Global Networks and Pipelines for Developing Exploratory Innovations in Emerging Economies

Abstract

This article shows that under weak institutional arrangements and institutional voids in emerging economies, local firms that are part of the global value chains of MNEs develop international network relationships as a *balancing mode strategy* in order to counter the negative influences of local institutions on exploratory innovations. Using in-depth qualitative analysis, we study 12 motorcycle parts suppliers of Pakistan that are working with some of the leading Japanese and Chinese motorcycle assemblers. The findings suggest that local institutional factors are only favorable for developing exploitative/incremental innovations, and the motorcycle parts suppliers develop international networks with global Tier 1 suppliers, international trade fairs and international institutions as a *balancing mode strategy* in order to circumvent the negative influence of home institutional factors for developing exploratory/radical innovations. Our study shows the importance of *global networks and pipelines* as a *balancing mode strategy* for developing exploratory innovations by emerging economies firms.

Keywords: exploratory innovations, exploitative innovations, institutions, emerging economy, motorcycle industry, international networks, global value chains

INTRODUCTION

The advancement in communication technology and intense competitive pressure forces firms to continuously pursue both exploratory and exploitative innovation in order to stay competitive (Benner & Tushman, 2003; Tushman & O'Reilly, 1996). Research has shown that exploratory and exploitative innovation contribute positively for firm performance (e.g., Bierly & Daly, 2007; Cao, Gedajlovic, & Zhang, 2009; Hortinha, Lages, & Lages, 2011; Lisboa, Skarmeas, & Lages, 2011), yet these innovations differ greatly in many respects, for example, in their antecedents and the conditions needed for their success (Jansen, Van Den Bosch, & Volberda, 2006; March, 1991). Exploitative innovation build on existing products and processes and these are geared towards refinements of existing products for the existing markets and customers (Holmqvist, 2004; Levinthal & March, 1993).

Exploratory innovation on the other hand includes search, discovery, experimentation, and risk taking and are aimed at new markets and customers (March, 1991; McGrath, 2001; He & Wong, 2004). Our current understanding on the effect of local institutions and MNEs on developing exploratory and exploitative innovations by emerging economies firms connected through global value chains (GVCs) is limited (e.g., Lorenzen & Mudambi, 2013; Mueller, Rosenbusch & Bausch, 2013). Scholars have suggested that global pipelines are becoming an important sources of external knowledge, however, whether emerging economies firms use these networks as a balancing mode strategy to overcome the institutional voids in their home markets and develop exploratory/exploitative innovations have been hardly investigated (e.g., Khanna & Palepu, 1997; Lorenzen & Mudambi, 2013; Maskell, 2014). Recent research suggests that international connections and trade fairs are important sources of assessing knowledge (Maskell, 2014; Li, 2014), yet our understanding remains unclear whether exploratory and exploitative innovations are successful in different institutional and across non-equity based settings. Emerging economies are characterized by weak and

underdeveloped institutions thus putting pressure on local firms to explore outside sources of knowledge and networks for pursuing both exploratory and exploitative innovations.

Research has noted that industry level factors such as the R& D intensity of the industry, environmental dynamisms as well as firms collaborative activities influence exploratory and exploitative innovations (Uotila, Maula, Keil, & Zahra, 2009; Jansen et al., 2006; Belderbos, Faems, Leten, & van Looy, 2010). Scholars have also indicated that top management team and absorptive capacity of the firm also have impact on the development of both innovations (e.g., Amason *et al*., 2006; Rothaermel & Alexandre, 2009). The later view suggest that resource endowments at the firm level play an important role for the successful development of exploratory and exploitative innovation. Such resource endowments are often determined by firm-specific factors, but they may also be influenced by institutional conditions in the firms' home market. For instance, Lavie, Stettner, and Tushman (2010) call for more research on cross-national differences for the understanding of factors behind the development of exploratory and exploitative innovation. This line of research also neglect the role of international networking as a balancing mode strategy by firms based in the emerging economies to develop exploratory innovation. The aim of this article is to fill this gap.

Using the context of the motorcycle components sector of Pakistan, we investigate the factors effecting the successful development of exploratory and exploitative innovation by the local suppliers who are working under non-equity network based relationships with core MNEs-Japanese and Chinese assemblers. Particularly, we are interested in exploring how local institutions and MNEs effect the development of exploitative and exploratory innovations of local firms. Our findings suggest that local suppliers use international networks as a *balancing mode strategy* for developing exploratory innovation and local institutional factors are only helpful for developing exploitative innovation. Our contributions are threefold: (1) we show the important role of international networks for the development of exploratory

innovation by the emerging economies firms. (2) emerging economies institutions effect exploitative innovations, therefore external sources of knowledge- global pipelines are a vital conduit for the development of exploratory innovation by the emerging economies firms. (3) provide important insights from Pakistan- a hardly explored country in the international business and strategy field. Overall, the findings contribute to a more subtle understanding of the effect of international networks as a *balancing mode strategy* by local firms to develop exploratory innovation, this suggest that emerging economies firms would benefit from international networking and the policy makers should facilitate and encourage local firms to develop variety of international connections for developing innovations.

LITERATURE REVIEW

Exploitative and Exploratory Innovations

According to Benner and Tushman (2002: 679), "exploitative innovations involve improvements in existing components and build on the existing technological trajectory, whereas exploratory innovation involves a shift to a different technological trajectory" Similarly, He and Wong (2004: 483) defined exploitative innovation as "technological innovation activities aimed at improving existing product-market domains" and exploratory innovation as "technological innovation aimed at entering new product- market domains."

Exploitation is the process of seeking new ways to improve existing organisational capabilities and using existing knowledge to increase organisational effectiveness (Jones, 2001). Exploitative innovations are incremental innovations and are developed and designed keeping in mind the needs and requirements of existing customers or markets (Benner and Tushman, 2003:243; Daneels, 2002). Several scholars, for example, (Abernathy and Clark (1985; Benner and Tushman, 2003; Levinthal and March, 1993; Lewin, Long, & Carroll,

1999) have suggested that these types of innovations broaden the scope of existing knowledge and skills, expand existing products and services, improve current designs, and also increase the efficiency of existing distribution channels.

Exploratory innovations are radical innovations that are designed to satisfy the needs of emerging markets and customers (Benner and Tushman, 2003:243; Danneels, 2002). These innovations offer new designs, create new markets, and develop new channels of distribution and thus require disrupting existing competencies and existing market linkages (Abernathy and Clark, 1985), and these types of innovations require new knowledge, or the departure from an existing knowledge base (Benner and Tushman, 2003; McGrath, 2001; Levinthal and March, 1993). These all studies show that learning, improvement, and acquisition of new knowledge are central to both exploitation and exploration. Emerging economies firms lack home based endowment resources including state of the art knowledge and may struggle to develop both exploitative and exploratory innovation. The disruption of existing competencies and market linkages are more important for the development of exploratory innovation (e.g., Abernathy & Clark, 1985). Under these conditions, international networking may become important for the emerging economies firms to acquire knowledge that is not available through home institutions. In recent years, global value chains (GVCs) approach has received lots of attention due to its explanatory power in explaining the process of upgrading of emerging economies firms working under the GVCs arrangement. Next we review this literature.

Global Value Chains (GVCs) and Upgrading

One of the central drivers of globalization has been the changing geography of MNEs activities that has resulted into new organizational forms of relationships across the globe (Dicken, 1992, Dunning, 1997, Rugman and D'Cruz, 2000, Gereffi, 1999). GVCs approach has tried to understand the upgrading potential of local actors linked with the flagship firms'

value chain through knowledge flows (Gereffi, 1999, Ernst and Kim, 2002, Giuliani et al., 2005, Humphrey and Schmitz, 2002, Gereffi et al., 2005, Henderson et al., 2002, Pavlínek and Ženka, 2011, Schmitz and Knorringa, 2000). Scholars have noted that it is in the interest of the lead MNEs to share knowledge with their suppliers under the GVCs arrangement. This line of reasoning has also suggested that once suppliers improve their capabilities then lead MNEs would transfer more sophisticated knowledge to their suppliers (Ernst and Kim, 2002; Gereffi, 1999).

The main claim of the GVCs led research is a positive potential of knowledge transfer and upgrading of local firms under these arrangements. However, under the GVCs arrangements complex governance mechanisms exist within these chains such as suppliers' abilities to absorb knowledge, and their upgrading efforts determined by governance types and local firms' capabilities (Cohen and Levinthal, 1990). For this reason, scholars suggest that upgrading of local firms through the insertion into GVCs is not guaranteed (Giuliani *et al*., 2005; Gereffi *et al*., 2005; Henderson *et al*., 2002; Humphrey and Schmitz, 2002; Pavlìnek and Zenka, 2011; Schmitz and Knorringa, 2000). This implies that local firms who are part of the relationship under the GVCs have to systematically invest in their capabilities-absorptive capacity and routines to benefit from the knowledge transfer taking place through flagship firms (Cohen and Levinthal, 1990). This kind of capability can be initiated by not only local firms' through their in-house routines for skills development, but also the existence of national systems of innovations to support these local firms (e.g. Ramirez and Rainbird, 2010; Pietrobelli and Rabellotti, 2011). For example, host government policy for skills development, R&D, education, access to finance and regulations plays pivotal roles in contributing for the knowledge transfer and upgrading of local firms within the FDI led GVCs arrangements.

Home country Institutions and Innovations

Host government policies shape the cooperation between heterogeneous actors, operating in a country as they provide local firms with qualified employees, basic research, advanced technological capabilities and subsidies (Meyer *et al*., 2011). In this vein, North (1990):defines institutions as 'rule of the game' or humanely devised constraint that structure political, economic and social interactions. From this perspective, institutions serve as referees, constraining and enabling roles of institutions in shaping firms' behaviors (Peng and Khoury, 2008, Saka-Helmhout and Geppert, 2011). Recently scholars have noted that local institutions play an important role in understanding firms' behavior and economic activity at a country level (Scott, 1988; Storper,1997). Within the economic geography literature, place has been noted to play a central role in determining firms' performance and their innovation capabilities. The central idea behind the place thesis is that economic development and innovation capability is highly uneven across places, due to the spatial variations in the socio-institutional environment of places (Porter, 1990; Storper, 1997; Cooke and Morgan, 1998; Gertler, 2001; Yeung, 2005; Rodriguez-Pose and Di Cataldo, 2014).

Recent research in the institution based view of the firm indicates that institutions play key role as actors rationally pursue their interests and make strategic choices within the formal and informal institutional set-up (Peng, 2003, Peng *et al*., 2009, Yamakawa *et al*., 2008, Dunning, 2006). Thus, variations in national institutional environments enable and constrain firms' strategic options, including innovations (Khanna and Palepu, 1997, Peng and Delios, 2006, Peng, 2003, Zhu *et al*., 2012). For example, previous research has noted that country level institutional environment influence innovations and entrepreneurial activity (Busenitz *et al*., 2000; Spencer *et al*., 2005; Zhu *et al*., 2012).

It has been noted that national governments keep their important role in governing economic activities and regulations (Coe et al., 2008; Hudson, 2008) and the government role has been critical in the development of the automotive industry (Dicken, 2007). Within the

GPN and GVCs literature, scholars have suggested a varying role of governments in different countries in stimulating upgrading of firms (Hess and Coe, 2006; Gereffi, 2009), however, the GVC literature pay closer attention to the governance issues within the value chain relationships, rather than on the role of the institutional factors (Gereffi et al., 2005). Similarly, Pavlinek and Zanka (2011) demonstrate a selective nature of the Czech automotive parts industry upgrading within the GVCs and limited effect of the government industrial policies on functional upgrading. Thus, institutions provide an ideal framework to examine the effect of institutions on the development of exploratory and exploitative innovations in emerging economies.

RESEARCH CONTEXT AND METHODS

Our research context is the motorcycle industry of Pakistan. This context is important for several reasons. First, the two- wheeler industry is one of the leading sectors in Pakistan in terms of motorcycle productions and sales volume, as the industry produced around 1.5 million motorcycles during 2013-14 compared to 100,000 motorcycles in 2000-1 (Pakistan AutoMark Magazine, 2014). Second, some of the leading Japanese and Chinese brands are operating in the sector such as Honda , Suzuki and Yamaha- Japanese, Qingui and Eagle-Chinese along with a number of local manufacturers. Third, according to various Pakistani media reports the industry has achieved around 90% parts localization thus making it an ideal setting to examine exploitative and exploratory innovations in the sector. Fourth, there are over 1000 local suppliers working directly with these core (multinationals) assemblers, making it one of the important manufacturing sectors in Pakistan due to its linkages and knowledge transfer potential to local components suppliers. Fifth, the sector is continuously introducing new models ranging from 70cc to 100cc and 125cc motorcycles and have introduced Euro II emission compliance motorcycles as well. Lastly, the location is important

as the development of the motorcycles parts industry and resultant components innovation could serve the growing markets of Afghanistan, China India and Middle East.

Data Collection and Analysis

The assemblers and local suppliers work under non-equity arrangements and have established network types relationships. The firms were identified through Pakistan automotive manufacturing associations, Pakistan parts manufacturing associations and through the database of Engineering Development Board of Pakistan which holds the data on various engineering sectors. Through these procedures, we identified a list of 35 suppliers and five core assemblers. We cross check the list of components suppliers with the assemblers and identified 29 suppliers who each works directly and supplied components to these five core assemblers. Out of these 29, 12 of the components suppliers agreed to participate in the study. Table 1 shows the components produced by these suppliers.

Table 1 Type of components and key interviewees

Components Suppliers	Types of components	Key interviewees/no of interviews
S1	Shock Absorbers/brakes	President/Design Engineer/2
S2	Wire harness, plastic parts	Manager Operations/1
S3	Brakes drum/batteries	Supply Chain Manager/Owner/2
S4	Wheels hub/brakes	CEO/1
S5	Starter plug/ignition system	President/Owner/2
S6	Steel Framework/ fuel pumps	Technical Director/1
S7	Lights and indicators	Owner/1
S8	Clutch/Seats	President/CEO/2
S9	Oil Pumps/Electronic systems	Owner/1
S10	Suspension parts	Manager/1
S11	Alloy Wheels and body parts	CEO/2
S12	Plastic/rubber parts/rear lights	President/2

We conducted qualitative in-depth interviews with the 12 motorcycle components suppliers, five of the core motorbike assemblers and with the officials of the Engineering Development Board of Pakistan to understand the important factors for the development of exploitative and exploratory innovations in the sector as well as knowledge transfer from assemblers to their

suppliers. In total we conducted 27 interviews with senior executives of the selected firms, each interviews lasted for approximately 55-70 minutes . These interviews were conducted from May 2013 to late 2014. We also conducted follow up interviews over the phone and via emails to clarify some of the points made by the interviewees during the initial round of interviews. Beside these interviews, we also consulted several other sources such as local daily English newspapers and industry publications for data triangulation purpose.

The data was analyzed following the procedures of qualitative data analysis (e.g., Miles & Huberman, 1994). We initially coded each of the interviews and then made comparisons with the rest of the interviews to understand the factors effecting exploitative and exploratory innovations at the local components suppliers end. We also compared the responses of the assemblers with the suppliers for understanding common factors as well as differences of opinion between the two groups. During this entire process of data analysis, we constantly engaged with the data, emerging themes and the extant literature (Eisenhardt & Graebner, 2007). We also reviewed the secondary sources of data for example motorcycle industry related publications and news clippings appearing in the local daily English newspapers for data triangulation purpose.

FINDINGS

Type of Knowledge transfer from assemblers to suppliers

The data indicate that assemblers transferred not only product and process related knowledge to their suppliers but also provide trainings to them as well. Table 2 highlights the type of knowledge that the assemblers transferred to the local suppliers during the start of any new model production and on regular basis.

Table 2
Type of knowledge transferred from assemblers to local suppliers (12 Suppliers)

Type of knowledge transfer	Yes	No
1. Product related knowledge		
(a) Provision on product designs and technical specifications	100%	n.a
(b) Provision, advice, or financial assistance to obtain raw materials and components	45%	55%
(c) Regular feedback on product performance to improve existing product technology	90%	10%
(d) Technical consultations on product characteristics to master new product technology	52%	48%
2.Process/Production related knowledge		
(a) Provision, advice, or financial assistance to obtain machinery and equipment	42%	58%
(b) Technical support to improve existing production technology	52%	48%
(c) Technical consultations on machinery operation to master new production technology	40%	60%
(d) Advice on production layout and organisation	48%	52%
(e) Assistance with quality assurance systems (e.g., ISO certification, TQM, etc.)	94%	6%
3. Training programmes for suppliers' workers		
(a) In-plant training for managers/ technicians at the supplier site	86%	14%
(b) Training for managers/ technicians at assemblers site	70%	30%

Factors effecting exploitative innovations

The findings suggest that local institutions and networking with MNEs (core assemblers) were helpful for the local motorcycle components suppliers to develop exploitative/incremental innovations. The findings suggest that components suppliers recognize the value of knowledge they have been receiving from their network assemblers for successfully developing the components. The suppliers and assemblers managers that we interviewed pointed out the importance of the existing capabilities of the suppliers to receive knowledge and make necessary adjustments in their products and processes, and bring improvements in their existing parts that they were supplying to the assemblers. One of the suppliers managers indicated:

> *''The knowledge that we have received about the design of the components has been helpful for us to develop the components for the assemblers. Our assembler also arranges training for the suppliers to help them in addressing their product*

> *and process related problems. These discussions are vital for bringing improvements in our products" [S1]*

Similar views were also expressed by the assemblers.

"*We feel that local suppliers must have some existing capabilities in order to benefit from our technology and to bring improvements in the products [Parts] that they are supplying to their assemblers*" [A 2]

These quotes suggest that some level of existing absorptive capacity is required to successfully internalize the knowledge and bring improvements in products and processes.

The interviews with assemblers suggest that not all of their suppliers possess a strong capability to absorb the transferred knowledge and launch new or improve existing products. One of the assemblers manager indicated:

> ‘‘*Some of our suppliers are quite weak in internalizing our technological knowledge and make necessary adaptations in components or to launch new ones’’* [A 5]

The results suggest that the problem with a low level of absorptive capacity with the recipients (component suppliers) was low level of investment in R&D and employees trainings and having weak linkages with local institutions. As Cohen and Levinthal (1990), argue, the firm’s ability to utilise external knowledge is often a by-product of R&D investment.

The suppliers managers noted that they have weak to non-functioning linkages with the local universities and training providing institutions. The managers from both the suppliers and their assemblers side suggested that local institutions do not offer motorcycle industry specific courses and there are limited university-industry interactions take place in Pakistan to develop the curriculum keeping in view the demands of the local industry. The findings indicate that the low level of interactions between the industry and the academia were major

hurdles for the development of new components especially engines and state of the art electronics components. One of the manager from the suppliers side noted:

> *''The local [motor cycle] industry and other manufacturing units suffers due to lack of consultations between the industry and the local educational institutes in developing modern industry specific courses. These are the major barriers to develop state of the art new components'' [S12]*

Similar views were expressed by other suppliers as well.

> *''The knowledge and training of the assemblers and local institutions are only helpful when it comes to bring improvement in our current products and processes '' [S9]*

> *''The local institutions lack modern machinery and the training that we can receive from these institutions is only helpful for make small changes to our current products and processes as the local training providers understand local market conditions however we can't really rely on this knowledge to develop new products hence we have to explore outside sources of knowledge'' [S5]*

These quotes indicate that local institutional support in emerging economies is relevant to making small adjustments to the existing products and the suppliers do recognize that they need to explore external sources of knowledge to develop new products.

The table 3 below shows the institutional support and linkages the local suppliers have with local institutions in Pakistan.

Table 3

Institutional support and linkages with local institutions (12 Suppliers)

Institutional Linkages	Yes	No
Your firm received support for R&D activities from local institutions	20%	80%
Your employees received specific training from Government-run skills development centres	60%	40%
Your firm received benefits from academic institution research activities	0%	100%
Your firm collaborates with any Government R&D institutions	35%	65%
Your firm has any internship programmes with the local universities	20%	80%

The table shows that 60% suppliers have received specific training from government run skills development centers. The results further show that none of the suppliers have received

any received benefits from the research activities of the local academics. These results show that there is very little support that the component suppliers can receive from the local institutions in developing their employees' absorptive capacity and developing exploratory innovation.

The findings also suggest that none of the suppliers have any employees with a PhD degree. The table 4 below shows the level of education of the local suppliers.

Table 4

Educational level of local suppliers' staff

Level of Education (final degree)	Yes	No
Have staff with PhDs	0	100%
Have staff with Master degrees, including Engineering degree	20%	80%
Have staff with Bachelor degrees	80%	20%
Have staff with technical diplomas	90%	10%

The table shows that majority of the suppliers staff holds technical diplomas and around 8% hold bachelor degrees, however very limited numbers of staff hold Master and Engineering degrees.

The findings also suggest that the Government of Pakistan has initiated several Government-run skills development and training centres for the manufacturing and services industries in Pakistan, for example, Government Poly-technical Institute, Technical Education and Vocational training Authority (TEVTA), Auto Industry Skills Development Company (AISDC), Technology Up-gradation and Skill Development Company (TUSDEC), Skill Development Council, and Pakistan Industrial Technical Assistance Centre (PITAC). Most of these centres either lack modern machinery or competent staff, and, moreover, there is a need to have a legal implementation of these initiatives, so that small and medium component suppliers can get access to their services and develop their capabilities through these public-

private collaborations. The findings also indicate that from time to time Small and Medium Enterprises Development Authority (SMEDA), Engineering Development Board and Suppliers associations organize seminars and few days trainings for the suppliers to address their productivity and quality related issues.

The findings further indicate that the local suppliers by working with their core assemblers and local training providing institutions such as suppliers associations and SMEDA have improved existing products for the local market or local assemblers. The suppliers managers mentioned that local sources of knowledge and the knowledge coming through their core assemblers have been helpful to make necessary improvements to their current portfolio of products and processes. One of the suppliers manager remarked:

> ‘‘*our company has upgraded existing products for instance we substantially improved electronic ignition switch and tail lights with the help of our core assemblers. From time to time we also get some training from local skills enhancement institutions* " [S4].

The assemblers also support these views and the data suggest that the local suppliers have consistently improved their components over the past few years. One of assemblers' managers said:

> *‘‘the local parts suppliers are consistently been improving their parts in recent years and we do support them to improve the functionality of their parts. Over the last few years, we have noticed that our suppliers have improved the quality of the parts for example our braking and suspension suppliers have been improving the parts" [A1]*

These findings highlight the important role of the core assemblers in helping their suppliers to improve their products and also the support local suppliers have been receiving from local institutions in improving their existing products. This suggest that knowledge coming through assemblers to local suppliers and their linkages with the institutions have been the key for the local suppliers to improve their products and processes.

International networking as a balancing mode strategy for exploratory innovations

The findings indicate that suppliers have been developing international networks and they view international networks as key sources of knowledge for the development of exploratory innovations along with the knowledge coming through assemblers. One of the component supplier managers stated:

> *''We have been exploring external [mainly international networks] sources of knowledge to balance with the current knowledge that we have from our assemblers to develop new components as we want to export parts and provide parts for the after sale market. We also attend international automotive trade fairs and these are very useful sources of knowledge for the development of newer components'' [S3]*

This quote highlights the importance of connections not only with the assemblers and local institutions but the international networks are key for developing exploratory innovations.

The suppliers' managers were of the view that to develop new products for the new market or for new customers requires taking risks. The managers also pointed out that to develop new state of the art components for the new clients and markets also require key know-how which is often time not available through local institutional support. The suppliers managers indicated that they try to form international network with global Tier 1 suppliers and attend international trade fairs and seminars to acquire the knowledge in order to develop new products. The suppliers managers suggested that Pakistan China Motor Industry Council also arranged visits and interactions between the local suppliers and the Chinese suppliers for knowledge exchanges.

The data suggest that suppliers are keen to develop new components for international markets and for this purpose they do view the vital role of international networks for assessing the key knowledge through these sources for the development of exploratory innovation. One of the suppliers' managers stated:

> *" We want to develop new components [such as engines part and electronics] as these are the key components for the motorcycle industry and for this we need*

variety of knowledge. We have been exploring international networks as a solution to overcome the weak local institutional support and for this purpose we have attended several trade fairs to acquire key knowledge in order to develop new components''. [S7]

The findings further indicate that local suppliers have been developing international network relationships as a balancing mode strategy for developing exploratory innovations. The suppliers managers suggested that local institutions and the knowledge coming through their core assemblers have been helpful in exploitative innovation and there is a greater need for the local suppliers to explore international connections and network relationships for developing new products. One of the suppliers' managers said:

"local institutions help is very weak and not really helpful for the development of new products although we are able to improve existing products. We are developing close connections and collaborative relationships with the international suppliers based in Japan and Japan International Cooperation Agency (JICA) help has been important for the development of new products for export markets. Our association with our assembler [Suzuki] and their [global suppliers] and JICA consultants have been helpful in developing the advanced capabilities and parts for international markets'' [S2]

Similar views were expressed by another suppliers in a following way:

''The current institutional environment in our country can only support the improvements of existing products for the local market and we are in the process of developing international network as a [balancing strategy] to support and extend our existing knowledge base and develop new products" [S 11]

The findings indicate that some of the global -oriented suppliers have been intentionally developing international network connections as balancing mode strategy to overcome the weak institutional support in the home market to develop exploratory innovation. The data also indicate that the owners/managers of some of the component suppliers are outwardly mobile and have been attending various world level trade fairs, for example, Hannover Messe, Germany, China and in Japan in order to develop exploratory innovation. One of the suppliers managers indicated:

''We consider ourselves internationally mobile as we are constantly exploring international networking opportunities whether these are trade fairs or seminars.

Our close connections with [Honda], SMEDA, PITAC [local training providing institutions and interactions in Japan with the Japanese suppliers have been useful for our company to expand its engineering and design. Through these external knowledge sources we have not only improved our current components but have successfully launched new components'' [S10]

Table 5 shows the relative importance of international networks for assessing knowledge for exploratory innovation.

Table 5 Relative Importance of International Networks for exploratory innovation

Importance of International network Linkages	Yes	No
International trade fairs for assessing knowledge for exploratory innovation	80%	20%
Global Tier 1 Suppliers collaborations	90%	10%
International Associations and Institutions such as JICA*	70%	30%

*Japan International Cooperation Agency

The table shows that suppliers managers rate global Tier 1 suppliers collaborations as by far the most important international network linkages for the development of exploratory innovation. 90% of suppliers noted that global Tier 1 suppliers collaborations are important sources of knowledge for developing exploratory innovations.. Around 80% of the suppliers indicated that international trade fairs as important for assessing knowledge for exploratory innovation. This shows that local suppliers view international networks to be important sources of knowledge for the development of exploratory innovation. Recent research also indicate that radical innovation is closely related with different sources of knowledge (e.g., Trippl et al., 2009; Fitjar & Rodriguez-Pose, 2011). For local firms in emerging economies trade fairs provide unique opportunities to develop knowledge and personal relationships with distant places (Bathlet & Schuldt, 2101; Maskell, 2014), they can then use this knowledge for both exploitative and exploratory innovations.

The interviews with the official of the Engineering Development Board also indicated that that they encourage the local suppliers to explore external sources of knowledge and for this purpose they have been exposing local suppliers to international trade fairs, as through these

global networks the local suppliers can access state of the art knowledge and develop new products for new clients and markets. The Official of the Engineering Development Board stated:

" To develop parts for the international markets and assemblers, the local suppliers need state of the art knowledge as well to develop new components for global markets and for this purpose we have been taking our suppliers on international trade fairs so they can interact with international customers and explore ways of developing new products for exporting"

[Official Engineering Development Board]

The above quote indicates that exposing suppliers to outside world is on the agenda of the policy markers as well. International trade fairs offers interactive and unstructured learning mechanisms for firms as part of what is called 'global buzz' (Maskell et al., 2006; Bathlet & Schuldt, 2008). Through these events the local emerging economies firms can learn valuable knowledge in an informal and unstructured way and these events also offer the opportunities to develop personal relationships as well which could become important for innovation (Bathlet & Schuldt, 2010).

Overall the findings suggest that local institutions and MNEs based in the motorcycle industry only effect exploitative innovation and the suppliers are developing international networks by interacting with global Tier 1 suppliers, attending international trade fairs and interacting with the consultants of Japan Industrial Cooperation Agency (JICA) as a balancing mode strategy to develop exploratory innovations. These findings resonate with extant literature emphasizing that to avoid the risk of lock-in, global networks spreading beyond the regional and national boundaries are crucial for being exposed to fresh knowledge (e.g., Bathlet et al., 2004; Boschama, 2005; Mossison et al., 2013). The data further highlight that suppliers who possess advanced capabilities have developed exploratory innovative capabilities. The findings highlight that international networks of global Tier 1 suppliers and

international trade fairs have been important sources of knowledge for the local suppliers to develop exploratory innovation along with the knowledge coming through their core assemblers.

Discussion & Conclusions

There is a paucity of research investigating how the MNEs and local institutions effect exploratory and exploitative innovations in emerging economies, and especially for those firms working under non-equity arrangements. Most of the research on exploring the factors for the success of exploitative and exploratory innovations have focused on well-known MNEs. Following previous research, we classify innovations into exploratory and exploitative innovations. Exploratory innovations are radical innovations that are designed to satisfy the needs of emerging markets and customers (Benner and Tushman, 2003:243; Danneels, 2002). These innovations offer new designs, create new markets, and develop new channels of distribution (Abernathy and Clark, 1985). These types of innovation require new knowledge or departure from the existing knowledge base (Benner and Tushman, 2003; McGrath, 2001; Levinthal and March, 1993). On the other hand, exploitative innovations are incremental innovations and are developed and designed keeping in mind the needs and requirements of existing customers or markets (Benner and Tushman, 2003:243; Daneels, 2002). Several scholars, for example, (Abernathy and Clark (1985; Benner and Tushman, 2003; Levinthal and March, 1993; Lewin *et al*., 1999) have suggested that these types of innovation broaden the scope of existing knowledge and skills, expand existing products and services, improve current designs, and also increase the efficiency of existing distribution channels.

Using the context of the motorcycle industry of Pakistan, the findings suggest that MNEs and local institutions effect exploitative innovation and the local suppliers have been developing international networks as a *balancing mode strategy* for the development of exploratory

innovations. The findings suggest that local suppliers view that local institutions and MNEs are helpful sources of knowledge for the development of exploitative innovations whereas international trade fairs, collaborations with global Tier 1 suppliers and international associations and institutions such as Japan International Cooperation Agency (JICA) are important for assessing knowledge for the development of exploratory innovation. These findings support the work of scholars noting that assessing external knowledge is critical requirement for innovations (e.g., Chesbrough, 2003; Nooteboom, 2004; Maskell, 2014). Emerging economies have been characterized by weak institutions (Peng, 2003; Khanna & Palepu, 1997), the findings indicate that in order to overcome the weak institutional conditions in home market, local firms rely on external international networks for sourcing of knowledge to develop exploratory innovation. These findings further support the work of scholars noting that firms collaborative activities influence exploratory and exploitative innovations (Uotila, Maula, Keil, & Zahra, 2009; Jansen et al., 2006; Belderbos, Faems, Leten, & van Looy, 2010). The findings also indicate that global-orientations of the managers heighten the awareness for the development of international connections for sourcing external international knowledge and resultant exploratory innovations. This support the view that top management team and absorptive capacity of the firm also have impact on the development of both innovations (e.g., Amason *et al*., 2006; Rothaermel & Alexandre, 2009). The article provides important insights and highlight the effect of international networking as a balancing mode strategy for the development of exploratory innovations by the emerging economies firms working under the GVCs arrangement. The GVCs literature mainly focuses on understanding the governance issues and upgrading of local suppliers. This line of literature notes that emerging economies suppliers have limited opportunities for upgrading as there is a glass ceiling of upgrading under the GVCs arrangements. However, our findings indicate that local suppliers can still develop exploratory and exploitative innovations by

working with MNEs and exploring external sources of knowledge. For this to take place, the suppliers' orientations and their ability to form international networks are the key for the successful development of both exploitative and exploratory innovations.

The article contributes to the limited work of scholars showing the importance of international personal and organizational relationships for the upgrading of firms in emerging economies (e.g., Lorenzen & Mudambi, 2013).

There are several limitations that provide important directions for future research. First, we only qualitative study the effect of local and international institutions and MNEs on exploratory and exploitative innovations. Future studies could build on to this work and do a large scale survey to test the effect of MNEs, local institutions and types of international networks on both types of innovations. Second, there could be many contingency variables for example firms prior knowledge base and managers international experiences that we have not looked in a qualitative investigation. Further studies need to take these and other contingency variables such as environmental turbulence and technological dynamisms into account and investigate their effect on both types of innovations. Lastly, we study only motorcycle parts suppliers of Pakistan. Future research need to investigate other sectors for example telecommunications, Pharmaceutical and oil & Gas sectors with varying degrees of market dynamism and high -low technology requirements and the effect of local and international networks on exploratory and exploitative innovations.

CONCLUDING REMAKRS

We investigated the factors that support exploitative and exploratory innovations for the emerging economies firms. The study highlights the important role of international networks and pipelines as a balancing mode strategy by the local firms for the development of exploratory innovation. Overall, the findings suggest that international connections and

pipelines are important sources of knowledge for innovations and especially for exploratory innovations. This suggests that effect of local institutions and MNEs operating in a given sector in emerging economies for both exploitative and exploratory innovation might be limited and local firms rely on international networks such as international trade fairs, foreign factory visits, collaborations with global Tier 1 suppliers and international institutions for the development of exploratory innovations.

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