

Technological innovation, organizational innovation and international performance of SMEs: The moderating role of domestic institutional environment

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Abstract

Despite the growing research on the performance implications of technological and organizational innovation, our understanding of how they impact SMEs' international performance is limited. Drawing from the dynamic capability and the institutional theories, this study argues that technological and organizational innovation has a synergistic effect on international performance and that this effect is contingent on unique domestic institutional factors. We test this model using structural equation modeling on a sample of 204 internationalized SMEs operating in Ghana. The findings from the analysis show that high levels of organizational and technological innovation jointly improve SMEs' international performance. In addition, the results show that institutional environment specificity and institutional environment enforceability enhance the complementary effect of organizational

and technological innovation on the international performance of SMEs. The theoretical and managerial implications of the findings are discussed.

Keywords: Organizational innovation; technological innovation; institutional environment; international performance; Ghana; sub-Saharan Africa

1. Introduction

The fundamental shift in the global business landscape and the dynamic nature of customers' needs have pushed small and medium-sized enterprises (SMEs) to develop new strategies and amend existing ones in order to remain relevant and competitive in both domestic and foreign markets. Research suggests that technology and innovation strategies are pathways for firms to expand and compete in foreign markets (Kyläheiko et al., 2010; Amankwah-Amoah Osabutey and Egbetokun, 2018; Ren, Eisingerich and Tsai, 2015). For example, it has been argued that certain technological strategies and adoptions are key to driving productivity while making countries efficient and knowledge intensive (Schniederjans, 2017; Wong and Goh, 2015). Relatedly, the extant literature (Naidoo, 2010; Sharif and Huang, 2012) emphasizes the significance of innovation to a firm's competitiveness and survival. Most importantly, for SMEs that are limited by resources, market power (Musteen, Francis, and Datta, 2010).and stifled by fierce competition in domestic markets, engaging in technological and innovative activities is considered a precursor to their growth and expansion into other markets.

Indeed, the innovation literature suggests that technological and organizational innovation individually drive firm performance (Ho, 2011; Damanpour and Aravind, 2012), including international performance. Even though firms sometimes engage in technological and organizational innovation simultaneously (Anzola-Román, Bayona-Sáez, and García-Marco, 2018; Azar and Ciabuschi, 2017), the extant literature is silent and provides limited insights on the extent to which the combined effect of technological and organizational innovation drives international performance of SMEs. Thus, both technological and organizational innovation come with costs, especially for SMEs that are mostly resource constrained. Hence, it is important to know the benefit associated with leveraging complementarity between technological and organizational innovation. The significance of

probing this gap in the extant literature is that variations in firm performance may be due to: (1) firms' engagement in the synergistic use of technological and organizational innovation and (2) firms' engagement in a single use of these innovation capabilities (see, Damanpour and Aravind, 2012).

This lack of clarity in the literature may differ in magnitude among countries characterized by strong or weak institutional frameworks. Unlike developed nations with stable institutional environments such as efficient legal systems and capital markets (Khanna and Palepu, 1999), developing and emerging economies suffer from weak and corrupt legal regimes, lack of transparency, and administrative inefficiencies. Such institutional frameworks can serve as a barrier or a propeller to firms' international performance (Adomako et al., 2019; Gaur, Kumar and Singh, 2014; Khanna and Palepu, 1999). Thus, the current study needs to delineate the institutional framework boundary conditions under which technological and organizational innovation can impact on the international performance of SMEs. Accordingly, the current study adopts specific domestic institutional environment dimensions – *institutional environment specificity* and *institutional environment enforceability* (Ngo et al., 2016) – as key contingent factors to the performance of internationalizing SMEs that engage in technological and organizational innovations. These two institutional environment dimensions jointly describe how firms' innovations, property rights, contracts, and transactions can be protected by institutional frameworks such as rules and regulations (Zhou and Poppo, 2010; Ngo et al., 2016). In effect, the degree of the existence of institutional specificity and enforceability is relevant to the protection and safeguard of firms' innovation process and activities, and subsequent international performance on the other hand. Consequently, from the tenets of the dynamic capability view and the institutional theory, we ask the questions: (1) how do technological and organizational innovations impact international performance? and (2) how does this impact vary across different levels of domestic institutional environment specificity

and enforceability? To answer these research questions, we rely on survey data obtained from internationalizing SMEs operating in a developing country within sub-Saharan Africa: Ghana.

This study makes contributions to innovation – international performance literature in three main ways. First, the study advances the extant literature on organizational and/or technological innovation and international performance (Azar and Ciabuschi, 2017; Castaño et al., 2016), by showing that technological and organizational innovation has a synergistic effect on the international performance of SMEs. Thus, from the dynamic capabilities’ perspectives, we demonstrate that technological and organizational innovation play a combinative capability role to drive SMEs’ international performance. Second, in light of recent research findings of the significance of institutional frameworks to firms’ internationalization (Amankwah-Amoah, 2019; Wu et al., 2016; Cavusgil, Knight and Riesenberger, 2012), this study further extends the innovation – international performance literature by highlighting the unique role of domestic institutional environment specificity and institutional environment enforceability as contingency factors that can enhance the relationship between technological/organizational innovation and international performance. Specifically, we show that the existence of institutional specificity and enforceability frameworks within domestic markets impacts positively on the relationship between innovation and international performance of SMEs. Third, by testing our model with data from an institutionally precarious developing economy within sub-Saharan Africa, Ghana, we make a unique empirical and contextual contribution.

The rest of the paper is structured as follows. The second part presents the theoretical background and the hypotheses development, as shown in Figure 1. This is followed by an analysis of the research data and findings. The final section focuses on the implications of the results as well as the limitations of the study and direction for future research.

---- *Figure 1* ----

2. Theoretical background and hypothesis development

2.1. The dynamic capability-based view

The proposed framework of our study is partly explained by the dynamic capability-based view. Early research underscores the role of dynamic capabilities in driving a firm's competitive advantage especially in times of changing environment (Eisenhardt and Martin, 2000; Teece, Pisano, and Shuen, 1997). Dynamic capabilities describe how managers acquire resources, alter the resource-base, integrate, and recombine these resources to create firm value. Thus, these capabilities are made up of both organizational and managerial routines that help in coordinating, learning, and resource reconfiguration. The tenets of dynamic capabilities have been used to explain several organizational processes and outcomes including: cognitive processes (Easterby-Smith, Lyles, and Peteraf, 2009), innovative capabilities (Wang and Ahmed, 2007), and internationalization decisions of firms (Prange and Verdier, 2011). With these characteristics of dynamic capabilities and taking a cue from the extant innovation and internationalization research (Lewandowska, Szymura-Tyc, and Gołębiowski, 2016; Michailova and Zhan, 2015), we conceptualize technological and organizational innovation as firm capabilities that have the potency to induce SMEs' international performance. Specifically, based on the analogy of combinative capabilities (Damanpour and Aravind, 2012), we contend that dynamic capability provides a useful theoretical lens through which the combined effect of technological and organizational innovation on SMEs' international competitiveness and performance can be explained.

2.2. The institutional theory

This study adopts institutional theory to explain the role of domestic institutional specificity and enforceability on the innovation – international performance relationship. Institutions are defined as “the rules of the game in a society or humanly devised constraints that shape human interaction” (North, 1990, p. 3). Thus, institutions encompass political and social agencies that

govern business environments, coordinate market transactions, and shape firms' decisions and strategic choices (North, 2005; Peng, 2003). The tenets of institutional theory make us understand that institutional arrangements and frameworks internal or external to the firm can influence strategic choices, market transaction mechanisms and subsequent performance outcomes, including the likelihood of engaging in international entrepreneurial activities (Bruton Ahlstrom, and Li, 2010; Volchek, Henttonen, and Edelman, 2013). Research has advanced the notion that certain institutional and governance systems are key precursors and/or limitations to firms becoming competitive, especially for those that operate in emerging and developing economies (Carney, 2005; Adomako et al., 2019). Thus, whether classified as an institutional environment (e.g., socio-political, legal, economic) or as an institutional arrangement (Davis, North, and Smorodin, 1971), institutions have a significant influence on firms' success – both home and abroad.

Considering this study's antecedent variables (technological and organizational innovation) and taking a cue from extant works in the international business literature (Zhou and Poppo, 2010; Ngo et al., 2016), we adopt institutional environment specificity and institutional environment enforceability as relevant boundary conditions. First, the existence or lack of strong institutional frameworks is crucial to firms' innovation activities (Berrone et al., 2012). Thus, our choice of institutional environment specificity and institutional environment enforceability is due to the cost of innovation and the need for SMEs' innovations to be protected, especially in developing economies. Both technological and organizational innovation come at a cost – for example, through R&D expenditure (Kyläheiko et al., 2011; Rammer, Czarnitzki, and Spielkamp, 2009), especially to SMEs that are resource constrained. Therefore, legal systems such as property rights specificity and enforceability that seek to protect and safeguard new product/process introductions and inventions of firms will be most appropriate for enhancing their international performance. Thus, the availability or lack of legal

systems and protection of firms' innovations can have a significant impact on the benefits of SMEs' innovations.

Second, research on internationalization highlights the role of institutional frameworks in firms' international performance. Thus, under different conditions and mechanisms, both strong and weak institutional frameworks do have a significant impact on firms' internationalization activities and performance (Adomako et al., 2019; LiPuma, Newbert, and Doh, 2013; Maekelburger, Schwens and Kabst, 2012). From these narratives, we contend that the tenets of institutional theory can help explain when SMEs' technological and organizational innovations can be most beneficial to their international performance.

Third, the context of our study provides us with a further rationale for investigating the relevance of institutional framework to SMEs' innovations and international performance. Unlike developed economies, developing economies are characterized by what is called institutional voids – a situation when “institutional arrangements that support markets are absent, weak, or fail to accomplish the role expected of them” (Mair and Marti, 2009, p. 422). Such voids include weak intellectual property rights, lack of property right specificity and/or enforceability, corruption, bureaucracy, administrative delays and uncertainties, and political instability, among others (see Khanna and Palepu, 2000), all of which can affect firms' international strategies and performance.

2.3. Organizational innovation, technological innovation, and international performance

In its broad conceptualization, innovation describes the process of developing and implementing an idea, product, process, and/or behaviors in an organization (Damanpour, 1996). Innovation is multifaceted and covers a wide range of activities including product and process development; administrative and managerial processes; and organizational structures (Damanpour and Aravind, 2012). For example, the Organization for Economic Co-operation

and Development (2005:46) defines innovation as “the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization external relations”. Accordingly, the extant innovation literature refers to several typologies in describing the nature and forms of innovation, including (1) product – process innovation, (2) radical – incremental innovation and (3) technological – organizational innovation (e.g., Subramaniam and Youndt, 2005). In light of recent research interest in technological, organizational innovation and firms’ internationalization nexus (e.g., Martínez-Román et al., 2019; Azar and Ciabuschi, 2017; Prange and Pinho, 2017), this study focuses on the *technological – organizational* typology of innovation and argues for its relationship with SMEs’ international performance.

Technological innovation refers to “the implementation of an idea for a new product or a new service or the introduction of new elements in an organization’s production process or service operation” (Damanpour and Evan, 1984:394). On the other hand, organizational innovation refers to new or significant improvements in the methods, procedures, or routines of running an organization such as employee management, marketing, database management, distribution of responsibilities, and managing external relationships, among others (OECD, 2005; Damanpour and Aravind, 2012). Thus, while technological innovation deals with the introduction of new products and processes directly for clients or customers, organizational innovation describes the application of new and/or improved ideas and processes within the firm’s workplace such as management and marketing systems to help reduce costs and create value for the firm and other external stakeholders (Weerawardena, 2003; Chetty and Stangl, 2010).

From the tenets of dynamic capabilities, innovation is considered as a source of firms’ competitive advantage (Ahuja and Katila, 2001; Teece, 1996) that can lead to improved firm

performance. Firms' internationalization decisions and performance of the same are considered one of the likely outcomes of innovation (see Castaño, Mendez, and Galindo, 2016; Pla-Barber and Alegre, 2007). Specifically, research shows that, for firms to gain maximum benefits from their innovations, they must expand to other foreign markets (Kafouros, et al., 2008). The extant literature typically documents technological and organizational innovation as separate antecedents to organizational performance. However, it is less forthcoming on how SMEs can achieve synergistic benefits from these two innovation capabilities during internationalization. In the next paragraphs, we argue that, due to the concept of combinative capabilities, the interaction between technological and organizational innovation will positively enhance SMEs' international performance.

First, research suggests that organizational innovations such as new or improved systems and structures are necessary conditions for a firm's overall innovativeness (Gunday et al., 2011; Love and Ashcroft, 1999). Thus, improved changes in an organization's internal characteristics can be a good source of competitive advantage (Goldman, Nagel, and Preiss, 1995), which can lead to an improvement in domestic performance (OECD, 2005) and international performance. Similarly, technological innovation such as new products and process introductions provides SMEs with some form of competitive advantage which catalyzes them to successfully compete in international markets (Filipescu, Rialp, and Rialp, 2009; López and García, 2005). For instance, research in innovation management suggests that product/process innovation has a relationship with a firm's internationalization decisions and can lead to an increase in international sales and profitability (e.g., Basile, 2001; Hennart and Park, 1993). SMEs that frequently engage in the introduction of new products and process or new and improved ways of administration, marketing and management methods have a high advantage and an increased ability to move into new markets in order to ascertain if these new introductions will be successful or not. In effect, firms that deploy both technological and

organizational innovation capabilities in a complementary manner can increase their performance levels in international markets.

Second, engaging in technological and organizational innovations in a combinative way provides a learning platform for firms to know more about the dynamics of the foreign markets in which they operate (Kyläheiko et al., 2011), thereby increasing their chances of high performance in these foreign markets. Specifically, new technological introductions in foreign markets mean firms will have to learn and adopt new organizational innovations such as new marketing and administrative methods (e.g., Azar and Ciabuschi, 2017; Gunday et al., 2011) peculiar to these foreign markets. Relatedly, organizational innovations such as improved communication channels, new relationships with external networks, and new and improved information sharing in international markets can improve firms' efficacy in new product introductions in the international markets, which in turn can improve the sales and profitability of these introductions. In effect, the optimal way to achieve innovation success in international markets is to align both innovation capabilities (i.e. technological and organizational innovation).

Third, both technological and organizational innovation come with high costs, especially to SMEs in developing economies. Thus, the high cost of innovation, for example through R&D expenditure (Kyläheiko et al., 2011; Rammer et al., 2009), means that firms will have to expand in foreign markets in order to diversify the cost of their innovations. In effect, and all things being equal, the continuous increase in international expansions due to the alignment of both innovation activities would likely lead to high international performance.

Thus, we contend that technological and organizational innovation play a complementary role to enhance the international performance of developing economy SMEs. Differently put, SMEs that align both technological and organizational innovation will achieve

enhanced international performance compared to those (SMEs) that adopt only technological or organizational innovation at a time. This leads to the following hypothesis:

Hypothesis 1. The interaction of technological innovation and organizational innovation is positively related to SMEs' international performance.

2.4. The moderating role of domestic institutional environment specificity

First, we focus on domestic institutional environment specificity; and conceptualize it as the extent to which firms' rights of ownership of their inventions, new product and process introductions, and new administrative and organizing methods, among others (thus, comprising technological and organizational innovations), are well defined and explicitly stated in the existing rules and regulations (Acemoglu and Johnson, 2005; Griffith and Zhao, 2015; Ngo et al., 2016). We contend that domestic institutional environment specificity enhances the interaction effect of technological and organizational innovation on the international performance of SMEs.

The logic underlying this proposition is that, when the protection of firms' innovative activities (both technological and organizational) is specified and defined by formal rules and regulations, it signals a form of assurance from institutions. Hence, this can encourage further technological and organizational innovations from firms. Firms' innovations are associated with high cost and investments and are most prone to opportunism, development of substitutes and imitations, especially in highly competitive markets (Geyskens, Steenkamp, and Kumar, 2006; Maekelburger, Schwens, and Kabst, 2012). In jurisdictions where institutional specificity is high, these innovations are well protected and safeguarded, thereby enabling firms reap the maximum benefits from their investment in technological and organizational innovations. Specifically, high domestic institutional specificity signals the notion that firms' innovations and investments are well secured, which gives them the latitude and the peace of mind to export

these products and further commit resources to other activities in their international markets, thereby increasing the performance of their internationalization activities. Further, it has been argued that high institutional specificity can lead to firms having lower transaction costs in foreign markets, reducing external uncertainty (Ngo et al., 2016; Maekelburger et al., 2012) and thereby enhancing their competitiveness and performance in these foreign markets (Malesky and Taussig, 2009). Accordingly, we state that:

Hypothesis 2. Domestic institutional environment specificity enhances the joint effect of technological and organizational innovations on SMEs' international performance.

2.5. The moderating role of institutional environment enforceability

Within the context of our study, we define *domestic institutional environment enforceability* as the extent to which firms' rights of ownership of their inventions, new product and process introductions, and new administrative and organizing methods are guaranteed and effectively enforced by the appropriate authorities within the home country (Bai, Sheng, and Li, 2016; Acemoglu and Johnson, 2005; Ngo et al., 2016). The absence of or weak institutional enforceability in the domestic market means that the legal systems cannot adequately enforce rules that seek to safeguard and protect firms' innovations, investments, and property rights. We argue that, in addition to specifying and clearly stating rules and regulations governing firms' innovations and property rights, these rules and regulations need to be enforced to guarantee absolute confidence in formal institutions. Accordingly, institutional enforceability plays a significant role in the innovation – international performance relationship.

First, when institutional enforceability is high, it reduces unfair market activities such as imitations and opportunism, leading to a balanced competitive environment (Scherer and Ross, 1990; Geleilate et al., 2016), where firms' innovations and R&D activities are safeguarded. Thus, in countries where law enforceability is more pronounced, it builds local

firms' sense of trust and credibility. This trust and credibility become an asset to local firms in foreign markets once they begin their internationalization process (Geleilate et al., 2016). Second, high institutional enforceability makes firms believe that their innovative activities would be safeguarded, especially in their home country. Thus, when perceptions of domestic institutional enforceability are strong, firms are more likely to feel that their technological and organizational innovations are safe and assume that their investments are protected. This provides firms with a sense of stability in the domestic market (Ngo et al., 2012) and subsequently an impetus to expand and perform in international markets.

Third, domestic institutional environment enforceability can reduce uncertainty in foreign market operations, transaction costs, and protect intellectual property (Meyer and Nguyen, 2005), thereby enhancing the effects of innovations on firms' international performance. In effect, the role of institutional enforceability on international performance is quite significant to the extent that, even when such a phenomenon (institutional enforceability) exists in high levels within domestic markets but low levels in foreign markets, performance might be negatively affected (see, Wu et al., 2016; Lu et al., 2014).

Accordingly, the sustainability of the joint effect of technological and organizational innovations on firms' international performance depends on the quality of the legal environment in terms of institutional enforceability. This leads to:

Hypothesis 3. Domestic institutional environment enforceability enhances the joint effect of technological and organizational innovations on SMEs' international performance.

3. Methods

3.1. Sampling and data collection procedure

To test our hypotheses, we use a sample of international SMEs operating in Ghana – a sub-Saharan African country. Several reasons inform our choice of Ghana as the research setting. First, privately owned small and medium-sized enterprises (SMEs) are the major contributors to the country's economic activities (about 88%), gross domestic product (GDP), and employment (Amankwah-Amoah, Boso, and Antwi-Agyei, 2018; OECD, 2008). Thus, the international business literature will benefit from studies that examine how developing economy SMEs – with their sterling impact on economic growth and development – continue to internationalize and what accounts for their performance levels in international markets. Second, Ghana has achieved substantial socio-economic transformation and policies over the years (Acquaah, 2007). Compared to other countries in sub-Saharan Africa, Ghana's stable political activities and favorable trade policies in recent times, have resulted in SMEs engaging in huge internationalization activities within and outside the sub-region, as they seek to grow and become competitive (African Development Bank Group, 2018; Boso, Oghazi, and Hultman, 2017). With these economic outlooks and the contributions of SMEs, the country provides a unique setting to test the proposed framework. Thus, data from this context has the potential of contributing significantly to the international business literature by shedding light on how different innovation types and domestic institutional frameworks can function to drive SMEs' international performance.

To determine our study participants, we followed past export performance and internationalization studies (Adomako, Opoku, and Frimpong, 2017; Boso, Cadogan, and Story, 2013) and developed a sampling frame from the Ghana Export Promotion Authority and Ghana Business Directory. Within our study context and from previous research (Gerschewski et al., 2018; Knight and Cavusgil, 2004; Wiklund and Shepherd, 2011), we adopted the

following criteria to identify and select the appropriate firms from the sample frame: (1) firms that engage in internationalization activities or cross-border activities with international sales of at least 35% within the last three years; (2) early internationalization firms, i.e. within five years of internationalization; (3) firms that are independently owned and have no subsidiary established business, to prevent transfer of profits from others; and (4) firms that engage in frequent innovations. From these selection criteria, 730 out of 4587 ventures qualified for our study. Accordingly, 730 questionnaires were sent through email, hand delivery, and post to the selected ventures. Our key respondents included CEOs and/or business owners, international business managers, R&D, and/or innovation officers, and finance managers. Due to the heterogeneous characteristics of the respondents, it was important to test their competency level in answering the survey questionnaire. Specifically, as part of the questionnaire design, we included questions that sought to test the competency level of the respondents based on the following: (1) their knowledge level on the specified issues; (2) their level of confidence about the answers being provided; and (3) the extent to which the given answers reflect their firms' situation. After many rounds of visits to the firms and reminder emails, 231 questionnaires were received. Specifically, there were 204 completed questionnaires, while 27 questionnaires were returned uncompleted, giving us a response rate of 28%.

3.2. Measurements

The constructs for our study comprise both multi-item and single-item measures. The measurement items for our multi-item constructs were adapted from the existing literature. Where necessary, the scales were reworded to suit the study context and the characteristics of the key informants. To give enough variability to the scoring, the scales for the multi-item variables were anchored on seven-point rating scales (1 – 7).

3.2.1. *Organizational and technological innovations*

Rather than using secondary data, this study uses more direct measures (primary data) to capture organizational and technological innovation. Accordingly, we follow recent procedures (Camison and Villar-Lopez, 2014; Azar and Ciabuschi, 2017) to measure organizational innovation based on the firms' managerial and marketing practices. Respondents were asked to indicate the extent to which their firms have recently adopted these management and marketing practices (1 = never; 7 = very often). Similarly, our measures for technological innovation comprise the process and product technological innovations of the firm. Thus, it evaluates the firm's ability to: (1) significantly improve existing products/processes and/or (2) completely create new products/processes (Camison and Villar-Lopez, 2014; Azar and Ciabuschi, 2017). This was rated on the scale 1 = never and 7 = very often.

3.2.2. *Domestic institutional environment specificity and enforceability*

We conceptualize domestic institutional specificity as the managerial perception of the degree to which firms' new product/process introductions, management and administration systems, and property rights of their inventions are well defined by the existing rules and laws within the country and the industry. Accordingly, we adopted measures from Ngo et al. (2016) and Zhou and Poppo (2010) to measure institutional environment specificity. On a seven-point scale (anchored on 1 = non-existing and 7 = prevalent), respondents were asked to indicate the extent to which they perceive the existence and recognition of institutional provisions regarding their firms' innovations within their home country. Domestic institutional environment enforceability is conceptualized as how firms' new product/process introductions, property rights of their inventions, and management and administration systems are well protected and

enforced by regulatory bodies and other government agencies. Similarly, we measure domestic environment enforceability on a seven-point scale (anchored on 1= very weak and 7 = very strong) by asking respondents to indicate the extent to which they perceive the effectiveness of legal protection and enforcement on issues regarding their innovations. Like institutional specificity, the measurement items for institutional enforceability were adopted from previous institutional environment research (Ngo et al., 2016; Zhou and Poppo, 2010).

3.2.3. *International performance*

Following the extant literature on SMEs' international performance (Gerschewski, Rose, and Lindsay, 2015; Adomako et al., 2019), this study used five indicators to measure the international performance of the sampled firms. Items were international sales growth, international profitability, the share of the international market, return on international investment, and overall international performance. On a seven-point scale (1 = much lower to 7 = much higher), finance managers were asked to rate these indicators as compared to similar firms that have internationalized.

3.2.4. *Controls*

Considering the study's outcome variable (international performance) and the context, we controlled for two firm-level factors and three environmental- and/or market-level variables: Firm size, age, and industry are important factors that can influence the outcomes of firms' internationalization decisions (Xiao et al., 2013; Boso, Cadogan, and Story, 2012). We measure firm size as the natural logarithm of the number of full-time employees; firm age as the number of years the firm has been in operation; and industry as whether the firm operates in a manufacturing or service industry. Similarly, we controlled for home country environmental factors such as technological dynamism and market competition. To measure these two factors, items were adopted from Grewal and Tansuhaj (2001) and Jaworski and Kohli (1993) and

anchored on a seven-point scale. Table 1 gives details of the study's constructs and their corresponding measurement items.

3.3. Reliability and validity of the measurement model

Before testing our hypothesized paths, we performed confirmatory factor analysis (CFA) to ensure the scales and, by extension, the constructs for our study are reliable and valid (both convergent and divergent validity). First, we employed Cronbach's alpha (α) and composite reliability (CR) values to assess the validity of the study's constructs. As shown in Table 1, the minimum Cronbach's alpha value is 0.84 while the maximum is 0.92. Again, the CR values range from 0.84 to 0.93. Since the α and the CR values exceed 0.70, it is safe to assume that the constructs are reliable. Second, we used both convergent and discriminant validity to assess the validity of our measures. For convergent validity, we used some conventional model fit measures. Following previous recommendations (Bagozzi and Yi, 2012; Kline, 2015), we used non-centrality-based measures including Root Mean Square Error of Approximation (RMSEA) and relative fit indices like Non-Normed Fit Index (NNFI) and Comparative Fit Index (CFI) to assess our model fit. Specifically, our CFA estimation provided the following fit statistics: $\chi^2/d.f. = 1.57$; NNFI = 0.91; CFI = 0.92; RMSEA = 0.05. Additionally, the standardized factor loadings of all measurement items for each construct are significant ($p < 0.001$), with a minimum and maximum factor loading of 0.61 and 0.92 respectively. Table 1 shows the standardized loadings for each item and their respective t-values (in parentheses). Lastly, we followed Fornell and Larcker's (1981) test of using the average variance extracted (AVE) for each construct and the squared correlations to assess discriminant validity. To do this, we compared the AVEs and the squared correlation coefficient to see if the AVE for each construct exceeds the squared correlations of each pair of constructs. From tables 1 and 2, it is evident that the lowest AVE of 0.51 exceeds the highest squared correlation of 0.09 (0.30²). From these

tests, we can conclude that the study's constructs have achieved both discriminant and convergent validity. Table 1 presents the results of the measurement model assessment, while Table 2 presents the correlation of the constructs and descriptive statistics of the same.

---- *Tables 1 and 2* ----

3.4. Assessment of common method bias

To check for the presence of common method bias in our data, we performed two procedures. First, we adopted multiple data sources (multiple informants), which included obtaining both the dependent and the independent variables from different sources as an ex-ante procedure. Second, we followed previous research (e.g., Chang, Van Witteloostuijn, and Eden 2010; Boso, Cadogan, and Story, 2013) during the data analysis stage to check for the possibility of any common method bias. Specifically, we estimated three competing CFAs as post-procedure to assess the presence of common method bias. The first CFA was a *method-only model* where all measurement items are modelled on a single latent factor, leading to the following poor fit indices: $\chi^2/DF = 9.70$; RMSEA = 0.20; NNFI = 0.15; CFI = 0.20; and SRMR = 0.19. In Model 2, we estimated a *trait-only* model. In this estimation, the measurement items are loaded on their respective latent factor, giving us the following fit indices: $\chi^2/DF = 1.57$; RMSEA = 0.05; NNFI = 0.91; CFI = 0.92; and SRMR = 0.05. Finally, we estimated a *method-and trait-model* (Model 1 and Model 2) with the following fit indices: $\chi^2/DF = 1.41$; RMSEA = 0.04; NNFI = 0.93; CFI = 0.94; and SRMR = 0.05. Findings of the three competing CFAs show that Model 1 provides very poor fit statistics, while models 2 and 3 have superior model fit statistics. With these, we can assume that common method bias does not greatly affect our study.

3.5. Structural model estimation

We used structural equation modeling to test our hypothesized relationships in the form of path analysis. To reduce the complexity of our analysis, we generated mean values for each multi-item construct. However, in the case of the dependent variable (international performance), the individual measurement items were used for the analysis. Considering the number of interactions terms we have in the models' estimations, we mean-centered all independent variables before the product terms were computed. This exercise thus helps in reducing the occurrence of multicollinearity in our results. In all, we estimated four nested models. The model fit statistics including R^2 values are reported for each model estimated. In Model 1, we estimated the effects of the control variables on international performance; Model 2 shows the effects of technological and organizational innovation on international performance; Model 3 shows results of the effect of the two interaction terms (technological innovation x organizational innovation) on international performance; while Model 4 estimates the effect of the three-way interaction terms (technological innovation x organizational innovation x institutional specificity; and technological innovation x organizational innovation x institutional enforceability) on international performance. Table 3 depicts the detailed results of our analysis.

---- Table 3 ----

4. Findings

The study argues in H1 that the interaction between organizational innovation and technological innovation is positively related to firms' international performance. We find support for H1 that there is a positive relationship between the interaction of organizational innovation and technological innovation and international performance ($\gamma = 0.17$; $p < 0.05$). The study further posits in H2 that institutional environment specificity enhances the effect of

the interaction between technological innovation and organizational innovation on international performance. Accordingly, we find empirical support that the product term of organizational innovation, technological innovation, and institutional environment specificity drives the international performance of the sample firms ($\gamma = 0.33$; $p < 0.01$). Finally, we find support for H3 that institutional environment enforceability enhances the effect of the interaction between technological innovation and organizational innovation on international performance ($\gamma = 0.15$; $p < 0.05$).

To interpret the significance of the two-way and three-way interaction terms on international performance, we followed recommended practices (Cohen et al., 2003; Aiken and West, 1991) and plotted: (1) the effect of the interaction between organizational innovation and technological innovation on international performance; (2) the effect of the product term of organizational innovation, technological innovation and institutional environment specificity on international performance; and (3) the effect of the product term of technological innovation, organizational innovation and institutional environment enforceability on international performance. Figures 2, 3, and 4 show the results of the analysis graphically. All three graphs confirm our hypothesized relationships.

---- *Figures 2, 3 and 4* ----

5. Discussions and Implications

5.1. Research implications

The purpose of this study is to address two key issues within the innovation and international performance literature: (1) to examine how technological innovation and organizational innovation act to drive SMEs' international performance, and (2) the role of the domestic institutional environment (institutional specificity and enforceability) in enhancing the joint

effect of technological and organizational innovation on SMEs' international performance. The study's findings show that, over and above the individual benefits of technological and organizational innovation, high levels of both innovation types complement each other to drive the international performance of a developing economy's SMEs. Further, the results indicate that both domestic institutional environment specificity and enforceability enhance the joint effect of technological and organizational innovation on international performance of SMEs.

Our findings contribute to the innovation, institutional environment, and international business literature in several ways. First, we add to existing research that argues that innovation strategies are key antecedents to firms' performance in foreign markets (Martínez-Román et al., 2019; Azar and Ciabuschi, 2017; Castaño et al., 2016; Cassiman and Golovko, 2011). Our point of departure and novel contribution is that we demonstrate a significant synergetic effect of specific innovation typologies (Damanpour and Aravind, 2012) – technological and organizational innovation – on international performance of developing economy SMEs. This finding contributes to the tenets of dynamic capabilities (i.e. combinative capabilities) by showing that continuous building, reconfiguration and integration of capabilities in a combinative way have significant implications for firms to remain competitive (Damanpour and Aravind, 2012; Sheng, 2017; Eisenhardt and Martin, 2000) in foreign markets. Thus, we shed light on the international business literature regarding the notion of combinative capabilities to demonstrate how SMEs align both technological and organizational innovation to drive their international performance.

Second, our findings on the role of domestic institutional specificity and enforceability contribute to the institutional framework literature, especially within the context of developing and emerging economies (Amankwah-Amoah, 2019; Cavusgil, Knight and Riesenberger, 2012). Most importantly, we extend this field of study by arguing for the role-specific institutional legal regimes in shaping the relationship between organizational/technological

innovation and SMEs' international performance. Specifically, we move the institutional environment – internationalization literature forward by showing that formal legal provisions such as institutional specificity and enforceability in domestic markets can enhance the effects of technological and organizational innovations on SMEs' internationalization efforts and success.

Third, relative to our unique sample of sub-Saharan African SMEs, we extend the literature of internationalizing SMEs in developing economies (Boso et al., 2016; Edeh, Obodoechi and Ramos-Hidalgo, 2020) by emphasizing the role that innovation and domestic environmental provisions play in firms' international performance. This is a significant addition to the SME internationalization literature, as there is little scholarly understanding of when and how internationalizing SMEs within developing economies can benefit most from their innovation activities.

5.2. Managerial implications

In addition to these theoretical contributions, the findings of this study have many implications for managers, SMEs owners, and other stakeholders who engage in internationalization activities. First, the study's findings show that technological and organizational innovation has a significant synergetic effect on the international performance of SMEs. This finding is relevant to SMEs that seek to reap the maximum benefits from their internationalization decisions. Thus, business owners ought to deploy both their technological and organizational capabilities simultaneously if they wish to enhance their international performance. Within the current context of developing economy SMEs, where firms' efforts to internationalize are often met by numerous barriers in both the domestic and foreign markets (Musteen, Francis, and Datta, 2010), it is satisfying to know that aligning both organizational and technological innovation capabilities can enhance international performance. Thus, new and/or improved

administrative procedures, marketing methods, and organizational systems work effectively together with new process/product introductions to drive firm performance in foreign markets. This also means that managers and owners of SMEs should commit more of their internationalization resources to developing technological and organizational capabilities, as it is at high levels of these innovative capabilities that international performance can be maximized.

Second, findings on the conditional effect of domestic institutional specificity and enforceability highlight the role of some specific institutional factors in making firms competitive in international markets. Specifically, managers will now appreciate what domestic institutional factors can hinder or improve their competitiveness in international markets. This will, in turn, make SMEs that seek to internationalize advocate for quality and efficient institutional environment provisions in their home country. Thus, such institutional specificity and enforceability frameworks can boost the confidence levels of managers, reduce the uncertainty that may surround their domestic operations, and give them the ‘freedom’ to expand in international markets. In effect, for SMEs to improve their competitive position in foreign markets, there must be a formal institutional framework that seeks to safeguard and protect their innovation activities. Relatedly, this finding has significant implications for policymakers and custodians of formal legal frameworks. Our research has demonstrated that specifying and enforcing certain legal frameworks within home countries is crucial to SMEs' innovative activities and their international performance. Thus, policymakers may be guided by these findings to ensure that there are appropriate and effective rules and regulations that seek to protect the innovations of SMEs while making them (SMEs) competitive in foreign markets.

6. Limitations and future research directions

Despite the significant managerial, policy, and research implications presented, our research findings are not without limitations. These limitations, however, provide an avenue for future research on the phenomena. First, this study examined the moderating effect of only domestic institutional specificity and enforceability. However, the conceptualization of the domestic institutional environment includes attributes such as institutional stability and institutional predictability (Acemoglu and Johnson, 2005; Ngo et al., 2016). Thus, additional studies may consider the role of these other domestic institutional environment dimensions in order to establish a more nuanced and comprehensive understanding of how the different types of the domestic institutional framework can affect our current findings. Relatedly, we measured domestic institutional environment specificity and enforceability from the perspective of managers. Future studies can contribute to the literature if the views of government representatives/units and public institutions are sought on these institutional factors. Such multiple sourcing can help validate the measures. Second, we capture international performance based on only financial performance. However, recent literature on firms' international performance advocates for measuring performance as a second-order construct, with multiple dimensions including operational, financial, and overall performance (Gerschewski et al., 2018; Ibeh, Jones, and Kuivalainen, 2018). Thus, future studies that treat international performance as a multidimensional construct can further enhance our understanding of the innovation typology – SMEs' international performance relationships. Third, a replication of this study through a cross-country comparison can further validate our research findings. Specifically, there are other developing countries in sub-Saharan Africa whose economic outlook mirrors that of Ghana, yet they have different market environments, cultural and legal frameworks (Amankwah-Amoah, Boso, and Debrah, 2018). We reckon that

studying these phenomena across these similar countries will bring more nuances and equally interesting findings.

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Figure 1: Conceptual framework

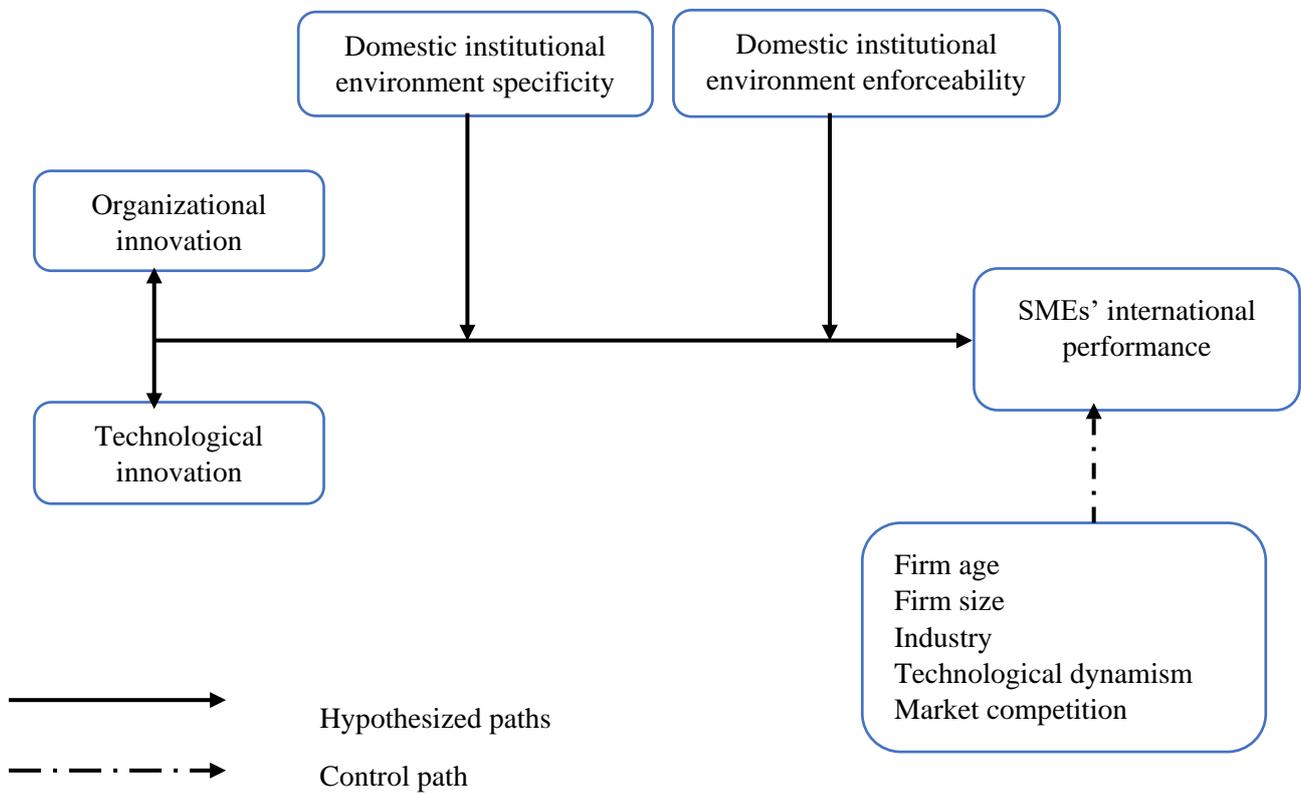


Table 1: Measures and results of validity tests of multi-item constructs

Measurement items	Standardized loadings (t-values) ^b
<i>Technological innovation: $\alpha = 0.92$; CR = 0.93; AVE = 0.76</i>	
The firm can extend its range of products	0.85 ^b
The firm can replace products that are obsolete	0.84 (15.06)
The firm continues to develop and improves programs to reduce cost of production	0.88 (16.20)
The firm efficiently integrates production management activities.	0.92 (17.73)
<i>Organizational innovation: $\alpha = 0.88$; CR = 0.88; AVE = 0.60</i>	
We develop cutting-edge marketing programs for our services/products	0.79 ^b
We collaborate with our customers	0.80 (11.86)
We ensure that employees within this firm have a high level of competence in developing and implementing new ideas	0.71 (10.44)
We encourage employees to experiment with new ideas and new ways of solving problems	0.76 (11.30)
The firm's decision-making processes are often decentralized	0.81 (12.06)
<i>Domestic institutional environment specificity: $\alpha = 0.84$; CR = 0.88; AVE = 0.53</i>	
Counterfeit products/services	0.71 ^b
Violation of intellectual property rights	0.74 (9.44)
Economic and commercial disputes between firms	0.72 (9.21)
Commercial fraud associated with new products/service introductions	0.77 (9.72)
Illegal cancelling of signed contracts	0.71 (9.06)
<i>Domestic institutional environment enforceability: $\alpha = 0.85$; CR = 0.86; AVE = 0.51</i>	
Counterfeit products/services	0.61 ^b
Violation of intellectual property rights	0.73 (8.13)
Commercial fraud associated with new products/service introductions	0.80 (8.66)
Economic and commercial disputes between firms	0.82 (8.78)
Monopoly in production and commercial activities	0.60 (6.98)
Illegal cancelling of signed contracts	0.68 (7.76)
<i>International performance: $\alpha = 0.88$; CR = 0.92; AVE = 0.62</i>	
International sales growth	0.84 ^b
Return on investment from international business	0.75 (12.16)
Market share in international markets	0.90 (15.78)
International profitability	0.78 (13.02)
Overall international performance	0.63 (9.66)
<i>Technological dynamism: $\alpha = 0.84$; CR = 0.84; AVE = 0.58</i>	
Technology in our industry is changing rapidly	0.75 ^b
Technological changes provide big opportunities in terms of new product/process introductions	0.79 (10.50)
It is very difficult to predict new technologies in our industry	0.83 (10.91)
Several new product/services have been made possible through technological breakthroughs in our industry	0.66 (8.86)
<i>Competitive intensity: $\alpha = 0.88$; CR = 0.88; AVE = 0.72</i>	
Competition is cut-throat	0.82 ^b
Anything that my company can offer, another company can match readily	0.89 (13.86)
We hear of new competitive moves in terms of new product/service development/discoveries every day	0.83 (13.26)
<i>Fit statistics</i>	
χ^2 /D.F.	698.67/443
RMSEA	0.053
NNFI	0.91
CFI	0.92
SRMR	0.052

b = fixed parameter; T-values in parentheses

Figure 2: Interaction effect of technological and organizational innovation on SMEs' international performance

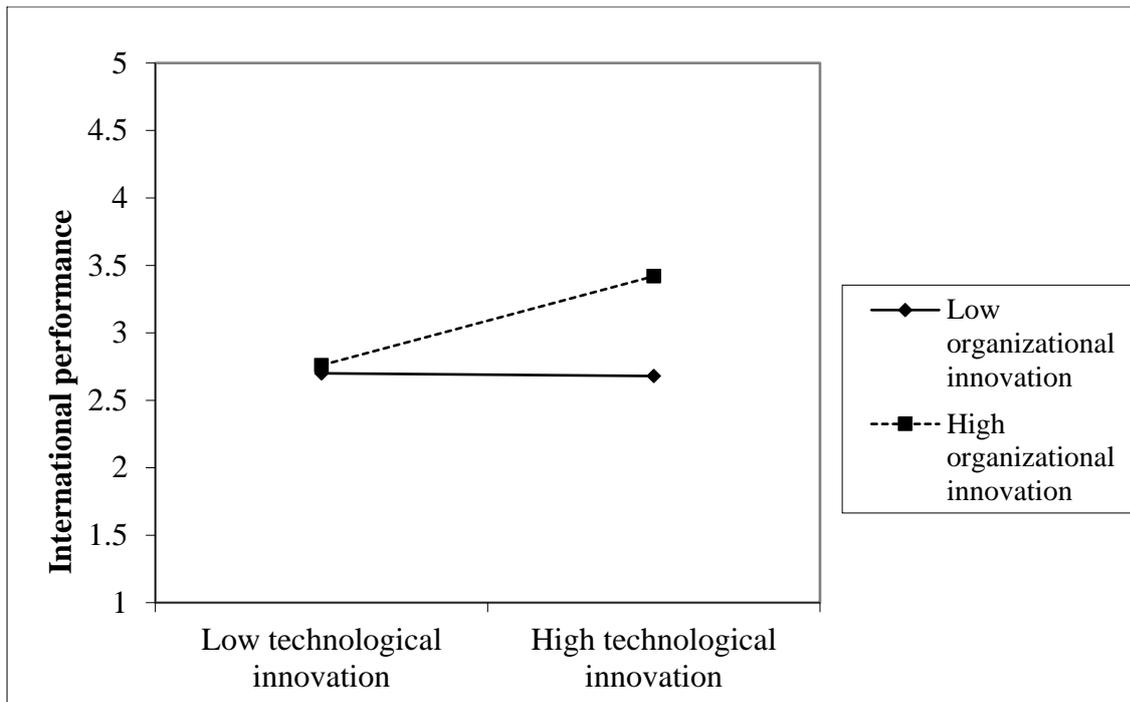


Figure 3: The interaction effect of technological innovation, organizational innovation and domestic institutional specificity on SMEs' international performance

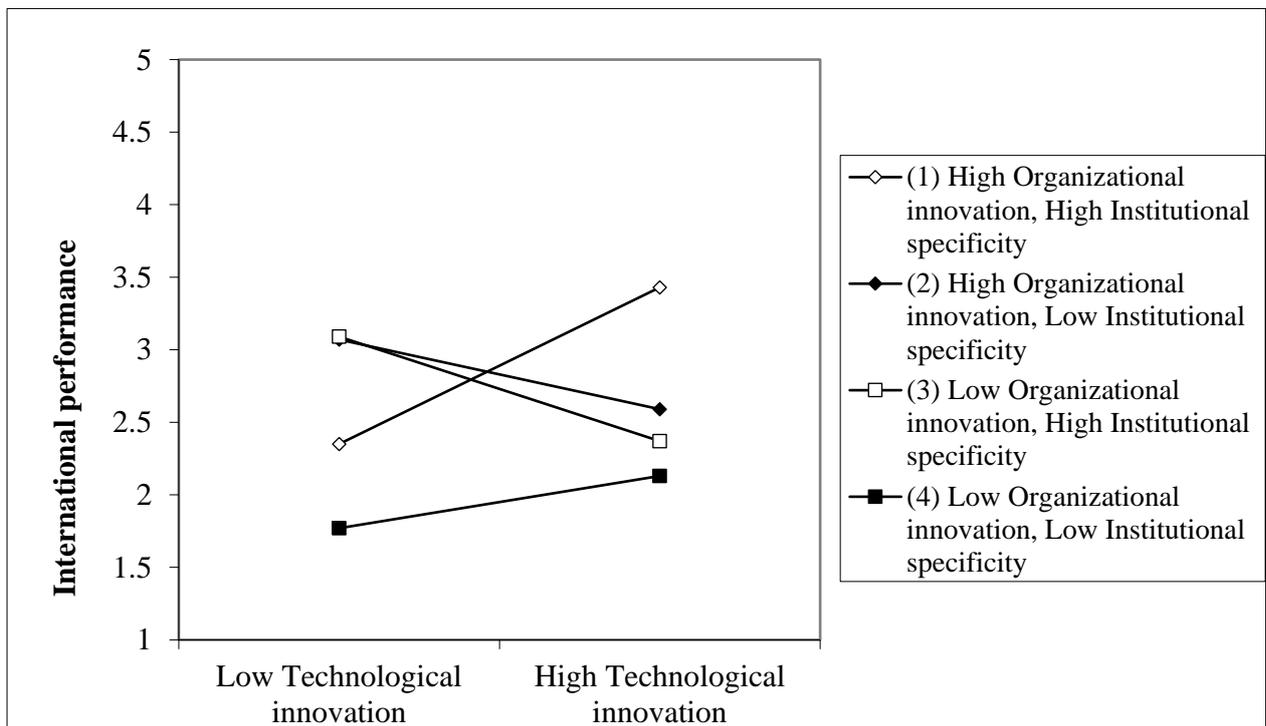


Figure 4: The interaction effect of technological innovation, organizational innovation and domestic institutional enforceability on SMEs' international performance

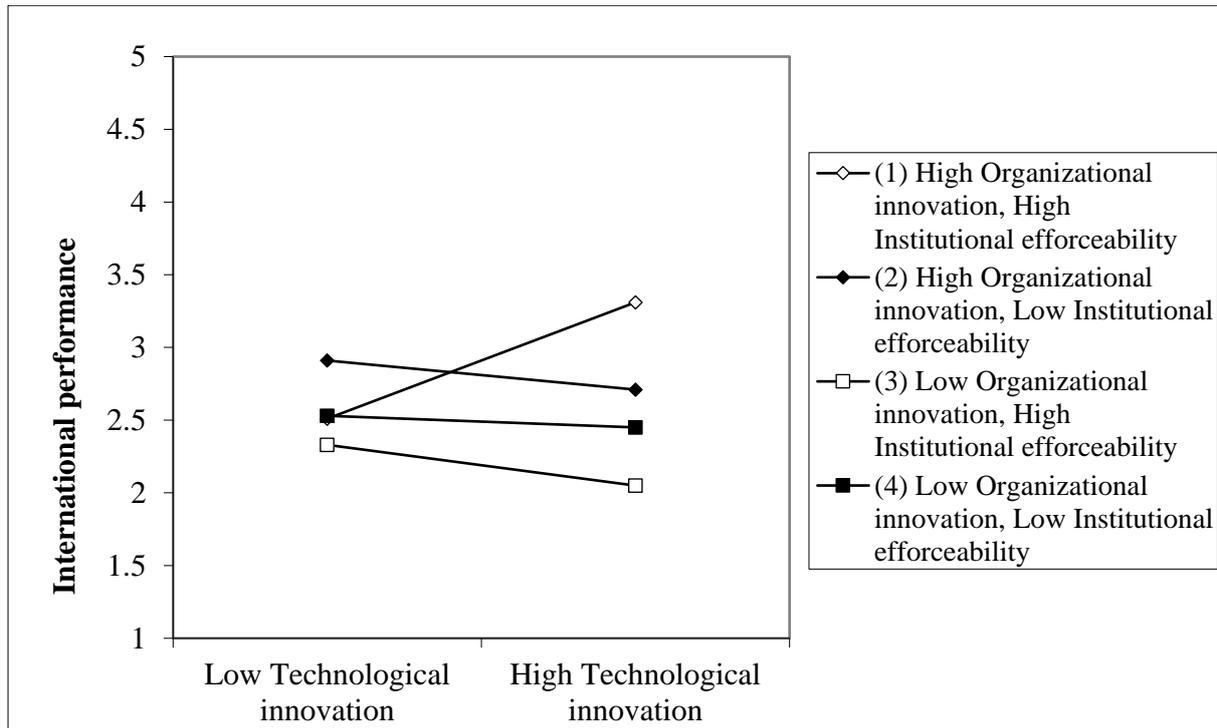


Table 2: Inter-construct correlation and descriptive statistics

No.	Variables	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10
1	Domestic institutional environment specificity	5.50	0.99										
2	Domestic institutional environment enforceability	4.89	1.02	0.09									
3	Technological innovation	4.54	1.17	-0.19	-0.09								
4	Organizational innovation	4.85	0.94	0.15	0.30	0.06							
5	Innovation performance	5.52	0.87	0.19	0.08	0.14	0.23						
6	Market competition	4.69	1.07	0.06	-0.11	-0.21	-0.04	-0.01					
7	Technological dynamism	5.25	0.73	-0.12	0.07	0.12	0.10	0.16	0.01				
8	Firm age ^A	2.49	0.38	-0.06	0.08	0.17	0.04	-0.05	-0.16	0.09			
9	Firm size ^A	4.11	0.74	0.14	0.11	-0.20	0.09	0.00	0.09	0.01	0.17		
10	Industry ^B	----	----	-0.04	0.04	0.01	0.01	0.01	-0.04	-0.13	-0.05	0.04	

A = natural logarithm transformation of original values; B = dummy variable; SD = standard deviation; M = mean. Correlations above 0.10 and 0.17 are significant at $p < 0.05$ and $p < .001$ respectively

Table 3: Results of structural model estimation

	Model 1	Model 2	Model 3	Model 4	Findings
Control paths					
Firm age ^A	-0.10	-0.11	-0.12	-0.12	
Firm size ^A	0.02	0.00	0.00	-0.04	
Industry ^B	0.01	0.02	0.02	0.05	
Technological dynamism	0.16*	0.16*	0.16*	0.18**	
Market competition	0.06	0.04	0.06	0.08	
Main effects paths					
Technological innovation (TN)		0.14	0.13	0.03	
Organizational innovation (ON)		0.17*	0.20*	0.26**	
Domestic institutional environment specificity (IES)		0.22**	0.20*	0.21**	
Domestic institutional environment enforceability (IEE)		-0.01	-0.05	-0.05	
Two-way interaction paths					
TN x IES			-0.08	0.06	
TN x IEE			0.01	0.04	
ON x IES			-0.07	-0.18	
ON x IEE			0.12	0.10	
IES x IEE			-0.02	-0.14	
H1: TN x ON			0.17*	0.12	Supported
Three-way interaction paths					
H2: TN x ON X IES				0.33**	Supported
H3: TN x ON X IEE				0.15*	Supported
Goodness of fit indices					
R-square	0.03	0.13	0.18	0.25	
Chi-square/DF	171.20/85	155.45/81	146.59/75	133.79/73	
RMSEA	0.071	0.067	0.069	0.064	
NNFI	0.76	0.88	0.78	0.81	
CFI	0.91	0.92	0.92	0.94	

Standardized estimates are reported. * $p < 0.05$ and ** $p < 0.01$ two-tailed. A = natural logarithm transformation of original values; B = dummy variable

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