Navigating borders, cultivating innovations: the dynamic role of cross-border knowledge transfer in SMEs

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Navigating Borders, Cultivating Innovations: The Dynamic Role of Cross-Border Knowledge Transfer in SMEs

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Abstract

While the last two decades have witnessed a burgeoning stream of research on cross-border knowledge transfer (CBKT), the current literature has remained relatively silent on how CBKT impacts innovation of SMEs in developing economies. Drawing on the dynamic capabilities view (DCV), this study examines the relationship between CBKT and small and medium-sized enterprises (SMEs)' innovation performance. In addition, we examined the mediating role of knowledge management dynamic capabilities (KMDC) in the relationship between CBKT and innovation performance. Empirical results using data from 370 SME owners and operators in Nigeria show that CBKT positively impacts the innovation performance of SMEs. We also found empirical support for the mediating role of KMDC on the relationship between CBKT and SMEs' innovation performance. Specifically, we observed that CBKT is significantly related to KMDC, leading to improved innovation performance among SMEs engaged in cross-border activities. This study advances existing literature by providing insight into the mechanisms and strategic linkages that support cross-border knowledge transfer and the innovation performance of SMEs in developing markets. The study outlines the implications for research and practice.

Keywords: Knowledge transfer; innovation performance; SMEs; dynamic capability

1. Introduction

In today's increasingly interconnected global economy, firms are compelled to forge international collaborations as a means to acquire new knowledge, nourishing their competitiveness in both domestic and international markets (Jandhyala & Phene, 2015; Pak & Park, 2004; Rammal et al., 2023; Rodríguez et al., 2018). Faced with limited knowledge and expertise within their own boundaries, many organizations turn to external sources of knowledge and information to address their problems (Phelps et al., 2012; World Bank, 1999; Xie et al., 2020). This is particularly important for firms operating in or seeking to operate in international markets epitomized by a diverse range of institutional impediments (Peng, Wang, & Jiang, 2008; North, 1990). Thus, the ability to develop and transfer knowledge and best practices can help businesses understand emerging trends, neutralize new and old threats, as well as enhance firms' market competitiveness (see Phelps et al., 2012).

Cross-border knowledge transfer (CBKT) is the exchange of knowledge between firms across geographic boundaries (Rammal et al., 2023) and can contribute incrementally to the firm's enhanced performance. However, previous studies have primarily focused on the role of CBKT in enhancing the competitive advantage and performance of established large firms (Ai & Tan, 2020; Pérez-Nordtvedt et al., 2008; Sheng & Hartmann, 2019). Recognizing that innovation is the lifeblood of both established and new venture organizations, the ability to capitalize on CBKT can further amplify the effects of a firm's ability to create new products and services. Firm-level innovation involves the conceptualizing and exploiting of ideas that culminate in commercial values in the form of developing new products and services that are able to service customers' expectations in new ways (Nieto & Rodríguez, 2011).

This is notably evident in recent studies within the context of multinational companies (MNCs) (Kotabe et al., 2007; Liu, 2019), however, there is currently a lack of empirical research on the role of CBKT in enhancing the innovation performance of SMEs in developing markets. This issue is particularly important given that SMEs constitute a major source of job creation and innovation in both developed and developing economies (World Bank, 2012). In addition, SMEs are mainly aggregators of economic value for nations through their active involvement in international business relationships with large distributor/production firms (Igwe et al., 2018).

Past studies indicates that small and medium-sized enterprises (SMEs) in particular face several difficulties due to their limited capacity to compete in markets such as production, marketing, and innovation (Villar, Alegre & Pla-Barber, 2014). In tandem with these vital contributions to nations' economies, these firms often grapple with institutional voids (IVs) such as lack of financial credit availability and weak legal enforcement mechanisms (Luo et al., 2009; North, 1990), coupled with limited access to scarce human capital and knowledge deficiencies, which impede their competitiveness (Amankwah-Amoah et al., 2019; Khanna & Palepu, 2005). For example, market conditions and the policy environment of the local economy differ from the foreign market (Boso et al., 2023). Therefore, innovation outcomes can be more effectively realized by the firms' ability to combine and recombine the acquired knowledge to suit the domestic environment in which they operate. The ability of SMEs to establish Knowledge transfer activities indicates one of their autonomous capacities, which ensures that they strategically use shared knowledge from international business associates for improving organizational survival and innovative performance (Khan et al., 2015). Therefore, we argue that SMEs require a better understanding of CBKT procedures that align with and can support their innovation capabilities.

Although CBKT plays an important role in promoting innovation, an appropriate knowledge management system alone cannot ensure improved innovation performance (Alegre et al., 2013). Furthermore, firms should use various types of dynamic capabilities to support the innovation process and respond to external demands (Teece, 2007). This highlights the need of Knowledge Management Dynamic Capabilities (KMDC) - defined as the firm's capability to adapt its stock of knowledge-based resources, created or acquired through transfer, into a valuable asset for the organization. These capabilities must be changed and renewed for the organisation to maintain extraordinary innovation performance (Alegre et al., 2013). Ferraris et al. (2021) found that KMDC supports firms in upgrading existing capabilities and creating new competencies that align their knowledge-based resources with advancements relevant to their domestic market. In addition, Robertson et al. (2021) suggested that SMEs in developing economies face greater pressure to develop dynamic skills that enable them to recognize, seize, and adapt external knowledge sources—such as CBKT—to achieve higher performance in innovation. Accordingly, effective knowledge management has the potential to yield positive results for organizations. However, there remain limited scholarly insights on the role of KMDC in enhancing the CBKT-innovation performance relationship.

Against this backdrop, this study aims to fill these gaps in the literature by examining the mediating role of KMDC on the relationship between CBKT and SMEs' innovation performance in developing markets. To achieve this objective, we used unique survey data from 370 SME owners and operators in Computer Village in Nigeria. Computer Village is West Africa's largest gadgets business hub with over three thousand SME operators (Salaudeen, 2022); it is the sales and distribution center for owners-managers and managers of small and medium enterprises in Nigeria's informal electronic and ICT market. In Nigeria, more than sixty-five percent of small

and medium enterprises operate in the informal economy. Their main business area includes importing products and services from foreign business partners from other countries spread across European, North American, and Asian countries.

The study contributes to the existing literature. First, although literature has focused on the impact of CBKT on improving the performance of MNCs and established firms (Ai & Tan, 2020; Liu, 2019; Pérez-Nordtvedt et al., 2008; Sheng & Hartmann, 2019), little is known about enhancing the innovation performance in the context of SMEs in developing markets. Drawing on dynamic capabilities view (Teece & Pisano, 1994; Teece et al., 1997), this study provides an in-depth analysis of the effects of CBKT in improving firm innovation performance. By focusing on small firms in a developing country, our study also sheds light on mechanisms that foster effective CBKT to improve innovation performance in a weak institutional environment by SMEs. In addition, although previous studies have focused on the role of KMDC (Alegre et al., 2013; Chen, 2003), little is known about its role in enhancing SMEs' innovation. This study extends the existing literature (Ferraris et al., 2021; Robertson et al., 2021) to examine the mediating effect of KMDC on the relationship between CBKT and SMEs' innovation performance.

The remainder of the paper is organized as follows. In the next section, we present a discussion of the theoretical background and hypotheses. This is then followed by a description of the methodology and data analysis. Finally, we discuss the main findings, the implications for both academia and owners in SMEs, and provide limitations and future research directions.

2. Theoretical background

2.1 Dynamic Capabilities View

Resource-based view (RBV) and knowledge-based view (KBV) are commonly used to explain the innovation performance of firms (Andersen, 2021; Ardito et al., 2021; Martín-de Castro, López-Sáez & Delgado-Verde, 2011; Quintane et al., 2011; Terziovski, 2010). The RBV suggests that resources that are rare, valuable, unique, and non-substitutable are crucial for gaining a competitive edge (Barney, 1991). The RBV can be used to conceptualize cross-border knowledge as a rare and valuable resource that enhances a firm's innovation performance. Grant (1996) presented a KBV of the firm as an extension of the RBV as it focuses on considering knowledge as the most valuable resource in the company. However, the static nature of this perspective led to a more dynamic view (Villar, Alegre & Pla-Barber, 2014).

We adopt the dynamic capabilities view (DCV), which helps to resolve a few issues that the RBV and KBV do not. DCV suggests that firms' innovation performance rests upon their ability to exploit and renew existing capabilities while also developing new ones (Teece & Pisano 1994; Teece et al. 1997). Dynamic capabilities define how firms can integrate, create, and continually configure internal and external capabilities/resources to adapt to the changing environment (Teece et al., 1997). Dynamic capabilities suggest that the firm's knowledge resources get deployed to perceive environmental dynamics and opportunities that can be seized and solved to facilitate the firm's economic value (Chen et al. 2022). We argue that the dynamic capabilities of the firm's knowledge represent the ability to integrate (acquire) and reconfigure (adapt) heterogeneous firm resources, especially knowledge from regionally bound internal and external networks, within the changing environment and to ensure the strategic renewal of the firm. Thus, integrating dynamic

capabilities and interfirm collaborative knowledge can enhance firms' innovation and competitive advantage (Faccin et al. 2019) as it reflects the ability of the firm to transform inputs through productive tasks and to create valuable or innovative outputs.

The adoption of DCV in the knowledge management literature supposes that when the firm appropriately manages its knowledge resources and KM processes, it becomes a strategic resource for maneuvering its competitive advantages and innovating for higher performance (Osorio-Londoño et al. 2021). Indeed, the merely possessing knowledge and knowledge-based resources is not sufficient for achieving a competitive advantage or higher levels of performance in the present dynamic and highly competitive business economy (Grant, 1996; Grant & Phene, 2022). Therefore, the firm’s acknowledgment and adoption of dynamic capabilities support its routines by enforcing organizational capabilities that result in innovative performance (Bocken & Geradts, 2020). Although the existing literature emphasizes the importance of DCV for SMEs, there is still a lack of research on the implications and adoption patterns of DCV among SMEs in developing markets (Weaven et al., 2021).

Hence, the configuration of dynamic capabilities enriches the understanding of firms' KMDC, which involves knowledge development processes, multifaceted combinations, and use under different prevailing contingencies (Ferraris et al., 2019). Furthermore, there is still a lack of understanding regarding the embeddedness of DC in justifications of the complementary roles played by KMDC and CBKT on IP in relation to SMEs in developing economies. The developing economy's SMEs are subject to various risks associated with the international business supply chain, global competitiveness, and limited access to valuable product knowledge, owing to their business dealings with large foreign partners (Adomako et al., 2019). This may require the SMEs

to shift from existing capabilities to developing new, valuable capabilities that supply them with better access to foreign partner knowledge and keep them adaptive to the external environment.

2.2 Hypotheses Development

2.2.1 Cross-border Knowledge Transfer and KM Dynamic Capability

CBKT is the exchange of knowledge between firms across geographic boundaries (Rammal et al., 2023). Firms should seek CBKT, according to Khan (2016), as long as it can be applied to the company's existing knowledge. In other words, the purpose of a firm's strategic recruitment of CBKT is to attain certain goals that contribute to the overall development of the firm's performance. Although possessing knowledge-based assets can provide competitive edge in overseas markets, it also takes a unique capability to transfer knowledge effectively as knowledge transfer is expensive and time consuming without this capacity (Martin & Salomon, 2003; Teece, 1977). In this regard, dynamic capacities and the host country's culture have an impact on knowledge transfer capabilities. Given the need to adapt CBKT into the home firm's existing knowledge, and into the home firm's operational environment, the role of KMDC of firms becomes crucial (Sheng & Hartmann, 2019). Knowledge management dynamic capabilities (KMDC) is defined as the firm's ability to integrate its stock of knowledge resources to the organizational context to improve the firm's outcomes (Alegre et al., 2013; Chen et al., 2022) which is critical to the usefulness of CBKT in the firm. KMDC enhances the firm's ability to identify, seize and reconfigure CBKT in ways that accomplish the performance goals of the firm (Chen et al., 2022). Firms may be able to create new dynamic capacities due to the shared knowledge in order to quickly respond to threats or seize market opportunities (Hart, 1995). Therefore, firms' ability to access external knowledge resources and its internal learning

mechanism work synergistically to enhance resource and capability building (Lorenzoni & Lipparini, 1999). Ferraris et al. (2021) found that KMDC support firms in upgrading existing capabilities and creating new competencies that align their knowledge-based resources with advancements relevant to their domestic market. In addition, Robertson et al. (2021) suggested that SMEs in developing economies face greater pressure to develop dynamic skills that would enable them to recognize, seize, and adapt external knowledge sources—like CBKT—to achieve higher performance in innovation. Accordingly, effective knowledge management (KM) has the potential to yield positive results for organizations, yet there remain limited scholarly insights on the role of (KMDC) in enhancing the CBKT- innovation performance relationship.

Although the dynamic capabilities of firms and their knowledge engagements have been extensively examined in the KM literature (Villar et al., 2014), there is still a dearth of research to support the link between cross-border knowledge exchange and SMEs' dynamic capabilities, particularly in developing nations (Guo et al., 2018). First, In the current knowledge economy, KMDC—the ability of the organization to transform its stock of knowledge-based resources, either internally or through transfer, into a useful asset for the organization—remains a vital tool for the success of the business (Kaur & Mehta, 2017). Second, KMDC involves the firm's ability to reconfigure the knowledge they have either created or gathered from external sources to explore environmental dynamics (Zheng et al., 2011). Thus, cross-border knowledge sharing between home-based SMEs and their foreign partners can lead to the SMEs' improved adaptations to the home industry challenges and the competitive business landscape (Forbes & Wield, 2008). However, such innovation outcomes can be more effectively realized by the firms' ability to combine and recombine the acquired knowledge to fit the domestic environment in which they operate. Therefore, we propose that:

H1: CBKT positively impact KM Dynamic capability.

2.2.2 KM Dynamic Capability and Innovation Performance

Firms with KM dynamic capability can adjust their KM practices based on their needs, meaning that organizations with KM dynamic capability often have specific and difficult-to-replicate configurations of KM practices (Alegre et al., 2013). Based on the framework provided by Alegre et al. (2013), KM dynamic capability consists of two main dimensions: internal learning competence and external learning competence, as they enable the reconfiguration of KM practice. Internal learning competence primarily originates from research and development (R&D) activities and the implementation of best practices developed through a firm's own cumulative experience. Accumulating internal knowledge is vital for value creation due to the ability to capitalize on new opportunities outside of a firm (Cohen & Levinthal, 1990). A firm's external learning competence indicates its ability to reconfigure practices through knowledge transformation by combining existing knowledge with new knowledge gained from interactions with other organizations, which plays a critical role in enhancing firm's innovation performance (Alegre et al., 2013; Chen, 2003). In the present knowledge-based economy, innovation outcomes largely depend on the capability of firms to adapt knowledge to the economic and social realities in which such innovations are required (Tödtling et al., 2009). Although firms require different types of knowledge to enhance innovation (Falasca et al., 2017), the need to continually reconfigure and renew existing organizational knowledge to create newer forms and levels of knowledge that drive innovation becomes inevitable. We propose that KM dynamic capability impacts innovation performance for the following reasons. First, it has been suggested by Kogut and Zander (1992) that firms can acquire new skills by combining their existing capabilities.

According to Ferraris et al. (2021), as firms continually seek new knowledge and adapt it to their environment, they both develop their capacities for sustenance and for improved innovation. In this regard, SMEs are required to absorb knowledge from external sources due to resource constraints (Durst & Edvardsson, 2012; Villar et al., 2014). Second, innovation results in new knowledge when existing knowledge is combined with new knowledge or when existing knowledge is applied in new ways (Zheng et al., 2011). Indeed, the relationship between KMDC and firm-level innovation performance reflects the extent to which firms have developed capabilities to innovate by absorbing and generating new knowledge that is value-driven (Mele et al., 2024). Furthermore, within the context of SMEs, the manner in which knowledge is adapted to achieve firm innovativeness in developing markets is not well explained in the literature. However, much of the existing works on KMDC pertain to conceptual clarifications (Easterby-Smith & Prieto, 2008), Therefore, we propose that:

H2: KM dynamic capability positively influence the innovation performance of SMEs.

2.2.3 Mediating Role of Knowledge Management Dynamic Capabilities (KMDC)

The concept of CBKT is closely related to innovation, as knowledge transfer is characterized by innovation diffusion, which involves the transmission of existing products, services, and technologies across borders (Makkonen et al., 2018). Firms of all sizes benefit from cross-border knowledge, especially through acquiring rapid learning from different global economies that enriches the firm (Rammal et al., 2023). Although much of the literature on cross-border knowledge exchange has focused discussions on MNCs (Chatterjee et al., 2021), the increasing digitalization of information and big data analysis techniques provide a platform for SMEs to access knowledge that supports their innovation outcomes (Amankwah-Amoah et al., 2021;

Oliveira et al., 2021). Equally, boundary spanning is advanced as a strategic means through which SMEs, with their limited access to resources and opportunities, are able to attract knowledge from their foreign partners to achieve better innovation performance (Liu & Meyer, 2020). Despite the role CBKT plays in enhancing innovation, an effective knowledge management system configuration cannot guarantee better innovation performance (Alegre et al., 2013). In addition, firms should utilize various types of dynamic capabilities that support the innovation process and adapt to external pressures in a turbulent business environment (Teece, 2007). This indicates the role of KM dynamic capabilities as these dynamic capabilities must be adapted and renewed so that the organization can maintain superior innovation performance (Alegre et al., 2013). Despite the importance of dynamic capabilities for knowledge management, few studies have examined their role in innovation performance in the context of SMEs.

KM dynamic capabilities are considered as the hub of the organization's ability to adapt its capabilities to a changing environment and serve as a formula to maintain a constant fit between these resources (Villar et al., 2014). In this regard, we propose that KMDC mediates the CBKT-innovation performance of SMEs relationship for the following reasons. First, KMDC includes the three dimensions of knowledge development, knowledge (re)combination, and knowledge use (Zheng et al., 2011; Ferraris et al., 2019). KMDC, as a facilitating variable that refines and integrates knowledge sourced from external sources into the recipient firm’s environment, potentially serves as an organizational capability that connects CBKT with innovation performance. Because of its adaptive capabilities, KMDC is able to bridge the source of knowledge (in this case CBKT acquired from foreign firms) to the recipient of such knowledge, for example, SMEs in the home country (Kaur, 2022). Second, while CBKT is a necessary condition for SMEs in the home country to advance their innovation performance, it is not sufficient in achieving these

innovation outcomes (Haasis, Liefner, & Garg, 2018), as it requires KMDC to reconfigure the knowledge attracted and make it suitable for the home market (Villar, Alegre, & Pla-Barber, 2014). Despite these existing conceptual clarifications associated with the CBKT literature, the existing studies are characterized by a missing link that explains the mediating role of KMDC in the relationship between CBKT and SMEs' innovation performance. Therefore, we hypothesize that:

H3: KMDC mediates the relationship between CBKT and SMEs' innovation performance.

[Insert Figure 1 about here]

The model depicted in Figure 1 illustrates the direct and indirect relationships elucidated in the present study, as hypothesized previously. CBKT is directly linked to the dynamic capability of knowledge management (KMDC). Additionally, a direct relationship is posited between KMDC and the innovation performance of SMEs. We propose that KMDC mediates the relationship between CBKT and innovation performance.

3. Methods

3.1 Research setting

To test the main hypotheses, we selected data from the SME owners and operators in Lagos State, Nigeria. In general, SMEs play an important role in the economy as they account for over 90% of manufacturing employment opportunities and 70% of aggregate employment created annually. Lagos State is selected for the following reasons: first, its crucial role in Nigeria's economy, owing to its strategic significance. As the economic hub of Nigeria, it boasts the highest concentration of small, medium, and large business enterprises (Ogunyomi & Bruning 2016). Second, numerous major companies have their headquarters in Lagos State, which serves as the hub of commerce

and industry in Nigeria. Additionally, in Lagos State, there were 17 percent more SMEs than in the entire country. Therefore, it presents an ideal position for data collection. The SME operators in this line of business are clustered in an ample market space, which is popularly referred to as Computer Village. Computer Village is West Africa's largest gadgets business hub with over three thousand SME operators (Salaudeen 2022); it is the sales and distribution centre for owners-managers and managers of small and medium enterprises in Nigeria's informal electronic and ICT market. The market is situated in Otigba, at Ikeja, the capital city of Lagos State, Nigeria. Onuorji (2021) suggests that more than twenty million imported mobile phones are sold in Computer Village daily. The market generates about 2 billion dollars annually, representing 2% of the national Gross Domestic Product. Operators in this market deal in electrical, electronic, and general areas of hardware and software IT products.

3.2 Data collection and sample

A self-administered questionnaire was used for data collection, and the measurement scales examined in the measurement section below were used to conduct the study. The data were collected during the period between March and June 2019. The population of this study includes owners-managers and managers of small and medium enterprises in Nigeria's informal electronic and ICT market which consists of 100,000 operators (Ibidunni et al., 2020). The questionnaire was disseminated online, and the invitations were sent via email to the selected respondents. We used Qualtrics as an online survey tool to design the survey due to its role in enhancing the survey's responses (Stress et al., 2018). We adopted a simple random procedure and selected 2,000 electronic SMEs for use in this study. The survey web link was sent to the respondents, and eventually, 500 SMEs responded to the survey. After reviewing all the responses, 130 (26%) were

discarded due to missing data and incomplete answers. Thus, the final sample consisted of 370 valid responses, corresponding to an acceptable response rate of 74%.

Table 1 shows the characteristics of the study respondents. Out of the 370 respondents, 298 are male operators, while 72 are female. Additionally, 54 (14.6%) respondents are below 20 years, followed by 156 (42.2%) respondents between 21 and 30 years, 114 (30.8%) respondents between 31 and 40 years, and 46 (12.4%) respondents are 40 years and above. Moreover, 190 (51.4%) of the respondents are single, 162 (43.8%) of the respondents are married, and 18 (4.9%) are either divorced or widowed. 120 (32.4%) of the respondents have below 5 years' experience in the business, 150 (40.5%) of the respondents have 5 to 10 years of experience in the business, and 100 (27.0%) of the respondents have 10 years and above experience in the business.

[Insert Table 1 about here]

We tested for non-response bias using the procedure outlined by Armstrong and Overton (1977). We compared the responses of the first 100 SMEs to return their responses with the last 100 SMEs' responses. We tested all crucial parameters of this study using the independent sample t-test and did not find any significant differences between the two, indicating no major concerns of non-response bias. In addition, we adopted Wagner and Kemmerling's (2010) method of comparing responses from complete and incomplete surveys for selected variables. We conducted t-test to analyse the data and we found that there were no significant differences between the two groups. This finding provides strong evidence that non-response bias does not pose a concern in our study.

3.3 Measures

3.3.1 Dependent Variable

The dependent variable for this study, innovation performance, measures the innovation-related activities of SMEs. Innovation performance of the SMEs is measured using three-items adapted from Kyrgidou & Petridou (2011). The instrument was conceived as a multidimensional capability that consists of the firms' adaptation of knowledge acquired from and knowledge-based relationships with their foreign associates to improve product offerings to their home market. Firms import new technologies from foreign markets to sell in their home country; import products and home-grown design models of such foreign products; or design new areas of use for existing products (Ibidunni et al., 2014). The innovation capability of SMEs in business with their foreign partners can be enhanced through various knowledge channels and the types of knowledge acquired to create a shift for the developing economy from consumption to production. A sample item from this scale is “Has your firm facilitated the introduction of new or technologically innovative products into the market within the last three years?” Responses were gathered on a 5-point Likert scale ranging from “strongly disagree” to “strongly agree.”

3.3.2 Independent Variables

The independent variable is CBKT. Our study conceived knowledge transfer of SMEs in international business relationships as a cross-border activity of knowledge exchange between the SMEs and their foreign business partners. Our aim to enhance the capacity of firms, not only to import knowledge but to transform and integrate knowledge as an economic good. The purpose we envision may be summed up as knowledge adoption for further replication to transition developing and emerging country SMEs to become more value-oriented in the global economy.

Consequently, CBKT consisted of four-items that were adapted from the scale of Liu (2019). A sample item from this scale is “Knowledge exchange from foreign businesses has enlarged the survival rate of the firm”. Responses were gathered on a 5-point Likert scale ranging from “strongly disagree” to “strongly agree.”

3.3.3 Mediator Variable

KMDC reflects the ability of firms to adapt internally created and externally acquired knowledge to develop innovations. Following previous studies (Villar, Alegre & Pla-Barber, 2014), KMDC was measured by the ability of firms to adjust and complement internal knowledge development and external learning competence, and it consisted of six-items using the scale developed by Alegre et al. (2013). We focused on the external learning competence as the firm can recombine their current knowledge with new information from their environment into new capabilities and knowledge, providing a global perspective and an insight into competitor behavior in foreign countries (Villar et al., 2014). In addition, SMEs are required to absorb knowledge from external sources due to resource constraints (Durst & Edvardsson, 2012; Villar et al., 2014). The scale asked questions like “this firm coordinates and integrate different innovation projects”. Responses were gathered on a 5-point Likert scale ranging from “strongly disagree” to “strongly agree.”

3.3.4 Control Variables

Our study used various control variables which may affect innovation performance at the owner and firm levels. At the owner level, we controlled for gender, educational background, and age. Prior studies suggested that the entrepreneur's gender, educational experience, and SMEs age may affect SMEs performance (Adomako & Ahsan 2022). Gender was coded as a dichotomous variable

where female respondents were coded with 1 and male respondents with 0. Literature suggested that male managers are more likely to introduce product innovations than female managers (Dohse, Goel & Nelson, 2019). The entrepreneur's educational attainment was captured as 1 = O'Level, 2 = NCE/OND, 3= HND/B.Sc, and 4 = Post Graduate, as it has been found that there is a positive relationship between owner's educational level and SMEs' performance (Gimeno et al., 1997) Manager's age was coded as a continuous variable.

At the firm level, we controlled for both the firm age, and external collaboration. We also controlled firm age (Hughes et al. 2021), measured as the length in years of the firm's operations. Although young firms could have a dedicated and flexible management team, they may be less experienced in innovation, which may lead to poorer innovation performance (Van der Panne, Van Beers & Kleinknecht, 2003). We also controlled for external collaboration and coded using a 7-point Likert scale of 1 (strongly disagree) to 7 strongly agree) developed by (Santoro, Bresciani & Papa, 2020). Research has found that external collaborations and networks play a significant role in the innovation process and in supporting firm growth (Gilsing, et al., 2008). As a result of the ability to select various types of knowledge and technologies, utilizing multiple external collaboration enable firms to be more innovative (Bellantuono, Pontrandolfo & Scozzi, 2013; Stuart & Podolny, 1996; Van de Vrande et al., 2009)

3.4 Common Method Bias (CBM)

Various approaches were taken to address the common method issue in the survey design. The independent and dependent variables were distributed across the survey, so that the respondents couldn't make any associations between those variables (Nagy et al., 2024; Tantawy et al., 2024). As a result of being assured of their anonymity and confidentiality, the respondents who evaluated

the survey had high levels of education and experience in the field (MacKenzie & Podsakoff, 2012; Podsakoff et al., 2003). Statistically, we test for the common bias issue by adopting Harman's single-factor test (Podsakoff et al. 2003) to evaluate the possibility of common method variance (CMV) since the data were derived from a single context – Small and Medium Enterprises in Nigeria's informal electronic and ICT market to assess whether any of the variations can be accounted for by a single factor. All the measures in this study were loaded into an exploratory factor analysis (EFA), assuming that CMV is traceable to a single factor or general factor that accounts for above 50% of the covariance among the measures. Therefore, all the CBKT items, knowledge management dynamic capability, and innovation performance variables were subjected to factor analysis. Our analysis constrained rotation in alliance with the suggestion of Podsakoff et al. (2003). The findings indicated that the analysis revealed five factors with eigenvalues greater than 1.0, explaining a total variance of 36.50%. Among these factors, the first one accounted for 8.41% of the variance, and no dominant factor was observed. Consequently, our study did not detect any evidence of CBM.

3.5 Analysis

We adopted the Structural equation modelling (SEM) with AMOS 28.0 to test our hypotheses. We used SEM followed previous studies (Chatterjee et al., 2021; Robertson, Caruana & Ferreira, 2021; Marozau, Aginskaja & Guerrero, 2023; Sheng & Hartmann, 2019; Simonin, 2004) over the regression analysis for the following reasons. First, SEM is a statistical tool for evaluating and validating theoretical models that identify the relationship between latent variables and observed variables (Xia et al., 2024) and can be used to model latent constructs along with multiple indicators (Kline 2015). Second, it is possible to test the entire hypothesized model simultaneously with SEM

(Byrne 1998). Third, the use of SEM is useful in testing the psychometric properties of measurements and for identifying measurement errors that might influence theoretical testing (Davvetas et al. 2020). Finally, the use of SEM is an effective method of understanding causal pathways between variables (Marozau, Aginskaja & Guerrero, 2023).

A two-step approach was used based on the guidelines of Anderson and Gerbing (1988) to assess the main study hypotheses (García de Blanes Sebastián et al., 2023; Xia et al., 2024). First, the measurement model was checked to test the reliability and validity through confirmatory factor analysis (CFA). Second, SEM was performed based on the measurement model to assess whether the model fit to our data. We adopted the following indexes to estimate the model fit: Chi Square ($\chi 2$) which should be insignificant and lower than 2.00 (Hair et al. 2008); Root Mean Square Error of Approximation (RMSEA) where the value is considered favourable if it is less than or equal to 0.08 (Browne & Cudeck, 1993). Comparative Fix Index (CFI) with value greater than or equal 0.90 (Bagozzi & Yi, 2012); Standardized Root Mean Square Residual (SRMR) with value greater than or equal 0.70 (Hair et al. 2008).

3.6 **Endogeneity issue**

Our study, like any reflective or retrospective study, has design elements that need additional evaluation regarding endogeneity in terms of measurement error, omitted variable bias and reverse causality (Wooldridge, 2002). We followed previous studies to discuss these issues (Luo & Bu, 2018; White III, Rajwani & Krammer, 2022). First, our measurement items and methods were designed based on prior well-designed empirical studies, as noted in the measurement section. The results of both construct validity and reliability indicates that a measurement error is not a significant issue in our study. Second, although this is a cross-sectional study, reverse causality

should not be an issue since the independent variable of interest (CBKT) would not be influenced or explained by cultivating innovations. Third, we attempted to address the potential for uncontrolled confounders to affect both independent and dependent variables in our model by accounting for industry and even country- specific features that might have an impact on SMEs behavior at the same time. Even after accounting for all these confounding variables, the proposed main and moderating effects are still significant. Finally, we also followed White III, Rajwani and Krammer (2022) and employed Hausman test (1978) and the results showed that there is no such simultaneity bias in our main variables of interest.

4. Results

4.1 Assessing the Measurement Model

Using AMOS 28.0., we adopted confirmatory factor analysis (CFA) to determine the reliability and validity of the main constructs (see Table 2). We obtained adequate model fitness values based on the CFA results: $\chi 2 = 190.017$ (89); CFI = 0.92, RMSEA = 0.07, SRMR = 0.06; NFI = 0.95 and TLI = 0.80. We evaluated the constructs for inter-rater reliability, convergent validity and discriminant validity. Inter-rater reliability was assessed using Cronbach's Alpha (CA) and composite reliability (CR) (see Table 3). The CA values were between 0.875 and 0.908, while the CR values were between 0.907 and 0.935. All the values are above the threshold limits recommended by Fornell and Larker (1981) and Hair et al. (1998) indicating the reliability of our data. We evaluated convergent validity using the average variance extracted (AVE) criteria, assuming that the AVE values for each item should be 0.5 and above (Hair et al., 1998). All the AVE values fall within 0.619 to 0.784 and thus were considered valid. The present study assessed the discriminant validity of the research items according to Fornell and Larcker's (1981)

recommendation that the correlation between measures must not exceed the square root of AVE.

[Insert Table 2 about here]

Table 3 shows the descriptive statistics and correlation matrix for the study variables. We also tested for multicollinearity by using the variance inflation factor (VIF). All the factors were lower than 10 (the cut-off value being 10) and that the average VIF was 1.90, indicating that multicollinearity was not an issue in this study (Hair et al., 2010).

[Insert Table 3 about here]

4.2 Assessing the Structural Model

We adopted the SEM including all hypothesized relationships using AMOS 28.0. The structural model provided a good model fit as follows: (χ2/df = 192.268/74; CFI = 0.94; NFI = 0.95; TLI =0.93; RMSEA = 0.06; SRMR =0.04). To test our hypotheses, we used path analyses and estimated six different models using AMOS.28. We used KM dynamic capability as a dependant variable for Models 1 &2. Model 1 includes only the control variables with the industry network was significant (β = 0.040, $p < 0.001$). Model 2 includes the control variable and the cross-border KT as independent variable. H1 suggests that cross-border KT relates directly with KM dynamic capability. The analysis reveals that the relationship is significant (β = 0.045, $p < 0.001$), and thus, the hypothesis is accepted (see table 4). We also used innovation performance as a dependent variable for Models 3-6. Model 3 includes only the control variables with both education (β = 0.047, $p < 0.01$) and industry network (β = 0.047, $p < 0.001$) were significant. Model 4 includes the control variables and the cross-border KT as independent variable. Model 5 (see table 4) encompassed the control variables and the KM dynamic capability as independent variable. H2

proposed that KM dynamic capability has a positive effect on innovation performance. The results shows that the relationship is significant ($\beta = 0.060$, $p < 0.001$); therefore, supporting hypothesis 2. Model 6 (see table 4) is used to test the mediation effect which includes the control variables and adding both cross-border KT and KM dynamic capability simultaneously. H3 proposed that KM dynamic capability mediates the relationship between CBKT and innovation performance. The analysis reveals that the mediating path is significant ($\beta = 0.065$, $p < 0.05$), and thus supporting H3.

[Insert Table 4 about here]

4.3 Robustness Tests

We carried out additional analyses to test the robustness of the regression results. First, we conducted a mediation analysis using Model 4 in Hayes (2022) PROCESS macro-4.0. The bias-corrected confidence interval estimate was based on 5000 bootstrap samples and the results of the indirect effect are displayed in Table 5. We argued that KMDC mediates the relationship between CBKT and innovation performance. The indirect effect of KMDC was positive and significant excluding Zero ($\beta = 0.08$, $p < 0.05$; 95 % CI = [0.03, 0.11]). This result indicates that KMDC mediates the CBKT-in novation performance link which in line with the main findings. Second, we discussed the problem of reverse causality as it is critical to validate our selected model. Following Kenny, Kashy & Cook (2020), we interchanged both the outcome (innovation performance) and mediator (KMDC) variables to make the outcome (innovation performance) cause the mediator (KMDC) to examine the indirect consequences of reverse causal variations. We rerun our analysis and found that no significant relationship between innovation performance and KMDC with support our main analysis.

Third, we conducted additional analysis using other control variables that may affect innovation performance such as absorptive capacity and foreign partner knowledge exchange. The findings support the main analysis. Finally, we performed a Sobel test to examine whether the indirect effect of KDMC to CBKT through innovation performance is significant or not. We used Sobel test to evaluate whether a mediating variable has considerable potential to serve as a mediator in the link between X and Y (Sobel, 1987). The mediation hypothesis is accepted if the Sobel test results indicate a value of $z \geq 1.98$ at the significance level ≤ 0.05. Table 6 shows the Sobel test results. The findings show that the impact of CBKT on innovation performance through KDMC provided a Z-value of 3.35 with a significant level ≤ 0.05 which indicates that KDMC is significantly able to mediate this relationship that aligns with our amin results.

[Insert Table 5 about here]

[Insert Table 6 about here]

5. Discussion

The aim of this study was to examine the impact of CBKT on innovation performance in developing markets. Drawing on the literature on dynamic capabilities and the KBV, this study investigated the relationships among CBKT, KMDC, and SMEs' innovation performance. Utilizing unique data from 370 SMEs operating in Nigeria, we found that CBKT positively impacted SMEs' innovation performance. Additionally, KMDC positively mediates the relationship between CBKT and innovation performance, as KMDC serves as an organizational capability that links CBKT with innovation performance. Our study aligns with the assertions of Khan (2016), who reported that the strategic pursuit of CBKT is crucial for achieving desirable

outcomes that enhance firm performance incrementally. We found that CBKT positively impacts KMDC. This result is consistent with Sheng and Hartmann (2019), who suggest that KMDC's role becomes vital given the necessity to adapt CBKT into the home firm's operating environment and existing knowledge. Furthermore, the results highlight the criticality of knowledge adaptation into the domestic market in improving SMEs' innovation performance. This finding aligns with Ferraris et al. (2021), who suggest that KMDC supports firms in upgrading existing capabilities while developing new ones, aligning knowledge-based resources with innovations relevant to the home market. The finding that KMDC mediates the relationship between CBKT and innovation performance underscores the role of KM dynamic capabilities. These dynamic capabilities must be adapted and renewed for the organization to maintain superior innovation performance.

5.1 Theoretical implications

This study offers several theoretical contributions to knowledge management and innovation literature. First, although existing literature suggests the role of CBKT in enhancing the innovation capabilities of large firms and MNCs (Liu, 2019), little is known about this role in the context of SMEs in developing markets. By synthesizing the literature on the dynamic capabilities view (Teece & Pisano, 1994; Teece et al., 1997), this study provides a more insightful analysis of the effects of leveraging CBKT to enhance firm innovation performance. The research context of Nigeria offers an opportunity to illuminate the complex relationships inherent in CBKT-oriented activities.

Related to the above, our study provides fresh insights into dynamic capabilities related to knowledge transfer across geographic boundaries for achieving innovativeness among SMEs in developing markets that engage in international transactions. The unique contribution of this study

lies in capturing knowledge from international business relationships between SMEs in developing nations and their foreign counterparts, and in internalizing and localizing this knowledge as an interfirm learning procedure for improved innovation. Therefore, the mediating role of KMDC in the relationship between CBKT and innovation performance is essential for SMEs in Nigeria to develop new capabilities as they continue to attract knowledge from their foreign business partners to advance innovation in the home market. Additionally, while there have been separate investigations on the relatedness of KM and DC constructs, the theorization of dynamic capabilities of knowledge resources that synchronizes the two constructs to explain the dynamic business environment and pursue firm innovativeness is scantily discussed in the literature (Zheng et al., 2011).

5.2 Managerial implications

This study provides valuable managerial implications for SME managers and policymakers. Our findings offer significant insights for SMEs involved in innovation-driven ICT industries, as these capabilities require greater managerial attention to gain a competitive advantage. SMEs should integrate the knowledge gathered from foreign business partners into the local business economy to improve outcomes for their firms and industry. This strategy entails ensuring that the type of knowledge gathered from foreign partners is adequate to support SMEs in deciphering and exploring opportunities and adapting the firm's resources and strategies to the changing environment.

Organizations must also devote additional resources to identifying foreign firms and actors, including higher education institutions and research centers. These entities not only strengthen existing capabilities but also provide avenues to develop more enduring knowledge capabilities,

thereby enhancing innovation. Moreover, SME managers can reinforce their dynamic capabilities via the integration and localization of knowledge that aligns with the competitive and dynamic realities of their home market. Understanding how the adoption and application of CBKT might improve a firm's overall performance can be achieved through the dual link between KMDC and CBKT. While implementing CBKT is critical, it is only considered a sufficient requirement for firms to enhance their innovation capabilities. Therefore, managers should include KMDC in developing the firm's strategy, as it connects CBKT and innovation performance.

From a public policy standpoint, this study on the linkages among CBKT, KMDC, and innovation performance underscores the need to further drive SME growth, particularly through designing and implementing diplomatic policies that strengthen common business interests between the home country and countries from which these SMEs primarily import. Given that CBKT could be impeded by nonmarket organizations, such as regulatory agencies and other political actors (Jandhyala & Phene, 2015), the government plays a pivotal role in creating an enabling environment for cross-cultural collaborations and striving to remove regulatory impediments. Continuously engaging SME operators in training and developing managerial skills that support their international business relations is recommended to increase their economic and overall impact on the home economy.

5.3 Limitations and Future Research

This study has certain limitations that offer avenues for further research. Firstly, it focuses on a single country, namely Nigeria. Given the presence of over 50 countries in the African region, the generalizability is limited. Future research should seek to collect large datasets from other West African countries, such as Benin, Burkina Faso, Côte d'Ivoire, and Gambia, to determine if similar

observations related to knowledge management can be found in those countries. Different cultures have different strategies for leveraging cross-border knowledge transfer, which may impact their capacity to develop new goods and services and their innovation performance (Rammal et al., 2023). Furthermore, distinct economic environments, such as developed and emerging markets, may involve varying degrees of uncertainty and unpredictability. This can affect the acquisition and utilization of new knowledge for survival and innovation performance. Secondly, because our study is limited to SMEs, future scholars could examine large and established firms and MNCs in developing markets. This may offer new perspectives and empirical support for our model, as well as broaden the concept of CBKT. Future studies should investigate whether CBKT and innovation performance are directly correlated, and how KMDC mediates this relationship in less-studied research contexts.

Thirdly, there is potential for future research to examine the dynamics of CBKT, focusing on African-owned multinational companies on the continent. While the research findings are valuable within the scope of the study, future research is required to investigate institutional variables that create the appropriate environment to facilitate the established relationships. The role of formal and informal institutions should be considered strategically in further investigations. Fourthly, future scholars could test our model in various industry contexts, such as the service, manufacturing, and digitalized industries, to determine whether the relationships are strong or weak for SMEs and other empirical settings.

Finally, this study utilizes cross-sectional data from surveys, which limits the possibility of identifying causal relationships. Future studies should use longitudinal research designs to test our model and examine how CBKT affects innovation performance. We hope this study will stimulate

further research into the challenges faced by SMEs in developing markets and foster a better understanding of how SMEs can enhance their innovation performance.

5.4. Conclusion

To conclude, we found that KMDC positively mediates the relationship between CBKT and innovation performance, as it serves as an organizational capability that links CBKT with innovation performance. We hope this study will stimulate further research into the challenges faced by SMEs in developing markets and advance a better understanding of how SMEs can enhance their innovation performance.

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Table 1

Demographic information

Variables	Frequency	%
Gender		
Male	298	80.5
Female	72	19.5
Total	370	100.0
Age		
20 and below	54	14.6
21-30	156	42.2
31-40	114	30.8
40-above	46	12.4
Total	370	100.0
Marital Status		
single	190	51.4
married	162	43.8
others	18	4.9
Total	370	100.0
Years of Operation		
Below 5 years	120	32.4
5-10	150	40.5
10 years and above	100	27.0
Total	370	100.0

Table 2
Construct validity and reliability

Measurement Items	Factor Loadings	CR	AVE	Cronbach Alpha
Cross Border Knowledge Transfer (CBKT)		0.94	0.78	0.91
Management conducts training for all employees on happenings with foreign businesses	0.82			
Equipping employees with knowledge acquired from foreign business partners encourages them to think better	0.90			
Knowledge exchange from foreign businesses has enlarged the survival rate of the firm	0.91			
Knowledge exchange from foreign businesses has helped our organization to increase the productivity of both quality and quantity of our products.	0.91			
Knowledge Management Dynamic Capability (KMDC)		0.90	0.62	0.88
This firm has the ability to create knowledge through cooperation with industry associations	0.77			
This firm has the ability to create knowledge through cooperation with R&D institutions such as universities and technological institutes	0.85			
This firm is updated about competitive trends in the industry	0.84			
This firm has the ability to be positioned on the technological front line	0.77			
This firm engages in innovating new processes	0.76			
This firm coordinate and integrate different innovation projects.	0.73			
Innovation Performance (IP)		0.89	0.73	0.88
We continually strive to enhance existing products with continuous improvements.	0.80			
We constantly seek to create new products and services.	0.88			
We actively seek out new business opportunities to exploit.	0.84			

AVE = average variance extracted; CR = composite reliability

Table 3
Descriptive Statistics and Correlations

Variables	Mean	S.D.	1	2	3	4	5	6	7	8
Gender	1.19	0.396	1							
Age	2.41	0.886	-0.028	1						
Firm Age	1.95	0.770	0.052	0.323**	1					
Education	2.03	0.979	-0.048	0.197**	0.149**	1				
Collaboration	3.87	0.975	-0.032	0.065	-0.015	0.004	1			
CBKT	4.26	0.820	-0.058	-0.016	-0.055	0.101	0.155**	1		
KMDC	3.92	0.767	-0.058	0.001	-0.010	0.062	0.270**	0.394**	1	
Innovation	3.84	0.913	-0.053	-0.028	-0.064	0.125*	0.284**	0.135**	0.286**	1

* Correlation is significant at the 0.05 level (2-tailed)
**Correlation is significant at the 0.01 level (2-tailed)

Table 4
Results of structural model

	Dependent variables					
	KM dynamic capability		Innovation performance			
	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Control paths						
Gender	0.098	0.091	0.115	0.115	0.112	0.112
	(-0.93)	(-0.66)	(-0.71)	(-0.64)	(-0.51)	(-0.52)
Age	0.047	0.044	0.055	0.055	0.054	0.054
	(-0.53)	(-0.35)	(-1.04)	(-1.00)	(-0.95)	(-0.94)
Firm age	0.053	0.050	0.063	0.064	0.061	0.061
	(-0.07)	(0.33)	(-1.16)	(-1.08)	(-1.18)	(-1.18)
Education	0.040	0.038	**0.047	0.048	0.046	0.047
	(1.25)	(0.50)	(2.80)	(2.62)	(2.58)	(2.57)
Collaboration	***0.040	***0.037	***0.047	***0.047	***0.047	***0.047
	(5.35)	(4.51)	(5.72)	(5.43)	(4.48)	(4.47)
Main path						
CBKT		**0.045		**0.056		0.059
		(7.46)		(1.45)		(-0.73)
Mediating path						
KMDC					**0.060	*0.065
					(4.26)	(3.98)
Fit indices						
χ 2/DF	163.500/44	239.755/89	90.399/26	150.015/63	192.429/429	192.429/429
CFI	0.91	0.91	0.95	0.93	0.95	0.95
NFI	0.95	0.95	0.95	0.94	0.92	0.92
RMSEA	0.07	0.06	0.07	0.07	0.06	0.06
SRMR	0.06	0.06	0.05	0.05	0.05	0.05

Note: T-values are in parentheses; KT= knowledge transfer; KM= knowledge management
*p < 0.05, **p < 0.01, ***p < 0.001.

Table 5
Robustness test: Mediation analysis

Mediator	**Innovation Performance**			
	Indirect effect	**Boot SE**	**BLL 95 % CI**	**BUL 95 % CI**
KMDC	0.06	0.02	0.03	0.11

Note: LL = lower limit; CI = confidence interval; UL = upper limit; Bootstrap sample size = 5000; The 95% bias-corrected bootstrap confidence intervals are performed where zero is not presented; indicating the strength and magnitude of the mediation

Table 6
Robustness analysis: Sobel Testing

Indirect effect	A	B	SEA	SEB	Z-value	P-value
KDMC	0.560	0.427	0.063	0.118	3.35	0.000

Note: KDMC: Knowledge Management Dynamic Capabilities; A = raw (unstandardized) regression coefficient for the association between independent and mediator variables; B = raw coefficient for the association between the mediator and the dependent variables (when the IV is also a predictor of the DV); SEA = standard error of A; SEB = standard error of B; Z-value = Sobel Test; P-value= probability (** ≤ 0.05)

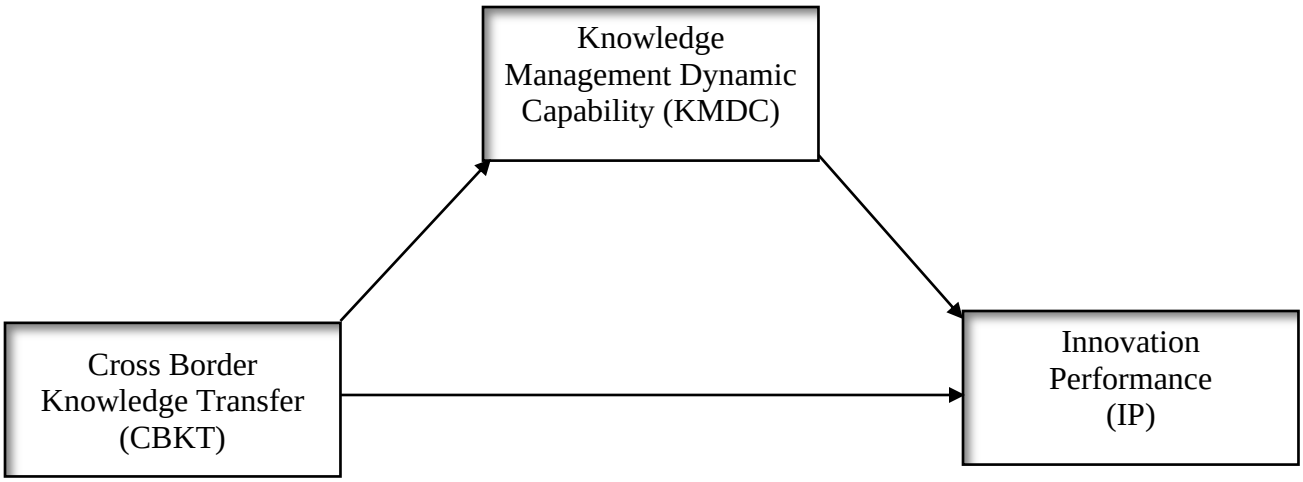

Figure 1
Conceptual Framework