

Technology Transfer Potential in Local and Foreign-Owned Firms in Emerging Economies

Ellis L. C. Osabutey ,¹ Konan A. Seny Kan,² P. K. Senyo,³ Felix Arndt⁴
and Christiaan Röell⁵

¹Newcastle Business School, Northumbria University, 5 Barrack Road, Newcastle-upon-Tyne, NE1 4SE, UK, ²Grenoble Ecole de Management, 12 rue Pierre Sémard, Grenoble, 38000, France, ³Southampton Business School, University of Southampton, University Road, Southampton, SO17 1BJ, UK, ⁴Gordon S. Lang School of Business and Economics, University of Guelph, 74 MacDonald Street, Guelph, Ontario, N1G 1M8, Canada, and ⁵UNSW Business Management School, University of New South Wales, Corner of Union Road & College Road, Kensington, NSW, 2052, Australia
Corresponding author email: ellis.osabutey@northumbria.ac.uk

Technology transfer in international collaborations is challenging but can bring benefits to both local and foreign-owned firms in emerging economies. In this paper we focus on conditions for potential technology transfer in emerging economies. We develop a configurational theoretical framework and empirically operationalize it using qualitative comparative analysis. Building on differences in absorptive capacity between these two kinds of firms and relying on data from the construction industry in Ghana, we develop a process model of technology transfer in emerging economies. Our model shows that technology transfer in local and foreign firms can be achieved through different combinations of human resource development and knowledge management, as well as international collaborations and networks. The model also explicates mechanisms leading to potential technology transfer. Based on the findings and the process model, the study makes several contributions to the absorptive capacity and technology transfer literature in emerging economies by shedding light on the underlying processes that foster a firm's ability to absorb technology in international collaborations.

Introduction

Absorbing knowledge across national boundaries through international collaborations has been identified as a factor for gaining and sustaining competitive advantage (Argote and Ingram, 2000; Dávila, Durst and Varvarkis, 2018; Penrose, 1973). Cohen and Levinthal (1990) and Teixeira, Rapini and Caliarì (2020) propose that absorptive capacity depends on the learning of individuals and how well an organization is able to integrate such knowledge into the organization. However, they fail to provide a clear explanation of the mechanisms through which individual interactions result in knowledge absorption, leading to firm-level absorptive capacity (Arndt *et al.*, 2023). We propose that the ‘ability of a firm to recognize new, external knowledge, assimilate it and apply it to commercial ends’ (Cohen and Levinthal, 1990, p. 128) depends on its development of human resources that support the process of knowledge absorption and underlying knowledge management processes that allow the firm to internalize

external knowledge. This ability may differ between local and foreign-owned firms (Cuervo-Cazurra and Rui, 2017).

Heterogeneity in firms’ absorptive capacities affects the potential of technology transfer from international collaborations. With their definition, Cohen and Levinthal (1990) shifted the focus in research on absorptive capacity to the process of absorbing external knowledge. While they offer some suggestions for the underlying organizational elements needed to do so, limited work has examined how firms, particularly in emerging economies, build absorptive capacity (Song *et al.*, 2018). Penrose (1973) has problematized the issue of knowledge transfer of firms across locations. However, both the management and the international business literature show gaps in understanding how firms can improve technology transfer potential across borders (Arndt *et al.*, 2023). Thus, uncovering firm-level configurations can explain how absorptive capacity can enhance technology transfer. Drawing on the notion that absorptive capacity not only requires prior knowledge,

but also an active effort to ‘assimilate and apply knowledge to commercial ends’ (Cohen and Levinthal, 1990, p. 128), we suggest that firms which (1) actively support the technology transfer process and (2) may have prior experience with technology transfer are more likely to successfully absorb the external knowledge. We also suggest that familiarity with the source or way of codifying knowledge is further nuanced by local/foreign ownership.

First, technology transfer potential requires individuals within firms to absorb knowledge and to internalize it within their organizations. We suggest that technology transfer works better when these individuals are supported by activities (e.g. motivation and training) that we categorize as human resource development (HRD). In addition, we argue that knowledge management (KM), for example, knowledge sharing and group learning, can be effective in building organizational knowledge and making knowledge more accessible throughout an organization (López, Peón and Ordás, 2006). Thus, we propose that two conditions for successful cross-border technology transfer are HRD and KM.

Organizational learning is the process of improving actions through better knowledge (Fiol and Lyles, 1985). Organizational learning occurs through individual learning embedded in routines, systems, structures, culture and strategy. Therefore, organizational learning cannot be viewed simply as an accumulation of individual knowledge, but as a process of preserving knowledge over time through organizational memory (Akinç and Sadler-Smith, 2019; Hedberg, 1981). While organizational learning is considered an essential part of human resource management (Pucik, 1988), with few exceptions (e.g. Minbaeva *et al.*, 2013), the characteristics of technology transfer and absorptive capacity have typically not been treated as endogenous to organizational processes. Extant research suggests that when employees possess the ability (e.g. due to training and prior related experience) and are motivated (e.g. because of performance-based compensation and internal communication), they can recognize distinct and rare knowledge within networks (Bresman, Birkinshaw and Nobel, 1999), which, in turn, facilitates technology transfer (Williams, 2009).

Zahra and George (2002) criticize existing work for applying quantitative measures (like R&D intensity, number of scientists working in R&D departments, etc.) that do not ‘fully reflect the richness of the construct’ (p. 199) and neglect the role of individuals in firms, which is crucial for knowledge utilization and exploitation (Minbaeva *et al.*, 2013). They continue by arguing that absorptive capacity has the character of a dynamic capability, which suggests that firm-level processes related to higher-order learning – such as KM and HRD – may play a larger role than proposed by Cohen and Levinthal

(1990). Given that absorptive capacity relies on routines and activities that allow the exploitation of the current knowledge base, as well as the training and motivation of employees, HRD can play a significant role in developing and maintaining knowledge and skills. It also adds to the dynamic character that Zahra and George (2002) attribute to absorptive capacity.

Second, the majority of technology transfer literature has focused on advanced economies (Butler and Felie, 2020; Chiva, Ghauri and Alegre, 2014). Most studies that incorporate the absorptive capacity lens focus on external factors and do not fully explain the internal organizational elements necessary to build absorptive capacity (Arndt *et al.*, 2023; Cohen and Levinthal, 1990; Volberda, Foss and Lyles, 2010). We posit the central role of the individual in the form of HRD to maintain and build a knowledge base for technology transfer that we name KM (Butler and Felie, 2020; Chiva, Ghauri and Alegre, 2014). Within an emerging economy context, there are few studies that adopt an absorptive capacity lens and often assume linear effects (Dávila, Durst and Varvarkis, 2018; Ivarsson and Alvs-tam, 2005; Teixeira, Rapini and Caliarì, 2020), yet they do not evaluate how absorptive capacity differs for both local and foreign-owned firms operating in the same industry and country. Therefore, the aim of this paper is to better understand the conditions under which technology transfer potential is realized (or not) in local and foreign-owned firms within an industry in an emerging economy. Based on the preceding arguments, we answer the following research question: *How do firms (local and foreign-owned) develop absorptive capacity to enhance technology transfer potential in emerging markets?*

To answer our research question, we gained access to 30 large local and foreign-owned construction firms in Ghana to investigate technology transfer potential via international collaborations. We employed qualitative comparative analysis (QCA) (Ragin, 2014) to demonstrate the different conditions and likely paths that explain both the presence and absence of technology transfer potential. The context of our study, Ghana, is chosen because of its relatively low construction industry technology transfer (Osabutey, Williams and Debrah, 2014). Since we consider the ownership characteristics of firms to be important determinants for potential transfers (Blalock and Simon, 2009; Spencer, 2008), we focus on large local and foreign-owned firms.

Our findings identify stark differences between technology transfer potential in local and foreign-owned firms. First, we found more presence of technology transfer potential in foreign-owned firms with both good HRD and KM systems. In local firms, there is limited technology transfer potential, regardless of the configurations of HRD and KM. We contribute to the literature by developing a process model to explain firm-level mechanisms that facilitate absorptive

capacity, which can lead to technology transfer (Cohen and Levinthal, 1990; Minbaeva *et al.*, 2013; Song *et al.*, 2018). We identify organizational practices that may contribute to better HRD and KM, which, in turn, may answer the question of how organizations can enhance technology transfer in international collaborations (Argote and Ingram, 2000; Cuervo-Cazurra and Rui, 2017).

The rest of the paper is organized as follows. First, we review the relevant technology transfer, absorptive capacity, HRD and KM literature. Second, the research methodology is described. Third, we present the findings and discussions and then conclude by evaluating the implications for theory and practice.

Theory and model development: Configurational theorizing of technology transfer

We build a theoretical framework using configurational reasoning (Fiss, 2007; Furnari *et al.*, 2021; Greckhamer *et al.*, 2018; Misangyi *et al.*, 2017). Core to this reasoning is that organizational phenomena are mostly causally complex, in the sense that: (1) different, mutually non-exclusive combinations of conditions, or paths, lead to a given outcome (equifinality tenet); (2) the effect of a condition on an outcome is dependent on the combination of conditions it is part of (multifinality tenet); and (3) the effect of a combination of conditions leading to an outcome is not indicative that the absence of that combination is systematically associated with the non-occurrence of that outcome. That is, the absence and presence of a condition denotes two qualitatively different states of nature (asymmetry tenets).

Against this backdrop, we identify human resource development, knowledge management and foreign/local ownership as essential conditions for an organization to receive technology transfer (outcome). Hereafter, we construct our configurational modelling of technology transfer potential. Based on relevant literature, we explain how and why the three conditions are crucial to technology transfer potential (Furnari *et al.*, 2021). Recent literature has acknowledged the innovation of local firms in emerging economies to show bidirectional technology transfer (Liu, Lu and Choi, 2014; Osabutey *et al.*, 2023). These studies emphasize technology exchange. We therefore examine the presence and absence of technology transfer for both foreign and local firms.

Combination of human resource development, knowledge management and foreign/local ownership

Absorptive capacity relates to organizational learning and inter-organizational learning, which examines the learning relationships between actors and groups of

organizations (Larsson, Lars Bengtsson and Sparks, 1998). Therefore, absorptive capacity is important for inter- and intra-firm technology transfer. Technology transfer refers to the transmission of product, process and managerial knowledge from one organization to another (Grosse, 1996). The effectiveness in transferring technology from and to firms has been considered as a key resource for developing and maintaining competitive advantage (Björkman, Barner-Rasmussen and Li, 2004; Gupta and Govindarajan, 2000; Minbaeva *et al.*, 2013). Technology transfer has primarily been discussed in the multinational enterprise (MNE) subsidiary context (Song, 2014; Zeng, Glaister and Darwish, 2019). Scholars have also used the absorptive capacity of local firms as an important determinant of technology transfer via foreign direct investment spillovers (Blalock and Simond, 2009; Eapen, 2012; Meyer and Sinani, 2009; Spencer, 2008).

International technology transfer depends on a subsidiary's absorptive capacity and the nature of relationships between firms (Björkman, Barner-Rasmussen and Li, 2004; Butler and Ferlie, 2020; Minbaeva *et al.*, 2013). Absorptive capacity refers to a combination of dynamic organizational routines and processes that influences how firms acquire, assimilate, transform and exploit new knowledge to sustain competitiveness (Bouguerra *et al.*, 2021; Griffiths-Hemans and Grover, 2006; Wales, Parida and Patel, 2013). Since we are interested in firms' potential ability to receive new technology, and given that absorptive capacity relies on routines and activities that allow the exploitation of the current knowledge base, HRD can play a significant role in developing and maintaining knowledge and skills. HRD involves a planned integration and combination of training and development, organization development and career development to improve individual, group and organizational effectiveness (McLagan, 1989; Osman-Gani, 1999). The need for interactions between the knowledge bearer and receiver to enhance technology transfer suggests that social networks (Eapen, 2012), characterized by strong 'knowledge networks' (Minbaeva, 2013), are also essential for receiving technology transfer, and HRD is expected to facilitate the processes involved. HRD is therefore important in maintaining human capital and knowledge networks.

KM has been viewed as an essential competitive advantage of MNEs (Kogut and Zander, 1992; Tallman and Phene, 2007). The literature suggests various definitions of KM. For instance, Egbu (2000) defines KM as the processes through which knowledge is created, acquired, communicated, shared, applied, utilized and managed to identify and exploit existing and acquired knowledge assets. KM can therefore be viewed as a complex social organizational process. Egbu (2000) further argues that KM is 10% technology and 90% people issues, which emphasizes the link between KM

and HRD. Subsidiaries develop new capabilities that allow them to receive technology transfer (Birkinshaw and Hood, 1998; Phene and Almeida, 2008). Although human resource practices promote absorptive capacity (Song, 2014), there is a need for studies that focus on HRD's specific role in human capital development and firm performance (Delaney and Huselid, 1996; Koch and McGrath, 1996; Winterton and Winterton, 1997). Recent relevant studies have noted that the human resource management/development (HRM/D) and KM were poorer in small/local firms compared to large/foreign firms operating in the same industry in emerging economies (Gooderham, 2007; Osabutey, Williams and Debrah, 2014). This suggests a need to examine the mechanisms of how HRD and KM in local and foreign-owned firms affect the technology transfer process.

Human resource development and absorptive capacity

We propose that the development of human resources is a condition required for enhancing absorptive capacity and therefore technology transfer potential. HRD includes a wide range of practices that aim to improve the knowledge, skills and abilities of employees. Since training, part of HRD, exposes individuals and organizations to new knowledge, it is an important element in developing a firm's absorptive capacity (Jansen, Van Den Bosch and Volberda, 2006) and an integral part of improving technology transfer potential to such firms.

The motivation to absorb new external knowledge is crucial in determining organizational outcomes (Gegenfurtner *et al.*, 2009). Seyler *et al.* (1998) further suggest that firms need to motivate trainees to make behavioural decisions that will improve job performance outcomes. Firms often develop training programmes to improve their capacity to acquire and utilize new technologies (Neirotti and Paolucci, 2013). The absence of non-firm-specific competencies would often lead firms to seek knowledge from external sources (Kor and Leblebici, 2005). Firms may, *inter alia*, utilize such new knowledge to increase productivity or stimulate innovation (Neirotti and Paolucci, 2013). Firms therefore complement technological needs with internal and external on and off-the-job training to absorb implicit and explicit knowledge (Laursen and Foss, 2003).

HRD and learning can occur through socialization within communities of practice and participation in conferences, and so on (Bessant, 2008). A community of practice refers to a work-related or professional group of individuals who share mutual interests, challenges and problems and can effectively learn from each other through ongoing interactions (Lave and Wenger, 1991). Professional bodies are an example of such communities and can play an active role in the technology transfer process. The ties between individuals within such

networks can enhance absorptive capacity and therefore technology transfer (Cross and Cummings, 2004; Martins, 2016). Firms that recognize the importance of external networks can encourage employees to join a community of practice or professional bodies by paying membership fees.

HRD literature explains that, to foster employee motivation and commitment, firms use training to respond to intrinsic and aspirational needs (Kuvaas and Dysvik, 2009; Nierotti and Paolucci, 2013). Individuals are motivated by their expectations of the outcomes of their actions (Bandura, 1997). Therefore, where training can lead, for instance, to promotion or remuneration, employees' motivation is likely to increase. On the other hand, the absence of HRD practices may prevent the absorption of new knowledge. Employees who are neither motivated nor able to learn about new technologies are likely to reject them (Katz and Allen, 1982).

Knowledge management and absorptive capacity

We propose that KM is a condition for improving absorptive capacity within international collaborations. While the literature offers several methods to conceptualize and operationalize absorptive capacity (Zahra and George, 2002), few studies have questioned whether and how firms can enhance absorptive capacity by engaging in KM. With some exceptions (e.g. Minbaeva *et al.*, 2013), scholars treat absorptive capacity as a given and as an exogenous determinant of knowledge processes.

Firms' ability to effectively absorb external knowledge depends on their internal knowledge production capability (Grigoriou and Rothaermel, 2017). Technology transfer is dependent on firms' ability to create, share and absorb new knowledge (Martins, 2016), for instance through interactions between colleagues (Smith and Tushman, 2005). Cohen and Levinthal (1990) assert that the absorptive capacity of an organization is dependent on the learning capability and absorptive capacity of these individuals. Firms can strengthen their absorptive capacity through informal KM mechanisms, such as promoting tightknit clusters or groups of employees, or through formal KM systems, such as boundary spanners (Cohen and Levinthal, 1990; Grigoriou and Rothaermel, 2017; Reagans, Zuckerman and McEvily, 2004).

Individuals are constrained by their limited capacity to acquire, store and process knowledge, according to the principle of bounded rationality (Simon, 1991). To overcome this limitation, firms aim to become knowledge-integrating institutions (Grant, 1996), which requires the effective storage, organization and retrieval of organizational knowledge, also known as organizational memory (Stein and Zwass, 1995). Knowledge transfer occurs within organizations where knowledge is acquired, created and shared (Martins, 2016), and

creating an environment that fosters knowledge sharing is crucial (Bandura, 1997; Grohmann, Beller and Kaufeld, 2014; Seyler *et al.*, 1998). This can be influenced by a variety of KM tools, such as the dissemination of locally harvested knowledge from subsidiaries to sister companies, enabling MNEs to access diverse ‘pockets of knowledge’ (Elsahn and Benson-Rea, 2018, p. 806). The most essential aspect of the KM process is ensuring that the necessary knowledge is transferred to individuals, groups and/or locations (Alavi and Leidner, 2001).

Local/foreign-owned firms and absorptive capacity

Local and foreign firms engage in international collaborations (e.g. joint ventures, strategic alliances) that provide possibilities for receiving new technologies. HRD practices and internal knowledge sharing varies between different types of firms (Meyer, 2004). While absorptive capacity is often lacking in firms in emerging economies, foreign-owned firms from advanced economies are generally expected to have more formal, developed HRD systems that can enhance the ability to receive technology transfer via international collaborations. By investing in the training and development of employees, leading to high levels of skills and knowledge, firms can facilitate learning (Williams, 2009) and therefore technology transfer potential.

Our proposition that local and foreign-owned firms may differ in how they build absorptive capacity finds support in prior literature. Local firms in emerging economies require sufficient absorptive capacity to benefit from the introduction of newer technologies (Saggi, 2004), yet are often characterized by low absorptive capacity due to deficiencies in technical skills and capabilities (Arnold *et al.*, 2000; Berger and Revilla Diez, 2008; Nguyen and Diez, 2019). As a result, local firms typically need to overcome resource constraints to improve the potential to receive technology transfer (Eapen, 2012). Clearly, with few exceptions, scholars have not sufficiently questioned how different types of firms can enhance their absorptive capacity. Yet, a greater understanding of how firms develop and apply absorptive capacity to engage in inter-organizational learning is essential for firms in emerging economies.

Methods

Our empirical work relies on the conceptualization from previous studies on the construction industry (e.g. Ganesan and Kelsey, 2006; Ofori, 1994; Osabutey, Williams and Debrah, 2014; World Bank, 1986), which identify project-based joint ventures, subcontracting arrangements, strategic alliances and consortia as types of international collaborations that could facilitate technology transfer. The construction industry was chosen because construction projects are often

transient (Dubois and Gadde, 2002). Consequently, the technology transfer process can be characterized by the changing micro-environment and allows the evaluation of product, process and managerial technologies (Dubois and Gadde, 2002; Manley, 2008). Ghana, the empirical focus, is classified by the World Bank as a middle-income economy with relatively low construction industry technology transfer (Osabutey, Williams and Debrah, 2014). The economy of Ghana has been characterized by innovation and technology outputs above the Sub-Saharan African average (Osabutey *et al.*, 2023; World Bank, 2021). For more than a decade, before the outbreak of COVID-19, Ghana witnessed steady economic growth. For instance, in the year 2011, the country achieved 14% gross domestic product (World Bank, 2024). Ghana has also experienced technology growth in recent times, becoming one of the fastest-growing technology hubs in Africa (Senyo *et al.*, 2023). Together, these specificities make Ghana an interesting context for our study. The study focuses on large construction firms in terms of size and turnover. We also divided the firms into either local or foreign-owned. We chose a mixed research approach to thoroughly understand contextual issues and provide a solid foundation for our ongoing theorization. Specifically, we adopted a combination of traditional qualitative analysis and QCA as the main research approaches. We affirm these with a post-QCA case analysis. We deemed these approaches suitable and appropriate because they enabled us to gain a deeper understanding of our phenomenon beyond descriptive accounts. In addition, given our multifaceted research question, there was a need for research approaches that enable thorough investigation beyond simply establishing causation.

First, we conducted an in-depth qualitative study guided by an initial literature review to develop the constructs for our study. We then adopted QCA to understand technology transfer through a configural lens. QCA is a set-theoretical method (Beynon *et al.*, 2021; Hughes *et al.*, 2018; Standaert, Knockaert and Manigart, 2021) for analysing complex causal and logical relationships between a combination of conditions and an outcome (Fiss, 2007; Furnari *et al.*, 2021; Misangyi *et al.*, 2017). Lahiri, Kundu and Munjal (2021) and Ragin (2014, p. 16) suggest the use of QCA as a ‘new analytical tool’ ... ‘gaining prominence in business scholarship’ to offer a middle ground between the quantitative and traditional qualitative methods (Ragin, 2014) by focusing on a combination or configurational effect of constructs that leads to an outcome instead of a correlation. We chose the QCA method for the following reasons. First, QCA can account for complex relationships between constructs more than traditional quantitative methods such as regression (Greckhamer *et al.*, 2018; Misangyi *et al.*, 2017; Standaert, Knockaert and Manigart, 2021). Second, QCA can support the

investigation of under-explored phenomena (Beynon *et al.*, 2021) and configurationally theorize them (Furnari *et al.*, 2021; Seny Kan *et al.*, 2016), which in our case is technology transfer in local and foreign-owned firms in emerging economies. Lastly, given our aim to investigate a combination of factors, we deemed QCA suitable because it can account for ‘synergistic relationships between variables’ as opposed to regression-based approaches that focus on linearity, single-path and additive effects of variables (Armanios *et al.*, 2017; Beynon *et al.*, 2021).

Construct measurement

Given the multifaceted nature of our research, we draw on qualitative data and constructs from existing studies to create our survey questions. In line with our focus, and the overarching aim to understand the successful absorption of external knowledge in local and foreign-owned construction firms located in emerging economies, we focus on HRD, KM and technology transfer as the main theoretical constructs. Supported by our earlier qualitative data, we subsequently adapted items from empirically validated instruments in prior studies to measure each of our constructs. Items measuring technology transfer via international collaboration – namely new technology application, new technology and performance and new technology and innovation – were adapted from Cohen and Levinthal (1990) and Grohmann, Beller and Kauffeld (2014). Similarly, items measuring KM – namely knowledge creation, individual learning, rewarding new knowledge, group learning, storing knowledge, knowledge sharing and external knowledge networks – were adapted from Cohen and Levinthal (1990), Bandura (1997), Tripsas (1997), Smith and Tushman (2005), Martins (2016) and Grigoriou and Rothaermel (2017). With regards to foreign/local ownership, we adapted the conceptualization from Ramachandran (1993), Gupta and Govindarajan (2000) and Inkpen and Tsang (2005). Finally, items measuring HRD – namely reason for training, internal training, external training, organization-led external knowledge networks and motivation to train – were adapted from Delaney and Huselid (1996), Koch and McGrath (1996) and Neirotti and Paolucci (2013). Table 1 presents details on each of the constructs as well as associated items.

Data collection and analysis

Given that the construction industry and emerging country contexts have been under-explored in technology transfer research, we started with in-depth interviews to support the refinement and consolidation of the quantitative data collection measures. To support our sampling, we relied on Ghana’s Ministry of Water Resources Works and Housing and the Ministry

of Roads and Transport classification and register of contractors, which is based on their resource base (financial, equipment, human resource, etc.). This classification determines the value and complexity of projects contractors are eligible to bid for. Our choice is motivated by earlier studies that expected larger firms to possess HRM/D and KM systems (Gooderham, 2007; Osabutey, Williams and Debrah, 2014). Lists from both the Ministry of Water Resources Works and Housing and the Ministry of Roads and Transport provided an appropriate sampling frame for our study. We chose the construction industry because we could study product, process and managerial technology integrally (Grosse, 1996; Osabutey, Williams and Debrah, 2014). The sampling frame relied on researchers’ experience of the industry and target firms (Morgan and Smircich, 1980) and allowed the creation of representative and information-rich data needed to fulfil research objectives.

We collected qualitative data through semi-structured interviews from two local and two foreign firms (interview questions outline in Appendix A). In each firm, we interviewed three senior managers on international collaboration opportunities, HRM/D and KM systems, processes and practices and how these related to technology transfer potential. To achieve our aim of configurational understanding of how HRD and KM of foreign/local-owned firms could influence technology transfer potential within an industry, we also collected quantitative data using a survey based on constructs developed in Table 1 to complement the qualitative data. The firm ownership and HRD sections were completed by senior managers whose responsibility includes HRD. The KM and technology transfer sections were completed by five construction professionals in each firm. Generally, the questions attempt to evaluate the extent to which a given phenomenon is perceived on a five-point Likert scale. Useful responses from 10 foreign-owned and 20 local-owned firms were included in the study.

We conducted two phases of data analysis: qualitative analysis and QCA. In the first phase, qualitative data analysis was conducted using established interpretive qualitative data analysis techniques. We conducted the data analysis by recursive identification of patterns, first through categorization and then abstraction (Gioia, Corley and Hamilton, 2013). Common themes were identified, and categories were assigned. We followed a systematic and rigorous approach of deriving first-order, second-order and aggregate concepts in three coding cycles. Applying this form of interpretation helped structure the categories, concepts and dimensions of technology transfer practices in a way that allows traceability of emerging theoretical constructs with the data collected (Gawer and Phillips, 2013). During the second phase of data analysis, we

Table 1. Constructs measurement

Construct	Items
Technology transfer potential (via international collaboration)	
<i>New technology application</i>	Firm eager to use new technology and knowledge Firm eager to share new technology and knowledge Continuous use of new technology and knowledge
<i>New technology and performance</i>	New technology and knowledge improved performance
<i>New technology and innovation</i>	Adopt and adapt new technology and knowledge to similar jobs Ability to develop new technology and knowledge, processes, etc. Improved innovative capability
HRD	
<i>Reason for training</i>	Current and future requirements Help adapt to new technology and knowledge
<i>Internal training</i>	In-house on-the-job In-house (in-house trainers) In-house (external local trainers) In-house (external foreign trainers)
<i>External training</i>	Overseas training Distance learning
<i>Organization-led external knowledge networks</i>	Overseas conferences Encouraged to join professional body Payment of professional subscriptions T&D improves job class and remuneration
<i>Motivation to train</i>	
KM	
<i>Knowledge creation</i>	Firm eager to acquire and create new knowledge Firm encourages new methods, procedures
<i>Individual learning</i>	Individuals expected to continue to learn Ability to follow manuals to apply new technology and knowledge Systems to learn about new technology
<i>Rewarding new knowledge</i>	Rewarding new technology and knowledge that increases productivity
<i>Group learning</i>	Exchange ideas about technology and productivity Open admission and analysis of errors Lessons-learned sessions
<i>Storing knowledge</i>	Develop manuals for new technology
<i>Knowledge sharing</i>	Firm ensures technology acquired/created is stored Encourage sharing new technology and knowledge from training Learn new technology and knowledge purposely to share New technology and knowledge quickly passed to relevant sections
<i>Individual external knowledge networks</i>	Belong to at least one professional body Subscriptions payment for at least one body
Firm ownership	
<i>Foreign/local-owned</i>	How is the ownership of your firm best described (foreign/local)

conducted QCA. We used the crisp-set (csQCA) – a form of QCA that uses Boolean algebra principles to analyse binary datasets (Ragin, 2014). In our study, the dataset was dichotomized because respondents were asked to indicate the presence or absence of interested constructs in their organizational context. Hence, we use csQCA to calibrate the data from ‘0.0’ to ‘1.0’, where ‘0.0’ means full non-membership and ‘1.0’ means full membership. We run four csQCA analyses: two using macro-variables for the conditions (for presence and absence of technology transfer via international collaboration) and two composing the detailed constituents of the three macro-variable conditions (HRD, KM and foreign/local ownership).

To affirm our findings, we conduct a single case-study analysis using a typical case; a firm initially foreign-owned that had been divested to 100% Ghanaian ownership (2009/2010) for over a decade (at the time of writing the case). Such additional empirical analysis corresponds to what is referred to as post-QCA analysis (Schneider and Wagemann, 2012). This resembles Rihoux, Álamos-Concha and Lobe’s (2021) QCA – ‘causal process tracing’ mixed methods (see Box 1). Core references to process tracing are George and Bennett (2005) and Beach and Pedersen (2019). We conclude the empirical study with a post-QCA analysis (Schneider and Wagemann, 2012), which consists of carefully selecting a case firm (Box 1) with a unique

ownership history and significant HRD, KM and absorptive capacity to buttress our QCA findings.

Findings

Themes from the qualitative data

The qualitative study revealed four key themes eliciting differences between foreign and local firms: (1) international collaboration opportunities; (2) HRM/D and KM systems and practices; (3) international knowledge networks; and (4) absorptive capacity. With regard to international collaboration, we found that most local firms, unlike their foreign counterparts, had limited or no international collaboration opportunities. As explained by one local manager, ‘... we have not collaborated on a project with a foreign firm for the past three years that I have worked here... but there have been very few such opportunities in the past... I think most local firms have not [had such opportunities] ... there are no incentives or policies to encourage that’. Drawing from this, we adapted the absorptive capacity measures to incorporate the limitation of international collaboration opportunities for local firms in emerging countries.

In terms of HRD practices, responses from both local and foreign firms asserted that ‘... most local contractors... do not value human resource management and training and development...’ and that most local firms ‘... did not have a structured knowledge management system’. Foreign firms demonstrated more presence of both efficient and effective HRD and KM systems and practices than their local counterparts. Given that this finding is consistent with prior studies (e.g. Gooderham, 2007), we largely maintained prior measures of HRD and KM. While foreign-owned firms had ‘access to knowledge from the parent company and international networks’, local firms did not. Local firms were rarely approached for collaboration or knowledge sharing by foreign entities. Foreign firms also showed commitment to ‘supporting employees to join local and international professional bodies than their local firms’. Consequently, foreign firms were embedded in wider and richer international knowledge networks than local firms. In comparison with local firms, foreign firms demonstrated more commitment to developing employees’ ‘ability to acquire and utilize new technology and knowledge’. We incorporate such support and commitment into the research items. Ultimately, the absorptive capacity and therefore technology transfer potential were much higher in foreign firms than in local firms. We use the survey data to further explicate more meaning from these initial findings. Insights from our qualitative analysis prompted us to consider three explanatory variables in the design of our questionnaire. HRD practices including international knowledge networks, KM systems including individual

Table 2. General model explaining technology transfer potential through international collaboration in emerging economies

Configuration	Solution 1
Foreign/local (local ●/foreign ∅)	∅
Human resource development (more ●/less ∅)	●
Knowledge management (more ●/less ∅)	●
Consistency	1.00
Raw coverage	0.28
Unique coverage	0.28
Overall solution consistency	1.00
Overall solution coverage	0.28

Black circles indicate the presence of a condition, and open circles with a line indicate its absence (or negation). Blank spaces indicate redundant condition.

external knowledge networks and foreign/local ownership. These three factors jointly contribute to the absorptive capacity associated with technology transfer potential (via international collaborations).

Scale reliability of measures

We performed initial reliability analysis of the measures before moving into csQCA. From the results, Cronbach’s alpha scores for the constructs are technology transfer (0.793), HRD (0.879) and KM (0.916). We use mean values of HRD, technology transfer and KM. Such composite measures are used in some studies for knowledge flows within MNEs (see Gupta and Govindarajan, 2000). There are relationships between these variables. Technology transfer has strong and significant positive correlation with KM (0.763), moderate and significant positive correlation between HRD and KM (0.537) and an appreciable correlation (but not significant) between technology transfer and HRD (0.385).

Analysis of technology transfer in emerging economies using csQCA

Using csQCA, we analyse the macro-variables and their relationship with technology transfer potential. Our analysis aims to explain how the three conditions – namely foreign/local-owned firms, HRD and KM – combine to explain the potential absorption of new technology taking place through international collaboration. The analysis reveals one causal path (Table 2), indicating that the potential absorption of new technology through international collaboration may be a consequence of the combination of more HRD, more KM and ownership mainly under foreign investors’ control. This confirms our conceptualization that superior HRD and KM of foreign firms enhance their absorptive capacity and technology transfer potential.

Table 3. General model explaining the absence of technology transfer potential through international collaboration in emerging economies

Configuration	Solution	
	1	2
Foreign/local (local ●/foreign ∅)	●	
Human resource development (more●/less ∅)		●
Knowledge management (more ●/less ∅)		∅
Consistency	0.90	1.00
Raw coverage	0.78	0.21
Unique coverage	0.60	0.04
Overall solution consistency	0.90	
Overall solution coverage	0.82	

Black circles indicate the presence of a condition, and open circles with a line indicate its absence (or negation). Blank spaces indicate redundant conditions.

We were interested in both the presence and the absence of technology transfer potential because we are convinced of the importance of understanding conditions associated with the presence or absence of technology transfer potential. Thus, we run another csQCA analysis where the outcome is simply the negation of the outcome assessed in Table 2. Interestingly, this analysis yields two causal paths (Table 3). The first causal path shows that no matter the level (more or less) of HRD and KM, there is an absence of technology transfer potential within companies dominantly held by local investors. This might be because the opportunities for international collaboration among locally owned companies are so low. The second causal path stresses the idea that there could be an absence of technology transfer potential regardless of foreign/local ownership. Therefore, even for more HRD, low engagement in KM would inhibit technology transfer potential. Thus, firms, whether foreign or local, with good HRD practices but weak KM systems, may still not experience technology transfer through international collaborations.

These first two analyses bring out two important results. First, they show that in the context of emerging countries, typically in Sub-Saharan Africa, the technology transfer due to international collaboration may take place more in foreign-owned firms with both good and active HRD and KM systems (see Table 2). Second, in some firms owned by local investors, there is an absence of technology transfer potential regardless of their level of engagement in HRD and KM (see Table 3).

We strengthen these first significant results by considering common dimensions of firms in terms of HRD and KM, that is, we disaggregate the two macro-variables. This helps us to focus on five essential activities of HRD and seven of KM. Thus, the two new models that we analyse are geared towards understanding the combination of 12 conditions in the presence

Table 4. Extended model explaining technology transfer potential through international collaboration in emerging economies

Configuration	Solution				
	1	2	3	4	5
Foreign/local (local ●/foreign ∅)	●	∅	∅	∅	∅
Human resource development (more ●/less ∅)					
Reason for training	∅	∅	∅	●	●
Internal training	∅	●	∅	●	●
External training	∅	●	∅	∅	●
Organization-led external knowledge networks	∅	∅	∅	∅	●
Motivation to train	∅	●	∅	●	●
Knowledge management (more ●/less ∅)					
Knowledge creation	∅	∅	●	●	●
Individual learning	∅	∅	●	●	●
Rewarding new knowledge	∅	∅	∅	●	●
Group learning	∅	∅	●	●	●
Storing knowledge	∅	∅	●	●	●
Knowledge sharing	∅	∅	●	●	●
Individual external knowledge networks	∅	∅	∅	●	●
Consistency	1.00	1.00	1.00	1.00	1.00
Raw coverage	0.14	0.14	0.14	0.14	0.28
Unique coverage	0.14	0.14	0.14	0.14	0.28
Overall solution consistency				1.00	
Overall solution coverage				0.85	

Black circles indicate the presence of a condition, and open circles with a line indicate its absence (or negation). Blank spaces indicate redundant conditions.

(or absence) of potential technology transfer through international collaboration within the firms.

Table 4 suggests that the analysis of the decomposition of the two macro-variables, HRD and KM, yields five causal paths associated with technology transfer potential through international collaboration. Solutions 2 to 5, which expand solution 1 in Table 2, are representative of a category of companies mostly held by foreign investors. Those firms invest in HRD and/or KM activities. For instance, solution 2 reflects firms more active in HRD than in KM activities. Solution 3 appears to be the opposite of solution 2 because in solution 3 there is more focus on KM than HRD activities.

Solution 4 illustrates the centrality of HRD and KM activities to the technology transfer process. Yet not all human resource activities are intensive, that is, external training and organization-led external knowledge networks. Finally, solution 5 represents companies with intensive efforts in all HRD and KM activities. These results significantly exemplify the need for both HRD and KM to enhance technology transfer potential. Solution 1 indicates that there is a category of local firms, that is, those mostly held by local investors, which can build technology transfer potential with low engagement in HRD and KM activities. This suggests that a certain

level of both activities remains essential to technology transfer.

The results of our last csQCA analysis, exhibited in Table 5, indicate that the absence of technology transfer potential is more complex for locally owned firms (see solutions 2, 3, 5, 6, 8, 9, 10, 11, 13, 14, 15, 16, 17 and 18) and foreign firms (see solutions 1, 4, 7 and 12). The condition that appears to be common among foreign firms with absence of technology transfer potential is lower organization-led external knowledge networks.

This suggests that one of the key determinants of technology transfer potential among foreign firms is the fact that they have access to richer and wider knowledge networks, which the local firms generally lack. It is also worth noting that, as seen in the qualitative findings, this wider knowledge network is also international. Table 5 also emphasizes that for local companies, even when there are evident good HRD and KM practices and systems, technology transfer may still not be achieved. We buttress these findings with a carefully selected single case study in Box 1.

Post-QCA case study analysis

Box 1: Excellence through HRD, KM, absorptive capacity and technology transfer potential

The case firm became a 100% Ghanaian-owned construction firm after foreign divestment in 2009/2010. After over a decade of Ghanaian ownership, the firm preserves a dedicated local and expatriate management team. A fifth of the current employees have been with the firm for more than 25 years (good source of organizational knowledge). The firm is a front runner in specialist construction technology and knowledge within the national and sub-regional markets.

HRD practices from the period of foreign ownership have been maintained and they continue to employ educated professionals who constantly receive training and development. Employees attest to annual performance appraisals, which identify and deliver training and development needs linked to career development and progression. For sustained competitive advantage, the firm stays up-to-date with emerging technologies and provides related skills development for employees. The capacity-building ethos from the period of foreign ownership has been continued. Employees are supported to be members of local and international professional bodies (communities of practice). They also attend relevant short courses and conferences and are mandated to share new technology and knowledge through seminars, reports, on-the-job and off-the-job training. Such new technology and knowledge are logged into the firm's KM system.

The KM system is deemed important for several significant reasons. Since construction operations are

transient, technology and knowledge acquired may not be readily used for current and immediate future projects. In addition, the individual who acquired the technology may not be working with the firm when the knowledge is needed. The KM system, which is on a secured intranet, has different sections for the key processes and activities. These are reviewed and updated during and after a project, in line with changing product, process or managerial technology and innovation. The system captures the name of any person who inputs or updates information on a technology or knowledge. This allows new users to know who to contact for clarification or further explanation, if needed. Expectations to engage with the KM system form part of the performance appraisal. Knowledge bearers are therefore always willing to give more insight into information on the KM system. Previous employees with a given knowledge either share the knowledge or are hired as consultants on related projects. KM has been shown to be an important source of performance improvement and competitive advantage of the firm. The use of the KM system encourages knowledge sharing and teamwork and is essentially an embedded organizational culture inherited from the period of foreign ownership. In addition to the KM system, the firm maintains archives inherited from the period of foreign ownership and retains the services of an archival manager. The archives, inter alia, store designs, reports, meeting minutes, and so on (knowledge repository) from previous projects.

The current local and foreign management team maintains national and international knowledge networks inherited from the period of foreign ownership. Prior relationships and communication with individuals and the previous parent foreign firm have sustained knowledge flows. The firm maintains HRD and KM systems with high absorptive capacity and technology transfer potential to maintain competitive advantage. It is not surprising that they remain a model of construction excellence (to both local and foreign firms), combining international knowledge and local experience to undertake large, complex projects.

Discussion

We set out to understand conditions for achieving technology transfer in foreign and local firms in emerging economies. Based on our findings from the qualitative analysis and QCA, we develop a process model of technology transfer potential in emerging economies (see Figure 1). While we uncover different pathways to technology transfer potential in emerging economies, our process model outlines a unifying pathway. The model posits that for technology transfer potential to

Table 5. Extended model explaining the absence of technology transfer potential through international collaboration in emerging economies

Configuration	Solution																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Foreign/local (local ●/foreign Ø)	Ø	●	●	Ø	●	●	Ø	●	●	●	●	Ø	●	●	●	●	●	●
Human resource development (more ●/less Ø)	●	Ø	●	Ø	●	Ø	Ø	●	●	●	●	●	●	Ø	●	●	●	Ø
Reason for training	●	Ø	●	Ø	●	Ø	Ø	●	Ø	Ø	●	Ø	●	●	●	Ø	●	Ø
Internal training	●	Ø	●	●	●	Ø	Ø	●	Ø	Ø	●	Ø	●	●	Ø	●	●	●
External training	●	Ø	●	Ø	Ø	●	Ø	●	●	Ø	●	Ø	●	●	Ø	●	●	●
Organization-led external knowledge networks	Ø	Ø	●	Ø	●	●	Ø	Ø	●	Ø	●	Ø	●	Ø	●	●	●	●
Motivation to train	●	●	●	●	●	●	Ø	●	●	●	●	●	●	●	●	●	●	●
Knowledge management (more ●/less Ø)	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø
Knowledge creation	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø
Individual learning	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø
Rewarding new knowledge	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø
Group learning	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø
Storing knowledge	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø
Knowledge sharing	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø
Individual external knowledge networks	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø	Ø
Consistency	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Raw coverage	0.08	0.08	0.08	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Unique coverage	0.08	0.08	0.08	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
Overall solution consistency	1.00																	
Overall solution coverage	0.91																	

Black circles indicate the presence of a condition, and open circles with a line indicate its absence (or negation). Blank spaces indicate redundant condition.

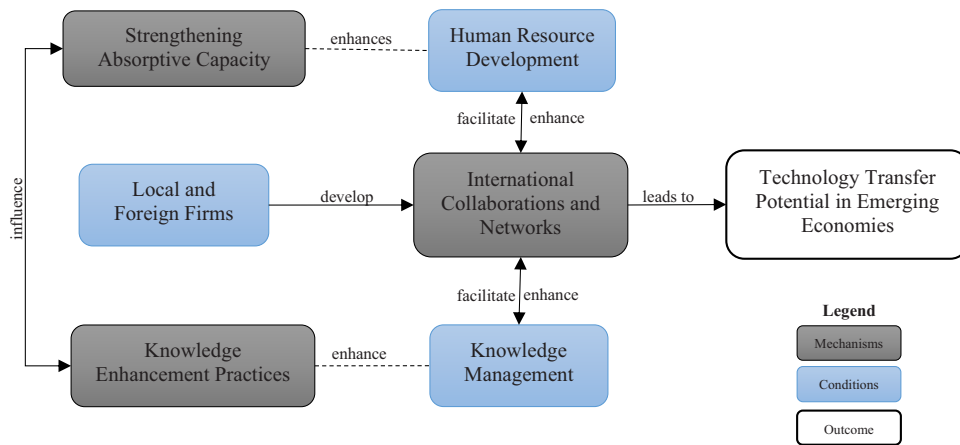


Figure 1. A process model of technology transfer potential in emerging economies [Colour figure can be viewed at [wileyonlinelibrary.com](https://onlinelibrary.wiley.com/doi/10.1111/467-8551.12814)]

occur in emerging economies, local and foreign firms (left middle box) need to develop international collaborations and networks (centre box), which in turn help enhance their HRD and KM capabilities and vice versa. Thus, we emphasize that international collaborations and networks alone are not sufficient to successfully absorb new technology, but that both firm-level HRD and KM are also important elements for technology transfer. In addition, the process model posits that there is a relationship between HRD and strengthening absorptive capacity, as well as KM and knowledge enhancement practices. This means that international collaborations and networks can enhance KM, which ultimately enhances knowledge enhancement practices for technology transfer potential. Again, there is a mutually exclusive relationship between knowledge enhancement practices and the ability to strengthen absorptive capacity, as improving the former also influences the latter. Therefore, achieving technology transfer potential in emerging economies requires a combination of HRD, KM and their respective mechanisms (i.e. strengthening absorptive capacity and knowledge-enhancing practices to achieve technology transfer) and international collaborations and networks.

Theoretical implications

In addition to our configurational theorizing of technology transfer, this study makes four key theoretical contributions. First, the study develops a process model (see Figure 1) that unpacks how technology transfer occurs in local and foreign firms in emerging economies. So far, there is limited theorization of how technology transfer unfolds in emerging economies. While the majority of the existing studies (e.g. Dávila, Durst and Varvarkis, 2018; Ivarsson and Alvstam, 2005; Minbaeva *et al.*, 2013; Teixeira, Rapini and Caliri, 2020) point to individual factors responsible for technology transfer, this study moves a step further to explicate

the underlying process through which it occurs. By this, our study makes a significant contribution to the technology transfer literature. Second, the study contributes by extending the absorptive capability literature (Arndt *et al.*, 2023; Cohen and Levinthal, 1990). Specifically, the study examines two internal organizational mechanisms that help develop purposeful absorptive capacity, namely HRD and KM. The study shows that successfully absorbing new external technology requires a firm to develop its human resources and use KM to internalize this new knowledge. Penrose (1973) assumes that knowledge transfer occurs when firms discover a profit opportunity. Our study suggests that the decision to absorb new knowledge may be more complicated as it requires various organizational systems. As such, we extend Cohen and Levinthal's (1990) perspective on the role of individuals in the process of absorbing knowledge, by showing that organizational systems, here HRD and KM, are important factors that support the knowledge absorption process. The study also explicates the link between strengthening absorptive capacity and knowledge-enhancing practices as mechanisms through which HRD and KM indirectly influence each other towards achieving technology transfer.

Third, the study further departs from existing literature to explain the underlying mechanisms and interactions between key variables and how they lead to technology transfer. Specifically, this study contributes to the HRD and KM literature by extending how HRM influences the technology transfer process (Minbaeva *et al.*, 2013) and answers a call from Song (2014) to formulate and examine new HRD conditions. In this study, we looked at reasons for training, internal training, external training, motivation to train and organization-led external knowledge networks. In the same sense, we examine KM conditions such as knowledge creation, individual learning, rewarding new knowledge, group learning, storing knowledge, knowledge sharing and individual external knowledge networks. By doing so, this

study contributes by complementing and extending previous research on technology transfer and the role of HRM/D (Evans and Davis, 2005; Minbaeva *et al.*, 2013; Pfeffer and Veiga, 1999). Our study aligns with Song (2014) in that such studies have largely ignored factors that directly relate to the technology transfer process (e.g. training and development). Identifying and including different factors for developing human capital (Delaney and Huselid, 1996; Koch and McGrath, 1996) allowed us to stress the importance of training and development activities. In addition, this study amplifies the rather ignored role of KM in the technology transfer literature. The study emphasizes the importance of HRD activities that underscore both internal and external training and the development of external knowledge networks. It also highlights that KM systems within firms, which enhance their ability to acquire, create, store, share and reward learning, are essential for increasing absorptive capacity and therefore the technology transfer potential. We further extend the assertion that foreign-owned firms invest more in HRM/D and KM systems to enhance technology transfer potential than local firms (Ramachandran, 1993), suggesting that the embeddedness of foreign firms into wider and, arguably, richer knowledge networks contributes to their superior absorptive capacity and therefore technology transfer potential. This supports the idea that the dynamics of technology transfer vary across network types (Inkpen and Tsang, 2005) but also emphasizes that network types depend on foreign/local ownership.

Lastly, the study contributes by accentuating the importance of foreign/local ownership in an emerging economy context. The study shows that the low opportunities for international collaboration for local firms in emerging economies may inhibit their technology transfer potential. Whilst good HRD and KM systems enhance technology transfer potential for both local and foreign-owned firms, the absence of collaborative opportunities and good organization-led and international knowledge networks for local firms explains their rather poor technology transfer potential. The contribution of this study to the literature on technology transfer, absorptive capacity, HRD and KM is enhanced particularly around the unique contextual aspects (both the construction industry and emerging markets). We explain that industry dynamics matter. For example, construction projects are transient and characterized by rapidly changing micro-environments (Dubois and Gadde, 2002; Manley, 2008), which accentuates the significance of KM. In addition, in emerging markets where state institutions do not function as expected and are considered weak (Khanna and Palepu, 2006), with most construction industry bodies ill-equipped to address technology transfer issues (Osabutey and Croucher, 2018), internal firm-level processes related to HRD and KM are critical. Our results show that HRD

and KM are pivotal in building absorptive capacity in the context of emerging economies. Compared with studies by Liu, Lu and Choi (2014) on China and Osabutey *et al.* (2023) on Ghana, we conjecture that a well-built absorptive capacity could improve local innovation capability.

Practical and managerial implications

This study was motivated by low technology transfer within the construction industry and a reluctance of local firms to invest in HRM/D and KM systems. There is a need for managers to understand that the reasons why technology transfer potential is not always sufficiently realized are more nuanced. Our findings and process model offer a holistic and unique medium for practitioners to implement technology transfer in emerging economies. Our post-QCA case analysis suggests that both foreign and local firms should consciously invest in KM by ensuring that projects have embedded elements of how to create, store, share and reward new knowledge. To augment HRD, training and development should be part of the organizational culture. Employees should also be sponsored to attend relevant short courses and conferences and be encouraged to share new knowledge during scheduled in-house seminars. In addition, foreign and local firms should engage with relevant communities of practice. Above all, KM and HRD systems should be a core part of performance appraisal.

Effective transfer may sometimes only be measurable when and/or if the firm gets the opportunity to use the technology. This perhaps highlights the need for KM systems to maintain organizational memory, since individuals who received the technology may no longer work for the organization when the use of the technology is required. Our findings emphasize that the combination of KM and HRD systems supports technology transfer potential. More importantly, managers must understand that learning via international collaboration is enhanced through good HRD systems of recipient firms. Another practical/managerial implication is that absorptive capacity, and therefore technology transfer potential into a given industry, is dependent on the joint effect of KM and HRD systems in both foreign and local collaborating firms.

Managers interested in new technologies need to continuously work on enhancing the quality, variety and quantity of knowledge networks of the firm and its individuals. Our findings suggest that rather than leaving engagement with knowledge networks to individuals, organizations should deliberately support and work towards developing external knowledge networks to purposefully pursue new technologies. The explanatory factor for effective technology transfer differences is that foreign firms are connected to rich knowledge networks

that local firms lack. This is because absorptive capacity and effective technology transfer depend on the nature of embedded knowledge networks. Even for foreign firms operating in developing/emerging countries, poor organization-led international external knowledge networks would inhibit technology transfer potential. Foreign firms should therefore also ensure that their embeddedness in an industry in a foreign country should not lead to disengagement with their external knowledge networks.

Conclusion

This study sought to address the research question dealing with how HRD, KM and local/foreign-owned firms explain the presence or absence of industry-level technology transfer potential through international collaboration in an emerging economy context. Our study has shown that existing literature has overlooked the configurational aspects of technology transfer potential. To address this, we develop a process model as a novel lens to understand how technology transfer in emerging economies unfolds. Our study also shows that good firm-level HRD and KM systems within an industry together enhance absorptive capacity and technology transfer potential for both foreign-owned and local-owned firms. Meanwhile, the absence of collaborative opportunities and good knowledge networks for local firms explains poor technology transfer potential. We also provide insights into how the nuances of knowledge networks within an industry environment influence technology transfer potential, even for foreign firms.

The study departs from existing literature to address the research question from a configurational perspective. Specifically, the study applied QCA to uniquely enhance our understanding of the configurations under which technology transfer potential may or may not be realized. In addition, the study emphasizes how QCA allows an in-depth exploration of important technology transfer issues, particularly in under-researched emerging economies. Whilst our study is novel in the configurational approach and how we analyse the relationship between the presence and absence of technology transfer potential in both foreign and local firms within an industry in an emerging economy, we recognize some limitations in the scope and scale of data used. Moreover, our study is limited by the focus on a single case (i.e. Ghana's construction industry), though the findings can be applicable to other countries in emerging markets with similar characteristics. These limitations present interesting avenues for future research. Future studies may find it interesting to have a better balance of the number of foreign and local firms, as this could enrich our understanding. Future studies could enlarge the sample and geographical coverage to uncover more tech-

nology transfer nuances in developing countries that remain under-researched. Exploration of other industries, together or separately, could also reveal industry effects.

References

- Akinci, C. and E. Sadler-Smith (2019). 'Collective intuition: implications for improved decision making and organizational learning', *British Journal of Management*, **30**, pp. 558–577.
- Alavi, M. and D. E. Leidner (2001). 'Review: knowledge management and knowledge management systems: conceptual foundations and research issues', *MIS Quarterly*, **25**, pp. 107–136.
- Argote, L. and P. Ingram (2000). 'Knowledge transfer: a basis for competitive advantage in firms', *Organizational Behavior and Human Decision Processes*, **82**, pp. 150–169.
- Armanios, D. E., C. E. Easley, J. Li and K. M. Eisenhardt (2017). 'How entrepreneurs leverage institutional intermediaries in emerging economies to acquire public resources', *Strategic Management Journal*, **38**, pp. 1373–1390.
- Arndt, F., B. Aharonson, J. Jansen, J. Jiang and T. Cao (2023). 'The past and the future of absorptive capacity', *Academy of Management Collections*, **2**, pp. 45–59.
- Arnold, E., M. Bell, J. Bessant and P. Brimble (2000). *Enhancing Policy and Institutional Support for Industrial Technology Development in Thailand – the Overall Policy Framework and the Development of the Industrial Innovation System*. Washington, DC: World Bank.
- Bandura, A. (1997). *Self Efficacy: The Exercise of Control*. New York: W.H. Freeman.
- Beach, D. and R. B. Pedersen (2019). *Process-Tracing Methods: Foundations and Guidelines*. Ann Arbor, MI: University of Michigan Press.
- Berger, M. and J. Revilla Diez (2008). 'Can host innovation systems in late industrializing countries benefit from the presence of transnational corporations? Insights from Thailand's manufacturing industries', *European Planning Studies*, **16**, pp. 1047–1074.
- Bessant, J. (2008). 'Dealing with discontinuous innovation: the European experience', *International Journal of Technology Management*, **42**, pp. 35–50.
- Beynon, M., M. Battisti, P. Jones and D. Pickernell (2021). 'How institutions matter in the context of business exit: a country comparison using GEM data and fsQCA', *British Journal of Management*, **32**, pp. 832–851.
- Birkinshaw, J. and N. Hood (1998). 'Multinational subsidiary evolution: capability and charter change in foreign-owned subsidiary companies', *The Academy of Management Review*, **23**, pp. 773–795.
- Björkman, I., W. Barner-Rasmussen and L. Li (2004). 'Managing knowledge transfer in MNCs: the impact of headquarters control mechanisms', *Journal of International Business Studies*, **35**, pp. 443–455.
- Blalock, G. and D. H. Simon (2009). 'Do all firms benefit equally from downstream FDI? The moderating effect of local suppliers' capabilities on productivity gains', *Journal of International Business Studies*, **40**, pp. 1095–1112.
- Bouguerra, A., K. Mellahi, K. Glaister, M. Hughes and E. Ekrem Tatoglu (2021). 'Revisiting the concept of absorptive capacity: the moderating effects of market sensing and responsiveness', *British Journal of Management*, **32**, pp. 342–362.
- Bresman, H., J. Birkinshaw and R. Nobel (1999). 'Knowledge transfer in international acquisitions', *Journal of International Business Studies*, **30**, pp. 439–462.
- Butler, M. J. R. and E. Ferlie (2020). 'Developing absorptive capacity theory for public service organizations: emerging UK empirical evidence', *British Journal of Management*, **31**, pp. 344–364.
- Chiva, R., P. Ghauri and J. Alegre (2014). 'Organizational learning, innovation and internationalization: a complex system model', *British Journal of Management*, **25**, pp. 687–705.

- Cohen, W. M. and D. A. Levinthal (1990). 'Absorptive capacity: a new perspective on learning and innovation', *Administrative Science Quarterly*, **35**, pp. 128–152.
- Cross, R. and J. N. Cummings (2004). 'Tie and network correlates of individual performance in knowledge-intensive work', *Academy of Management Journal*, **47**, pp. 928–937.
- Cuervo-Cazurra, A. and H. Rui (2017). 'Barriers to absorptive capacity in emerging market firms', *Journal of World Business*, **52**, pp. 727–742.
- Dávila, G. A., S. Durst and G. Varvarkis (2018). 'Knowledge absorptive capacity, innovation and firm's performance: insights from the South of Brazil', *International Journal of Innovation Management*, **22**, pp. 1–34.
- Delaney, J. T. and M. Huselid (1996). 'The impact of human resource management practices on perceptions of organisational performance', *Academy of Management Journal*, **39**, pp. 949–969.
- Dubois, A. and L.-E. Gadde (2002). 'Systematic combining: an abductive approach to case research', *Journal of Business Research*, **55**, pp. 553–560.
- Eapen, A. (2012). 'Social structure and technology spillovers from foreign to domestic firms', *Journal of International Business Studies*, **43**, pp. 244–263.
- Egbu, C. O. (2000). 'Knowledge management in construction SMEs: coping with the issues of structure, culture, commitment and motivation'. *16th Annual ARCOM Conference, 6–8 September 2000, Glasgow Caledonian University, Vol. 1*, pp. 83–92.
- Elsahn, Z. and M. Benson-Rea (2018). 'Political schemas and corporate political activities during foreign market entry: a micro-process perspective', *Management International Review*, **58**, pp. 771–811.
- Evans, W. R. and W. D. Davis (2005). 'High-performance work systems and organizational performance: the mediating role of internal social structure', *Journal of Management*, **31**, pp. 758–775.
- Fiol, C. M. and M. A. Lyles (1985). 'Organizational learning', *Academy of Management Review*, **10**, pp. 803–813.
- Fiss, P. C. (2007). 'A set-theoretical approach to organizational configurations', *Academy of Management Review*, **32**, pp. 1180–1198.
- Furnari, S., D. Crilly, V. F. Misangyi, T. Greckhamer, P. C. Fiss and R. V. Aguilera (2021). 'Capturing causal complexity: heuristics for configurational theorizing', *Academy of Management Review*, **46**, pp. 778–799.
- Ganesan, S. and J. Kelsey (2006). 'Technology transfer: international collaboration in Sri Lanka', *Construction Management and Economics*, **24**, pp. 743–753.
- Gawer, A. and N. Phillips (2013). 'Institutional work as logics shift: the case of Intel's transformation to platform leader', *Organization Studies*, **34**, pp. 1035–1071.
- Gegenfurtner, A., K. Veermans, D. Festner and H. Gruber (2009). 'Motivation to transfer training: an integrative literature review', *Human Resource Development Review*, **8**, pp. 403–423.
- George, A. L. and A. Bennett (2005). *Case Studies and Theory Development in the Social Sciences*. Cambridge, MA: MIT Press.
- Gioia, D. A., K. G. Corley and A. L. Hamilton (2013). 'Seeking qualitative rigor in inductive research: notes on the Gioia methodology', *Organizational Research Methods*, **16**, pp. 15–31.
- Gooderham, P. N. (2007). 'Enhancing knowledge transfer in MNCs: a dynamic capability driven model', *Knowledge Management Research and Practice*, **5**, pp. 34–43.
- Grant, R. M. (1996). 'Prospering in dynamically-competitive environments: organisational capability as knowledge integration', *Organization Science*, **7**, pp. 375–387.
- Greckhamer, T., S. Furnari, P. C. Fiss and R. V. Aguilera (2018). 'Studying configurations with qualitative comparative analysis: best practices in strategy and organization research', *Strategic Organization*, **16**, pp. 482–495.
- Griffiths-Hemans, J. and R. Grover (2006). 'Setting the stage for creative new products: investigating the idea fruition process', *Journal of the Academy of Marketing Science*, **34**, pp. 27–39.
- Grigoriou, K. and F. T. Rothaermel (2017). 'Organizing for knowledge generation: internal knowledge networks and the contingent effect of external knowledge sourcing', *Strategic Management Journal*, **38**, pp. 395–414.
- Grohmann, A., J. Beller and S. Kauffeld (2014). 'Exploring the critical role of motivation to transfer in the training transfer process', *International Journal of Training and Development*, **18**, pp. 84–103.
- Grosse, R. (1996). 'International technology transfer in services', *Journal of International Business Studies*, **27**, pp. 781–800.
- Gupta, A. K. and V. Govindarajan (2000). 'Knowledge flows within multinational corporations', *Strategic Management Journal*, **21**, pp. 473–496.
- Hedberg, B. (1981). 'How organizations learn and unlearn?' In P. C. Nystrom and W. H. Starbuck (eds), *Handbook of Organizational Design*, pp. 8–27. Oxford: Oxford University Press.
- Hughes, M., M. Filser, R. Harms, S. Kraus, M. L. Chang and C. F. Cheng (2018). 'Family firm configurations for high performance: the role of entrepreneurship and ambidexterity', *British Journal of Management*, **29**, pp. 595–612.
- Inkpen, A. C. and E. W. K. Tsang (2005). 'Social capital, networks, and knowledge transfer', *Academy of Management Review*, **30**, pp. 146–165.
- Ivarsson, I. and C. G. Alvstam (2005). 'Technology transfer from TNCs to local suppliers in developing countries: a study of AB Volvo's truck and bus plants in Brazil, China, India, and Mexico', *World Development*, **33**, pp. 1325–1344.
- Jansen, J. P., J. Van Den Bosch and H. K. Volberda (2006). 'Exploratory innovation, exploitative innovation, and performance: effects of organisational antecedents and environmental moderators', *Management Science*, **52**, pp. 1661–1674.
- Katz, R. and T. Allen (1982). 'Investigating the Not Invented Here (NIH) syndrome: a look at the performance, tenure, and communication patterns of 50 R&D project groups', *R&D Management*, **12**, pp. 7–20.
- Khanna, S. and K. G. Palepu (2006). 'Emerging giants: building world-class companies in developing countries', *Harvard Business Review*, **84**, pp. 60–70.
- Koch, M. J. and R. G. McGrath (1996). 'Improving labour productivity: human resource management policies do matter', *Strategic Management Journal*, **17**, pp. 335–354.
- Kogut, B. and U. Zander (1992). 'Knowledge of the firm, combinative capabilities, and the replication of technology', *Organization Science*, **9**, pp. 383–397.
- Kor, Y. Y. and H. Leblebici (2005). 'How do interdependencies among human-capital deployment, development, and diversification strategies affect firms' financial performance?', *Strategic Management Journal*, **26**, pp. 967–985.
- Kuvaas, D. and A. Dysvik (2009). 'Perceived investment in employee development, intrinsic motivation and work performance', *Human Resource Management Journal*, **20**, pp. 138–156.
- Lahiri, S., S. Kundu and S. Munjal (2021). 'Processes underlying inter-firm cooperation', *British Journal of Management*, **32**, pp. 7–19.
- Larsson, R., K. H. Lars Bengtsson and J. Sparks (1998). 'The inter-organizational learning dilemma: collective knowledge development in strategic alliances', *Organization Science*, **9**, pp. 285–305.
- Laursen, K. and N. J. Foss (2003). 'New human resource management, complementarities and the impact of innovation on performance', *Cambridge Journal of Economics*, **27**, pp. 243–263.
- Lave, J. and E. Wenger (1991). *Situated Learning: Legitimate Peripheral Participation*. Cambridge: Cambridge University Press.
- Liu, X., J. Lu and S. J. Choi (2014). 'Bridging knowledge gaps: returnees and reverse knowledge spillovers from Chinese local firms to foreign firms', *Management International Review*, **54**, pp. 253–276.
- López, S. P., J. M. M. Peón and C. J. V. Ordás (2006). 'Human resource management as a determining factor in organizational learning', *Management Learning*, **37**, pp. 215–239.

- Manley, K. (2008). 'Implementation of innovation by manufacturers subcontracting to construction projects', *Engineering, Construction and Architectural Management*, **15**, pp. 230–245.
- Martins, J. D. M. (2016). 'Factors in the effective transfer of knowledge from multinational enterprises to their foreign subsidiaries: a Mozambican case study', *International Journal of Training and Development*, **20**, pp. 224–237.
- McLagan, P. A. (1989). 'Models for HRD practice', *Training and Development Journal*, **43**, pp. 49–59.
- Meyer, K. (2004). 'Perspectives on multinational enterprises in emerging economies', *Journal of International Business Studies*, **35**, pp. 259–276.
- Meyer, K. E. and E. Sinani (2009). 'When and where does foreign direct investment generate positive spillovers? A meta-analysis', *Journal of International Business Studies*, **40**, pp. 1075–1094.
- Minbaeva, D. (2013). 'Strategic HRM in building micro-foundations of organisational knowledge-based performance', *Human Resource Management Review*, **23**, pp. 378–390.
- Minbaeva, D., T. Pedersen, I. Björkman, C. F. Fey and H. J. Park (2013). 'MNC knowledge transfer, subsidiary absorptive capacity, and HRM', *Journal of International Business Studies*, **34**, pp. 586–599.
- Misangyi, V. F., T. Greckhamer, S. Furnari, P. C. Fiss, D. Crilly and R. Aguilera (2017). 'Embracing causal complexity: the emergence of a neo-configurational perspective', *Journal of Management*, **43**, pp. 255–282.
- Morgan, G. and L. Smircich (1980). 'The case for qualitative research', *Academy of Management Review*, **5**, pp. 491–500.
- Neirotti, P. and E. Paolucci (2013). 'Why do firms train? Empirical evidence on the relationship between training and technological and organisational change', *International Journal of Training and Development*, **17**, pp. 93–115.
- Nguyen, T. X. T. and J. R. Diez (2019). 'Less than expected—the minor role of foreign firms in upgrading domestic suppliers—the case of Vietnam', *Research Policy*, **48**, pp. 1573–1585.
- Ofori, G. (1994). 'Construction industry development: role of technology transfer', *Construction Management and Economics*, **12**, pp. 379–392.
- Osabutey, E. L. and R. Croucher (2018). 'Intermediate institutions and technology transfer in developing countries: the case of the construction industry in Ghana', *Technological Forecasting and Social Change*, **128**, pp. 154–163.
- Osabutey, E. L. C., M. Papanastassiou, Z. Jin, J. Navare and A. Agyapong (2023). 'Revisiting FSAs and CSAs in Sub-Saharan Africa: evidence from Ghanaian firms', *International Business Review*, <https://doi.org/10.1016/j.ibusrev.2023.102106>.
- Osabutey, E. L. C., K. Williams and A. Y. Debrah (2014). 'The potential for technology and knowledge transfers between foreign and local firms: a study of the construction industry in Ghana', *Journal of World Business*, **49**, pp. 560–571.
- Osman-Gani, A. A. M. (1999). 'International technology transfer for competitive advantage: a conceptual analysis of the role of HRD', *Competitive Review: An International Business Journal*, **9**, pp. 9–18.
- Penrose, E. (1973). 'International patenting and the less-developed countries', *The Economic Journal*, **83**, pp. 768–786.
- Pfeffer, J. and J. F. Veiga (1999). 'Putting people first for organizational success', *Academy of Management Perspectives*, **13**, pp. 37–48.
- Phene, A. and P. Almeida (2008). 'Innovation in multinational subsidiaries: the role of knowledge assimilation and subsidiary capabilities', *Journal of International Business Studies*, **39**, pp. 901–919.
- Pucik, V. (1988). 'Strategic alliances, organizational learning, and competitive advantage: the HRM agenda', *Human Resource Management*, **27**, pp. 77–93.
- Ragin, C. C. (2014). *The Comparative Method: Moving beyond Qualitative and Quantitative Strategies*. Oakland, CA: University of California Press.
- Ramachandran, V. (1993). 'Technology transfer, firm ownership, and investment in human capital', *The Review of Economics and Statistics*, **75**, pp. 664–670.
- Reagans, R., E. W. Zuckerman and B. McEvily (2004). 'How to make the team: social networks vs. demography as criteria for designing effective team', *Administrative Science Quarterly*, **49**, pp. 101–133.
- Rihoux, B., P. Álamos-Concha and B. Lobe (2021). 'Qualitative comparative analysis (QCA): an integrative approach suited for diverse mixed methods and multimethod research strategies'. In A. J. Onwuegbuzie and R. B. Johnson (eds), *The Routledge Reviewer's Guide to Mixed Methods Analysis*, pp. 185–197. Abingdon: Routledge.
- Saggi, K. (2004). *International Technology Transfer to Developing Countries*. London: Commonwealth Secretariat.
- Schneider, C. Q. and C. Wagemann (2012). *Set-Theoretic Methods for the Social Sciences: A Guide to Qualitative Comparative Analysis*. Cambridge: Cambridge University Press.
- Seny Kan, K. A., E. Adegbite, S. El Omari and M. Abdellatif (2016). 'On the use of qualitative comparative analysis in management', *Journal of Business Research*, **69**, pp. 1458–1463.
- Senyo, P. K., D. Gozman, S. Karanasios, N. Dacre and M. Baba (2023). 'Moving away from trading on the margins: economic empowerment of informal businesses through FinTech', *Information Systems Journal*, **33**, pp. 154–184.
- Seyler, D. L., E. F. Holton III, R. A. Bates, M. F. Burnett and M. A. Carvalho (1998). 'Factors affecting motivation to transfer training', *International Journal of Training and Development*, **2**, pp. 2–16.
- Simon, H. A. (1991). 'Bounded rationality and organizational learning', *Organisation Science*, **2**, pp. 125–134.
- Smith, W. and M. Tushman (2005). 'Managing strategic contradictions: a top management model for managing innovation streams', *Organisation Science*, **16**, pp. 522–536.
- Song, J. (2014). 'Subsidiary absorptive capacity and knowledge transfer within multinational corporations', *Journal of International Business Studies*, **45**, pp. 73–84.
- Song, Y., D. R. Gnyawali, M. K. Srivastava and E. Asgari (2018). 'In search of precision in absorptive capacity research: a synthesis of the literature and consolidation of findings', *Journal of Management*, **44**, pp. 2343–2374.
- Spencer, J. W. (2008). 'The impact of multinational enterprise strategy on indigenous enterprises: horizontal spillovers and crowding out effects in developing countries', *Academy of Management Review*, **33**, pp. 341–361.
- Standaert, T., M. Knockaert and S. Manigart (2021). 'Venture capital winners: a configurational approach to high venture capital-backed firm growth', *British Journal of Management*, **33**, pp. 211–230.
- Stein, E. W. and V. Zwass (1995). 'Actualizing organizational memory with information systems', *Information Systems Research*, **6**, pp. 85–117.
- Tallman, S. and A. Phene (2007). 'Leveraging knowledge across geographic boundaries', *Organization Science*, **18**, pp. 252–260.
- Teixeira, A. L. D. S., M. S. Rapini and T. Caliarri (2020). 'Organizational determinants and idiosyncrasies of firms' absorptive capacity in a developing country', *Science and Public Policy*, **47**, pp. 384–395.
- Tripsas, M. (1997). 'Unravelling the process of creative destruction: complementary assets and incumbent survival in the typesetter industry', *Strategic Management Journal*, **18**, pp. 119–142.
- Volberda, H. W., N. J. Foss and M. A. Lyles (2010). 'PERSPECTIVE—absorbing the concept of absorptive capacity: how to realize its potential in the organization field', *Organization Science*, **21**, pp. 931–951.
- Wales, W. J., V. Parida and P. C. Patel (2013). 'Too much of a good thing? Absorptive capacity, firm performance, and the moderating role of entrepreneurial orientation', *Strategic Management Journal*, **34**, pp. 622–633.
- Williams, C. (2009). 'Subsidiary-level determinants of global initiatives in multinational corporations', *Journal of International Management*, **15**, pp. 92–104.

- Winterton, J. and R. Winterton (1997). 'Does management development add value?', *British Journal of Management*, **8**, pp. S65–S76.
- World Bank. (1986). *The Construction Industry: Issues and Strategies in Developing Countries*. Washington, DC: World Bank.
- World Bank. (2021). *Ghana Rising – Accelerating Economic Transformation and Creating Jobs*. Washington, DC: World Bank.
- World Bank. (2024). 'GDP growth (annual) – Ghana'. Available at https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?end=2022&locations=GH&most_recent_value_desc=false&start=1984&view=chart
- Zahra, S. A. and G. George (2002). 'Absorptive capacity: a review, reconceptualization, and extension', *Academy of Management Review*, **27**, pp. 185–203.
- Zeng, J., K. W. Glaister and T. Darwish (2019). 'Processes underlying MNE subsidiary absorptive capacity: evidence from emerging markets', *Management International Review*, **59**, pp. 949–979.

Appendix A

Interview questions outline

Drawing from your knowledge and experiences in this company, could you please throw detailed light on the following key questions on international collaboration opportunities, human resource management/development (HRM/D), knowledge management (KM).

International collaborations

- Could you please describe what kinds of international collaboration (joint ventures, subcontracting arrangements, strategic alliances, consortia, etc.) opportunities your company has been involved in.
- Could you please recollect and elaborate, with notable examples, how often your company is involved in such international collaboration opportunities.
- Could you please describe in more detail a recent/current international collaboration.
- In your opinion, what new technology or knowledge did your company gain from the international collaboration opportunity? Some specifics will be useful.

Human resource management/development (HRM/D).

- Could you please describe the human resource management (HRM) functions in this company and how you ensure efficient management of your employees.
- Could you please explain what kinds of human resource development (HRD) practices through training and development activities (internal/external) your company undertakes and prioritizes, and why.
- Could you please describe how you recognize and reward training (internal/external).
- Could you please describe a recent/current training and development programme that your company is involved in.
- Could you please explain how you support your employees to engage with communities of practice in their professional fields.
- Could you please evaluate how you think your commitment to HRM and HRD influences technology transfer potential in this company.

Knowledge management (KM)

- Could you please describe how your company manages knowledge.
 - How does your company create new knowledge?
 - How does your company acquire new knowledge?
 - How does your company share new knowledge?
 - How does your company use new knowledge?
 - How does your company reward new knowledge?
 - How does your company store new knowledge (to maintain organizational memory)?
- Could you please describe a recent/current knowledge management programme or activity.
- Could you please evaluate how you think your commitment to knowledge management has influenced technology transfer potential in this company.

Ellis L. C. Osabutey is a Professor of International Business Strategy and Technology Management at Northumbria University. His research interests include FDI and technology transfer, digitalization and innovation strategies. Ellis has published in *Journal of World Business*, *International Business Review*, *Journal of Business Research*, *Technological Forecasting and Social Change (TFSC)*, *Technovation*, *Information Technology and People*, *International Journal of Production Research*, among others. He serves on *TFSC*'s editorial board and helps SMEs, MNEs and universities develop strategies.

Konan A. Seny Kan is currently Associate Professor at Grenoble Ecole de Management (France). He was lecturing at Otago Business School (New Zealand) until July 2021. He obtained his PhD at Toulouse School of Management – University Toulouse 1 Capitole (France). His research intersects three themes: (1) accounting and governance; (2) organizations (emerging economies); and (3) configural thinking. He is an Associate Editor of the *Journal of African Business*.

P. K. Senyo is Associate Professor in FinTech and Information Systems at Southampton Business School. His research interests include FinTech, artificial intelligence, platform ecosystems, ICT for development and digital transformation. He has published in *Information Systems Journal*, *European Journal of Information Systems*, *Technovation*, *Information Technology and People*, *Technological Forecasting and Social Change*, amongst others. He is an Associate Editor for the *European Journal of Information Systems* and a Senior Editor for *Information Technology and People*.

Felix Arndt is a Professor and the John F. Wood Chair in Entrepreneurship in the Department of Management at the Gordon S. Lang School of Business and Economics at the University of Guelph, and a Research Fellow at the Centre for Business and Sports of the Stockholm School of Economics, Sweden.

Christiaan Röell is a Lecturer (Assistant Professor) in International Business at the UNSW Business School, University of New South Wales. His research intersects strategy and international business, with a primary focus on how multinationals use corporate strategies to manage socio-political risk and stay ahead of the competition in foreign markets. He has published in *Journal of World Business* and *Journal of Management Studies*, among others.