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The mirage of upgrading local automotive parts suppliers through the creation of vertical linkages with MNEs in developing economies

Zaheer Khan Yong Kyu Lew Rudolf R. Sinkovics

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The mirage of upgrading local automotive parts suppliers through the creation of vertical linkages with MNEs in developing economies

Upgrading
local
automotive
parts suppliers

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Zaheer Khan

Hull University Business School, University of Hull, Hull, UK

Yong Kyu Lew

*Manchester Business School, The University of Manchester,
Manchester, UK, and*

Rudolf R. Sinkovics

*Manchester Business School, The University of Manchester,
Manchester, UK and Lappeenranta University of Technology,
Lappeenranta, Finland*

Abstract

Purpose – This paper aims to explore inter-organizational linkages and the extent of technology transfer and develop propositions related to the linkages, technology transfer and upgrading of local suppliers in developing economies.

Design/methodology/approach – The authors conduct a literature review and 50 exploratory interviews with senior managers and policymakers in the automotive parts industry of Pakistan.

Findings – The data revealed that three major international joint ventures (IJVs) established in the automotive industry of Pakistan have created significant vertical linkages. However, advanced high-level technology transfer has not actually taken place due to the following reasons: IJV parents are reluctant to engage in technology transfer, there is limited support from local government and local suppliers exhibit limited improvement in their innovation capability. The vertical linkage creation and low-medium technology transfer contributes to incremental product upgrading of the local suppliers, rather than their process upgrading and insertion into the global value chain (GVC).

Research limitations/implications – This research looked at technology interactions between IJVs and local tier-1 suppliers (not tier 2 and tier 3) in Pakistan's automotive industry. This paper's illustrative case indicates what is required for local suppliers in developing economies to make breakthrough upgrades of their products and processes through their vertical linkages with foreign-owned indigenous firms.

Originality/value – Unlike prior research, the authors investigate the role of inter-organizational linkages and the extent of technology transfer, and how these affect local suppliers' product/process upgrading in the local value chain. Highlighting the illusion of upgrading in the GVC, this paper reveals the difficulties involved in upgrading suppliers' positions (e.g. insertion and functional upgrading in the GVC) through their vertical linkages with foreign multinational enterprises in developing economies.



The illusion of upgrading sheds a rather disappointing light on the position of developing country supplier *vis-à-vis* their powerful international partners.

Keywords Technology transfer, Developing economy, International joint ventures, Upgrading, Vertical linkages

Paper type Research paper

Introduction

What are the prospects of locally owned suppliers operating in developing economies to upgrade? How does being part of the supply chain of multinational enterprises (MNEs) facilitates the upgrading process for these suppliers? These questions are critically important in the context of developing economies, as MNEs spread their value chain activities to these economies and local firms start to benefit from MNEs' advanced technologies. The extant literature on foreign direct investment (FDI) in international business and strategy has primarily focused on the motivations for and consequences of MNEs' overseas investment (Buckley and Casson, 1976; Cantwell, 1989; Caves, 1996; Kogut and Chang, 1991; Martin and Salomon, 2003). In the field of international economics, scholars have primarily been interested in the impact of inward FDI on the productivity of local firms and on the economic development of the host country. One stream of research documents a positive effect of this investment on host country firms in the form of knowledge spillovers (Haskel *et al.*, 2007; Keller and Yeaple, 2009).

Another stream of research notes a negative impact of inward FDI on the development of the host country's economy and local firms' productivity (Aitken and Harrison, 1999; Haddad and Harrison, 1993; Konings, 2001; Yamin and Sinkovics, 2009). One of the important negative implications suggested by these studies is the "crowding out and market stealing" effect of FDI on host country firms by offering superior product and taking away skilled labor from local firms (Aitken and Harrison, 1999; Altomonte and Pennings, 2009; Feinberg and Majumdar, 2001; Kokko, 1996; Spencer, 2008). This crowding out and market-stealing effect puts pressure on the local firms to reduce their productivity, thus raising their operation and production costs with less capital to invest in new technologies (Aitken and Harrison, 1999; Altomonte and Pennings, 2009; Konings, 2001). The negative effects may further hinder the local entrepreneurship growth, value creation and innovation performance of local firms (Cheung and Lin, 2004; De Backer and Sleuwagen, 2003).

Setting aside the above arguments, other scholars from the fields of international business to economics have shared one aspect in common, that is, a potential for positive spillovers to take place from inward FDI to host country firms (Caves, 1974; Kearns and Ruane, 2001). A number of other studies have examined FDI-induced knowledge transfer to host country firms through either direct or indirect channels. The knowledge transfer can take place from MNEs' parents to their overseas subsidiaries (Hobday and Rush, 2007) or to local suppliers that are part of the local supply chain dealing with MNEs (Blalock and Gertler, 2008; Haskel *et al.*, 2007; Keller and Yeaple, 2009; Smarzynska Javorcik, 2004). Thus, policymakers in developing economies treat attracting inward FDIs as a priority on the basis of the belief that MNEs' investments in host developing countries will deliver tangible economic benefits.

From an industrial development perspective, the entry of MNEs contributes to the development of underdeveloped supply chains in host developing countries through MNEs' sourcing behaviors. Recent literature shows that the entry of MNEs is beneficial

for the local suppliers in developing economies, as transferring technology to local suppliers is in the interests of the MNEs, and the MNEs create vertical linkages and improve the productivity of local suppliers (Blalock, 2001; Blalock and Gertler, 2008). However, one aspect that still needs a better understanding is how MNEs may influence the development of local firms through their local sourcing behaviors in particular (Moran, 2005; Smarzynska Javorcik, 2004). The entry of MNEs can affect technology transfer in a host country through two channels: the generation of vertical (i.e. backward and forward) and horizontal linkages (Meyer, 2004).

In the development economics literature, academics study the upgrading prospects of local actors through their dealings with flagships MNEs, under a global value chain (GVC) arrangement (Ernst and Kim, 2002b; Gereffi, 1999; Humphrey and Schmitz, 2004a). Within this body of literature, one approach points toward the positive benefits of participation in the GVC. For instance, a number of scholars point out that, once local suppliers deal with flagship MNEs, they improve their capability levels and the MNEs will then transfer more sophisticated knowledge and processes to these local suppliers (Ernst and Kim, 2002b; Gereffi, 1999; Schmitz, 2004). Similarly, Humphrey and Schmitz (2004a, p. 356) state:

Local producers learn a great deal from global buyers about how to improve their production processes, attain consistency and high quality, and increase their speed of response to customer orders. This upgrading effect is particularly significant for local producers new to the global market.

However, other scholars point at the challenges for local firms of upgrading through GVC linkages and evaluate these in a rather negative manner. For example, Giuliani *et al.* (2005) note significant differences in the upgrading of local firms in Latin America, notably explained by the type of value chain governance. Giuliani *et al.* (2005, p. 566) state:

[...] in quasi hierarchical value chains, the pressure to comply with the standards imposed by the chains leaders often enhances product and process upgrading, but functional upgrading is almost always inhibited.

In a similar vein, Scott-Kennel (2007) reports rather negative effects on the local economy of linkages made through MNEs' FDI, in that only a few of the affiliates studied had actually created collaborative linkages with the local suppliers. More specifically, studies conducted within the automotive industry show that due to their extensive use of standardized parts within modular types of value chains, MNEs offer limited upgrading opportunities for local suppliers (Giuliani and Bell, 2005). Pavlínek and Ženka (2011) share this view in their research on the automotive industry in the Central and Eastern (CE) Europe. Pavlínek and Ženka (2011, p. 560) note:

While the overall automotive production in CE has increased, it is less clear to what extent these developments have affected the overall position of CE-based automotive manufacturers (both foreign-owned and domestic-owned) in the European automotive value chain.

Particularly, only few studies have examined international joint ventures (IJVs) in emerging economies or the pattern of their linkages in host countries (Ivarsson and Alvstam, 2005; UNCTAD, 2001). To this end, existing research offers a somewhat limited understanding of the mechanisms through which linkages promote upgrading of local firms (McDermott and Corredoira, 2009).

In all, the existing international business literature is still uncertain about kinds of technology transfer from MNEs that influence local suppliers' product/process/functional upgrading in value chains. To this end, this paper has two objectives. First, it explores the nature of inter-organizational linkages and the extent of technology transfer through an illustrative study in the context of the automotive industry in Pakistan. Second, it develops propositions, focusing on the relationship between the technology transfer that occurs through linkages between MNEs and local suppliers, and the suppliers' actual upgrading in the value chain.

The rest of the paper is organized as follows. The next section discusses the conceptual background. In particular, it explains the concepts of linkages, technology knowledge transfer and upgrading from the innovation perspective. The following sections present our research approach and an illustration of the automotive industry in Pakistan. After this, we develop two propositions that highlight the illusion of local suppliers' upgrading in developing economies. The final section concludes.

Conceptual background

Linkages and technology knowledge transfer

In this paper, we decidedly view inter-organization linkages as "inter-firm transactions that go beyond arm's length, one-off transactions and involve longer-term collaborations between the parties" (Hansen *et al.*, 2009, p. 122). In other words, we distinguish between linkages (i.e. a kind of broad transactional form) and knowledge transfer actually taking place between heterogeneous firms. For instance, the business exchange relationship between foreign-owned MNEs (e.g. assemblers) and their local suppliers (e.g. components or parts firms) is one example of inter-organizational linkages, and these firms can transfer or exchange technological knowledge through the linkages. From the knowledge-based view of the firm, scholars posit that the most important strategic resource is knowledge and investigate the role of knowledge in achieving sustainable competitive advantage of the firm (Grant, 1996; Kogut and Zander, 1996; Liebeskind, 1996; Nahapiet and Ghoshal, 1998; Spender, 1996). Here, knowledge is different from information in that:

[...] information is a flow of messages, while knowledge is created by that very flow of information, anchored in the beliefs and commitment of its holder. Knowledge is essentially related to human action (Nonaka and Takeuchi, 1995, pp. 58-59).

From this perspective, knowledge can broadly be classified into two types: explicit and tacit knowledge. Explicit knowledge can be codified and put into manuals or expressed in symbols, whereas tacit knowledge is difficult to transfer due to its complex and implicit nature. Accordingly, Polanyi (1962, p. 4) states, "we can know more than we can tell".

The tacit and explicit categorization of knowledge has implications for the technology transfer from MNEs to local suppliers in the developing economy context, as explicit technologies are more easily codifiable and transferrable than tacit and complex ones. For this reason, the technological knowledge of MNEs can be specified and documented in the form of manuals for example, whereas social interactions are required to transfer tacit and complex knowledge (Gupta and Govindarajan, 2000; Kogut and Zander, 1993; Noorderhaven and Harzing, 2009). Both explicit and tacit knowledge are embodied in certain types of technology. According to the

knowledge-based view, technological knowledge is transferable at the inter- and intra-firm levels, and valuable knowledge contributes to firms' innovation capabilities and gives them a competitive advantage (Benner and Tushman, 2003; Grant, 1996; Nonaka *et al.*, 2000). Particularly, in tech-intensive industries, such as the automotive industry, combining and utilizing previously existing knowledge is important for generating both incremental and radical innovation, as knowledge improves firms' exploitative and exploratory learning capabilities (Kumaraswamy *et al.*, 2012; March, 1991). Therefore, through existing and newly created linkages in developing economies, both explicit and tacit knowledge can be transferred from MNEs to local firms with which they collaborate. This raises transferring mechanism issues, such as how and to what extent knowledge is transferred from firm A to firm B. For example, these transferring mechanisms could be the recipient's technology staff training, socialization events, transfer of key staff members from the sender of knowledge to the recipient, presentations, etc. With respect to this, identifying the relationships between technological knowledge senders and recipients is imperative for firms from emerging economies (Ivarsson and Alvstam, 2005). These relationships can be well examined by drawing on value chain perspectives.

GVC and upgrading

The GVC approach and upgrading through GVCs have gained increasing attention in the development economics literature due to their plausible perspectives about the upgrading of local firms and their insertion into the GVC (Gereffi, 1999; Gereffi *et al.*, 2001; Gereffi and Korzeniewicz, 1994; Giuliani *et al.*, 2005). Through the GVC, MNEs are dispersing their value chain activities across the globe, and coordinating and controlling their affiliates and suppliers by transferring of technical and managerial knowledge to them. Knowledge transfer under this arrangement enables local affiliates and suppliers to meet the quality standards of the MNEs and lower their production costs. Once the local firms have improved their capability levels, arguably the MNEs will then transfer more sophisticated knowledge and processes to these local suppliers (Ernst and Kim, 2002a; Gereffi, 1999; Schmitz, 2004). This line of research highlights how the asymmetrical structure of the GVC (e.g. the relationship between powerful buyers/assemblers and less powerful suppliers) shapes the opportunities for the participating firms' value creation and capture within the value chain arrangement (Henderson *et al.*, 2002). Through the coordination and control of value chains, global flagship MNEs provide local producers or suppliers with the opportunities to improve their position in the value chain (Humphrey and Schmitz, 2002). These studies also incorporate the local firms' absorptive capacity, which is the ability to recognize the value of external knowledge and assimilate it for their own production-related uses (Cohen and Levinthal, 1990; Ernst and Kim, 2002b; Schmitz, 2004). Some studies report that local firms supplying MNEs experience positive product, process and functional upgrading (Gereffi *et al.*, 2005; Humphrey and Schmitz, 2004a; Schmitz, 2006). For instance, Humphrey and Schmitz (2004a, p. 356) state:

Local producers learn a great deal from global buyers about how to improve their production processes, attain consistency and high quality, and increase their speed of response to customer orders. This upgrading effect is particularly significant for local producers new to the global market.

Local firms' technological learning and upgrading through MNEs have the double character of the GVCs. On the one hand, the flagship firms limit, subordinate and

frequently exclude the participation of local firms, preventing them from moving up the value chain. On the other hand, they facilitate local firms' access to global markets and the acquisition of technical and managerial knowledge, which can improve the local firms' positions within value chains. Furthermore, the local institutional environment in which the MNEs operate defines the scope for the local interactions of the MNEs, whether that is interacting with the existing firms and institutions or stimulating the creation of new social and economic networks in the place (Henderson *et al.*, 2002; North, 1990; Peng *et al.*, 2008).

In the context of developing economies, MNEs generate heterogeneous spillover effects, depending not only on firm-specific efforts but also on the local environment in which the firms operate. The local environment is largely shaped by the type of governance in the value chains, the manner of learning and innovation patterns and the local institutional arrangements. With regard to this, Giuliani *et al.* (2005) argue that local firms in developing economies can benefit from quasi-hierarchical value chains by such activities as product and process upgrading, as the local firms tend to follow the high standards of lead firms. However, these local firms may have difficulties in upgrading their value chain positions through their involvement in vertical linkages with MNEs (Giuliani *et al.*, 2005; Scott-Kennel, 2007). Therefore, it is necessary to investigate how and to what extent local firms in developing economies gain benefits such as product, process and functional upgrading from MNEs' technology transfers to the host country firms. In this paper, we define upgrading as the firm's ability to move up in the value chain, by designing and introducing advanced product lines, superior technological processes and logistics systems and by elevating to become a system and advanced design suppliers (Humphrey and Schmitz, 2002; Mudambi, 2008). Table I gives a clarification of upgrading from the product, process, insertion and functional perspectives.

Research methods

As for the research context, the automotive industry in Pakistan is an interesting one, as the industry is dominated by Japanese MNEs (i.e. Toyota, Honda and Suzuki) through their substantial inward FDI in 1990s. The foreign-owned IJVs almost monopolize the market and thousands of local components suppliers, directly and indirectly, work with

Upgrading	Incremental	Breakthrough
Product upgrading	Product quality enhancement, improvement of existing products	Innovative components, new to the market or firm
Process upgrading	Improvement of existing production systems, logistics and engineering processes	Introducing advanced new production systems, logistics and engineering processes
Functional upgrading in local value chains	Move from tier-3 to tier-2 to tier – supplier position in local value chains	
Insertion into GVCs	Entering GVC supplier position from tier-1 supplier positions in local value chains	
Functional upgrading in GVCs	Moving from tier-2 to global tier-1 position in GVCs	

Table I.
Types of upgrading

them[1]. For this reason, this industry is a suitable developing economy context for investigating vertical linkages and technology transfer and their relationships with the upgrading of local suppliers.

We used purposive sampling for our research. First, we contacted the Pakistan Association of Automotive Parts and Accessories Manufacturers (PAAPAM) and the Ministry of Industries and Production (MIP). Then, we obtained a list of 200 tier-1 local suppliers and three IJV assemblers, and sent them an introductory letter about this research. Particularly, we asked each supplier to provide the names of the main contact persons directly responsible for their supply relations with the three IJV assemblers. We received positive replies from 75 local components suppliers and three IJVs willing to participate in the interviews and managers' contact details. After this, we sent individual managers a personalized letter, emphasizing that their responses would be treated in confidence and would remain anonymous.

In the end, we conducted exploratory interviews with 50 managers from local suppliers, three IJVs and the MIP in Pakistan. Interviewees were senior managers in various positions (e.g. President/CEO, Vice President, Directors, Senior Managers of the firms and the Secretary of the MIP). The interviews helped us understand technology transfer and upgrading in the developing economy context. We open-coded and analyzed the interview data to identify major themes and categories (Nadin and Cassell, 2004). This inductive approach contributed to the development of an illustrative case about how the inter-organizational linkages created between the IJVs and their local suppliers affect the suppliers' upgrading through technology transfers from the MNEs.

Illustration: automotive industry in Pakistan

Pakistan is strategically close to China, India, Afghanistan, Iran and the Middle East. The development of the automotive parts industry through IJV-led linkages and technology transfers offers good prospects for local suppliers to upgrade and form a regional hub for parts manufacturing for the automotive industry. The population of Pakistan was over 187 million as of 2011, making it the sixth largest country, just behind Brazil. World Bank (2012) data show that its gross domestic production (nominal) is USD 211,092 million, slightly behind Ireland (USD 217,275 million) and the Czech Republic (USD 215,215 million). Pakistan enjoys liberal trade with China and has recently signed a trade agreement with India, the first in its history. These circumstances offer opportunities and challenges for Pakistan's automotive industry, and especially for the components parts suppliers to upgrade and become part of increasingly powerful MNE network in the region.

Brief industry background

Pakistan's automotive industry was formed in the 1950s, and has gone through nationalization in the 1970s and liberalization in the 1990s. Local firms view FDI as both a competitor and a source of advanced technologies and managerial knowledge (Meyer and Sinani, 2009). With the benefits in mind, the Government of Pakistan have embarked upon liberalization, de-regulation and privatization programs and have sector-specific policies in place for FDI. The automotive industry offers one of the most representative cases of the role of MNEs in the economic development of Pakistan. Since the 1990s, Pakistan has attracted key Japanese assemblers. Due to low production costs, Pakistan offers a strategic location for these automotive plants. In theory, the industry

also offers a good opportunity for local components' suppliers to benefit from knowledge transfer through their interactions with these automotive assemblers and their global tier-1 suppliers. Furthermore, the industry itself is one of the most important industries in this developing economy in terms of its multiplier effects and strong backward (e.g. materials such as steel, copper, aluminum, plastics, glass, paint and electronics, etc.) and forward (e.g. dealerships, credit and financing, advertising, repair and maintenance, petroleum products, insurance and service parts) linkages. In particular, Japanese MNEs' investments in assembly plants have had a significant impact on local component suppliers in this industry. The industry has technical tie-ups and IJVs with the leading MNEs. The three major IJVs in the industry are between Japanese automotive assemblers, such as Suzuki, Honda, and Toyota, and Pakistani partners. The industry manufactures' products consist of a large number of different components, which requires long supply chains in Pakistan (see Figure 1). The three IJVs established in the auto industry have also played an important role in the development of the auto components sector of Pakistan. The Pakistan's economy benefited through import substitutions, substantial taxes and a pool of trained skilled labor. These benefits were not possible without the investment of the three IJVs operating in the auto industry of Pakistan.

Created linkages, but limited upgrading

The three IJVs have helped in the development of two clusters in Pakistan, one in Lahore and one in Karachi. Moreover, they have created three types of technical linkages with the local components suppliers. First, the local suppliers have contractual/commercial relationships with their assemblers. In this type of linkage, the components suppliers receive very limited technology in the form of documents, and there is limited social interaction between the staff of the components suppliers and the assemblers. The suppliers of this category also pointed out in our interviews that they do not receive any on-going assistance with regard to product development or the improvement of their processes. The technical director of one of the components suppliers said:

We have been stuck in this relationship and this is not going anywhere [...] we feel that our clients (assemblers) are always using their power and negotiating prices with us, but when it comes to providing technological assistance, their (I mean the client's) attitude is not serious enough. If we don't give them the prices of our parts according to their liking, the client tells us that they will go ahead with another supplier. We also feel that our clients are not keeping their word and we have no social links with them, I mean we don't attend each other's social functions.

Second, the local suppliers have calculated linkages. The assemblers appear to be very calculating when it comes to transferring particular technologies to their firms. The

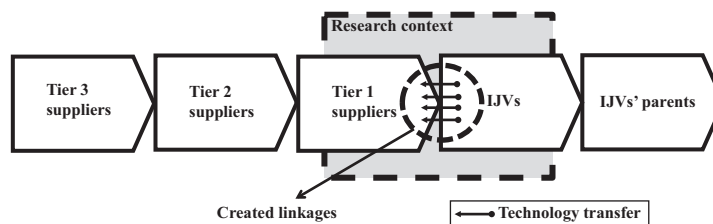


Figure 1.
Simplified local value chain of the automotive industry and research context

managers of some of the components suppliers were of the view that their assemblers only transferred product-related specifications to them but were reluctant to go beyond this transfer relationship. For instance, the components suppliers in the calculated linkages category mentioned having received product specifications and help with improving quality, and, in some cases, they had also received quality control-related training from their automotive assemblers but not more than this. The suppliers in this category said that they had few social ties with the assemblers, and the relationships appear to be based on a low level of trust with their assemblers. Although some suppliers reported having received financial assistance from their assemblers, this appears to have an *ad hoc* nature and depends on the relationship in question. The Vice President of one of the components suppliers said:

Loans and advances depend on a case-to-case basis, but are generally granted as long as the supplier is not habitual and it also depends on the state of the relationship with the master (assembler).

Third, the assemblers have established relational linkages with the suppliers. In this type of linkage, some suppliers reported having good relationships with their assemblers and explained that owner/managerial ties had helped them to receive technology from their assemblers. Suppliers in this category indicated that, because their owners and managers attended social events with their assemblers, they had developed close personal contacts with the Japanese managers. They pointed out that, on the basis of these personal informal contacts, the assemblers viewed them as preferred suppliers and had helped them with product, and in some cases managerial, technology.

Furthermore, it was found that the auto assemblers (IJVs) appear to want to control critical parts of the technology and the technology transfer so that the strategic decision-making remains with their headquarters in Japan. Thus, the Japanese managers' decisions are final and binding on all parties. Our interviews with the assemblers' managers suggested:

We have been transferring the technology for the low-medium tech parts, as [economics] dictates the need for transfer of technology cost benefit ratio and moreover we don't want to disrupt our existing supply chain relationships with our global suppliers.

Complete technology transfer can only be achieved once the volumes of production increase and we see a lot of potential in the [Pakistan's auto] market as compared to other countries markets.

The assemblers' managers also pointed out the issues of lack of absorptive capacity as one of the major obstacles in the transfer of high-tech parts technology to the local Pakistani suppliers. One of the assembler's managers indicated:

Some of our suppliers lack absorption capability for know-how of the critical parts to be transferred and we also decide on the basis of the parts that we want to develop in the local market as compared to getting it from our network [global] suppliers. Our Parent firm keeps this decision whether to start the process of developing a part in the [host] market or keep that part with the existing supplier that may be supplying to our worldwide assembly plants.

The suppliers' managers pointed out that, as the assemblers' strategic decisions are made in their home country, Japan, it is up to them whether or not they transfer any

particular components technology to their local parts suppliers. The suppliers' managers also pointed out that the local government did not provide much support for upgrading. One of the interviewees said:

Pakistan's government did not follow the local content program diligently [...] if there [had been] strong monitoring in place to check the components that assemblers were bringing in [to] the country to assemble cars, we would have been exporting cars from Pakistan with 100 per cent local components. The Pakistan market has become a blessing for the Japanese auto assemblers, which hardly transfer [any] high-tech components technology to us. I mean [for] their local vendors (suppliers) to manufacture parts locally. We (the suppliers) have adequate in-house engineering facilities and [the] technological capability to produce high-tech parts. I can give you the best example of Massey Ferguson (Tractors) UK. They have achieved local content of over 90 per cent of their parts. This shows you that the technological capability exists in the country, but in the case of the auto assemblers, they are intentionally diverting to their principals for the imports of parts and avoiding the local content and development of local suppliers in Pakistan.

The CEO of one of the leading components suppliers also emphasized the role of the host government in developing protective policies for the local components suppliers and promoting high-tech transfers from the MNEs to local firms to facilitate their upgrading:

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 [...] look at the local content policy [...] even now these assemblers are importing parts from Japan when these parts can be made locally [...] and moreover, nobody in the world is willing to transfer technology unless they have to [...].

The components suppliers' managers also suggested lack of support both from the government and the assemblers in developing their capabilities and technology transfer. The suppliers' managers pointed out:

We see a lack of seriousness both from the assemblers operating in our market and the government [...]. Our government want to only facilitate these powerful assemblers by providing them incentives and we have received little help from the government and the assemblers in training our staff and in the transfer of technology [...]. The assemblers only want to manipulate the auto industry policy by getting favorable policies, and they [assemblers] want to import high technology components from their parent country's suppliers instead of developing local suppliers.

The government doesn't provide us any help in securing loans from the banks neither we have received any help in training our employees to improve our processes and products. If our government provides us support for training and hiring of auto consultants, we will be in a position to develop our capabilities.

These concerns from the suppliers were echoed by the Secretary of the Ministry of Industries and Production of Pakistan in a following way:

We are in touch with the car manufacturers to transfer complete technology, and especially the high-tech critical components technology to the domestic [Pakistan] suppliers. Over the period of time we have observed that the present scenario is not only hampering further technological improvements of critical components, but also has resulted in lack of competition in our auto industry. The present state of affairs is being criticized for providing undue protection to the existing car manufacturers, creating an impediment for new investment in the auto industry and creation of a monopolistic situation.

The above quote indicates the important role of the MNEs' willingness to transfer and the host government support in the process of technology transfer and the upgrading of the local firms.

Discussion

Our study was guided by various streams of research, from the extant international business literature to development economics literature, on GVCs and the upgrading of local firms through different types of linkage arrangements. Overall, these literatures offer a positive view of FDI for the development of linkages with local firms and argue that it has the potential to help local firms to upgrade and move up the value chain through these linkages (Ernst and Kim, 2002b; Gereffi *et al.*, 2005; Humphrey and Schmitz, 2004b; Schmitz, 2006).

Our illustrative case of the Pakistani automotive industry shows that inter-organizational linkages have occurred through FDI, particularly in the form of IJVs, to local automotive components suppliers. However, based on our interviews, the actual technology transfer from the IJVs to the suppliers is very limited, consisting only of low and medium technology parts.

Furthermore, there are asymmetric power relationships between the suppliers and the three dominant IJVs that hold them captive. This suggests that the breadth of vertical linkages has contributed to incremental product upgrading. However, limited process and functional upgrading has taken place in the context of this emerging economy. As far as the upgrading prospects of relatively less-capable local suppliers are concerned, the benefit of being part of the quasi-hierarchical value chain is limited to product upgrading, and depends on the nature and quality of the linkages with the Japanese assemblers (Giuliani *et al.*, 2005; Scott-Kennel, 2007). A similar view is shown in McDermott and Corredoira's (2009) Argentinian automotive industry study: the quality of the ties between local parts suppliers and their assemblers is an important influence on whether the suppliers can upgrade their products and processes.

This case further indicates that there is very limited support coming from the local government to promote either a breadth or depth of linkages or upgrading through IJV arrangements. From the depth of vertical linkages perspective, the focus should be placed on the development of good-quality linkages, such as social and learning. From the breadth perspective (e.g. scope and extent of relationships), the focus should be on the improvement of learning opportunities (Giroud and Scott-Kennel, 2009; McDermott and Corredoira, 2009). Partly related to this, we interestingly find that the technology transfer from the IJVs to the local suppliers is calculated. This indicates that calculative relational capital exists in the linkages, based on the perception of the suppliers regarding the IJVs' local business practices (Cullen *et al.*, 2000; Mathieu and Zajac, 1990). Although a large number of extant studies in international business have noted the essentiality of social capital in inter-organizational relationships, it may play a limited role in transferring technology in the context of the vertical linkages between MNEs from advanced economies and local suppliers in developing ones. Although social capital is important in inter-organizational knowledge transfer, we propose that the technology knowledge senders' willingness and the host government's supportive policy developments toward local firms may in fact be the key in the context of technology transfer through linkages in developing economies (Khanna and Palepu, 2000; Lyles and Salk, 1996; Peng *et al.*, 2008).

The case suggests that strategic decision-making is being done at the headquarters level in Japan in this case. The extent to which technology is transferred through these linkages is actually being affected by the three IJVs' parent firms' calculative policies. This implies that powerful MNEs' strategies have impacts on the developmental prospects of developing economies through their FDI (Yamin and Sinkovics, 2009). To support this, there is not a single local supplier in this study that has successfully experienced functional upgrading in the GVC through leveraging local linkages. This indicates that product or process upgrading seems to be a predecessor of functional upgrading. With regard to this, our study has important implications for the local firms wishing to upgrade and become part of the GVC. Furthermore, it provides host governments with useful insights into how they might promote such upgrades through FDI. Based on the discussions above, we develop the following propositions related to vertical linkages, technology transfer and upgrading:

- P1. The greater is the extent of the foreign MNE's willingness to transfer technology to local firms, the greater will be the extent of the local suppliers' breakthrough product upgrading, process upgrading and insertion into the GVC.
- P2. The greater is the extent of the host government's support for local firms' innovation, the higher is the possibility that local suppliers will achieve breakthrough product upgrading, process upgrading and insertion into the GVC.

Contributions

This study contributes to the existing debate on whether FDI promotes the development of linkages and the upgrading of local firms in emerging economies. First, this paper illustrates some important issues regarding inter-organizational linkages between MNEs and local firms, and technology transfer to local components suppliers, in the context of a developing economy. This shows how the inter-organizational linkages formed by hosting FDI from advanced economies should be investigated jointly with technology transfer to determine the real impacts of MNEs on local firms in host developing economies. In this vein, we make a distinction between linkages and technology knowledge transfer. Thus, arguably, vertical linkages can be necessary for technology transfer from one firm to the other but not sufficient for it. Second, our illustrative case suggests that IJVs have created inter-organizational vertical linkages, particularly with the local tier-1 suppliers. Nevertheless, so far, these linkages have not helped to transfer high-level components technology, as this has not taken place from any of the three IJVs to any of the local components suppliers interviewed for this research. Therefore, for successful technology transfer and upgrading through FDI-induced vertical linkages, three elements are essential:

- (1) the MNEs' willingness to transfer technology;
- (2) the host government's support for local firms' innovation; and
- (3) the nature of the relationship between the technology senders and recipients.

Limitations and recommendations

Like most research, our study has some limitations. Although we used data from interviews with IJVs, local suppliers and policymakers in our research, we cannot completely rule out the political bias of some of the respondents. However, the

inclusion of respondents from the automotive assemblers and the MIP reduced our concerns in this regard. Nevertheless, future studies may consider including tier-2 and tier-3 suppliers as a control group to better assess technology transfer through the value chain. Second, this study is limited to a single industry and a unidirectional technology transfer from automotive assemblers to their components suppliers. While investigating inter-organizational linkages, technology transfer and innovations from automotive assemblers to their components suppliers increased the internal validity of this research; at the same time, it sacrificed its external validity. Future research may need to extend these findings to other industries. Cross-country studies on the automotive industry would also provide more useful insights for corroboration. The results of this study should be interpreted with caution because we did not statistically measure the inter-relationship between inter-organizational linkages, technology transfer and upgrading. Thus, future studies may need to test the relationships between the variables statistically, based on our propositions. In addition, there might be issues related to the knowledge appropriability, as tacit high-tech parts technologies of Japanese MNEs could be the source of their core competences. For this reason, the assemblers may concern about knowledge leakage. Thus, we suggest that future research focus on knowledge appropriation issues associated with the actual willingness of MNEs and particular technology transfer.

Conclusion

This paper has investigated the prospects of upgrading for local-owned suppliers in the developing economy Pakistan context and how suppliers benefit from being part of the MNEs' value chains. It shows that MNEs' joint venture operations, active in the automotive industry of Pakistan, have created opportunities for the development of vertical linkages, but that the actual transfer of technology through these linkages is very limited and confined to low-to-medium complexity components. We document that there are limited opportunities for local suppliers to upgrade through "piggybacking" on MNEs without the willingness of the MNEs to transfer their advanced technology to the suppliers and without host government support for the suppliers' innovation. We argue that developing vertical linkages is not a sufficient condition for high-level (i.e. complex, tacit and advanced) knowledge transfer from the MNEs to the suppliers. Thus, when it comes to technology transfer, pursuing depth as well as breadth of vertical linkages is of crucial importance. Otherwise, emerging market suppliers' insertion and furthermore, functional upgrading into GVCs will merely be a mirage and the suppliers will continue to operate at the low-value adding position, supplying standard parts to the local auto assemblers. For this reason, their prospects for upgrading and becoming part of the rising power of the MNE network seem to be limited at this point, as these isolated local suppliers in developing economies are finding it difficult to be a part of the innovative global networks.

Note

1. In Pakistan, there are around 800 organized and 1,200 unorganized components suppliers that provide parts to the three major assemblers from the developed economy.

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About the authors

Zaheer Khan is Lecturer (Assistant Professor) of International Business at Hull University Business School of University of Hull, UK. He received his PhD from the University of Birmingham, UK. His research focuses on FDI and technology transfer in emerging markets and innovation and learning in the automotive industry.

Yong Kyu Lew is Lecturer (Assistant Professor) in International Business and Management at Manchester Business School, UK. He received his PhD from Manchester Business School, The University of Manchester, UK. His research interests include international strategic alliances, inter-firm governance and internationalization, and innovation capabilities in high-tech industries. His work has appeared in *Long Range Planning* and *International Business Review*. Yong Kyu Lew is the corresponding author and can be contacted at: yklew@sejong.ac.kr

Rudolf R. Sinkovics is Professor of International Business at Manchester Business School, UK. He has published on inter-organizational governance, the role of ICT in firm internationalization and research methods in international business. Recent work focuses on rising powers, emerging markets firms and drivers of economic change. He received his PhD from Vienna University of Economics and Business (WU), Austria, in 1998. His work appeared in International Business and International Marketing journals, such as *Journal of International Business Studies*, *Management International Review*, *Journal of World Business*, *International Business Review* and *International Marketing Review*. Born in Austria, he now lives and works in Manchester, UK.

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