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Examining the role of intellectual capital on knowledge sharing in digital platform-based MNEs and its impact on firm performance

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ABSTRACT

Non-market strategies are strategies that happen outside the marketplace. Despite their increasing relevance, they have been overlooked when studying digital platform-based enterprises. To address this gap, our study focuses on digital platforms and builds and tests hypotheses in relation to digital platform based MNEs. First, we identify several antecedents and consequences of the adoption of non-market strategies by digital platform-based multinational enterprises (MNEs). Secondly, after conducting a survey on 11 digital platform-based MNEs, we deploy the PLS-SEM technique to analyze the data. We find that intellectual capital positively influences digital platform-based MNE subsidiaries' knowledge sharing and seeking. This, in turn, positively influences coordination and cooperation that ultimately positively affect firm performance. This study makes several contributions. First, it suggests that the evolution of digital platform-based MNEs involves also non-market strategies. Second, it finds that intellectual capital is among the most relevant antecedents of the adoption of non-market strategies by digital platform-based MNEs. Third, it reveals that the adoption of non-market strategies by MNE subsidiaries is conducive to highest levels of firm performance for digital platform-based MNEs themselves. Last, it finds that *coordination* and *cooperation* represent enablers of the relationship between knowledge transfer and firm performance.

1. Introduction

Digital platform-based firms have created disruptive innovation that has engendered value for them (Gawer and Cusumano, 2002, 2014; Helfat and Raubitschek, 2018). More specifically, digital platform-based firms like Uber, Ola, Makemytrip, Oyo, and Airbnb are growing and are playing an increasing role in the global economy (Acs et al., 2021). These firms leverage digital multi-sided platforms to connect partners and customers through their digital platforms of direct and indirect networks (Mariani and Nambisan, 2021; Nambisan et al., 2019; Tan et al., 2015). So far, most of the scholarly attention has focused on their market strategies (Nambisan et al., 2019; Teece et al., 2022), overlooking non-market strategies. Though digital platform-based firms can create value by means of network effects (McIntyre and Srinivasan, 2017), they have faced several challenges and costs to dominate international markets (Nambisan and Baron, 2021). Accordingly, it is

important to understand how they could establish legitimacy across different markets with the help of internal and external non-market strategies (Haggiu, 2014) that can be juxtaposed to market strategies. Non-market strategies are conceptualized as strategies that happen outside the marketplace. They come under the guise of public policies and private politics strategies. When using public politics strategies, firms lobby and closely engage with regulators to gain due or undue benefits. When deploying private politics strategies, firms engage with activists. Mellahi et al. (2016, p.167) observed that "borrowing new insights from non-business disciplines may potentially lead to some of the greatest advances in our understanding on non-market strategy". To understand non-market strategies, scholars have suggested to integrate corporate social responsibility (CSR) and corporate political activities (CPA) successfully (Rodriguez et al., 2006), though this research stream is still in a developmental stage (Mellahi et al., 2016).

Recently, researchers have been taking an increasing interest in the

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mechanisms and drivers of firms' non-market strategies across both developed and emerging economies (Hillman et al., 2004; Rajwani and Liedong, 2015; Mellahi et al., 2016; Frynas et al., 2017). However, so far, scholars have not characterized the adoption of non-market strategies by digital platform-based multinational enterprises in international contexts (Boddewyn, 2016; Rao-Nicholson et al., 2019). Accordingly, a key research question is still unanswered: *What are the antecedents and consequences of the adoption of non-market strategies by digital platform-based multinational enterprises (MNEs)?*

To address this question, we argue that non-market strategies might secure MNEs complementary strategies merging corporate political activities (CPA) and corporate social responsibility (CSR) strategies in the host markets to mitigate market costs and develop legitimacy (Rodgers et al., 2019).

Extant literature suggests that knowledge transfer is essential to develop non-market strategies (Hagi and Wright, 2015). In its turn, knowledge transfer depends on the quality of firms' intellectual capital (Mehralian et al., 2018). We blend conceptually these arguments to move a step forward, with the aim to understand how digital platform-based MNEs' non-market strategies, supported by knowledge transfer across MNEs subsidiaries, are affected by intellectual capital and, in turn, can influence firms' performance. Thus, to bridge the research gap and address the research questions, we achieve two inter-related objectives: (a) we shed light on the role of a firm's intellectual capital in developing non-market strategies for knowledge transfer across subsidiaries of digital platform-based MNEs; (b) we gain an understanding of the extent to which the adoption of non-market strategies, by influencing cooperation and coordination among the employees, can ultimately affect firms' performance. The above objectives have been addressed by combining the resource-based view (Barney, 1991) and the absorptive capacity theory (Cohen and Levinthal, 1990) to develop and test a conceptual model using a factor-based PLS-SEM approach. This combination is an advancement, as none of the two aforesaid theories is able, alone, to explain how firms' intellectual capital can influence the non-marketing strategies and ultimately firm performance. The remainder of the paper is organized as follows. Section 2 portrays the literature review, while Section 3 illustrates the theoretical background and the hypotheses development. Thereafter, Section 4 describes the research methodology, followed by data analysis and results that are illustrated in Section 5. Subsequently, Section 6 develops a discussion of the results and showcases the implication of the study, also covering the limitations and future scope of this work. Eventually, Section 7 elucidates the concluding remarks.

2. Literature review

Non-market strategies are concerned with a firm's activities outside the marketplace (Hagi, 2014). Platform-oriented firms try to develop their intellectual capital (IC) to improve the quality of non-market strategies, thus generating economic value as well as disruptive innovation (Zeng and Khan, 2019). Knowledge transfer is also deemed to be essential for improving IC (Vrontis et al., 2020). IC is defined as "the intangible assets that could be used by an organization to create value" (Stewart, 1991, p.4). IC is conceptualized as a combination of several types of knowledge concerning firms' operational activities to achieve better firm performance (Youndt et al., 2004; Christofi et al., 2018; Thrassou et al., 2020; Chaudhuri et al., 2021). A study of Al-Omouh et al. (2022) has demonstrated how the unprecedented crisis triggered by the COVID-19 pandemic has influenced the intellectual capital of many organizations often leading to disruptions of collaborative knowledge creation capabilities and supply chain flows. Various studies suggest that IC includes resources which are valuable, rare, inimitable, and non-substitutable (VRIN). If a firm can successfully achieve this, it will be able to ensure better performance (Zlatkovic, 2018; Elia et al., 2021; Thrassou et al., 2022). IC consists of two components: human capital, and structural capital (Edvinsson and Malone, 1997; Christos,

2019). Human capital includes employees' knowledge that could help them perform specific actions (Komnenic and Pokrajčić, 2012; McDowell et al., 2018). Other research has highlighted that platform-based sharing economy business model supported by social media could improve non-marketing capabilities by strengthening firms' knowledge management activities (Laurell and Sandström, 2017).

Studies have highlighted that internal resources play a vital role in achieving better firm performance (Wright et al., 2001; Mariani and Dagnino, 2007; Crespo et al., 2020; Maheshwari et al., 2022). According to Dess and Picken (2000: p.8), human capital "is generally understood to consist of individual's capabilities, knowledge, skills, and experience of company's employees and managers, as they are relevant to the tasks at hand, as well as capacity to add to this reservoir of knowledge, skills, and experience through individual learning".

Structural capital is codified in knowledge artifacts, and it is embedded in systems, databases, and programs (Edvinsson and Malone, 1997; Longo et al., 2009). Structural capital contains mechanisms and structures that improve a firm's performance (Mehralian et al., 2018; Rana et al., 2020). The IC is associated with better knowledge transfer among firms' employees and the knowledge transfer is facilitated by knowledge sharing as well as knowledge seeking activities (Mahnke et al., 2009; Mehralian et al., 2018). A cross country study of the Polish and US healthcare sector has demonstrated that effective knowledge sharing activities could improve the quality of intellectual capital and firms' innovative capabilities (Chatterjee et al., 2023; Kucharska, 2022; Mariani and Wamba, 2020). To develop a non-market strategy, knowledge transfer in a firm is necessary, and if firms' employees transmit knowledge in a combined, synchronized effort, the firm performs better (Lin, 2007; Barton and Court, 2012).

Studies revealed that platform based MNEs utilize non-market strategy for seeking legitimacy (Reast et al., 2013) and overcoming their liability of foreignness (Zaheer, 1995). This is ensured by focusing on setting agendas commensurate with the regulators. In the context of non-market strategies, CPA is perceived to be highly important for the success of a firm's performance, allowing it to become successful in political markets (Rajwani and Liedong, 2015). Farzaneh et al. (2022) have highlighted that firms' intellectual capital and innovativeness can be improved through dynamic capabilities, which is consistent with recent studies (Chatterjee et al., 2023). Such improvements could also eventually enhance firms' explorative and exploitative innovative capabilities, resulting in overall performance improvement (Akter et al., 2021). Again, how can CSR be operationalized across several institutional issues? Researchers have observed that politicizing CSR is becoming a tool to ensure better firm performance (Scherer and Palazzo, 2007). This happens through conceptualizing the fact that non-market strategies can be developed to improve performance by prioritizing governmental responsibilities over and above a firm's ethical, philanthropic, and legal obligations (Scherer and Palazzo, 2011).

3. Theoretical background and hypotheses development

3.1. Theoretical background

The concept of intellectual capital (IC) is associated with a firm's four salient resources. This concept is in consonance with resource-based view (RBV) theory (Barney, 1991). These four resources may be construed to form a valuable framework towards identifying a firm's strategic resources (Roos and Roos, 1997). It is pertinent to mention here that, in relation to the RBV theory, a firm's resources should be both tangible as well as intangible.

Intangible resources are human capital and structural capital (Edvinsson and Malone, 1997; Christos, 2019). Tangible resources are physical and financial resources (Wernerfelt, 1984). However, the concept of IC emerges mainly from the concept of human capital, and this intangible capital is considered the main source of non-market strategy, which is the core theme of the RBV theory (Barney, 1991).

This theory posits that, to improve its performance, a firm needs to develop a set of valuable strategic resources. Its economic and technological resources can be imitated easily. Therefore, its performance depends mainly on its valuable, rare, inimitable, and non-substitutable (VRIN) resources. In this context, since human capital is an invisible as well as intangible asset, it may be deemed to be associated with VRIN (Stiles and Kulvisaechana, 2003). This idea is supplemented by RBV theory. The earlier view was to consider strategic investments that could deter market entry as well as raise the price to ensure profitability. However, the RBV has an intra-firm focus since it can explain how a firm could gain better competitiveness by deploying the VRIN resources lying within the firms (Wójcik, 2015; Aziz and Samad, 2016).

Here it should be mentioned that the mere acquisition of VRIN resources would not ensure better firm performance. Employees must have the abilities to analyze, process, and report relevant information in order to develop the firm's ability to meet and respond to the dynamic business environment. Hence, employees' abilities to absorb information need to improve to develop firms' non-market strategy. This concept is in consonance with absorptive capacity theory (Cohen and Levinthal, 1990). A firm's structural capital is also concerned with absorptive capacity that helps a firm to efficiently acquire, effectively assimilate, and exploit knowledge (Lund Vinding, 2006). The previous discussion highlights that a firm's IC, comprising human and structural capital, can help to develop firms' non-market strategy. This will assist in the effective transfer of knowledge through a coordinated and cooperative process of knowledge sharing and seeking that will ultimately lead to better firm performance.

3.2. Formulation of hypotheses and development of conceptual model

From the literature review and the theories considered, we have been able to identify the determinants that could impact firms' knowledge sharing and knowledge seeking activities for developing non-market strategy to improve firm performance. We shall discuss the determinants and formulate hypotheses that would help us to develop conceptually our model.

3.2.1. Human capital (HUC)

Human capital (HUC) is concerned with employees' business skills, expertise to assimilate the changed business culture, and multifarious abilities. These assets are not owned by the firm itself, but are important elements, as they help employees to function in any situation despite change (Hsu and Fang, 2009). This concept is more impactful for platform-based MNEs when they strive to develop their non-market strategy by exchanging knowledge among their subsidiaries in different countries where business-specific cultural environments are different (Kim and Kim, 2017). This requires improving subsidiaries' HUC so that employees do not feel uneasy about working in the host countries (Butter et al., 2015). This study construes HUC as the collective abilities and skills of the employees of the subsidiaries in the context of platform-based MNEs (Phusavat et al., 2011; Thrassou et al., 2021). The notion of HUC is associated with innate ability, intelligence, innovation, brainpower, and invention (Seleim and Bontis, 2013; Chatterjee, 2019). The ability of HUC drives employees' ability to disseminate the knowledge to the knowledge seekers. Knowledge sharers and seekers are involved in knowledge exchange to improve the non-market strategy of platform-based firms (Sharabati et al., 2010). Thus, HUC may be considered to have VRIN characteristics which support the concept of RBV (Barney, 1991). Accordingly, we hypothesize as follows.

H1a. Human capital (HUC) of digital platform-based MNEs positively impacts knowledge sharing behavior among the subsidiaries (KSH) of these MNEs to improve non-market activities.

H1b. Human capital (HUC) of digital platform-based MNEs positively impacts knowledge seeking behavior among subsidiaries (KSE) of these MNEs to improve non-market activities.

3.2.2. Structural capital (STC)

Structural capital (STC) is associated with the firms' structure and mechanisms that support employees' productivity and performance (Mehralian et al., 2018). This concept is in accordance with the RBV theory (Barney, 1991). In the context of platform based MNEs, the STC of subsidiaries needs to be improved to help their non-market strategy by sharing knowledge that knowledge seekers assimilate (Latilla et al., 2018; Garud et al., 2022; Sharma et al., 2021). STC helps in transferring knowledge among the subsidiaries of the platform based MNEs (Kang and Snell, 2009). With these inputs, the following hypotheses are developed.

H2a. Structural capital (STC) of digital platform-based MNEs positively impacts knowledge sharing behavior among subsidiaries (KSH) of these MNEs for improving non-market activities.

H2b. Structural capital (STC) of digital platform-based MNEs positively impacts knowledge seeking behavior among subsidiaries (KSE) of these MNEs for improving non-market activities.

3.2.3. Knowledge sharing behavior among subsidiaries (KSH)

Platform-based MNEs have subsidiaries in different geographical locations. To improve the IC driving economic growth and disruptive innovation (Yaseen et al., 2016), the employees of one subsidiary of a platform-based MNE should share knowledge to employees of the other subsidiaries (Rodgers et al., 2019). Knowledge sharing activities among the subsidiaries is also considered a part of non-market strategy (Frynas et al., 2017; Raziq et al., 2019; Saïd et al., 2019), that platform based MNEs need to follow to improve subsidiaries' efficiency. These activities are also helpful in developing non-market strategies (Mahnke et al., 2009; Xie et al., 2014; Yaseen et al., 2016). Sharing knowledge among the subsidiaries of these MNEs is perceived to influence employees' synchronized teamwork to perform a specific task (Peter and Martin, 2002; Sheshadri, 2015; Gölgeci et al., 2019). This will help MNE employees to use the knowledge available from external sources. Such external knowledge could help MNE employees to improve their coordination activities, thus improving the non-marketing strategy. This idea is supplemented by absorptive capacity theory (Cohen and Levinthal, 1990). Accordingly, the following hypotheses are developed.

H3a. Knowledge sharing behavior among subsidiaries (KSH) of digital platform-based MNEs positively impacts coordination (COD) among the employees of these MNEs to improve non-market activities.

H3b. Knowledge sharing behavior among subsidiaries (KSH) of digital platform-based MNEs positively impacts cooperation (COP) among the employees of these MNEs to improve non-market activities.

3.2.4. Knowledge seeking behavior among subsidiaries (KSE)

Platform-based MNEs perform their knowledge transfer activities among subsidiaries in different countries or continents as a part of their non-market strategic internationalization initiatives (Boddewyn, 2016). Their success depends on how the MNEs can share their best practices and business-oriented knowledge among the employees of its subsidiaries in different geographical locations (Vrontis et al., 2017). This helps the subsidiaries' employees to use their intellectual capital for firms' non-market strategic initiatives (Sheshadri, 2019; Rodgers et al., 2019). Employees' success encourages better articulation of an enterprise's non-market strategic activities. However, success depends on the capability of employees of sharing business related knowledge and best practices among other subsidiaries with the help of the MNEs' developed infrastructure (Latilla et al., 2018; Chaudhuri and Vrontis, 2021). The employees of the subsidiaries must work in a cooperative environment that facilitates knowledge sharing activities to motivate knowledge seekers to absorb the transferred knowledge. Subsidiaries' employees must take part in knowledge seeking activities in a synchronized manner to achieve a goal (Mohr and Nevin, 1990; Chatterjee et al., 2021; Chaudhuri, 2022). Knowledge transfer activities are likely to help

knowledge seekers recognizing and assimilating the available knowledge in their firms. Such knowledge transfer activities are likely to improve non-marketing strategy in a synchronized manner. This idea is supported by the absorptive capacity theory (Cohen and Levinthal, 1990).

Accordingly, the following hypotheses are developed.

H4a. Knowledge seeking behavior among subsidiaries (KSE) positively impacts coordination (COD) among the employees of digital platform-based MNEs to improve non-market strategy.

H4b. Knowledge seeking behavior among subsidiaries (KSE) positively impacts cooperation (COP) among the employees of digital platform-based MNEs to improve non-market strategy.

3.2.5. Coordination (COD)

If employees synchronize their activities, it is a coordinated effort (Mohr and Nevin, 1990). Coordination happens when employees work together to achieve a common goal (Anderson and Narus, 1990). The notion of coordination is also concerned with some forms of compromise. Coordination to accomplish a task enhances performance (Mohr and Spekman, 1994; Bhattacharjee et al., 2021), and helps employees to reach a target more efficiently (Mohr and Nevin, 1990; Nguyen, 2021). Enhancing coordination among their subsidiaries' employees would help platform based MNEs to develop non-market activities thus improving firm performance (Jap, 1999; Singh and Koshy, 2010). Accordingly, it is hypothesized as follows.

H5. Coordination (COD) among the employees of the subsidiaries of digital platform-based MNEs positively impacts the firm performance (FIP) by developing non-market strategy.

3.2.6. Cooperation (COP)

The concept of cooperation is associated with involved parties reconciling their differences to solve conflicts (Barnes et al., 2011) and build integrated value chains (Mariani, 2016). Cooperation is associated with collaboration and team spirit, with the aim to "work together" to successfully achieve inter- and intra-firm goals (Leonidou et al., 2002; Dagnino and Mariani, 2010; McGrath et al., 2019; Sheshadri, 2020). Cooperation is a firm's effort to provide a collaborative atmosphere to ensure better firm performance (Barnes et al., 2011). In the context of knowledge transfer for improving the intellectual capital of subsidiaries of the platform-based MNEs, a cooperative effort makes the mission successful in developing non-market activities (Mavondo and Rodrigo, 2001). This is perceived to eventually impact firm performance. These inputs help to formulate the following hypothesis.

H6. Cooperation (COP) among the employees of the subsidiaries of

digital platform-based MNEs positively impacts firm performance (FIP) by developing non-market strategy.

With all these inputs, a theoretical model was developed conceptually and is shown in Fig. 1.

4. Research methodology

The hypotheses developed have been tested deploying partial least square structural equation modeling (PLS-SEM) technique. This way the conceptual model has been validated, as this study is exploratory in nature. The PLS-SEM technique can analyze data even if the data is not normally distributed which is not allowed in case of CB-SEM technique (Rigdon et al., 2017). PLS-SEM does not require any sample restriction (Hair et al., 2018), but it requires the survey responses to be quantified. The quantification is done using a standard scale. In our study, we used a 5-point Likert scale, where the options were from 1 (*Strongly Disagree* (SD)) to 5 (*Strongly Agree* (SA)). Each participant was asked to tick one of the five options for each question. Here, consistently with other surveys in technology management literature, a 5-point Likert scale has been deployed because it is easy to apply, and it allows respondents to take a neutral stand by choosing the 'neither disagree nor agree' option.

4.1. Measurement instrument

With the inputs from the literature review and from the knowledge of the constructs, the instruments for measuring the constructs were designed to confirm content validity. To prepare the set of questions (questionnaire), we followed the step-by-step approach recommended by Carpenter (2018). The prepared questions were given to a sample participant to obtain feedback and to revise the questions. With the feedback, we realized that some questions were not effective or suitable, and we eliminated them. With the feedback from this pre-test, we added some other questions. In this way, 33 questions were prepared. We consulted five experts in the domain of our study to scrutinize the readability and comprehensiveness of the questionnaire. With their opinions, we updated and improved some of the questions to enhance their comprehensiveness and readability. Again, we conducted a pilot test to fine-tune these 33 items. With the results from the pilot test, we finalized the questionnaire. The questionnaire along with the source(s) is included in Appendix 3.

4.2. Collection of data

This study aimed to investigate how the digital platform-based MNEs could improve the IC of their subsidiaries through exchanging knowledge for developing their non-market strategy. To recruit usable

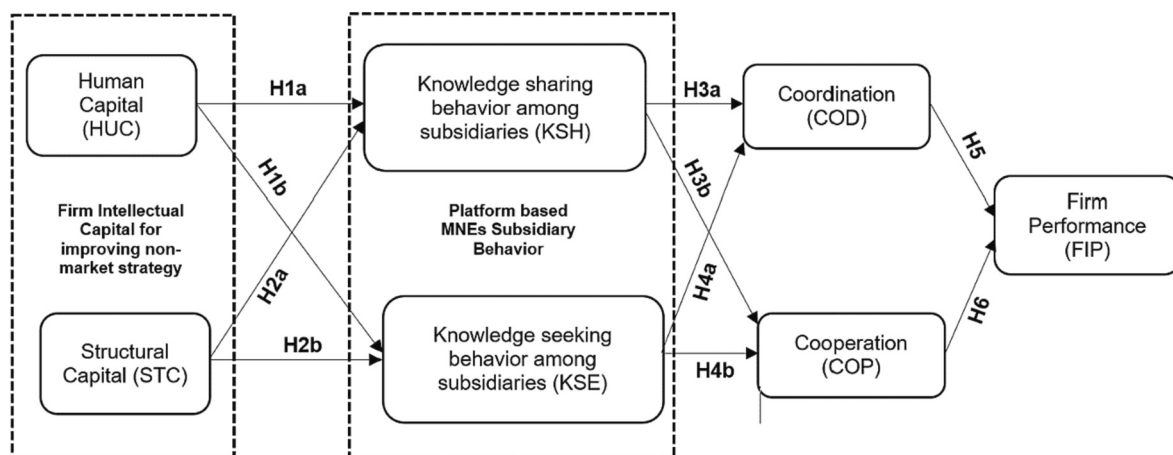


Fig. 1. Conceptual model.

respondents to take the survey, we initially identified 17 digital platform-based MNEs. We requested the top executives of these 17 MNEs to allow their managers, of different ranks, to participate in our survey. After the initial hiccups, top executives of 11 MNEs agreed to allow their managers to participate in the survey. We randomly selected 753 managers (respondents) from these 11 MNEs. We sent the questionnaire, response sheet and instructions on how to fill in the response sheet. The prospective 753 respondents were also assured that their identities would not be disclosed. These steps were taken to enhance the response rate (Chidlow et al., 2015). More specifically, the 753 prospective respondents were requested to respond within two months from the date of receiving this communication. Within the stipulated time, we obtained feedback from 341 respondents, which was a 45.3 % response rate. Here, a non-response bias test has been conducted following the recommendations of Armstrong and Overton (1977). For this, independent *t*-test and chi square test have been performed considering the responses of the first and the last 100 respondents. No meaningful difference of results was observed. Hence, non-response bias did not pose any threat to distort the data. We scrutinized the feedback and found that 17 responses were incomplete, and discarded those. We started our PLS-SEM analysis on 324 responses to 33 questions. It is within allowable range (Deb and David, 2014) because the ratio between number of items and the number of responses should be between 1:4 to 1:10. It is worth noting that the 324 respondents were employees of different ranks, working in MNEs from the USA, India, the UK, and other countries. The demographic statistics are shown in Table 1.

5. Data analysis and results

5.1. Measurement properties and discriminant validity test

To assess convergent validity, the loading factor (LF) of each item was estimated. We estimated AVE (average variance extracted), CR (composite reliability), α (Cronbach’s alpha), and VIF (variance inflation factor) to verify the validity, reliability, consistency, and multicollinearity potential issues of each construct. It was found that all the parameters are within the specified range. The results are shown in Table 2.

It is necessary to perform a discriminant validity test to make sure that the items fully explain the corresponding construct and do not relate to the other constructs. It is observed that square roots of all AVEs are greater than the corresponding bi-factor correlation coefficients. This satisfies Fornell and Larcker criteria (Fornell and Larcker, 1981). The results confirm discrimination validity. The estimates are shown in Table 3.

5.2. Common method variance (CMV)

Since the study is based on data from participants’ survey responses, CMV needed to be analyzed. As a preemptive approach, the respondents

Table 1 Demographic statistics (N = 324).

Particulars	Category	Number (USA) N = 64 (100 %)	Number (India) N = 113 (100 %)	Number (UK) N = 103 (100 %)	Number (others) N = 44 (100 %)
Gender	Male	45 (70.3 %)	80 (70.8 %)	77 (74.1 %)	29 (65.4 %)
	Female	19 (29.7 %)	33 (29.2 %)	26 (25.9 %)	15 (34.6 %)
Employee rank	Junior manager	32 (50.0 %)	56 (49.6 %)	51 (49.5 %)	20 (45.5 %)
	Mid-level manager	20 (31.2 %)	32 (28.3 %)	30 (29.1 %)	15 (34.1 %)
	Senior manager	12 (18.8 %)	25 (22.1 %)	22 (21.4 %)	9 (20.4 %)

Table 2 Measurement properties.

Constructs/ items	LF	AVE	CR	α	t- Value	VIF	No. of items
HUC		0.79	0.83	0.87		4.8	5
HUC1	0.84				21.22		
HUC2	0.96				26.67		
HUC3	0.90				24.06		
HUC4	0.88				31.64		
HUC5	0.86				37.41		
STC		0.79	0.84	0.88		3.9	6
STC1	0.84				32.22		
STC2	0.83				19.09		
STC3	0.88				26.68		
STC4	0.96				29.11		
STC5	0.93				31.12		
STC6	0.90				37.06		
KSH		0.77	0.81	0.83		3.7	5
KSH1	0.85				29.04		
KSH2	0.81				19.12		
KSH3	0.89				25.52		
KSH4	0.94				27.11		
KSH5	0.90				31.17		
KSE		0.78	0.84	0.88		4.1	5
KSE1	0.84				33.42		
KSE2	0.83				36.17		
KSE3	0.88				21.21		
KSE4	0.96				26.17		
KSE5	0.94				33.07		
COD		0.80	0.87	0.91		4.6	4
COD1	0.85				29.77		
COD2	0.90				24.85		
COD3	0.95				26.22		
COD4	0.88				21.01		
COP		0.82	0.90	0.93		3.8	4
COP1	0.89				29.48		
COP2	0.94				26.66		
COP3	0.87				27.82		
COP4	0.91				29.07		
FIP		0.84	0.87	0.89		3.5	4
FIP1	0.85				26.12		
FIP2	0.98				25.52		
FIP3	0.87				26.62		
FIP4	0.94				28.45		

were assured that their identity would be protected. This was expected to reduce the chance of bias. A post-hoc single factor test (Harman, 1976) was performed. The first factor is seen to account for 30.66 % of the variance, which is found to be less than the highest cutoff value of 50 %, as recommended by Podsakoff et al. (2003). Since Harman’s single factor test is not a robust and conclusive test for CMB as observed by Ketokivi and Schroeder (2004), a marker correlation ratio test was conducted (Lindell and Whitney, 2001). Both these tests did not highlight any evidence of CMB.

5.3. Hypotheses testing (SEM)

A blindfolding process was undertaken. For this, a bootstrapping procedure was adopted for 5000 resamples. Omission separation was taken as 5 for obtaining cross-validated redundancy relating to exogenous variables (Lew et al., 2016). Stone-Geisser Q^2 value came out to be 0.66 (Stone, 1974; Geisser, 1975). This confirms that the results have effective predictive relevance. For confirming the model fit, standardized root mean square residual (SRMR) has been considered as the standard index (Mishra et al., 2018). The values of SRMR were 0.062 for PLS and 0.033 for PLSc. Both these values are found to be less than the highest cutoff value of 0.08 (Hu and Bentler, 1999). This means that the model is in line with current methodological recommendations. This procedure helped us to compute the path coefficients of the different linkages along with coefficients of determinants and *p*-values. Table 4 highlights the results.

After analysis, the validated model is shown in Fig. 2.

Table 3
Discriminant validity (Fornell and Larcker criterion).

Constructs	HUC	STC	KSH	KSE	COD	COP	FIP	AVE
HUC	0.89							0.79
STC	0.17	0.89						0.79
KSH	0.28***	0.26	0.88					0.77
KSE	0.32	0.27	0.26	0.89				0.78
COD	0.34	0.29*	0.17**	0.27	0.89			0.80
COP	0.19**	0.34	0.22	0.31	0.28	0.91		0.82
FIP	0.21	0.19	0.24***	0.22**	0.29*	0.26	0.92	0.84

Note: $p < 0.05$ (*); $p < 0.01$ (**); $p < 0.001$ (***) and diagonal = $\sqrt{\text{AVE}}$.

Table 4
Estimation of path coefficients and p -values.

Linkages	Hypotheses	Path coefficients	p -Values	Remarks
Effects of HUC				
On KSH	H1a	0.22	<0.05(*)	Supported
On KSE	H1b	0.31	<0.01(**)	Supported
Effects of STC				
On KSH	H2a	0.27	<0.05(*)	Supported
On KSE	H2b	0.36	<0.05(*)	Supported
Effects of KSH				
On COD	H3a	0.27	<0.01(**)	Supported
On COP	H3b	0.34	<0.05(*)	Supported
Effects of KSE				
On COD	H4a	0.42	<0.05(*)	Supported
On COP	H4b	0.33	<0.001(***)	Supported
Effects on FIP				
By COD	H5	0.41	<0.001(***)	Supported
By COP	H6	0.47	<0.001(***)	Supported

We also show the linkages without path coefficients indicating the different instruments with the constructs in the figure in [Appendix 1](#).

5.4. Results

In this study, we originally formulated 10 hypotheses. Based on the application of the PLS-SEM analysis, it appears that all the hypotheses were supported. The results highlight that HUC significantly impacts KSH (H1a) and KSE (H1b), since the path coefficients concerned are 0.22 and 0.31 with significance levels of $p < 0.05$ (*) and $p < 0.01$ (**), respectively. The results show that STC influences KSH and KSE significantly, as the respective path coefficients are 0.27 and 0.36, and each significance level is $p < 0.05$ (*). Further, the results reveal that KSH

impacts COD (H3a) and COP (H3b) significantly, as the concerned path coefficients are 0.27 and 0.34, and significance levels are $p < 0.01$ (**) and $p < 0.05$ (*), respectively. Also, the results highlight that KSE impacts COD (H4a) and COP (H4b) significantly, with path coefficients at 0.42 and 0.33 and significance levels of $p < 0.05$ (*) and $p < 0.001$ (***), respectively. COD impacts FIP significantly, as the path coefficient is 0.41 with the level of significance of $p < 0.001$ (***). Results also show that impacts of COP on FIP (H6) are significant, as the concerned path coefficient is 0.47, with significance $p < 0.001$ (***)

As far as coefficients of determination are concerned, KSH could be explained by HUC and STC to the extent of 29 % ($R^2 = 0.29$). Also, it is seen that KSE could be interpreted by HUC and STC to the tune of 33 % ($R^2 = 0.33$). Again, KSH and KSE could explain COD and COP 29 % of the time ($R^2 = 0.29$) and 36 % of the time ($R^2 = 0.36$), respectively. The results show that COD and COP could explain FIP to the tune of 69 % ($R^2 = 0.69$), which is the predictive power of the tested model.

6. Discussion of results

This study has highlighted that non-market strategies of digital platform-based MNEs can enhance firm performance through the applications of CPA-CSR tactics (den Hond et al., 2014). Furthermore, it has demonstrated that important components of intellectual capital (namely human and structural capital) can help MNEs to effectively deploy non-market strategies to enhance their performance through knowledge sharing, knowledge seeking, coordination, and cooperation activities. The study has shown that the intellectual capital of a firm mainly comprises human capital and structural capital (Edvinsson and Malone, 1997). Our study has further analyzed that, by developing a non-market strategy, the performance of the subsidiaries of the MNEs could be improved. The development of a firm's non-market strategy basically depends on the quality of its intellectual capital. Our study has shown that HUC and STC, through exchange of knowledge, eventually help improve the firm performance when mediated through the joint efforts of coordination and cooperation.

Our study has also shown that human capital and structural capital

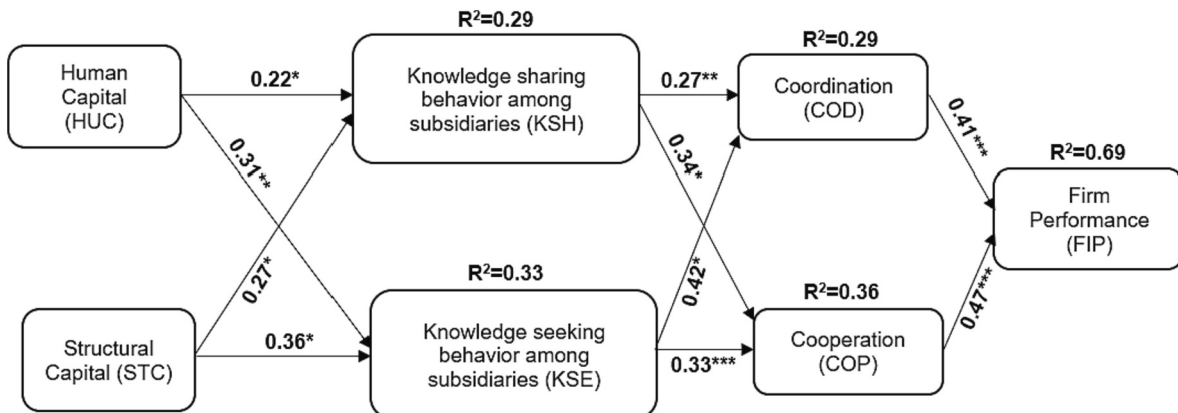


Fig. 2. Validated model (SEM).

impact on a firm's knowledge sharing and knowledge seeking activities. This concept has received support from earlier studies (Phusavat et al., 2011; Latilla et al., 2018). More specifically, the study of Phusavat et al. (2011) highlighted that intellectual capital can improve firms' performance for achieving enhanced internationalization. However, the aforementioned study did not examine how the nexus between intellectual capital and firm performance could be strengthened by other intermediate factors. This research gap has been addressed by our study which has demonstrated that improvement of human capital can enhance firm's performance by focusing on various mediating contextual factors like knowledge sharing and knowledge seeking behavior among different subsidiaries, as well as better cooperation, and coordination activities between various subsidiaries of MNEs. Another study by Latilla et al. (2018) found that efficiency in knowledge management can improve the performance of firms operating in the arts and crafts industry. However, that study did not investigate the effects of other factors like intellectual capital and non-market strategy on the performance of platform based MNEs. Our study has bridged this research gap by linking intellectual capital with firm performance by entailing several intermediate factors. Again, knowledge sharing and knowledge seeking activities have a direct impact on employees coordinated and cooperative efforts. This has been hypothesized in our study, which has been statistically validated. These validated hypotheses have also received support from an earlier study (Frynas et al., 2017). This study has shown that coordination and cooperation among the employees will help a firm improve its performance. This concept has been supplemented by earlier studies (Anderson and Narus, 1990; Leonidou et al., 2002). All these studies – i.e., Frynas et al. (2017), Anderson and Narus (1990), and Leonidou et al. (2002) – investigated the effects of cooperation and coordination on firm performance but did not investigate the influence of intellectual capital and knowledge management system on firm performance. The present study has bridged this gap by considering the simultaneous impacts of all these salient factors on firm performance.

The model is also equally applicable for improving the intellectual capital of the subsidiaries of the MNEs by exchanging knowledge through employees coordinated and cooperative efforts, which would ultimately improve the performance of the firm. This study has shown that the effects of the two mediating variables COD and COP play vital roles in achieving better firm performance in the context of developing non-market strategy. This is observed that the predictive power of a rival model that does not consider COD and COP is reduced considerably. The details of the rival model are provided in Appendix 2.

6.1. Theoretical contributions

This work makes several theoretical contributions. First, we contribute to the nascent research stream on the evolution of multi-sided digital platforms and ecosystems in international management and entrepreneurship (Acs et al., 2021), by suggesting that the evolution of digital platform-based multinational enterprises (MNEs) involves not only embracing market strategies but also effectively engaging with non-market strategies. This way we extend extant work on multi-sided digital platforms (Hagiu and Wright, 2015), by suggesting that it is the symbiosis of these types of strategies (market and non-market) to guarantee the necessary complementarity that contemporary digital platform-based MNEs need to navigate the competitive arena.

Second, we contribute to the research stream on digital platforms and ecosystems in international management and entrepreneurship (Mariani and Nambisan, 2021; Nambisan et al., 2019) by suggesting that intellectual capital is among the most relevant antecedents of the adoption of non-market strategies by digital platform-based multinational enterprises (MNEs). Accordingly, knowledge transfer is a necessary precondition, and this involves multiple actors such as knowledge sharers and seekers (Trier and Richter, 2015).

Third, we contribute to the research stream on the effects of digital platforms and ecosystems on firm performance (McIntyre and

Srinivasan, 2017) by suggesting that the adoption of non-market strategies by those MNE subsidiaries in conducive to the highest levels of firm performance for digital platform based MNEs themselves.

Last, we contribute to the literature at the intersection of digital innovation/entrepreneurship, coordination, and multi-sided platforms (e.g., Chen et al., 2023; Nambisan, 2017; Nambisan et al., 2019) by suggesting that two key mechanisms – *coordination* and *cooperation* – represent the enablers of the relationship between knowledge transfer (between knowledge sharers and knowledge seekers) and firm performance. Thus, there are several studies that have investigated the impact of either intellectual capital or knowledge management activities on firms' performance. Also, there are various research works that have analyzed the effects of cooperation and coordination among different subsidiaries of MNEs and their impact on firms' performance. However, none of extant studies has extensively investigated the role of firms' intellectual capital in improving non-market strategy and the significance of knowledge sharing and seeking behavior among subsidiaries to improve firms' performance through intermediate factors such as coordination and cooperation activities between subsidiaries of platform based MNEs. The present study has been able to bridge this gap and extended some of earlier scholarly works by considering these salient factors simultaneously. This is particularly important as it allowed us to examine their synergistic effects on the performance of the platform based MNEs, thus extending extant literature.

6.2. Practical implications

Our study provides several practical implications. Our study highlights that human capital and structural capital constitute jointly intellectual capital, and the two variables help to improve knowledge sharing and knowledge seeking process. This implies that, in developing non-market strategy of a firm, knowledge sharing is essential for improving intellectual capital. Thus, knowledge transfer is deemed to be a fundamental condition towards improving non-market activities. As such, practitioners should advance the firm's infrastructure for easy and uninterrupted transfer of knowledge. In the context of subsidiaries of MNEs, the policy makers need to develop a congenial knowledge dissemination policy so that both knowledge sharers and knowledge seekers in MNE subsidiaries get involved in contributing as well as seeking knowledge. In other words, a firm needs to improve structural capital to improve human capital, which ultimately leads to a non-market strategy to generate economic value and disruptive innovation (Chen et al., 2019; Mariani et al., 2023; Zeng et al., 2019). The MNE managers need to develop structural capital using global digital platforms so that subsidiaries of MNEs have the scope to transmit their best practices to the other subsidiaries located across the national boundaries. This will spread knowledge more widely. Our study has shown that coordination and cooperation significantly impact firm performance (H5 and H6). This implies that the leaders of the firms must see that a conducive atmosphere prevails in knowledge transfer activities. Conducive atmosphere can happen if employees transfer knowledge with coordination and cooperation, because these two factors include the concept of employees collaborating in a synchronized manner (Mohr and Spekman, 1994).

6.3. Limitations and scope for future research

This study has a few limitations. We know that there are several knowledge actors that take part in the knowledge transfer process. In this study, we have only focused on the contributions of knowledge sharers and knowledge seekers. Future researchers may consider other actors to examine if inclusion of other actors could improve the model. In the survey, we obtained feedback from respondents with varied professional statuses and genders. However, this study did not consider if these factors might have any moderating influence on the results. It is left for the future researchers to follow up on this aspect. In the survey,

we received feedback from 324 usable respondents from different countries, and after analyzing the responses, we arrived at the result. We claim to have projected an international view. However, in the context of this claim, the number of respondents is considered inadequate. Future researchers should dig in depth about this point. The predictive power of the model is 69 %. Future researchers may consider including other boundary conditions to examine if the predictive power of the model could be improved. The results of our study depend on cross-sectional data. Future researchers may conduct a longitudinal study to remove this defect of our study.

7. Conclusion

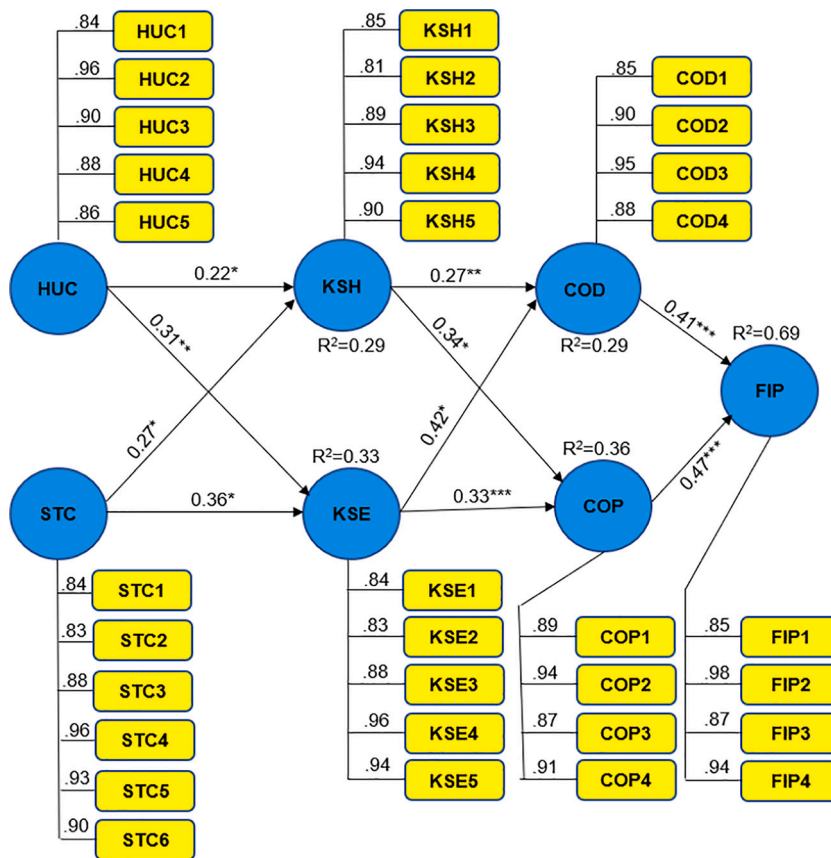
This study has taken a holistic attempt to investigate how digital platform-based MNEs could improve the intellectual capital of their subsidiaries to develop non-market activities. This study highlighted that intellectual capital of a firm comprises human capital and structural

capital (Edvinsson and Malone, 1997; Christos, 2019). Human capital has been identified as an important factor to improve firm performance, as it improves knowledge sharing activities in the context of managing non-market strategy. This study has focused on how the digital platform based MNEs could make their subsidiaries work efficiently by improving human capital in the context of managing non-market strategy. This study also recommends that these MNEs need to focus more on capacity-building activities of their subsidiaries, by integrating CSR and CPA properly to develop non-market strategy, which could help to improve disruptive innovation (McIntyre and Srinivasan, 2017). The theoretical model is expected to help not only digital platform based MNEs but also the other firms understand how their non-market activities could be improved to generate economic value.

Data availability

The authors do not have permission to share data.

Appendix 1. Estimated model with all items



Appendix 2. Rival, or alternative, model

Here, we present a rival, or alternative, model (Fig. 3) relating to the proposed model in our study, shown in Figs. 1 and 2.

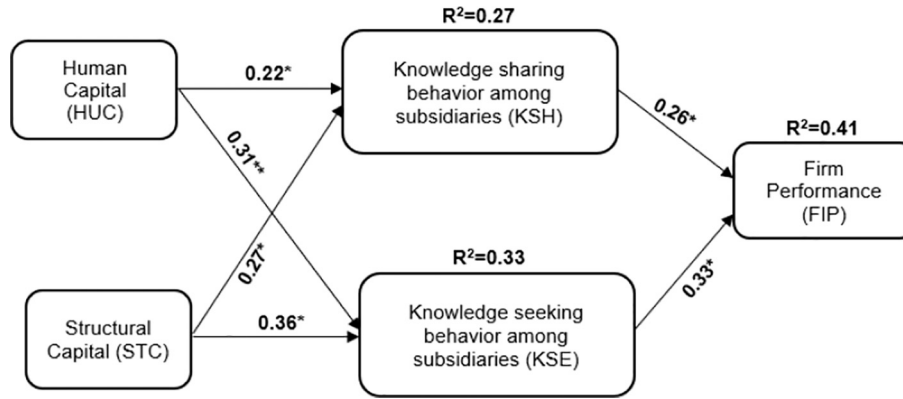


Fig. 3. The rival model.

The rival model shows that HUC and STC could impact FIP, mediating through KSH and KSE. We have tried to analyze the rival model with reference to our proposed theoretical model. The rival model is simplified by dropping the two mediating variables COD and COP from our proposed model, as here we have investigated how the direct effects of KSH and KSE on FIP could improve the model in comparison to our proposed model. The analytic results show that the impacts of HUC and STC on KSH and on KSE have remained the same in both the models. However, the path coefficients concerning the direct effects of KSH on FIP and the effects of KSE on FIP became 0.26 and 0.33, respectively, with both having significance levels of $p < 0.05$ (*). In the context of coefficient of determinant, we observed that KSH and KSE could explain FIP to the extent of 41 %, and it is the predictive power of the rival model. Studies of this rival model show that, by not considering the mediating role of COD and COP, the predictive power of the rival model has been reduced from 69 % (Fig. 2) to 41 % (Fig. 3). Thus, our proposed theoretical model (Fig. 2) is deemed to be more robust compared to the rival model shown here.

Appendix 3. Summary of questionnaire

Items	Source	Statements	Response [SD][D][N][A][SA]
HUC1	Hsu and Fang, 2009; Stiles and Kulvisaechana, 2003; Sharabati et al., 2010; Phusavat et al., 2011; Seleim and Bontis, 2013; Butter et al., 2015; Kim and Kim, 2017	I believe that human capital is the most important asset of our firm.	[1][2][3][4][5]
HUC2		Proper training is necessary for the employees involved in developing and executing nonmarket strategies.	[1][2][3][4][5]
HUC3		Developing human capital is the key to successful execution of nonmarket strategies.	[1][2][3][4][5]
HUC4		I believe that there is a positive correlation between development of human capital and knowledge-sharing behavior among the employees involved in nonmarket activities.	[1][2][3][4][5]
HUC5		I believe that there is a positive correlation between human capital development and knowledge seeking behavior among the employees involved in nonmarket activities.	[1][2][3][4][5]
STC1	Cohen and Levinthal, 1990; Lund Vinding, 2006; Kang and Snell, 2009; Latilla et al., 2018; Mehralian et al., 2018	I think that the structural capital of a firm plays an important role while developing nonmarket strategies.	[1][2][3][4][5]
STC2		Proper funding is necessary for the development of appropriate structural capital of a firm.	[1][2][3][4][5]
STC3		I believe that firms' structural capital helps them to execute nonmarket strategies successfully.	[1][2][3][4][5]
STC4		I believe that there is a positive correlation between structural capital of a firm and knowledge-sharing behavior among the employees involved in nonmarket activities.	[1][2][3][4][5]
STC5		I believe that there is a positive correlation between structural capital of a firm and knowledge-seeking behavior among the employees involved in nonmarket activities.	[1][2][3][4][5]
STC6		I believe we have an adequate investment in developing appropriate structural capital for our firm.	[1][2][3][4][5]
KSH1	Mahnke et al., 2009; Peter and Martin, 2002; Xie et al., 2014; Yaseen et al., 2016; Gölgeci et al., 2019; Raziq et al., 2019; Said et al., 2019	I think that knowledge sharing is an important aspect for successful development of nonmarket strategies.	[1][2][3][4][5]
KSH2		I believe that the management of the firm should motivate their employees involved in nonmarket activities to proactively share their knowledge with the other employees.	[1][2][3][4][5]
KSH3		I believe that employees in our firm involved in developing nonmarket strategies are willing to share the best practices with the other employees.	[1][2][3][4][5]
KSH4		I believe that proactive knowledge-sharing behavior among the employees involved in nonmarket activities positively influences the coordination among the employees.	[1][2][3][4][5]
KSH5		I believe that proactive knowledge-sharing behavior among the employees involved in nonmarket activities positively influences the cooperation among the employees.	[1][2][3][4][5]

(continued on next page)

(continued)

Items	Source	Statements	Response [SD][D][N] [A][SA]
KSE1	Mohr and Nevin, 1990; Boddewyn, 2016; Yaseen et al., 2016; Vrontis et al., 2017; Latilla et al., 2018; Garud et al., 2022	I think that knowledge seeking is an important aspect for successful development of nonmarket strategies.	[1][2][3][4] [5]
KSE2		I believe that employees in our firm involved in developing nonmarket strategies are willing to seek knowledge from their counterparts in other subsidiaries.	[1][2][3][4] [5]
KSE3		I believe that the leadership team of the firm should motivate their employees involved in nonmarket activities to proactively seek knowledge from their counterparts in other subsidiaries.	[1][2][3][4] [5]
KSE4		I believe that proactive knowledge-seeking behavior among the employees involved in nonmarket activities positively influences the coordination among the employees.	[1][2][3][4] [5]
KSE5		I believe that proactive knowledge-seeking behavior among the employees involved in nonmarket activities positively influences the cooperation among the employees.	[1][2][3][4] [5]
COD1	Anderson and Narus, 1990; Mohr and Nevin, 1990; Mohr and Spekman, 1994; Jap, 1999; Singh and Koshy, 2010	We have good coordination with the employees of other subsidiaries	[1][2][3][4] [5]
COD2		Better coordination with the employees of other subsidiaries helps in developing superior nonmarket strategies.	[1][2][3][4] [5]
COD3		Better coordination among employees of different subsidiaries helps in sharing best practices while executing nonmarket strategies.	[1][2][3][4] [5]
COD4		Close synchronization among the employees of subsidiaries helps in proper execution of nonmarket strategy.	[1][2][3][4] [5]
COP1	Mavondo and Rodrigo, 2001; Leonidou et al., 2002; Barnes et al., 2011; McGrath et al., 2019	I believe that in our firm, employees of different subsidiaries involved in executing nonmarket strategies maintain a good cooperative environment among their counterparts in other subsidiaries.	[1][2][3][4] [5]
COP2		I believe that in our firm, employees involved in executing nonmarket strategies work with good team spirit.	[1][2][3][4] [5]
COP3		I believe that, in our firm, employees of different subsidiaries cooperate with each other for executing the nonmarket strategies which helps to achieve our firm business objectives.	[1][2][3][4] [5]
COP4		I think that employees of our firm involved in executing nonmarket strategies maintain a cordial relationship among each other which in turn helps to solve any conflict quickly.	[1][2][3][4] [5]
FIP1	Dess and Picken, 2000; Hsu and Fang, 2009; Komnenc and Pokrajčić, 2012; Kim and Kim, 2017; Latilla et al., 2018; McDowell et al., 2018; Gölgeci et al., 2019	I believe that proper execution of nonmarket strategies helps to improve the firm's performance.	[1][2][3][4] [5]
FIP2		I think that appropriate coordination among the employees involved in developing and executing nonmarket strategies helps to improve firm performance.	[1][2][3][4] [5]
FIP3		I think that proper cooperation among the employees of different subsidiaries involved in developing and executing nonmarket strategies helps in improving the firm's performance.	[1][2][3][4] [5]
FIP4		I believe that different nonmarket strategies play a significant role in improving firm performance.	[1][2][3][4] [5]

Note: SD = strongly disagree; D = disagree; N = neither disagree nor agree; A = agree; SA = strongly agree.

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