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ABSTRACT

This paper contributes to understanding the potential for localised knowledge creation that can be generated by multinational enterprise (MNE) entry into cities in the global South from both the MNE and the local economy's perspectives. It presents a qualitative analysis of the activities of the MNE subsidiaries in the information and communication technology (ICT) sector in an emerging investment hub in Medellín, Colombia. The analysis differentiates between the MNEs' local strategies to explore distinct configurations of MNE–local economy relations and their potential for unilateral or mutually beneficial knowledge creation. The findings suggest that the synergy between the MNE strategies and the evolving knowledge environment in the local economy increases the potential of the MNEs' activities for interactive and mutually beneficial knowledge and capability creation with other local stakeholders. In Medellín, these effects predominantly concerned the market-seeking MNEs, not those seeking strategic assets, as expected by evidence in the literature. They also revealed how the specific MNE strategies tended to use and influence the creation of local knowledge resources, which helps shape policies that indiscriminately aim to attract all kinds of knowledge-intensive MNE activities to emerging investment hubs.

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MNEs; ICT; knowledge creation; local development; Medellín

1. Introduction

In the global competition for knowledge resources, cities worldwide have endeavoured to attract the knowledge-intensive activities of multinational enterprises (MNEs; e.g. Castellani et al. 2022). These activities have been considered a strategic resource for renewing local economies by generating high-value jobs, new businesses, and innovative services (Fallon and Cook 2010, 338; Mudambi and Mudambi 2005; Porter 2003). When integrated into local innovation and business ecosystems, these activities may create new knowledge and upgrade local capacities and innovation performance (cf., Autio and Thomas 2014; Cantwell and Iammarino 2000). For developing countries, capturing MNE knowledge-intensive activities is considered particularly crucial since they can be an essential source of business-specific knowledge and technologies for the development of high-tech industries. Well-known examples of this phenomenon are the software and film industries in Bangalore and Mumbai, India (e.g. Lorenzen and Mudambi 2012; Patibandla and Petersen 2002; Täube, Karna, and Sonderegger 2019). To hasten the expected positive gains from the knowledge-intensive activities of MNEs in local economies, local governments are increasingly adopting strategies to boost local innovation capabilities.

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MNEs in knowledge-intensive sectors continually search for new sources of knowledge and capabilities to develop and maintain their competitive advantage (Bathelt and Cohendet 2014; Li and Bathelt 2018). Even new and smaller MNEs leverage both cost- and capability-related opportunities in foreign locations (Narula and Dunning 2010, 278); increasingly, they are ‘born global’ (Øyna and Alon 2018). The quest for diverse resources has intensified the MNE spread to less traditional locations and more peripheral areas of advanced and emerging economies (Glückler 2014; Manning 2013; Mudambi and Santangelo 2016). Such areas, although often narrow in terms of technical competence or knowledge resources, can offer valuable pockets of resources integratable into global innovation networks (Caleb et al. 2021; Mudambi and Santangelo 2016, 1967). The variety of industries and complementary specialised assets can influence MNE competence creation (e.g. Hennart 2009). To benefit from the variety of factors in different locations, MNEs increasingly microsegment their production and innovation activities worldwide (Narula and Dunning 2010, 278; Papanastassiou, Pearce, and Zanfei 2020, 635).

MNEs and local governments thus pursue the advancement of knowledge resources, but their goals obviously differ. MNEs seek locations that help enhance their profitability and competitiveness, while local governments seek to attract MNEs’ knowledge-intensive activities because of their potential to spur specific economic developmental outcomes. However, not all the MNE activities nor the locations they enter are equally beneficial for knowledge diffusion or creation. Places lacking high-quality resources may attract only low-tech MNE operations, which offer little potential for advanced knowledge flows (Mudambi and Mudambi 2005, 155). Technologically advanced locations with corresponding skill bases offer better opportunities and incentives to develop activities conducive to knowledge creation (Cantwell and Janne 1999; Cantwell and Mudambi 2005, 1124). The potential for mutually beneficial knowledge creation is determined by the fit between MNE strategies and location-specific factors (cf. Narula and Dunning 2010).

Even if the growing presence of the MNE knowledge-intensive activities in less-advanced locations is acknowledged in the literature (e.g. Barrett, van Biljon, and Musso 2011; Chaminade and Gómez 2016; Gómez, Oinas, and Wall 2022; Manning 2013), the current understanding of localised knowledge creation is primarily based on studies of advanced economies and on specialised technology clusters and innovation hubs, mainly in China and India (e.g. Chaminade and Vang 2008; Karna, Täube, and Sonderegger 2013; Lorenzen and Mudambi 2012; Täube, Karna, and Sonderegger 2019; Wang, Lin, and Li 2010; Wang and Wu 2016). Often, studies on interactive knowledge creation have focussed either on endogenous processes within MNEs (e.g. Andersson, Forsgren, and Holm 2002; Figueiredo 2011; Figueiredo, Larsen, and Hansen 2020) or on the impact of their knowledge-intensive activities on (uneven) economic development at regional and global scales (e.g. Buckley et al. 2020; Iammarino 2018; Lorenzen, Mudambi, and Schotter 2020). Interdependent knowledge creation between MNEs and local stakeholders remains under-researched in technologically less advanced locations in the global South. The literature does not inform about the range of activities MNEs perform in these environments, the knowledge resources they accrue in these locations, their engagement with local stakeholders, or the impact of their activities on local knowledge creation. This study contributes by filling some of these gaps in the literature. Additionally, it answers calls for a context-sensitive approach (cf. Pike, Rodríguez-Pose, and Tomaney 2014) by studying knowledge creation at the local scale where MNEs interact with actors in the local economy (Narula and Dunning 2010, 269).

In particular, the paper investigates how differently motivated internationalisation strategies (Dunning and Lundan 2008) influence MNE behaviour in the host environment. Identifying distinct strategies helps understand MNEs’ local activities, knowledge-generating interactions with local stakeholders, and the benefits they may acquire in the host environment. It helps to answer the first research question: *How do different MNE types source and create knowledge in an emerging investment hub?* The identification of MNE strategies also helps distinguish the different configurations of MNE–local economy relations from the perspective of local stakeholders and the local economy. It thereby helps to answer the second research question: *How does the local economy benefit from the presence of different MNE types in terms of knowledge creation and capacity upgrading?* To answer these

questions, the paper explores the activities of MNE subsidiaries in the information and communication technology (ICT) sector in Medellín, Colombia. The city experienced a sharp increase in MNE presence after opening a high-quality publicly owned innovation and business centre in 2012, called Ruta-N. A qualitative exploratory case study on foreign firms in Ruta-N allows the investigation of MNE strategies and evolving configurations of MNE–local stakeholder relations in their new location. This helps understand the contextual factors potentially giving rise to interactive knowledge creation in MNEs’ local relations in an emerging investment hub of the global South.

The remainder of this paper is organised as follows. Section Two presents a critical review of the literature on knowledge creation from the perspectives of MNEs and local economies in general and in the global South in particular. It also presents an established typology of the internationalisation strategies of MNEs as a tool for distinguishing four types of MNE subsidiaries, their local activities, and influences on local knowledge creation. Section Three presents Medellín as an emerging and increasingly internationally recognised innovation hub, describes the data, and operationalises the framework outlined in Section Two. Section four provides an in-depth analysis of the instances of local use and creation of knowledge from the perspectives of the MNEs and the local economy. The analyses are carried out separately for the four types of strategically motivated MNEs in the sample. Section Five discusses which strategies are conducive to MNE–local economy relations that can benefit knowledge creation for both parties as well as how this understanding contributes to the literature. Section Six reconsiders the roles MNEs may play in local economic development in the emerging investment hubs of the global South. Additionally, it proposes an analytical framework as a tool to assess how MNEs motivated by distinct strategies use and influence knowledge creation in local economies and shape relevant policies.

2. MNEs and local knowledge creation: advantages for MNEs and the local economy?

The potential benefits arising from the MNE presence in (emerging) cities and engagement in knowledge use and creation are analysed here from the MNE and local economy perspectives.

2.1. MNE perspective

The literature mainly discusses three overlapping factors that benefit MNEs’ use and creation of knowledge in host locations: the location as a whole, local networks, and local industrial clusters.

Overall, the *location* is vital if it provides favourable institutions and resources for MNEs’ knowledge creation (Buckley and Munjal 2017, 372). MNEs seek locations with features that help implement their strategies (Narula and Dunning 2010, 276). These include environments with reliable local governance frameworks, variety in local industries, suitable levels of local development, and thriving knowledge environments driven by scientific progress or cultural trends (cf. Buckley and Casson 2020). They may also comprise complementary resources that benefit MNEs, such as pools of skilled labour, specialised knowledge agglomerations, R&D infrastructure, technologies, or local government facilitation (cf. Caleb et al. 2021, 7; Lorenzen, Mudambi, and Schotter 2020, 1207). MNEs’ higher value and strategic activities are conditional on the existence of specialised location advantages (Narula and Dunning 2010), which are available only in select locations. However, MNEs are also quick to recognise opportunities to develop knowledge and capacities in new locations, and once located, MNE capabilities and location-specific factors co-evolve (Albis, Álvarez, and García 2021).

MNEs form *networks* within the corporate organisation and with other stakeholders within cities and regions and internationally. Local networks are fundamental for accessing, using, and enhancing valuable specialised knowledge and other strategic resources and for complementing MNEs’ in-house knowledge and capabilities (cf. Papanastassiou, Pearce, and Zanfei 2020, 635). MNEs access complementary knowledge and skills through networks to (a) *exploit* existing capabilities

more efficiently; (b) *adapt* products and production to local conditions; or (c) *augment* existing capabilities that can improve processes, products, or services through the acquisition or exchange of knowledge with local stakeholders that possess specific advantages (Bell and Pavitt 1995; Le Bas and Sierra 2002). In emerging economies, MNEs' local networks have traditionally been associated with exploiting existing capabilities, production networks or market expansion (see Albis, Álvarez, and García 2021). However, they have also evolved as important sources for MNE knowledge acquisition, development, and reverse knowledge transfers (cf. Jha, Dhanaraj, and Krishnan 2018; Zhao et al. 2020). Although different types of local relations can contribute to MNEs' capability-building (generic or knowledge-intensive relations), close knowledge-intensive relations have the most significant potential for leading to knowledge creation (Andersson, Forsgren, and Holm 2002, 992; Figueiredo 2011, 417; Figueiredo, Larsen, and Hansen 2020). Yet MNEs' propensity to collaborate with local stakeholders is often limited to local universities and research institutes (or international partners in global networks) rather than to domestic firms. MNEs tend to form vertical relationships with the latter (cf. Papanastassiou, Pearce, and Zanfei 2020, 639).

Clusters comprise specialised knowledge hubs and therefore may provide ideal environments for knowledge-intensive and innovation activities (Mudambi and Swift 2012). MNEs leverage knowledge and resources for global knowledge creation in diverse locations by strategically locating activities across clusters (Li and Bathelt 2018, 968) with varying levels of sophistication (Meyer, Mudambi, and Narula 2011, 243). MNEs collocate with other firms engaged in similar or related activities to take advantage of local skills, resource pools, and networks (cf. Bathelt, Malmberg, and Maskell 2004). Clusters that provide advanced infrastructure, global connectivity, and networking are particularly interesting for MNEs' knowledge-intensive activities (McCann and Acs 2011). Nevertheless, emerging clusters and clusters in emerging economies can also provide efficient environments for undertaking these activities, as they are often less congested and offer comparatively more stable institutional and business environments than do other contexts in the economy (e.g. Karna, Täube, and Sonderegger 2013). They can support relatively standardised activities or services (e.g. Manning 2013), or offer abundant resources for knowledge creation. The latter are often shaped with policy support (e.g. Zhao et al. 2020).

The evidence in the literature about the advantages MNEs accrue in *emerging* clusters for knowledge use and creation is often fragmented or narrow. The advantages are studied considering the evolutionary stage of the cluster (cf. Karna, Täube, and Sonderegger 2013; Täube, Karna, and Sonderegger 2019; Zhao et al. 2020). In young clusters, MNEs may find generic resources, such as untapped pools of cost-effective talent. In more mature clusters, they obtain more specialised knowledge resources like networks of local firms or ties to local markets. Alternatively, the advantages are examined by considering preselected MNE strategies (cf. Mudambi and Santangelo 2016), although MNEs with different strategic motivations may be located in a single cluster, and each strategy requires specific resource types and benefits from different collocation advantages (Mudambi and Swift 2012, 15).

2.2. Local economy's perspective

City governments increasingly compete to attract knowledge-intensive MNE activities to improve the international standing of cities and to speed socioeconomic transformations. The concentration of knowledge-intensive activities encourages direct and indirect interactions amongst firms and other local organisations, and breeds knowledge-creating synergies that strengthen the local economy (Bathelt 2005). These activities can also be a channel for local actors to participate in external markets through global innovation networks and value chains or to obtain essential knowledge from abroad (cf. Bathelt and Cohendet 2014). Ensuing processes of knowledge dissemination can support competence accumulation in local firms, benefit local productive capacity (e.g. Nooteboom 2006), and trigger further resource agglomeration and upgrades (e.g. Asheim, Cooke, and Martin 2006; Mudambi and Santangelo 2016) as well as catch-up processes

(Narula and Dunning 2010, 266). They can also enhance cluster development (e.g. Täube, Karna, and Sonderegger 2019).

Exposure to MNEs' knowledge flows and technologies in the local economy, however, does not occur automatically. The agglomeration of knowledge-intensive activities may not translate into functional proximity between local stakeholders and foreign firms, leading to collaborative knowledge creation or upgrades in the local economy (Malmberg and Power 2006; e.g. Wang, Lin, and Li 2010). Clearly, not all MNE activities boost local development. Many merely provide low-level employment or tax revenues (Mudambi and Mudambi 2005; Narula and Dunning 2010, 263). Additionally, MNEs' greater international connectedness often means that their higher-end activities are concentrated in core cities, leaving them disconnected from local ecosystems in other locations with no valuable diffusion of knowledge or skills within the local economy (Lorenzen, Mudambi, and Schotter 2020; Yamin and Sinkovics 2009, 146).

Local economic structures and institutions also shape MNE activities (high or low value-added, knowledge-creating or efficiency-exploiting) as well as local stakeholders' abilities to benefit from them. The weak technological capabilities of local firms or human capital may limit the capacity to absorb the kinds of useful new knowledge MNEs may introduce to a location (Cohen and Levinthal 1990). Nevertheless, with support from MNE activities, location-specific advantages can also be cocreated or influenced, according to evidence from both advanced and emerging economies (e.g. Lorenzen, Mudambi, and Schotter 2020; Mudambi and Santangelo 2016; Zhao et al. 2020). However, existing evidence is from locations with a history of MNE presence, not those only beginning to attract MNEs.

According to the literature on emerging clusters, the engagement of local stakeholders with MNE activities is gradual, but when it happens, it has implications for local knowledge resources (cf. Karna, Täube, and Sonderegger 2013; Lorenzen and Mudambi 2012; Täube, Karna, and Sonderegger 2019). In emerging economies, MNE subsidiaries initially remain in strictly hierarchical relations vis-à-vis their headquarters, merely receiving up-to-date external knowledge and practices. Over time, local stakeholders may start engaging with the subsidiaries and absorb selected knowledge influencing local resources, e.g. technological upgrades, educational curricula, or recruitment practices. Eventually, local networks may form part of MNEs' extended relations, which improve local stakeholders' international exposure, access to external markets and final customers, and spark catch-up processes (Chaminade and Vang 2008; Lorenzen and Mudambi 2012). Extended relations can also result in independent international partnerships with local stakeholders adopting roles in global value chains or innovation networks and engaging in the translocal use and production of knowledge. The latter, knowledge-intensive economic connections within and outside the local economy, can contribute to virtuous cycles of local development (Lorenzen, Mudambi, and Schotter 2020).

2.3. Matching the MNE and the local economy's perspectives: strategic motivations and location determinants

The literature on MNEs and local knowledge creation acknowledges the diversity amongst locations and investigates location-specific advantages. From the MNE perspective, the literature suggests that the type of MNE strategy impacts location choice according to the quality of local advantages and the benefits they accrue in a location (cf., Buckley and Casson 2020; Buckley and Munjal 2017; Caleb et al. 2021). Literature that takes the local economy perspective shows that the locations able to attract, engage with, and benefit from MNEs' knowledge-intensive activities are those rich in specific advantages (cf. Chaminade and Vang 2008; Lorenzen, Mudambi, and Schotter 2020; Lorenzen and Mudambi 2012). The literature tends to be interested in success stories. It focuses on MNEs' most advanced activities (i.e. R&D and innovation) and their production in successful locations in advanced technological clusters. This also holds for research on emerging economies where, however, advanced activities and clusters are actually still scarce (e.g. Karna, Täube, and

Sonderegger 2013; Täube, Karna, and Sonderegger 2019; Zhao et al. 2020). Selected ex post longitudinal studies from contexts with a long history of MNE presence demonstrate the gradual development toward successful high-end activities (ibid.).

Earlier research has paid insufficient attention to MNEs and local knowledge creation in the more prevalent host environments that are not (yet) specialised in advanced activities. Examples of such in-between places are the increasing number of emerging investment hubs in the global South. The literature does not discuss the propensity of different types of MNEs to engage in knowledge creation in such environments, nor does it postulate when diverse MNE activities contribute to the development of those locations. Moreover, while locations' contribution to diverse MNE activities and knowledge creation has been studied to a large extent, there is not a corresponding level of understanding about the specifics of the contributions of MNE activities in a location. The latter is the case because MNE activities are often studied in quantitative analyses of their impact on city regions' domestic growth, development, (un)employment, or patents in aggregate terms (cf. Mudambi and Mudambi 2005; Narula and Dunning 2010; Wang and Lin 2010; Yamin and Sinkovics 2009). What is lacking is understanding of the knowledge- and capacity-enhancing potential of MNE – local economy relations: how they may mutually benefit both local stakeholders and MNEs if they provide access to knowledge that is relevant to the operations of each (Spencer 2008; Wang and Wu 2016).

In an attempt to remedy these shortcomings in the literature, this study uses Dunning and Lundan's (2008) typology of the strategic determinants of MNE location, which corresponds to the MNEs' search for *resources*, *markets*, *efficiency*, or *strategic assets*. These motivations were originally used to explain MNEs' location choices among countries. The country scale, however, is insufficient to explain the processes of MNE knowledge creation (cf. Li and Bathelt 2018, 984). Instead, the local scale is increasingly seen as more appropriate to understand interactions in host environments (Narula and Dunning 2010, 269). When the MNE role is studied in local knowledge-creation processes, the distinction between the strategic motivations of MNEs is useful, as these motivations indicate both MNEs' behaviours towards the local environment and aid in an understanding of the consequences MNEs' activities may have (Narula and Dunning 2010, 278). The types of local resources sourced (generic or specialised), the use or creation of knowledge, the establishment of local relations, or the spillovers in the local economy differ among the MNE operation types (ibid., 275) and expose locations differently (Iammarino 2018, 158).

This study thus builds on the premise that different MNEs' strategic motivations (a) correspond to more- or less-advanced activities, (b) require local knowledge resources with different levels of complexity, and (c) engage to different degrees with the local economy. These issues were investigated in the case of the MNEs hosted by Ruta-N in Medellín. This paper presents an empirical analysis of MNEs with different strategic motivations to help reveal how they source and create knowledge in an emerging investment hub as well as how they influence local knowledge creation and capacity upgrading in the local economy.

3. Study context, data, and methods

In the past decade, the city of Medellín has been transitioning from socioeconomic turmoil. A former industrial centre and Colombia's second-largest city, it became isolated during the 1980s and 1990s while functioning as the infamous Medellín drug cartel headquarters site; simultaneously, its industrial base lost competitiveness. A positive developmental cycle started a gradual transformation in the new millennium, and the city has lately been recognised as an emerging international innovation hub (2Thinknow 2019). As part of its efforts to renew the local economy, the city has implemented two main strategic policy tools to support knowledge-intensive activities amongst technology firms. In 2009, a dedicated organisation, *Corporation Ruta-N*, was established to support the city's science, technology, and innovation (STI) strategy. In 2012, the *Ruta-N Innovation and Business Centre* was opened to host and facilitate the operation of domestic and foreign technology

firms with the potential to generate value-adding activities and promote R&D and innovation in the city. The attraction and integration of these firms into the local innovation ecosystem was facilitated through a business-landing programme that included tax benefits and a range of services.¹ The programme has resulted in a growing MNE presence in the ICT sector, one of the three priority sectors in the STI strategy (Ruta-N n.d.). Between 2012 and 2016, 154 companies from 23 countries operated at Ruta-N, each for a maximum of 2 years allowed (Ruta-N 2016).

The new course of development in Medellín, centrally the entry of a relatively large number of small and medium-sized MNEs to Ruta-N in a short period of time, made it an appropriate setting for exploring how the MNEs and the local economy benefited from the situation. In this study, the flow of foreign firms to Ruta-N was taken as an unfolding phenomenon suitable for answering questions about causal relationships between MNE type and interactive knowledge creation in this new operating environment. It can assist in extending prevailing understanding in existing scholarship by providing evidence on the contextual factors potentially giving rise to interactive knowledge creation in MNEs' local relations. The *contextualised explanations of the potential of knowledge creation from both the MNE and the local economy perspectives* suggest theoretical interpretations that may be relevant to a broader class of phenomena (Plakoyiannaki, Wei, and Prashantham 2019; Welch et al. 2011) – i.e. cities like Medellín emerging as investment hubs.

Qualitative evidence was gathered through multiple methods. I previously studied Ruta-N and learned about the organisation and the presence of MNEs through *interviews* with stakeholders and *secondary data* (Gómez and Oinas forthcoming). For this study, I was granted access to the Ruta-N premises in November 2017. The daily presence onsite and working in open office spaces allowed *the observation* of informal activities and prompted fortuitous meetings and *informal discussions* with professionals from Ruta-N and firms. These discussions were an information source about the interactions amongst firms at Ruta-N and the role Ruta-N played in the firms' operations. *Semi-structured interviews* with fifteen top managers of MNE subsidiaries (CEOs, managing directors, country managers, or general managers) provided the main source of the primary data to explore the nature of the firms' local operations and to understand knowledge creation from the MNE perspective. These interviews also provided data to help infer the significance of MNE operations for the rest of the local economy.

Additionally, thirteen interviews were carried out with other local stakeholders to complement the local economy's perspective and to triangulate the data on the MNEs' local relations (i.e. reconcile the evidence and limit information bias in the analysis). These interviews consisted of four members of the staff at Ruta-N and its business-landing programme management, six managers of domestic ICT firms operating in Ruta-N, two CEOs of the local business association of software companies, and one staff member of the local Chamber of Commerce ICT cluster. *Secondary data* collected from the websites and the firms' and relevant organisations' social media communications provided additional background information on Ruta-N and the firms.

At the time of the data collection, 41 MNEs were operating at the Ruta-N office complex. The contact information of the onsite firms was confidential, and local managers had to be identified through webpages, LinkedIn, or Facebook. Often, the firms' digital fingerprints differed from their registered names, and the staff names or their contact information was not available on the web pages. These hurdles added to the general difficulty of conducting interviews with businesspeople (cf. Eriksson and Kovalainen 2008). Of the 36 MNEs contacted, fifteen managers (36%) agreed to be interviewed. The interviews were one-time face-to-face events that lasted between 30 min and 2 h and were, on average, 50 min. The data gathered included systematic and detailed accounts of the firms and their activities in Medellín, including local relations.

The interview data were recorded (except in a case when the interviewee did not consent and I relied on interview notes) and transcribed to facilitate coding, categorising, and revisiting. The data on the MNE subsidiaries were anonymised to put interviewees at ease when sharing business information. (Individualised data on firms were not relevant for this study, as the focus was on firm types.) The data analysis indicated that the firms could be systematically categorised into four

groups following Dunning and Lundan (2008), according to the firms' strategic motivations for operating in Medellín. This categorisation was based on the subsidiaries' main activities, that is, whether their principal occupation in Medellín was acquiring resources, markets, efficiency, or strategic assets. Appendix Table A1 presents the key characteristics of the firms and their categorisation based on their strategic motivations. Table A1 reveals that the sample consisted of firms in each category even if, according to Dunning and Lundan (2008), motivations that are more demanding are usually developed over time by MNEs in their various locations. However, the firms in the sample in Medellín had been operating for only a relatively short period (from six months to three years), suggesting that their motivations likely stemmed from the time of their entry.

The framework for analysing the significance of knowledge creation from the MNE and the local economy's perspectives (see Section 2 above) is operationalised in Table 1.

Table 1 provides the basis for the data coding, analysis, and presentation of findings in Section 4. To analyse the MNE perspective, the interview data were first coded using NVivo according to the sources of the advantages supporting the MNEs' use and creation of knowledge locally: *location-specific advantages*, *local relations*, and *advantages of collocation* (indicators 1–3 from the MNE perspective). Then, to analyse the local economy's perspective on the MNE presence in terms of the effect of their activities on local knowledge creation and capacity upgrading, three categories were identified of their potential to benefit: *value creation*, *local actors' engagement*, and *translocal relations* (indicators 1–3 from the local economy's perspective). In both perspectives, the subindicators specified the advantages identified in earlier research for MNEs in given locations and for (other stakeholders in) the host environments (Section 2).

The analysis presented in Section 4 consists of a systematic examination and interpretation of the data to investigate, first, the MNEs' activities and their classifications according to the categories presented by Dunning and Lundan (2008), and second, the advantages of the MNE presence in Medellín from the MNE and the local economy's perspectives according to the key indicators as summarised in Table 1. The same analysis is iterated for each of the four MNE types. The thick description of the MNE activities in Medellín and the iterative analysis presented in Section 4 reveal the use, adaptation, or creation of knowledge within each MNE category. The application of the analytical framework thus allows not only the identification of MNE categories but also the definition of what the strategic categories mean in the location, what the MNEs do in Medellín, and how the MNEs and the location benefit. The discussion in Section 5 presents the theoretically informed interpretations of the findings in Section 4.

Table 1. Operationalisation of the analytical framework.

MNE ADVANTAGES		LOCAL ECONOMY'S ADVANTAGES	
Indicator	Subindicator	Indicator	Subindicator
1. Location-specific advantages	Local developmental level	1. Value creation	Influence of MNE activities on the fulfilment of development strategies
	Favourable governance and knowledge environments		Improvement in activities, knowledge, or products
	Complementary and strategic resources		Agglomeration and advancement of knowledge resources
2. Local relations	Type of relations	2. Local actors' engagement with MNEs	Local stakeholder exposure to MNE activities
	Level of knowledge creation		Knowledge-intensive connections
3. Collocation advantages	Business and institutional facilitation	3. Translocal relations	Access to global knowledge flows and practices
	Pools of resources, specialised skills, and networks		Translocal relations impact on local resource enhancement
	Generic or specialised knowledge		Participation of local partners in the production and use of translocal knowledge

4. Findings

The findings of the empirical analysis are presented separately for each of the four categories. They interpret the evidence to answer the research questions. Table 2 shows the structure of the analysis corresponding to Table 1 and the summary of the findings in the case of the four MNE types.

4.1. Resource-seeking MNEs

4.1.1. MNE perspective

Medellín advantages. The two resource-seeking MNE subsidiaries benefitted from an existing pool of inexpensive semiskilled and skilled labour as well as from Medellín's location in the same time zone as their headquarters and customer bases in the USA. Thus, Medellín was used as an offshore hub for advanced services.

Local relations. The resource-seeking MNE subsidiaries relied on a few local knowledge sources, as local relations were limited in scope and autonomy. Local activities consisted of labour-intensive tasks supporting subsidiaries and headquarters in the USA and relied on existing corporate knowledge generated at the MNE headquarters. The MNE headquarters also oversaw product and service development and customer relations. The local relations of the subsidiaries contributed to the

Table 2. Structure of the analysis and summary of the findings: sources of localised knowledge creation from the perspectives of the MNEs and the local economy.

MNE PERSPECTIVE		LOCAL ECONOMY'S PERSPECTIVE	
RESOURCE-SEEKING MNEs			
Medellín advantages	Proximity to a key market	Employees' capability upgrade and skilled labour agglomeration	Value creation
Local relations	Mediation by Ruta-N in local recruiting	Employment	Local actors' engagement with MNEs
Collocation advantages at Ruta-N	Intermediation in the local economy	Increase of advanced offshore services; internationalisation of local firms	Translocal relations
MARKET-SEEKING MNEs			
Medellín advantages	Unfolding knowledge-based development	Consolidation of the knowledge-based economy	Value creation
Local relations	Partnerships to source, develop, and combine knowledge	Introduction, development, and use of MNEs' products and services	Local actors' engagement with MNEs
Collocation advantages at Ruta-N	Strategic business and market information, partners, and customers	Collaboration between local actors' and MNEs' networks	Translocal relations
EFFICIENCY-SEEKING MNEs			
Medellín advantages	Favourable location, institutions, and resources to serve advanced markets	Labour market diversification and upgrade	Value creation
Local relations	Influencing educational curricula to meet MNE labour demands	Cocreation of local knowledge resources	Local actors' engagement with MNEs
Collocation advantages at Ruta-N	Easy entry and visibility in a qualified community	Local knowledge and labour upgrade to international standards	Translocal relations
STRATEGIC ASSET-SEEKING MNEs			
Medellín advantages	Emergent innovation ecosystem	Stimulation of the local innovation ecosystem with up-to-date industry knowledge	Value creation
Local relations	Monitoring and nurturing the innovation ecosystem	Local innovation ecosystem supported and influenced by MNEs	Local actors' engagement with MNEs
Collocation advantages at Ruta-N	Access to technology firms, participation in innovation ecosystem	Local resource nurturing for global consumption	Translocal relations

enhanced competitive performance of the MNEs by ensuring the capacity supply of cost-efficient labour (the primary complementary local knowledge resource) according to the demand determined by the USA market. The primary local relation was formed with Ruta-N. The organisation facilitated the recruitment of a specialised local labour force and mediated relevant local relations. For instance, through continuous public exposure as a successful technology business model, *Mi*, the fastest-growing firm by the number of employees at Ruta-N, obtained new customers (local firms operating in the USA) and business partners.

Collocation advantages. The advantages of the collocation of the resource-seeking MNE subsidiaries were limited to the hosting organisation. Ruta-N provided the MNE subsidiaries with a low threshold to operate in Medellín, institutional support, and an established business community within which to operate. It also provided intermediation in the local business environment, facilitating access to other stakeholders or labour.

4.1.2. Local economy's perspective

Value creation. Value creation in the local economy, influenced by the resource-seeking MNE activities, was mainly due to the capability upgrade of the MNEs' employees. They were on-the-job trained in corporate processes and product customisation. However, the MNE local operations also attracted qualified labour from other regions, contributing to the agglomeration of knowledge resources. Resource agglomeration was helped by Ruta-N's promotion of the MNE subsidiaries as models of successful knowledge-based businesses in the city. Ruta-N sent the message to other technology firms, 'you can grow here'.

Local actors' engagement with the MNEs. The local economy did not have much exposure to the local activities of the resource-seeking MNEs, which were tightly enclosed within corporate structures and disengaged from the local entrepreneurial ecosystems. The MNEs' products and services were not available in the local market since it was not sufficiently mature. Locally hired employees, however, participated in the production of the MNEs' high-end e-commerce services, albeit not in highly specialised tasks. Additionally, the Ruta-N organisation, which ran recruitment services, became acquainted with the MNEs' up-to-date skills requirements, which could influence demand and upgrades in the labour market.

Translocal relations. These resource-seeking MNE subsidiaries remained in strict hierarchical relations vis-à-vis their headquarters. The local employees participating in the provision of corporate services and international relations had direct access to some global knowledge and practices. They obtained up-to-date knowledge from advanced markets and increased their translocal social capital and skills. Exceptionally, the MNEs' activities influenced local firms' upgrades; a few local firms operating in the USA market and using the MNEs' services had access to relevant market knowledge that could improve their performance and competitiveness abroad.

4.2. Market-seeking MNEs

4.2.1. MNE perspective

Medellín advantages. For the five market-seeking MNE subsidiaries, location in Medellín either consolidated their operations in Latin America or established a gateway to the region. Deepening knowledge-based development in the city created advantageous conditions for the MNEs, who were accustomed to operating in more-advanced ecosystems. Changes in Colombia's labour and environmental policies created a national demand for environmental technologies such as those of *Delta* and *Xi*. The local government's focus on regulatory compliance and increasing environmental deterioration in Medellín boosted local demand for the MNEs' products and services. Additionally, the emergent innovation ecosystem, enabled by the opening of Ruta-N and the implementation of an innovation district, generated a demand for *Gamma's* and *Epsilon's* dedicated services to the increasing number of technology firms in the city. Additionally, it generated a

demand for new business models, such as *Dseta's*, which created opportunities for unskilled labourers.

Local relations. The focus on the Colombian market made it essential for the market-seeking MNEs to source locally relevant specialised knowledge for adapting or developing their products and services, which required a higher degree of engagement in the local economy. The MNEs accessed complementary knowledge by entering strategic partnerships with local stakeholders with the needed expertise and, in many cases, with an existing customer base. For instance, Delta collaborated with a firm specialising in national labour and environmental safety legislation to adapt and distribute its digital products. Gamma collaborated with locally operating technology giants to consolidate its data storage services and products among technology firms. *Dseta* developed relations with local government officials and leaders of low-income neighbourhoods to buy and promote the services of the unskilled among renowned international MNEs. Epsilon built extensive translocal networks to help create external connections for the technology firms it hosted and to coordinate diverse business services providers for the coworking spaces it operated. Xi established solid partnerships; it entered into consortia with local and international public and private enterprises as well as research institutes to collaborate in developing locally appropriate green infrastructure. These collaborations enabled Xi to produce new knowledge for local and international use.

The complexity of the local collaborators' knowledge varied from business and legal configurations to distribution, marketing support, and technological development capacities. The last included reciprocal knowledge exchanges with the MNE for R&D activities. The applied or scientific knowledge obtained through local collaborations of market-seeking subsidiaries mainly contributed to advancing the MNEs' competitiveness in the local market. In some cases, it also contributed to generating knowledge and capacities relevant to either other locations or the regional or global strategies of the MNEs.

Collocation advantages. For the market-seeking MNEs, the main advantage was a presence at Ruta-N. The organisation functioned as an information hub. It provided the MNEs with crucial business and market knowledge to enter the city and find local partners. Through Ruta-N's information channels, *Dseta* began working with the local government and planning Medellín's innovation district. Later, it established permanent operations in Medellín. Xi entered a consortium with a local technological developmental centre to compete for government funds from the UK. In other cases, Ruta-N itself was a customer and a business partner. Gamma delivered data storage services and products to Ruta-N and hosted firms, and in partnership, they implemented local government projects. Epsilon provided expertise to Ruta-N in operating coworking spaces, and together they developed a branded local network of them.

4.2.2. Local economy's perspective

Value creation. The introduction of the market-seeking MNEs' products and services into the local economy helped to consolidate and upgrade the emergent innovation ecosystem as follows. Their more-advanced knowledge and technology contributed to filling knowledge voids that appeared in the local economy as the knowledge-based development deepened. Local technological firms had access to business environments that were more sophisticated and digital tools that were more advanced in the city. Finally, digital tools and services were made available to other industry sectors, impacting their efficiency and working conditions (e.g. health and safety).

Local actors' engagement with the MNEs. Local stakeholders engaged with the market-seeking MNEs as they used or collaborated to adapt the MNEs' products and services. Adaptation to local and regional customer needs and market conditions required inbound global knowledge transfers from the MNEs. Exceptionally, adaptation involved reciprocal knowledge-intensive exchanges to develop locally appropriate technologies. Additionally, local stakeholders from the public and private sectors were directly involved with the MNEs as customers of their products and services.

Translocal relations. Local firms and other organisations established relations beyond Medellín by collaborating with the market-seeking MNEs and their international partners locally, which made it possible to adapt the existing MNE knowledge to the local market conditions. Alternatively, local stakeholders engaged in reciprocal knowledge-intensive exchanges within the MNEs' local and international networks whereby they could participate in the production of new knowledge that was locally and internationally relevant. Through these collaborations, local stakeholders gained direct access to up-to-date, state-of-the-art knowledge.

4.3. Efficiency-seeking MNEs

4.3.1. MNE perspective

Medellín advantages. The five efficiency-seeking MNEs in the group focussed on maintaining their digital global service platforms, which were mainly used in advanced markets. Being located in Medellín allowed them to provide 24-hour customer service and technical support worldwide and to operate in a USA time zone. They could also benefit from the skilled labour available at a relatively low salary level and a future supply of knowledge resources from a variety of well-functioning educational institutions in the city. Additionally, three of the MNEs ran technology centres to diversify the risk of those operating in Estonia (*Theta*), Ukraine (*Iota*), and Venezuela (*Ni*). *Alfa* (from Brazil) and *Ni* (moving its technology centre from Venezuela) found it advantageous to operate in a fairly familiar sociocultural and institutional environment and to benefit from tax differentials. (*Kappa* and *Theta* also had minor market-seeking motivations.)

Local relations. The local activities of the efficiency-seeking MNEs were embedded in global corporate structures, but compared to the resource-seeking firms, the MNE subsidiaries had more autonomy to perform highly specialised tasks. These operations depended on the availability of specific types of specialised labour, their primary local resource. The local labour pool included highly skilled graduates hired directly from local universities and trained on the job. Managers were Colombians with foreign university degrees or foreigners with international experience within the MNEs (*Theta* and *Ni*). The MNEs' most significant local relations were with universities and the vocational school SENA to ensure appropriate training and a sufficient labour supply. MNEs collaborated with these institutions in developing curricula and expertise suited to the new-to-the-locality business types and technologies. Other local relations were limited to obtaining services for administrative tasks.

Collocation advantages. For the efficiency-seeking MNEs, Ruta-N was a springboard to enter the city. The subsidiaries operated independently, but at Ruta-N, they benefited from the international prestige of the organisation and the high-quality, low-cost environment with an international community. These characteristics made the MNEs efficient from day one and attractive to potential recruits.

4.3.2. Local economy's perspective

Value creation. Collaborations between educational institutions and the efficiency-seeking MNEs created opportunities to upgrade knowledge resources in the local economy. These institutions acquired knowledge on industry requirements and new job types that prompted curricula updates, potentially benefitting the ICT and other sectors. The MNE activities also had an impact on professional skills upgrading, local employees worked with new technologies and business models on international corporate teams. This work concerned especially those operating in technology centres.

Local actors' engagement with the MNEs. Educational institutions were the predominant local stakeholders engaging with the efficiency-seeking MNEs. These relations influenced the development of curricula aligned with the global requirements on high-tech activities. The exposure of other local stakeholders to the MNEs' activities was limited. The MNE high-tech activities remained enclosed within corporate structures and products and services mainly aimed at more-advanced

markets. Some minor exceptions included Kappa and Theta, who sold their services also within Latin America, and Alfa, who participated in developing collaboration schemes with local firms as the only MNE member in the local association of software firms.

Translocal relations. The relations of local stakeholders with the efficiency-seeking MNEs contributed to local knowledge upgrades to international standards. The local educational institutions that collaborated with the MNEs absorbed up-to-date global knowledge which was transferred to new graduates and the labour market. The MNEs' employees participated in international teams within corporate structures in the orchestration and development of the firms' global high-tech activities, maintaining and developing of products, and providing of customer services for advanced markets. These activities contributed to employees' technical capacity upgrading and social capital. In the long term, these knowledge, skills, and high-tech linkages may spill over from corporate structures into the local economy.

4.4. Strategic asset-seeking MNEs

4.4.1. MNE perspective

Medellín advantages. By operating in Ruta-N, the three strategic asset-seeking MNEs in this group established a presence in Medellín (or found a new site; *Beta* and *Eta* have been operating in Medellín for over a decade). They actively participated in the local innovation ecosystem and benefitted from the improved knowledge environment. The MNE activities at Ruta-N were predominantly administrative, with only a few employees for *Eta* and *Ipsilon*, but they ensured a tactical presence. Occasionally, the MNEs organised high-profile events (e.g. information dissemination on technology, trends, and products, or organised contests), which helped them find potential local knowledge sources (technology firms, start-ups or talent) with which to engage. These newly developed activities and relations denoted their willingness to harness emerging knowledge assets in the local economy.

Local relations. The local relations developed by the strategic asset-seeking MNE subsidiaries sought to influence and monitor the development of the emerging innovation ecosystem, which was their expected source of complementary knowledge. As technology leaders (often involved in large public projects), the MNEs had political leverage with governmental officials, which they could exploit to influence the policies and legislation affecting the local innovation ecosystem. At Ruta-N, they could establish relations with technology firms or individual talent through their organised events. These relations gave the MNEs access to up-to-date local industry-specific knowledge and allowed them to take stock of available local knowledge resources, trends, and industry gaps. Local relations helped these MNEs gather and facilitate the creation of knowledge assets that were able to contribute to their competitive performance at a global scale.

Collocation advantages. Being part of the Ruta-N knowledge hub allowed the MNE subsidiaries to monitor and influence the evolution of the local innovation ecosystem. Additionally, it provided a communication channel to talent pools, technology firms, and start-ups (either hosted or not at Ruta-N) to (potentially) gather specialised knowledge.

4.4.2. Local economy's perspective

Value creation. The public activities of the strategic asset-seeking MNEs in the local ecosystem legitimated and increased the attractiveness of Ruta-N and Medellín as knowledge hubs. The organised events were a source of specialised information, latest technological displays, and training for local technology firms and talent. The showcasing of the existing capabilities of local technology actors during these events may have stimulated local competition and capacity upgrades and helped to attract other technology firms and talent.

Local actors' engagement with the MNEs. Local stakeholders' engagement with these high-profile strategic asset-seeking MNEs allowed for asymmetrical relations only. Local stakeholders could attend organised activities that provided access to relevant industry-related information

and the possibility of interacting with other stakeholders in the innovation ecosystem. However, the scope of those activities was largely under the MNEs' control. In the local economy and as anchor firms at Ruta-N, these MNEs drew public and policy attention to the innovation ecosystem and used their political leverage to influence its development.

Translocal relations. Local stakeholder relations with the strategic asset-seeking MNEs beyond Medellín were also asymmetrical. The MNEs provided local stakeholders (technology actors and local institutions) with access to handpicked advanced, industry-related knowledge and technologies. Simultaneously, they functioned as career channels for local talent or as access channels to the MNEs' business ecosystems for local firms using the MNE technologies.

5. Discussion

Growing evidence shows that MNEs increasingly engage in knowledge-intensive activities in less-advanced locations. However, limited attention has been given to the specifics of interdependent knowledge creation between MNEs and other stakeholders in local economies and how it potentially benefits each party. The literature has often drawn attention to MNEs' high-end technological activities associated with specific strategic motivations and specialised locations. However, the heterogeneity of both MNEs' activities and host locations and the myriad ways they may contribute to the upgrading of each other's capabilities have received relatively little attention. Furthermore, the prevalent use of quantitative data and methods to assess the impact of MNEs' activities in (country) locations has prevented intricate micro-level analyses at the local scale. Analyses at the subnational scale, customary in economic geography (e.g. Iammarino 2018; Lorenzen, Mudambi, and Schotter 2020) and increasingly embraced in international business studies (e.g. Buckley et al. 2020), will enable a better study of the knowledge creation occurring in interactions between MNEs and other actors in the local economy (Narula and Dunning 2010, 269). This paper helps to fill the gaps in the literature by providing a qualitative analysis of diverse MNEs operating in a city still emerging as an investment hub. It does so by presenting nuanced results on how different types of MNEs benefit from operating in the city in terms of using and creating knowledge locally and the distinct influence of their activities on knowledge creation and capacity upgrading in the emerging local economy.

Dunning and Lundan's (2008) categorisation of strategic motivations underlying MNE internationalisation decisions was employed in the analysis to differentiate between configurations of MNE–local economy relations involving types of localised knowledge and capability use and creation. In Medellín, the presence of MNEs driven by the four different strategic motivations suggests that the MNEs' internationalisation strategies were for the most part diversified from the beginning; they did not have time to evolve in Medellín. The strategic asset-seeking motivation, however, emerged when new opportunities and resources to develop knowledge and capacities appeared with the implementation of policy tools supporting technology firms' knowledge-intensive activities, such as the opening of Ruta-N. The simultaneous presence of MNEs with distinct strategic motivations in the emerging city can be a consequence of both the fast pace of global competition for new and diverse markets and knowledge resources (cf. Narula and Dunning 2010; Øyna and Alon 2018) and the increasing attractiveness of knowledge environments in emerging economies evolving with the adoption of knowledge-based and pro-innovation policies (cf. Caleb et al. 2021).

The analysis of the MNE perspective showed how different MNE strategies coexist and adapt to local circumstances to source and create knowledge. It also revealed the MNE types engaged in localised knowledge creation, on their own or with local partners. Locally engaged MNE activities were the exception and not the rule in the sample of MNE groups in Medellín. The MNEs' local activities largely remained within corporate structures. Only the market-seeking MNE subsidiaries created synergies with the evolving knowledge environment in Medellín and showed potential for interactive knowledge and capability creation within the local economy. These results contrast with earlier

findings that associated the market-seeking strategies of MNEs merely with the inflows of products and services and the exploitation of existing knowledge (cf. Albis, Álvarez, and García 2021; Mudambi and Santangelo 2016). Additionally, it is noteworthy that the strategic asset-seeking MNE subsidiaries in the Ruta-N sample were not associated with the localised knowledge creation with other stakeholders (cf. Dunning and Lundan 2008; Li and Bathelt 2018; Mudambi and Swift 2012; Narula and Dunning 2010). These findings suggest that the emerging investment hub lacks specialised or advanced resources or that there are significant knowledge or technological gaps between the strategic asset-seeking MNEs and the local economy. One of these factors may be stifling the MNEs' engagement with other local stakeholders and preventing them from carrying out activities that are more complex and of the kind for which strategic asset-seeking MNEs aim in other contexts. However, location-specific advantages in the emerging investment hub still positively impacted market-seeking MNEs' knowledge sourcing and creation, supporting Narula and Dunning's (2010) general finding that the potential for local knowledge creation and diffusion is determined by the fit between MNE strategies and location-specific factors.

The analysis of the local economy's perspective inquired how it benefits from the presence of differently motivated MNEs to spur economic developmental outcomes. In Medellín, this occurred in two ways. First, multiple exposures to the activities of market-seeking MNEs in the local economy contributed to knowledge-based development. These MNE activities had a strategic role in introducing and developing knowledge-based products and services (and occasionally exploiting them in other markets). The introduction of new technological knowledge had a potentially transformative socioeconomic impact in a location where related technologies and services were not previously available. The development of products and services involved local stakeholders in translocal collaborative knowledge exchanges: the type of MNE-local economy relations with the best potential for strengthening productivity performance and innovation capabilities for local stakeholders (cf. Karna, Täube, and Sonderegger 2013; Lorenzen and Mudambi 2012; Täube, Karna, and Sonderegger 2019). Second, while in general, the activities of other strategically motivated MNEs in this study seemed to have a more marginal impact on knowledge creation outside the MNE, those of the efficiency- and strategic asset-seeking MNEs involving local stakeholders seemed to help enhance local knowledge resources. Those knowledge resources concerned the upgrade of technological and other skills in the labour market and in the emerging innovation ecosystem. These findings support that MNEs' activities can also help enhance and cocreate location-specific advantages in a specific type of emerging economy that is nonspecialised and only recently exposed to MNE activity (cf. Lorenzen, Mudambi, and Schotter 2020).

The main finding in this study suggests that the potential of MNEs to contribute to localised knowledge creation is not specific to one strategy type, whereas in the literature this potential is often associated with strategic asset-seeking motivations (cf. Dunning and Lundan 2008; Narula and Dunning 2010). MNE strategies may play different roles in terms of the specific activities they trigger in diverse locations; MNE activities are strategy specific but also context sensitive. The strategic motivation categorisation used in this study as a tool helped to differentiate the potential for knowledge creation in different MNE strategies and the activity types it fostered in specific locations. In Medellín, market-seeking MNEs focussed on creating and adapting strategic knowledge in collaboration; efficiency- and strategic asset-seeking MNEs focussed on leveraging and developing local knowledge resources in collaboration. These findings suggest that the potential benefits from the MNE presence in local economies must be set against the multifaceted configurations of diverse contexts, strategies, and interactions in what scholars have casually referred to as 'international presence'. An in-depth understanding of MNE heterogeneity helps better balance the expectations generated by MNE attraction and the real opportunities for integrating knowledge and technology from MNEs in local economies. The findings in this study underscore the theoretical need to allow for a more comprehensive variety of explanatory factors when examining the MNE role in localised knowledge creation.

6. Conclusion

In their quest to advance the urban economic development, local governments in developing countries increasingly strive to create conditions to attract the knowledge-intensive activities of MNEs. This study took a comprehensive approach to delve into the complexities of that general idea to understand how the MNEs' activities in a city emerging as an investment hub lead to localised knowledge creation and capability upgrading. The study offers two main contributions to the research on MNE knowledge creation in nonspecialised emerging economies of the global South. First, the findings reveal the complex role of corporate internationalisation dynamics on localised knowledge creation. Building on Dunning and Lundan's (2008) categorisation of MNEs' strategic motivations, this study presents an analysis at the local scale that identifies the nature and significance of different configurations of MNE–local economy relations. The distinction between MNEs' strategic motivations and the context-sensitive qualitative exploration proved essential to show the role that individual MNE location strategies may play in processes of localised knowledge creation in an emerging investment hub and how they differ from those in specialised and more-advanced contexts.

Second, it considers the versatile effects of MNEs' activities on knowledge creation from the perspectives of the MNEs and the local economy. The perspectives also helped to discover the nexus between MNE strategies, local knowledge and capability creation, and economic development. The Medellín case showed that public policy efforts to support knowledge-intensive activities amongst technological firms in the form of infrastructure and dedicated organisations effectively attracted the knowledge-intensive activities of the MNEs. The MNE perspective showed how the location factors created by the local government to benefit the local economy also benefited the MNE strategies, contributing to favourable conditions and specific resources. While a stable local business environment, advanced infrastructure, and translocal intermediation essentially explained the presence of the four types of MNEs in Medellín, knowledge-based development and the improved local knowledge base became a specific advantage for market-seeking and strategic asset-seeking MNEs. These findings support research highlighting local governments' role in creating and facilitating access to specific resources, including the resources arising as a result of local economic development. They drive demand for external knowledge and contribute to MNE knowledge and capability creation (Albis, Álvarez, and García 2021; Caleb et al. 2021). However, the local economy's perspective suggests that the MNEs' activities that disproportionately benefit the MNEs and the technologically skilled segment of the population – i.e. use valuable and scarce public and knowledge resources for employment creation – fall short vis-à-vis local government goals to boost local development.

Given the heterogeneity of the MNE activities, the analytical framework proposed here provides a foundation for assessing the MNE influence on development in local economies. The assessment can be useful for locations in emerging economies in relatively peripheral positions implementing strategies to attract MNE knowledge-intensive activities in support of local innovation ecosystems. The findings of this study suggest that, to achieve that aim, publicly owned organisations, such as Ruta-N, should transition to specific programmes supporting those MNE activities that can have a broader socioeconomic impact.

The study limitations point to directions for future research. The exploratory nature of the study is reflected in the relatively small number of MNEs in the sample and the lack of primary data on their local partners. Although the study findings cannot be generalised, they suggest theoretical interpretations potentially relevant to cities like Medellín that are emerging as investment hubs. The contextual approach also proved crucial for extending understanding on the nature of MNEs' strategically motivated activities, the activity types conducive to impacts in local knowledge creation and the versatile effects from both the MNE and the local economy's perspectives. Future research could further evaluate the nature of the MNEs' local strategies and relations using more extensive datasets and comparative studies in other contexts. Context-sensitive studies could further examine knowledge creation in MNE–local economy relations from the perspectives of local firms, new ventures, and (public) organisations. Finally, the study only explored the potentially beneficial

impacts of MNE–local economy relations on knowledge and capability creation. Future studies could also consider harmful impacts and other types of outcomes inherent in these relations.

Note

1. These included infrastructure (affordable, serviced office spaces, laboratories, and auditoriums), facilitation services (recruitment, linkages with local authorities and the innovation system, legal and tax advice, market access support, and finance for innovation), access to general and sectoral information, and immaterial resources (marketing visibility and support in creating local legitimacy for foreign operations; Ruta-N n.d.).

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References

- 2Thinknow. 2019. “Innovation Cities™ Index 2019.” Accessed May 19 2020. <https://www.innovation-cities.com/index-2019-global-city-rankings/18842/>.
- Albis, N., I. Álvarez, and A. García. 2021. “The Impact of External, Internal, and Dual Relational Embeddedness on the Innovation Performance of Foreign Subsidiaries: Evidence from a Developing Country.” *Journal of International Management* 27 (4): 100854.
- Andersson, U., M. Forsgren, and U. Holm. 2002. “The Strategic Impact of External Networks: Subsidiary Performance and Competence Development in the Multinational Corporation.” *Strategic Management Journal* 23 (11): 979–996.
- Asheim, B., P. Cooke, and R. Martin. 2006. “The Rise of the Cluster Concept in Regional Analysis and Policy: A Critical Assessment.” In *Clusters and Regional Development: Critical Reflections and Explorations*, edited by B. Asheim, P. Cooke, and R. Martin, 1–29. Abingdon: Routledge.
- Autio, E., and L. Thomas. 2014. “Innovation Ecosystems: Implications for Innovation Management.” In *The Oxford Handbook of Innovation Management*, edited by M. Dodgson, N. Phillips, and D. M. Gann, 204–228. Oxford: Oxford University Press.
- Barrett, C. W., P. van Biljon, and C. Musso. 2011. “R&D Strategies in Emerging Economies: Results from the McKinsey Global Survey.” *Research-Technology Management* 54 (4): 17–22.
- Bathelt, H. 2005. “Geographies of Production: Growth Regimes in Spatial Perspective (II) – Knowledge Creation and Growth in Clusters.” *Progress in Human Geography* 29 (2): 204–216.
- Bathelt, H., and P. Cohendet. 2014. “The Creation of Knowledge: Local Building, Global Accessing and Economic Development—Toward an Agenda.” *Journal of Economic Geography* 14 (5): 869–882.
- Bathelt, H., A. Malmberg, and P. Maskell. 2004. “Clusters and Knowledge: Local Buzz, Global Pipelines and the Process of Knowledge Creation.” *Progress in Human Geography* 28 (1): 31–56.
- Bell, M., and K. Pavitt. 1995. “The Development of Technological Capabilities.” In *Trade, Technology, and International Competitiveness*, edited by Irfan-ul-Haque, R. Martin, and N. Bell, 69–101. Washington, DC: The World Bank.
- Buckley, P. J., and M. Casson. 2020. “The Internalization Theory of the Multinational Enterprise: Past, Present and Future.” *British Journal of Management* 31 (2): 239–252.
- Buckley, P. J., and S. Munjal. 2017. “The Role of Local Context in the Cross-Border Acquisitions by Emerging Economy Multinational Enterprises.” *British Journal of Management* 28 (3): 372–389.
- Buckley, P. J., R. Strange, M. P. Timmer, and G. J. de Vries. 2020. “Catching-Up in the Global Factory: Analysis and Policy Implications.” *Journal of International Business Policy* 3: 79–106.
- Caleb, H. T., C. K. B. Yim, E. Yin, F. Wan, and H. Jiao. 2021. “R&D Activities and Innovation Performance of MNE Subsidiaries: The Moderating Effects of Government Support and Entry Mode.” *Technological Forecasting and Social Change* 166: 120603.
- Cantwell, J., and S. Iammarino. 2000. “Multinational Corporations and the Location of Technological Innovation in the UK Regions.” *Regional Studies* 34 (4): 317–332.
- Cantwell, J., and O. Janne. 1999. “Technological Globalisation and Innovative Centres: The Role of Corporate Technological Leadership and Locational Hierarchy.” *Research Policy* 28 (2–3): 119–144.
- Cantwell, J., and R. Mudambi. 2005. “MNE Competence-Creating Subsidiary Mandates.” *Strategic Management Journal* 26 (12): 1109–1128.

- Castellani, D., K. Lavoratori, A. Perri, and V. G. Scalera. 2022. "International Connectivity and the Location of Multinational Enterprises' Knowledge-Intensive Activities: Evidence from US Metropolitan Areas." *Global Strategy Journal*, 12 (1): 82–107.
- Chaminade, C., and L. Gómez. 2016. "The Changing Geography of Innovation: Technology Driven Investments 'Within' the Global South." In *The Global Innovation Index 2016. Winning with Global Innovation*, edited by S. Dutta, B. Lanvin, and S. Wunsch-Vincent, 81–89. Ithaca: Cornell University.
- Chaminade, C., and J. Sang. 2008. "Globalisation of Knowledge Production and Regional Innovation Policy: Supporting Specialised Hubs in the Bangalore Software Industry." *Research Policy* 37 (10): 1684–1696.
- Cohen, W. M., and D. A. Levinthal. 1990. "Absorptive Capacity: A New Perspective on Learning and Innovation." *Administrative Science Quarterly* 35 (1): 128–152.
- Dunning, J. H., and S. M. Lundan. 2008. *Multinational Enterprises and the Global Economy*. Cheltenham, UK: Edward Elgar Publishing.
- Eriksson, P., and A. Kovalainen. 2008. "Access and Relationships." In *Qualitative Methods in Business Research*, 52–61. London: Sage.
- Fallon, G., and M. Cook. 2010. "Exploring the Regional Distribution of Inbound Foreign Direct Investment in the UK in Theory and Practice: Evidence from a Five-Region Study." *Regional Studies* 44 (3): 337–353.
- Figueiredo, P. N. 2011. "The Role of Dual Embeddedness in the Innovative Performance of MNE Subsidiaries: Evidence from Brazil." *Journal of Management Studies* 48 (2): 417–440.
- Figueiredo, P. N., H. Larsen, and U. E. Hansen. 2020. "The Role of Interactive Learning in Innovation Capability Building in Multinational Subsidiaries: A Micro-Level Study of Biotechnology in Brazil." *Research Policy* 49 (6): 103995.
- Glückler, J. 2014. "How Controversial Innovation Succeeds in the Periphery? A Network Perspective of BASF Argentina." *Journal of Economic Geography* 14: 903–927.
- Gómez, L., and P. Oinas. *Forthcoming*. "Traveling Planning Concepts Revisited: How they Land and why it Matters." *Urban Geography*.
- Gómez, L., P. Oinas, and R. Wall. 2022. "Undercurrents in the World Economy: Evolving Investment Flows in the South." *The World Economy* 45 (6): 1830–1855.
- Hennart, J.-F. 2009. "Down With MNE-Centric Theories! Market Entry and Expansion as the Bundling of MNE and Local Assets." *Journal of International Business Studies* 40 (9): 1432–1454.
- Iammarino, S. 2018. "FDI and Regional Development Policy." *Journal of International Business Policy* 1 (3): 157–183.
- Jha, S. K., C. Dhanaraj, and R. T. Krishnan. 2018. "From Arbitrage to Global Innovation: Evolution of Multinational R&D in Emerging Markets." *Management International Review* 58 (4): 633–661.
- Karna, A., F. Täube, and P. Sonderegger. 2013. "Evolution of Innovation Networks Across Geographical and Organisational Boundaries: A Study of R&D Subsidiaries in the Bangalore IT Cluster." *European Management Review* 10 (4): 211–226.
- Le Bas, C., and C. Sierra. 2002. "'Location Versus Home Country Advantages' in R&D Activities: Some Further Results on Multinationals' Locational Strategies." *Research Policy* 31 (4): 589–609.
- Li, P., and H. Bathelt. 2018. "Location Strategy in Cluster Networks." *Journal of International Business Studies* 49 (8): 967–989.
- Lorenzen, M., and R. Mudambi. 2012. "Clusters, Connectivity and Catch-Up: Bollywood and Bangalore in the Global Economy." *Journal of Economic Geography* 13 (3): 501–534.
- Lorenzen, M., R. Mudambi, and A. Schotter. 2020. "International Connectedness and Local Disconnectedness: Mne Strategy, City-Regions and Disruption." *Journal of International Business Studies* 51 (8): 1199–1222.
- Malmberg, A., and D. Power. 2006. "True Clusters: A Severe Case of Conceptual Headache." In *Clusters and Regional Development*, edited by B. Asheim, P. Cooke, and R. Martin, 68–86. Abingdon: Routledge.
- Manning, S. 2013. "New Silicon Valleys or a New Species? Commoditisation of Knowledge Work and the Rise of Knowledge Services Clusters." *Research Policy* 42 (2): 379–390.
- McCann, P., and Z. J. Acs. 2011. "Globalization: Countries, Cities and Multinationals." *Regional Studies* 45 (1): 17–32.
- Meyer, K. E., R. Mudambi, and R. Narula. 2011. "Multinational Enterprises and Local Contexts: The Opportunities and Challenges of Multiple Embeddedness." *Journal of Management Studies* 48 (2): 235–252.
- Mudambi, R., and S. M. Mudambi. 2005. "Multinational Enterprise Knowledge Flows: The Effect of Government Inward Investment Policy." *MIR: Management International Review* 45 (2): 155–178.
- Mudambi, R., and G. D. Santangelo. 2016. "From Shallow Resource Pools to Emerging Clusters: The Role of Multinational Enterprise Subsidiaries in Peripheral Areas." *Regional Studies* 50 (12): 1965–1979.
- Mudambi, R., and T. Swift. 2012. "Multinational Enterprises and the Geographical Clustering of Innovation." *Industry and Innovation* 19 (1): 1–21.
- Narula, R., and J. H. Dunning. 2010. "Multinational Enterprises, Development and Globalization: Some Clarifications and a Research Agenda." *Oxford Development Studies* 38 (3): 263–287.
- Nooteboom, B. 2006. "Innovation, Learning and Cluster Dynamics." In *Clusters and Regional Development: Critical Reflections and Explorations*, edited by B. Asheim, P. Cooke, and R. Martin, 137–163. London: Routledge.
- Øyna, S., and I. Alon. 2018. "A Review of Born Globals." *International Studies of Management & Organization* 48 (2): 157–180.

- Papanastassiou, M., R. Pearce, and A. Zanfei. 2020. "Changing Perspectives on the Internationalisation of R&D and Innovation by Multinational Enterprises: A Review of the Literature." *Journal of International Business Studies* 51 (4): 623–664.
- Patibandla, M., and B. Petersen. 2002. "Role of Transnational Corporations in the Evolution of a High-Tech Industry: The Case of India's Software Industry." *World Development* 30 (9): 1561–1577.
- Pike, A., A. Rodríguez-Pose, and J. Tomaney. 2014. "Local and Regional Development in the Global North and South." *Progress in Development Studies* 14 (1): 21–30.
- Plakoyiannaki, E., T. Wei, and S. Prashantham. 2019. "Rethinking Qualitative Scholarship in Emerging Markets: Researching, Theorizing, and Reporting." *Management and Organization Review* 15 (2): 217–234.
- Porter, M. 2003. "The Economic Performance of Regions." *Regional Studies* 37 (6–7): 549–578.
- Ruta-N. 2016. "Distrito de Innovación en Medellín [Medellín Innovation District]." Power Point Presentation.
- Ruta-N. n.d. "Landing empresarial [Enterprise Landing]." Accessed October 14, 2019. https://www.rutanmedellin.org/es/oferta/empresarios-y-emprendedores/item/landing-empresarial?category_id=200.
- Spencer, J. W. 2008. "The Impact of Multinational Enterprise Strategy on Indigenous Enterprises: Horizontal Spillovers and Crowding Out in Developing Countries." *Academy of Management Review* 33 (2): 341–361.
- Täube, F. A., A. Karna, and P. Sonderegger. 2019. "Economic Geography and Emerging Market Clusters: A Co-Evolutionary Study of Local and Non-Local Networks in Bangalore." *International Business Review* 28 (5): 101496.
- Wang, C. C., G. C. Lin, and G. Li. 2010. "Industrial Clustering and Technological Innovation in China: New Evidence from the ICT Industry in Shenzhen." *Environment and Planning A: Economy and Space* 42 (8): 1987–2010.
- Wang, C. C., and A. Wu. 2016. "Geographical FDI Knowledge Spillover and Innovation of Indigenous Firms in China." *International Business Review* 25 (4): 895–906.
- Welch, C., R. Piekkari, E. Plakoyiannaki, and E. Paavilainen-Mäntymäki. 2011. "Theorising from Case Studies: Towards a Pluralist Future for International Business Research." *Journal of International Business Studies* 42 (5): 740–762.
- Yamin, M., and R. R. Sinkovics. 2009. "Infrastructure or Foreign Direct Investment?: An Examination of the Implications of MNE Strategy for Economic Development." *Journal of World Business* 44 (2): 144–157.
- Zhao, S., H. Tan, M. Papanastassiou, and A.-W. Harzing. 2020. "The Internationalization of Innovation Towards the South: A Historical Case Study of a Global Pharmaceutical Corporation in China (1993–2017)." *Asia Pacific Journal of Management* 37 (2): 553–585.

Appendix

Table A1. Characteristics of the sample MNEs.

Strategic motivation	MNE name	Nationality of ownership	Size by employees worldwide	Firm type
Resource-Seeking	<i>Lambda</i>	USA	Small	Digital commerce
	<i>Mi</i>	USA	Small	Digital commerce
	<i>Delta</i>	Puerto Rico	Small	Digital platform for environmental, health, & safety management
	<i>Xi</i>	UK	Small	Consulting for sustainable processes, green cities, & buildings
Market-Seeking	<i>Dseta</i>	Argentina	Medium	Springboard in the technological sector, social enterprise
	<i>Gamma</i>	Mexico	Small	Data storage, technological products & services provider
	<i>Epsilon</i>	Chile	Small	Coworking services
	<i>Alfa</i>	Brazil	Large	Business IT solutions & telecommunication services
Efficiency-Seeking	<i>Kappa</i>	The Netherlands	Medium	Digital platform for gyms & trainers
	<i>Iota</i>	USA	Large	Digital commerce
	<i>Theta</i>	UK	Large	Digital platform for sports technology
	<i>Ni</i>	Canada	Medium	Digital platform for job search aggregator
	<i>Ipsilon</i>	USA	Medium	Digital platform for voice, writing, & translations
Strategic Asset-Seeking	<i>Beta</i>	China	Global	Telecommunications equipment
	<i>Eta</i>	USA	Global	Consulting for IT services

Note: MNE sizes: global (more than 10000), large (400–10000), medium-sized (100–200), and small (less than 100 employees).