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Technological catch-up by component suppliers in the Pakistani automotive industry: A four-dimensional analysis

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A B S T R A C T

This qualitative paper reports findings of an investigation into buyer–supplier interaction in the Pakistani auto-parts industry. We conceptualize technological catch-up by Pakistani suppliers in four relatio-spatial dimensions with international joint ventures (IJVs) as mediating gateways between dimensions. A critical realist lens is deployed to connect macro-level constructs with micro-level concepts and expose the interplay between agency (micro-level) and structurally constraining (macro-level) conditions inherent in a late-liberalizing emerging economy. Key findings are that catch-up occurs in four temporally overlapping dimensions in which, different macro-level governance mechanisms and firm-level orientations transform and affect the degree of catch-up. The findings support an optimum pathway for catch-up from an apprentice like transactional state in Dimension One to a fourth dimension in which relational interaction with foreign suppliers becomes lightly mediated by the IJV's gateway.

1. Introduction

In this paper, we ask how the catch-up processes of locally-owned suppliers in a late liberalizing emerging economy are affected by the dual networks of co-located international joint ventures (IJVs) involving local and advanced economy (AE) partners. Studies examining catch-up processes in emerging economy (EEs) firms have focused on so-called BRIC economies; less attention has been paid to EEs that have undergone later liberalization (which we will abbreviate to LEE). Domestic firms operating in LEEs have been argued to suffer even greater resource structural constraints than BRIC economies (Chittoor et al., 2009). Against this backdrop, the challenge for domestic firms in LEE countries to catch-up technologically is significant (Zhao, Anand, & Mitchell, 2005). In this paper, we refer to catching-up as an LEE supplier's ability to bring improvements and efficiencies into its products and processes and thus move up the value chain. Such catch-up is underpinned by the capture or creation of new resources, knowledge, skills and competences (Lamin & Livanis, 2013; Malerba & Nelson, 2011; Mudambi & Swift, 2012). One important facilitator of acceleration in a catch-up process for EE firms is their interaction with co-located AE firms. The positive benefits of co-location with AE investors on catch-up by EE suppliers have been the subject of only limited inquiry (Inemek & Mathyseens, 2012; Kumaraswamy et al., 2012). In particular, the opportunity for micro-level (i.e., dyad, firm or individual agent) studies in the industrial marketing tradition to add additional insight to the more macro-level studies (i.e., country, region or industry) grounded in Economic Geography (EG) and International Business (IB) disciplines has not been fully harnessed (a point alluded to by Meyer, 2004; Peng, Wang, & Jiang, 2008). More specifically, in a spectrum of relational to transactional interaction between MNEs and local actors, the substance of many macro-level findings have focussed on the transactional end of the spectrum and the resources that form the content of such transactions (Mesquita, Anand, & Brush, 2008; Zhou & Xu, 2012). In comparison, the impact of micro-level relational proximity between co-located MNEs and EE firms on catch-up has received more limited attention (Lorenzen & Mudambi, 2013; Mudambi & Swift, 2012). McDermott and Corredoira (2010:309) for instance call for "greater focus on the types of inter-firm relationships that can facilitate or impede one's access to knowledge resources," and such impediment due to a lack of relational proximity would seem to include the extent to which knowledge is purposefully protected. Alongside relational factors, the dynamics of knowledge and technology protection and transfer may be of great significance in understanding how and why catch-up occurs for certain LEE suppliers, and not for others. The investigation reported in this paper has focused on a single local sub-industry, the Pakistani auto parts industry, but as an entity embedded in a global supply-chain via interaction with foreign (Japanese) investors.

The analysis of many factors discussed in this literature is beset by unhelpful dichotomies — resource-based vs. relational, local vs. international, and knowledge protection vs. knowledge transfer are examples. In order to break with the assumed atomism in much of this work, in this paper we undertake a critical realist analysis (Bhaskar, 1978,

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1993) and instead visualize problems as multi-dimensional but essentially holistic. In these terms we see LEEs as structurally constrained and foreign investors as agents capable of enabling catch-up and thus disrupting and positively transforming structural/institutional conditions.

The contribution we therefore seek to make in this paper is in several parts. We identify specifically the neglect afforded to the impact of the dual networks of foreign and domestic investors in IJVs (much work studies FDI generally, regardless of mode) and we seek to understand how these dual networks impact on catch-up outside the IJVs — in our case on domestic suppliers who interact with these co-located IJVs. We study this matter in the context of Pakistan and therefore also address the empirical neglect of late-liberalizing emerging economy contexts. In deploying principles drawn from dialectical critical realism, we challenge many of the atomistic underlying assumptions in the current discourse. Instead, our central contribution in this paper is to identify the micro and macro-level factors that enable catch-up in four temporally overlapping relatio-spatial dimensions as mediated by the dual networks of IJVs. As a counter to static notions of catch-up, our findings are dynamic and processual in nature. The review of literature in Section 2 will reveal further where neglect exists at macro and micro-levels of consideration and where the unhelpful dichotomies we speak of are apparent. Before presenting our findings in the last half of our paper, we will explore how a critical realist lens helps to avoid atomism.

2. Conceptual background and framework

As we attempt to develop a *multi-dimensional* contribution, we divide our literature review into three sections. Each sub-section concludes with a conceptual proposition and we end Section 2 by proposing a conceptual framework (Fig. 1) in which these three propositions are juxtaposed to reveal four sets of tensions (which we will reveal as four relatio-spatial dimensions) in which the central mediating factor is posited to be the dual networks of IJVs.

2.1. Foreign investors and catching up

Some scholars have discussed EEs as suffering from institutional voids defined as weaknesses in market and political mechanisms, often mediated by network (relational) forms of governance (Khanna & Palepu, 1999). The influence of foreign investors can help to offset institutional voids and link embedded local networks into a global economy. Lamin and Livanis (2013: 580) suggest that “critical to the catch-up process is to identify, acquire and use externally generated knowledge”. Alongside catch-up generated externally from local institutions; resource transfers from AE investors to local LEE firms have been argued to be an important driver of, and benchmark for catch-up (Corredoira & McDermott, 2014). However, the results of a significant body of macro-level research into the impact of spillovers from foreign direct investment (FDI) on local firms across all economic contexts is mixed, some reporting positive catch-up effects (Blalock & Simon, 2009; Keller & Yeaple, 2009), some reporting uncertain or negative impacts on local firms (Altomonte & Pennings, 2009; Humphrey & Schmitz, 2002).

An important element in catch-up is the enhancement of learning. Scholars have identified two main strategies for organizational learning: exploration and exploitation (March, 1991). Exploration involves actively seeking new knowledge that will add to an organization's dynamic capabilities (Teece, 2014). On the other hand, exploitation is the process of seeking new ways to improve existing organizational capabilities and use existing knowledge to increase organizational effectiveness (Andriopoulos & Lewis, 2009). Several authors have identified that EE firms are initially more inclined to catch-up in terms of developing imitative exploitative strategies (Awate, Larsen, & Mudambi, 2012; Sun & Lee, 2013) or incremental-exploitative innovations that are developed for the needs of existing customers or markets (Benner & Tushman, 2003). In fact, for an LEE firm the interaction with an AE investor may initially resemble an apprenticeship (Herrigel, Wittke, & Voskamp, 2013). Little is yet known about an LEE supplier's movement from incremental-exploitative innovations to exploratory innovation due to interaction with AE investors. Lorenzen and Mudambi (2013) suggest that catch-up can be achieved along two dimensions, through value creation and through value capture. The former relates to achieving technological catch-up, the latter to capturing greater value from existing operations, such as through incremental efficiency improvements. More radical innovations in LEE firms can be later achieved through value co-creation with foreign investors (Benner & Tushman, 2003), and are manifest as the generation of new designs, creation of new markets and development of new channels of distribution (Abernathy & Clark, 1985). Such innovations require new knowledge or departure from an existing knowledge base (Benner & Tushman, 2003; Levinthal & March, 1993). To date, little research has yet been conducted on the dynamics of learning in LEE-AE dyads (Sun & Lee, 2013). We propose in this paper to examine the evolution of innovative capabilities in an LEE supplier through interaction with an IJV and the nature to which the AE investor acts as a local knowledge governor in an LEE context.

Proposition 1. That IJVs act as an important mechanism for the transfer of knowledge, skills and technology to LEE suppliers.

We next move to consider whether this proposition can be considered as having a spatial and a relational dimension.

2.2. Foreign investors and dual networks: a spatial dimension?

In this paper we are interested in local and international spatial dimensions as geographically distinct but relationally connected dimensions within which foreign investors play a crucial *gatekeeping* role (Giuliani, 2011; Graf, 2010), undertake a *flagship* firm role (Rugman & D' Cruz, 2000), or become an *anchor tennant* in a cluster (Agrawal & Cockburn, 2003). Knowledge, resources and communication can flow through this *gate* and can facilitate catch-up. However, due to the relative resource asymmetries (local to foreign) and relatively few alternative sources of advanced knowledge available to local agents, foreign investors become significant macro-level governors of catch-up. A gatekeeping role effectively centralizes network connectivity around a foreign investor and in an LEE, introduces certain asymmetries into resource flows (Lorenzen & Mudambi, 2013; Sun & Lee, 2013).

A number of authors have discussed the interplay between local and international geographic dimensions on an LEE firm's potential to catch-up (Bathelt, Malmberg, & Maskell, 2004; Lorenzen & Mudambi, 2013; Storper & Venables, 2004). For instance, the association between these geographic dimensions has been discussed as the interplay between a

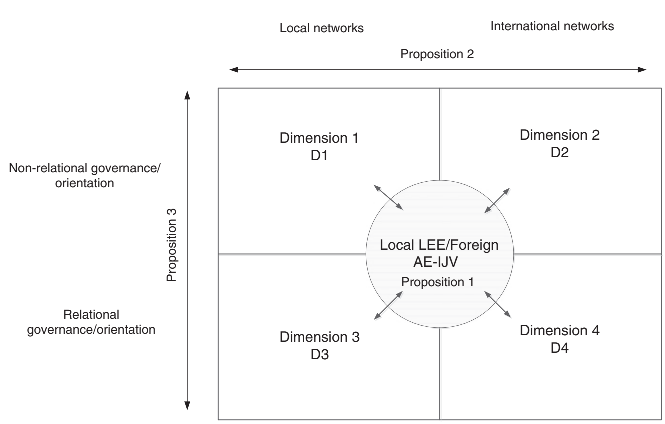

Fig. 1. Four relatio-spatial dimensions in IJV mediated buyer–supplier interactions.