventions are needed from the government and industry decision-makers.

*Insert Table 1 and Table 2 about here*

### **3.1.3 Research Method**

#### ***3.1.4 Data Collection***

This is an exploratory study to investigate the role of the industrial policy and NSI in the development of learning capabilities in the emerging economy. This research is based on a qualitative interviews methodology. We adopted purposive sampling technique to select the suppliers for this study. The initial list of the suppliers was obtained through the Pakistan Association of Automotive Parts and Accessories Manufacturers (PAAPAM), and Ministry of Industries and Production (MOI&P). All the local suppliers that supply parts directly to the assemblers are members of PAAPAM. We conducted semi-structured interviews with 50 local suppliers, the three assemblers, and policy makers from Pakistan's Ministry of Industries and Production. Along with the aforementioned interviews, we also collected data through follow-up emails and phone calls to clarify details related to the role of industrial policy and suppliers' capability development, and used secondary sources, such as leading Pakistani newspapers, Pakistani auto industry-related magazines and conversations with industry professionals. We adopted a pre-designed interview protocol and guide, but we kept

this guide flexible and more questions were added during the interviews. For example, we asked questions related to the types of knowledge/technology being transferred from the three assemblers to the local suppliers, the mechanisms of such transfer, the capabilities the local suppliers have developed through such interactions, types of parts suppliers supplying to the three assemblers, the role of the industrial policies on suppliers capability development, financial assistance the suppliers receive from the government for R&D and new product development, their interactions with the local institutions, type of support and staff training the suppliers receive from the government led training centers, any joint projects the suppliers were doing with R&D centers and local universities, and internship programs they have with the local universities. We also provided relevant research-related information to all participants. Through this approach, we were able to obtain rich contextual data. Our purposive sampling and data triangulation help to improve the confirmability, credibility, and dependability of our findings (Sinkovics et al. 2008).

### ***3.1.5 Data Analysis***

The interview data were coded and analyzed according to the suggestions of prior qualitative studies (Eisenhardt and Graebner 2007; Eisenhardt 1989; Miles and Huberman 1994). This process consisted of identifying major themes and categories in the individual interviews (Marschan-Piekkari and Welch 2004). We applied cross- and within-case analyses, keeping in mind the suggestions of Eisenhardt (1989) and Miles and Huberman (1994). We constructed our analysis keeping in view the above conceptual underpinnings of this study. As the purpose of the current research is not a theory-testing, but inductive exploration of phenomena in an under-studied context, this process helped us to identify similarities and differences within and across our cases. This flexible coding and labeling of the data continued until we developed an analytical template that we were confident of, which we

tailored through repetition of the coding process. However, we also remained open to the development of additional templates, being cautious about data condensation as well as non-categorized data organization during the analysis stage (Miles and Huberman 1994; Spencer et al. 2004).

## **4. Findings**

Based on the above conceptual underpinnings, we present the key findings that emerge from the data as below.

### ***4.1 Industrial Policy and Local Suppliers' Capability Development***

The data indicate that the automotive industry policy has helped to develop a supplier base and has resulted in incremental innovations in the low- to medium-technology components segments. However, the policy has resulted in no further investment or localization of components, particularly complex technological components, such as power steering, engines and transmission, and no exploratory innovations have taken place in relation to the higher value-added components. The Deputy Managing Director of one of the leading suppliers suggested:

*“The automotive policies have helped only at the lower, low complexity tier parts and have not improved the suppliers’ capacities in higher value-added parts, because the soft element of the automotive policy, such as providing training, establishing auto industry-related institutions and R&D funds for upgrading the products, have not been implemented in good faith and from time to time it [policy] lacks strict monitoring” [Supplier firm 33]*

This quote highlights the importance of both hard and soft elements of industrial policies for the development of innovative capabilities of local firms. These findings are consistent with previous studies indicating the important role of local institutions for industrial development (Lazzarini, 2015).

The data also suggest that the localization-related policies of the 1980s led to the progressive sourcing of parts locally and that this has had a positive impact on the development of local suppliers and import substitutions. The President of one of the parts suppliers commented:

*“The local automotive industry exists today because of the local content requirement policy in place until 2005. Our industry has suffered considerably after doing away with the local content requirement under the WTO (TRIMS), because local suppliers were not well prepared to design complex parts and the government support is also limited when it comes to developing and promoting small enterprises’ training needs through industry-specific training centers.”*

[Supplier firm 15]

The results seem to indicate that local firms lacked innovative capabilities to design complex parts and to compete effectively with the market leaders during the post liberalization phase, thus highlighting the important role of local government supports in preparing local firms to design innovative products and compete effectively at the post liberalization phase.

The findings suggest that there is no legal implementation of government policies, and the auto assemblers pressurize the government to give them concessions on imported parts. The suppliers’ managers also pointed out that the government has not diligently followed the



local content level and has not put pressure on the assemblers to transfer the advanced parts technology to the local component suppliers. Between 1994 and 2000, various policies were in place but their enforcement was flawed. The CEO of one of the leading components suppliers stated:

*“I believe government policies play a major role...the problem with our government policies is that they are very weak and no enforcement mechanisms are in place”* [Supplier firm 3]

These findings highlight the important role of government in providing not only incentives to local firms to develop their capabilities, but also the implementation of the industrial policies is the key for the development of such capabilities. For example, scholars have documented the important role of South African automotive policy in integrating the auto suppliers into the global value chains (Barnes and Morris 2008; Lorentzen 2005). Similarly our interviews with the assemblers also suggested that policy issues were the main hurdle that had led to the slow rate of innovation in different components segments. One of our interviewees pointed out:

*“the Auto Industry Development Program (AIDP) is important and necessary. Its implementation is overdue and, from time to time, we need amendments in the AIDP in order to make the technology transfer and innovations in different parts segments more effective.”* [Assembler 1]

Taken together these findings indicate that industrial policy has not been helpful for the local suppliers to develop a range of capabilities especially in the advanced engineering components segments.

#### ***4.2 NSI and Local Suppliers' Capability Development***

The findings indicate that local institutional support is limited when it comes to developing exploratory innovations. The suppliers' managers expressed the view that doing so would require them to take risks, and to do this they would need to have strong support from local institutions and the assemblers. The data suggest that there are several other issues related to this, such as the complex nature of the technology, the assemblers' readiness, and the suppliers' capabilities. Close ties, mutual trust, individual suppliers' willingness to learn and keep investing in human capital and strong local institutional linkages are the key ingredients needed in order for component suppliers to develop these sorts of capabilities. One of the suppliers' managers stated:

*“We would love to explore new markets. I know that China, India and even Latin America offer good pay back, and these markets are the automotive supply hubs, but we would need more complex technology and the readiness and capability of our assemblers is important, as without their willingness we cannot acquire the know-how to develop new parts with which to serve international markets. There are no linkages with our local R&D institutions, and I do not think - on the basis of this - we can even think about serving China and India, which are becoming lucrative auto supply markets.” [Supplier firm 10]*

These findings support the view of scholars, noting that institutional support is important for local firms to develop absorptive capability (Lorentzen and Barnes 2004; Lorentzen 2005; Criscuolo and Narula 2008). The suppliers' managers also mentioned that they have not developed the design and manufacturing capabilities for developing complex components, because the assemblers are mainly interested in sourcing standards low-complexity components from the local suppliers. Beside this, there is also a limited support coming from the NSI to the local suppliers and on these basis, the suppliers have been unable to develop the exploratory learning capabilities. One of the suppliers' manager expressed these concerns in a following manner:

*“We have not mastered the design or manufacture of new complex parts because the assemblers are only interested in standard parts and, for these parts, we only need basic capabilities. The assemblers have not transferred design know-how and the help from local institutions is also very weak. We need the support of all these actors to develop the capacity [to design] and then we will be in a position to develop high-precision parts for the foreign markets as well. I believe that personal associations with assemblers and their top suppliers and training institutes would be helpful for developing advanced capabilities.”* [Supplier firm 23]

The assemblers' managers also pointed out that, due to the lack of NSI related to the automotive industry and the lack of highly skilled manpower, they found it difficult to transfer know-how related to advanced-manufacturing design. One of the assemblers stated:

*“The government of Pakistan has not focused on developing research and development facilities and auto industry-related training centers which would provide help to the local suppliers to develop their design performance and capacities.” [Assembler 3]*

This quote highlights the important role of local institutions for the development of learning capabilities of firms, as weak institutional infrastructure will hinder the development of local firms absorptive capacity (Cohen and Levinthal 1990; Lorentzen 2005). The suppliers’ managers further indicated that the auto assemblers were only interested in procuring standard (low- to medium-tech parts) and labor-intensive parts from them, and that for the labor-intensive parts they were willing to transfer technology, explaining why a wide range of capabilities had been developed among the local suppliers in relation to medium- high complexity parts.

The findings also suggest that Pakistan’s education system is not producing well-trained and properly educated engineers. They also pointed that few universities in Pakistan offer automotive engineering courses, and that university graduates lack much-needed project management and manufacturing skills. There is also a lack of interaction between the industry and the universities, which is a big hurdle to developing the skills required in order to move up in advanced- components design value chain. The suppliers’ managers also noted that there is no coherent innovation policy and the government should focus on developing and implementing a sound innovation policy.

The data also suggest that the suppliers believe that innovation institutions such as local R&D institutes and Centers of Excellence could form an important network of partners giving them access to technology and the opportunity to develop the absorptive capacity of their staff but that, so far, the government has not established the right institutions to achieve this.

These views seem to support the work of scholars that have emphasized that innovation is an interactive process, and are also closely related to the triple-helix approach on innovation (Etzkowitz and Leydesdorff 2000). Thus, inter-collaborations with public research institutions and universities are also important for the development of learning capabilities of the local suppliers. One of our respondents put it as follows:

*“Local R&D centers and universities could be beneficial for us in terms of locating the key technology and sources of knowledge to move up into complex components but, unfortunately, in our country, local institutions and the private sector do not view each other as key partners...our universities do not even consult with us when designing their courses, so there is very little we can get from our institutions in terms of skills development for our staff.”* [Supplier firm 7]

This quote lends support to the extant research acknowledging the important role of public research and universities in promoting local innovation and economic development (Boucher et al. 2003; Etzkowitz and Leydesdorff 2000; Arundel and Geuna 2004). Overall, the findings demonstrate that the suppliers are mainly designing and developing only low-to medium-complexity parts, and the support they receive from local institutions is very limited in terms of helping them to develop exploratory innovative capabilities for technological breakthrough innovation.

## **5. Discussion and Conclusion**

Extant research notes a positive role of the industrial policies in promoting economic development and local industries (Bell et al. 1984; Amsden 2001; Chang 1993; Chu 2011;

Wade 1990). Despite this, existing literature on this topic has not fully explored the role of national industrial policy on MNEs market presence and local firms' learning capability development in late liberalizing emerging economies. Above all, very few studies have investigated the role of industrial policies by adopting detailed, industry-level and firm level analysis (Thun 2006). In this paper, we investigated the role of the industrial policy and national systems of innovation on local firms' learning capability development in the context of the Pakistani automotive parts suppliers.

The findings indicate that the automotive policy in Pakistan has been helpful in developing a local industry in low- to medium-complexity parts through '*local content requirements*'. However, the post-liberalization industrial policy has not helped the local suppliers to engage in exploratory learning that might help them to develop breakthrough innovative capabilities such as design and engineering capabilities for producing higher-value-added components such as transmission and engine parts. From the emerging economy firm's perspective, the above problems are owing to the government failure on the development, institutional enforcement, and implementation of proper industrial policies conducive for the development of exploratory learning capabilities of local parts suppliers in Pakistan. The results also indicate that government-run training and support institutions are needed to help develop advanced learning capabilities among the local suppliers, but that they lack legal implementation and currently provide very limited support. As such, local institutional support is important for the development of broad base technological capabilities (Dutrénit 2007; Lall 2000; Choung et al. 2014; Cimoli et al. 2009; Dodgson 2009).

The institutional entrenchment process positions local firms in a strategic position to pave the way, through linkages with a particular training/R&D institution, for connections to other training provider institutions. This helps local firms to access a range of such resources. This institutional entrenchment process is a key ingredient for the development of exploratory

learning capabilities among local firms (Lall 2000; Cimoli et al. 2009). Previous research has indicated that involvement in NSI is important for innovation because it is an interactive process among institutional actors (Jackson and Deeg 2008; Morgan et al. 2010; Lundvall 1992; Amsden 2001; Moran et al. 2005). Our findings also support the view that, along with industrial policies, national and provincial institutions and coherent innovation policies are important factors in helping emerging economy suppliers to move up the value chain and develop their exploratory learning capabilities.

Consistent with the existing literature on developing economies (e.g., Amsden 2001; Chang 1993), we find that Pakistan's national industrial policy has helped to create a market presence in the form of a local supply base and employment, through Japanese MNEs' FDI. Despite a positive influence of such policy on the industry development, our results suggest that the transferred technology and local content policy have only helped Pakistani suppliers to develop exploitative capabilities.

Regarding NSI, national-provincial training and R&D institutions (e.g. Skills Development Council) should be antecedents to the development of exploratory learning capabilities among local firms, and the local firms must also be closely tied to both the MNEs they supply and these local institutions. However, our findings indicate that networking with MNEs combined with weak training and R&D institutions in the local environment are insufficient for the development of such capabilities (Lorentzen 2005). An institutional entrenchment process, that is local firms' deeply embedded connections with the local training and R&D institutions, would shelter the local firms from the low-capability trap. Such a process would put the local suppliers in a position to train their employees and absorb the advanced knowledge needed to engage in exploratory innovation. This is consistent with the work of institution-based view (Hall and Soskice 2001; Meyer et al. 2009; Meyer and Peng 2005; Hoskisson et al. 2000). This view argues that institutions provide more than just

background conditions but in fact establish a key basis for local firms' activities and the achievement of their competitive advantage as institutions constrains economic and technological actors. Our findings coincide with the recent research emphasizing the notion that emerging and developing economy firms could gain new knowledge from close interaction with MNEs and by participating in R&D programs at local research universities and training centers, but that their local organizational and institutional environments may be too weak to offer relevant resources and information (Giuliani et al. 2005; Moran et al. 2005).

Based on the above, we infer that the absence of strong industrial policy hinders the development of emerging economy firms' learning capabilities and the utilization of the knowledge transfer from MNEs to the local firms. This is in line with the view of McDermott et al. (2009) in that institutionally entrenched local firms are in a better position to develop new and diverse learning capabilities for innovation. Thus, strong foundations of NSI and institutional support will promote the development of innovation and learning capabilities of the local firms in emerging economies.

In the context of this study, we further note that an institutional entrenchment process between local firms and national-provincial institutions providing and supporting learning and upgrading among local firms would be a key factor for the development of exploratory learning capabilities. In addition, networking with MNEs is helpful for the local firms based in the emerging economy to develop incremental innovation related capability. However, as the industry evolves, industrial policy alone is not sufficient to ensure that exploratory learning take place, thus networking by the local firms with foreign MNEs of which willingness to transfer advanced technological knowledge to local firms will contribute to the achievement of both types of learning. Overall, we suggest that a key element of industrial policy in developing and emerging economies should be the introduction and implementation



of policies that strengthen national-provincial innovation systems and the development of closer linkages between these institutions and the local firms.

### ***5.1 Implications for Research***

Our theoretical contributions are threefold. First, our conceptually integrative approach contributes to the industrial policy literature (Lazzarini 2015). It makes important contributions to the understanding of the role industrial policy plays in local suppliers' exploratory innovative capability development. It also brings the literature on industrial policy and NSI together by highlighting the importance of public-private institutions for the development of local suppliers' innovative capabilities. Also, our analysis complements the perspective of scholars who suggest taking an institution-based view of international business strategy (Meyer and Peng 2005). From this view on FDI, capability-constrained local firms in emerging markets such as Pakistani suppliers may overcome institutional constraints (*e.g.*, weak training supports from governments and weak ties with public R&D labs) through institutional outsourcing such as FDI (Dodgson 2009). However, only foreign MNEs presence *per se* may not suffice to enhance exploratory learning capabilities of local firms because MNEs may continue to source advanced and critical parts from their established global network suppliers. Arguably the industrial policy of government in emerging and developing economies needs to intervene in the development of NSIs for those constrained local firms in order to develop their innovative capabilities (Chang 2002; Jackson and Deeg 2008). In this vein, our findings based on automotive parts suppliers in Pakistan offer important insights that could be applied to other emerging and developing economies whose institutions are in a state of flux.

Second, our findings have important implications for organizational learning theory, as current research suggests that being ambidextrous is desirable if a firm wishes to build

competitive advantage in terms of building both exploratory and exploitative learning capabilities (Ahuja and Morris Lampert 2001; Colbert 2004; Gibson and Birkinshaw 2004; He and Wong 2004; Levinthal and March 1993). Levinthal and March (1993, p.105) suggest that long-term survival and success depend on an organization's ability to "*engage in enough exploitation to ensure the organization's current viability and to engage in enough exploration to ensure future viability*". Third, this paper extends the extant literature that has mainly highlighted R&D intensity as a proxy for firm-level learning capability (Cohen and Levinthal 1990). We find that such capability is not only a firm-level construct, but also associated with other actors such as local institutions, and foreign MNEs in the emerging economy. Thus, our study provides useful evidence by investigating learning capability development at the (inter)firm level and shows that industrial policy should be viewed in a broader institutional context.

### ***5.2 Implications for Policy Makers and Business Managers***

The following recommendations are made to the policy makers: First, it is important for an emerging economy government to create linkages with MNEs which have abundant advanced knowledge sources, thereby creating knowledge spillovers and developing learning capability for local firms. However, to enable local suppliers to develop exploratory innovative capabilities for breakthrough innovation, and further move up to the higher value-added technology segments, it is recommended that their technological capabilities should be developed through public-private collaborations. For this purpose, government-run centers should be given greater incentives to collaborate with local suppliers. Second, the government should set up a 'self-organizing industry investment board' (Romer 1993) as part of its industrial policy. Its purpose would be to provide useful inputs for the setting up of an industry-specific R&D laboratory for the industry or other specific public-private institutions

aimed at local suppliers' capability development. Third, the suppliers' traditional knowledge bases should be extended and organized in accordance with modern scientific expertise, by placing specialists, preferably from higher academic institutions, at suppliers' sites for periods of one to two years to allow close interaction between academics and suppliers. This measure would also facilitate more links between universities and industry. Fourth, the various government-run training and R&D centers should be brought under a single set-up. To achieve this, a new organization, namely, a technology transfer agency would be required to handle matters related to technology transfer and suppliers' capability development. Such an organization could assess the technology transfer and development work already being done by existing government-run training and development centers. Thus, the role of the government should be to help these training centers to acquire modern industry-specific machinery and to put in place laws to encourage close co-ordination between these centers and the local component suppliers. Finally, as part of the industrial policy, national-provincial institutions related to the automotive industry should be set up to assist in suppliers' capability development and upgrading.

We also recommend that managers in charge of developing firms' innovative capabilities consider the following: First, they need to put more emphasis on in-house R&D and training programs aimed at developing absorptive capacity at the firm level. Second, they need to emphasize the importance and benefits of having linkages to local institutions and these linkages should be encouraged and sought with the help of the government. Specifically, joint training and R&D programs should be developed with local R&D institutions through the support of public-private partnerships.

### ***5.3 Limitations & Future Research***

Like all studies, this research has some limitations, which can be thought of as promising avenues for future studies on the effect of industrial policy and national systems of innovation on local firms' innovative capability development. First, we did not link the overall evolution of a range of capability development path with the introduction of pre and post liberalization industrial policies. It would be important for future studies to do a processual study and capture various types of capabilities development along with the introduction of industrial policies. Second, we interviewed only those suppliers that supply parts directly to the assemblers, therefore, it would be useful to include a lower-tier suppliers in order to better assess the effect the industrial policy and local institutions have further down the supply chain. Third, this study is also limited by its research setting of a single industry and country context. Future research may need to extend these findings to other industries, and cross-country studies on the automotive industry could also provide useful insights for corroboration purposes. Finally, more work is needed in order to understand the role industrial policy plays in local firms' innovative capability development in different contexts.

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## Tables and Figures

**Table 1.** Three Assemblers Annual Plant Capacity

Company	2005	2006	2007	2008	2009	2010
Atlas Honda	30,000	50,000	50,000	50,000	50,000	50,000
Indus Motor (Toyota)	44,298	53,040	53,040	53,040	53,040	-
Pak Suzuki Motor	120,000	150,000	150,000	150,000	150,000	150,000

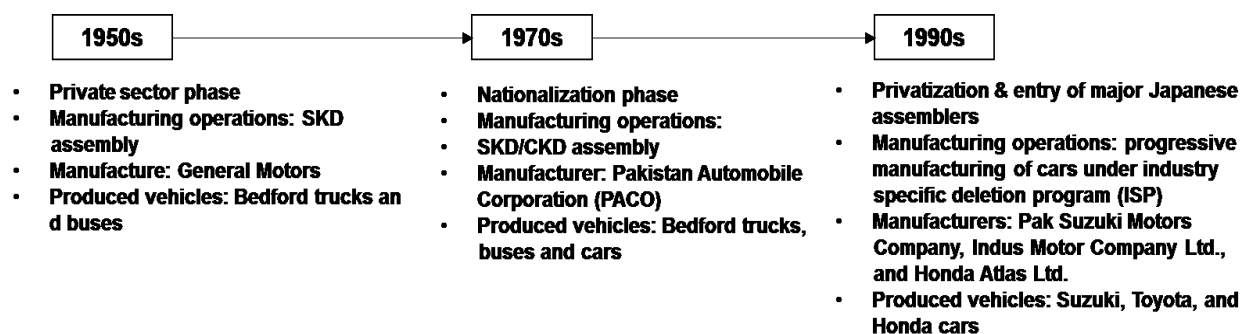
*Source: PAMA*

**Table 2.** Five year tariff rates for the automotive industry of Pakistan - Cars segments

Product category	2007-08	2008-09	2009-10	2010-11	2011-12
<b>CKD</b>					
Localized Components	50%	50%	47.5%	45%	45%
Non-Localized Components	35%	32.5%	32.5%	30%	30%
<b>CBU</b>					
cars 800cc	50%	50%	50%	50%	50%
801-1000cc	55%	55%	55%	55%	55%
1001-1500cc	60%	60%	55%	55%	55%
1501-1800cc	75%	75%	70%	70%	70%
above 1800cc	90%	90%	85%	85%	85%

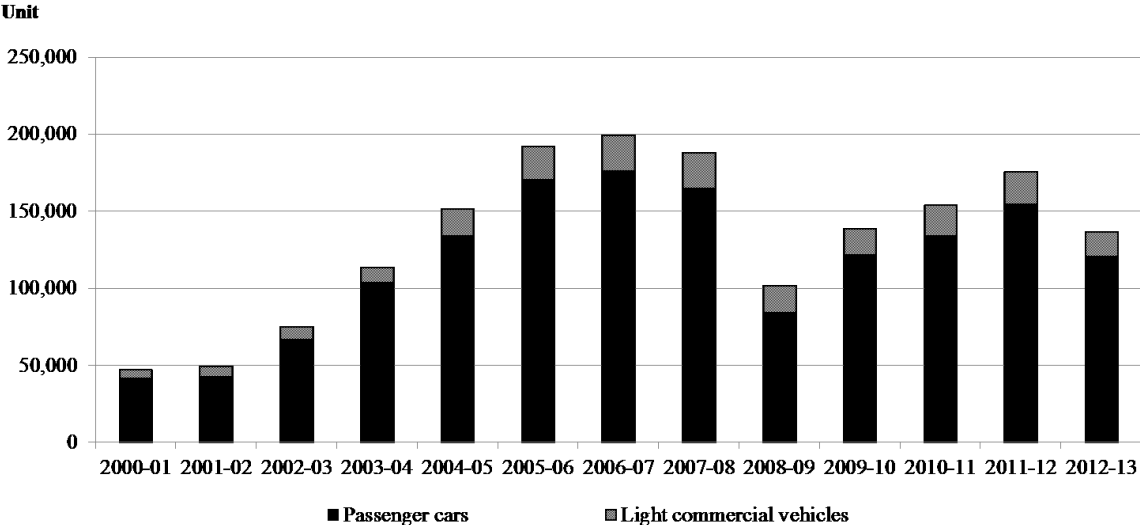
*Source: Engineering Development Board of Pakistan (EDBP)*

**Figure 1.** Various phases and the historical evolution of the Pakistan's automotive industry



*Source: Engineering Development Board of Pakistan*

**Figure 2.** Pakistan vehicle production



*Source: Authors' calculation based on PAMA's production data.*