Board's human capital resource and internationalization of emerging market firms: Toward an integrated agency–resource dependence perspective

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A B S T R A C T

To improve our understanding of the strategic role of the board in emerging market firms (EMFs), we investigate the role of the board's human capital resource in a firm's internationalization. Integrating the monitoring role (to reduce agency costs) and the resource provisioning role (to augment strategic resource base) of the board, we propose that the board's aggregate education and professional experience influence the degree of international expansion of EMFs. Further, the board's knowledge heterogeneity and skill heterogeneity play a contingent role from a resource orchestration perspective. Based on a dataset of 906 firm-years drawn from 201 Indian firms (2008–2012), we find support for the proposed hypotheses that the board's aggregate education and professional experience have a U-shaped effect on international expansion, and that this relationship flips to an inverted U-shaped relationship at higher levels of knowledge and skill heterogeneity, respectively, within the board.

1. Introduction

One of the key expectations from the board members of a firm is to manage agency costs (Jensen & Meckling, 1976) by monitoring and controlling the management team so that it adopts strategies that are compatible with the firm's capability and are aligned with the stated goals (Rindova, 1999). Board members also provide resources in the form of board capital to the firm (Haynes & Hillman, 2010), as proposed by the resource dependence theory (Pfeffer & Salancik, 1978). Thus, the board plays a monitoring and controlling role (by reducing agency costs) and a provisioning role (by providing strategic resources) in the strategic decision-making of a firm. Integrated propositions about the strategic role of the board based on agency and resource dependence theories have been tested extensively in the context of developed markets where stringent corporate governance practices are followed (Dalziel, Gentry, & Bowerman, 2011; Pearce II & Patel, 2018; Zona, Gomez-Mejia, & Withers, 2018). We still do not know whether the findings reported in the context of developed markets will apply for emerging market firms (EMFs), because the corporate governance standards that are followed in emerging markets vary considerably, especially by the firms with large proportion of domestic shareholders (Gibson, 2003).

In the context of India, one of the largest emerging markets, Chakrabarti, Megginson, and Yadav (2008: 63) observed that "corporate boards had often been largely ineffective in their monitoring role, and their independence perceived as highly questionable". However, in recent years, emerging markets – including India – have been undergoing institutional transformation, and consequently, the corporate governance environment in these markets is evolving as well (Chittoor, Kale, et al., 2015). Supporting the view of the *emergingness* of corporate governance practices, some recent studies have observed the greater strategic role that board members play in EMFs (Chen, Chang, & Hsu, 2017; Sarkar, Sarkar, & Sen, 2008; Singh & Delios, 2017).

In this study, we focus on the board's human capital resources, defined as "unit-level capacities based on individual knowledge, skills, abilities, and other characteristics (KSAOs) that are accessible for unit-relevant purposes" (Ployhart, Nyberg, Reilly, & Maltarich, 2014: 374). Human capital resource management relates to strategic outcomes, especially when the human capital in question is not readily tradable in labor markets (Crook, Todd, Combs, Woehr, & Ketchen, 2011; Wright, Coff, & Moliterno, 2014). We consider the extent of international expansion as a strategic outcome in the context of EMFs, because institutional transformation in the domestic market provides both

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support and encouragement for rapid international expansion (Kumar, Singh, Purkayastha, Popli, & Gaur, 2020; Luo & Bu, 2018). To improve our understanding of the role board's human capital resources play in driving such strategic outcomes in the context of EMFs, we seek to answer the following research questions: *What is the role of the board's human capital resources of an EMF in firm-level internationalization? If the board's human capital resources do influence the firm's internationalization, what are the factors that might enable or constrain this effect?*

To answer these questions, we adopt an integrated approach by considering both the agency theory and the resource dependence theory in setting up our theoretical framework (Hillman & Dalziel, 2003). Based on the theoretical lenses used, the board's human capital resources could have two opposing effects on a firm's international expansion. On the one hand, the complexity associated with internationalization and the resulting information-processing requirements could result in greater agency discretion (Eisenhardt, 1989). Therefore, the agency theory focuses on the board's role (based on its resource base) in monitoring and controlling the opportunistic behavior of the management team that is operating in far-flung international locations, governed by local norms, and characterized by specific knowledge (Nohria & Ghoshal, 1994). On the other hand, the resource dependence argument considers the role of the board of directors in provisioning external resource (Pfeffer & Salancik, 1978). In this line of argument, the board inorganically provides valuable and rare resources to the management to guide the firm through the internationalization process (Henderson & Fredrickson, 1996). Interestingly, while prior research has integrated the agency and resource dependence theories to explore the effect of board capital on performance (Hillman & Dalziel, 2003), the R&D spending of firms (Dalziel et al., 2011), and more recently, the board-interlock and performance relationship (Zona et al., 2018), the association between the board's human capital resources and a firm's international expansion has not been investigated from a combined view of the monitoring and controlling perspective and the resource provisioning perspective.

In this study, we focus on the aggregate[1] effect of the board members' education[2] and professional experience[3] (as the board's human capital resource)[4] separately in the context of internationalization of the EMFs. Considering that internationalization induces greater costs (Gaur, Kumar, & Sarathy, 2011) and deferred benefits (sometimes) (Luo & Tung, 2018) to EMFs, these firms need to succinctly evaluate the risks associated with their global strategy. The board's aggregate education and professional experience can independently restrict the EMF from adopting an internationalization strategy depending on the assessment of their ability to absorb the associated risks. In this context, the role of the board is to reduce agency costs by monitoring and controlling the management from taking unnecessary risks, especially when international expansion negatively impacts the EMF's performance initially due to the liability of foreignness (Zaheer, 1995) and the liability of

emergingness (Madhok & Keyhani, 2012). In contrast, in its resource provisioning role, the board's aggregate education and professional experience might augment the managerial capability (Adner & Helfat, 2003) of the firm. In this role, the board advises and counsels the CEO and the top management team to navigate the risks associated with internationalization (Carpenter, Pollock, & Leary, 2003) to reap the benefits of the economy of scale and scope from international expansion.

In addition to the board's aggregate education and professional experience resource stock, the dispersion of the board's human capital resources might add further theoretical nuance to our perspective (Haynes & Hillman, 2010). Schematically, the board's aggregate education and professional experience can be viewed as the depth of the board's human capital resources, while the heterogeneity of knowledge and skill can be considered as the breadth of the board's human capital resources. Therefore, we separately explore (1) the contingent effect of knowledge heterogeneity on the direct effect that the board's aggregate education has on a firm's international expansion, and (2) the contingent effect of skill heterogeneity on the direct effect that the board's aggregate professional experience has on a firm's international expansion.[5]

Using manually collected data from 201 Indian firms over a period of five years (2008–2012), we find support for the proposed hypothesis that the board's aggregate education and professional experience independently have a U-shaped effect on international expansion. The results of the model for the contingent hypothesis indicate that the U-shaped relationship flips to an inverted U-shaped relationship at higher levels of knowledge heterogeneity for the board's aggregate education and at higher levels of skill heterogeneity for the board's aggregate professional experience.

Our study contributes to the strategy literature in three ways. First, in response to Hillman and Dalziel (2003) call to integrate agency and resource dependence perspectives, we find that the board's human capital resources play a restraining role (by reducing agency cost through monitoring and controlling) and a facilitating role (by augmenting strategic resources through provisioning) in the international expansion of EMFs. Supporting the broad hypothesis that corporate governance practices are improving in EMFs, including the effective role of board members (Aguilera & Crespi-Cladera, 2016), the interesting finding from our study is that the board members in EMFs neither underestimate the risks and costs of internationalization, nor approve risky internationalization strategies to overcome the firms' late-mover disadvantages. Our study provides a more comprehensive understanding and contextual intelligence of the strategic implications of the board in the context of EMFs (Kaymak & Bektas, 2008; Singh & Delios, 2017). Second, the U-shaped effect (first restraining and then enabling) of the contextual firm-specific assets (or the board's aggregate education and professional experience) on the internationalization of EMFs (Ramamurti, 2012) contributes to the literature that deals with the role of the board in global expansion (Barroso, Villegas, & Pérez-Calero, 2011; Chen et al., 2017). The non-linear effect also extends the discussion on the risk-adjusted behavior of board members (Carpenter et al., 2003; Pearce II & Patel, 2018). Third, the contingent model demonstrates the significance of appropriate resource bundling between aggregate resource stock and resource heterogeneity at the board level for the international expansion of EMFs (Sirmon, Hitt, & Ireland, 2007). This model provides empirical support for the resource orchestration argument (Sirmon, Hitt, Ireland, & Gilbert, 2011), thereby expanding the understanding of the effect that board-level group composition (Payne, Benson, & Finegold, 2009) has on the performance of cognitive tasks in

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[1] Our choice of the aggregate board's human capital resources is based on Kor and Sundaramurthy (2009: 983)'s assertion that individual directors "may not possess the complete set of skills and knowledge to meet a firm's advisory and governance needs". Thus, we look at the aggregate effect of the board's human capital resources.

[2] Following Ployhart et al. (2014), we explore education as the declarative or procedural information that is necessary for performing a task and the foundation on which skills are developed.

[3] We focus on the board members' professional experience that enables them to fulfill their monitoring and resource provisioning role (Castanias & Helfat, 1991; Ployhart et al., 2014).

[4] We build on the strategic human capital literature that emphasizes education as the source of individual knowledge (the 'K' part of KSAO) and experience as the source of individual skills (the 'S' part of KSAO) (Ployhart & Moliterno, 2011; Wright et al., 2014). Because education and professional experience separately contribute to strategic human capital resources, we empirically treat education and professional experience as separate constructs.

[5] Strategic human capital research links education to knowledge, and experience to skill (Ployhart & Moliterno, 2011). Hence, we explore the board's aggregate education-knowledge heterogeneity and the board's aggregate experience-skill heterogeneity as two independent manifestations of the depth and breadth combination of strategic human capital resources.

the context of internationalizing EMFs (Chittoor, Aulakh, et al., 2015; Chittoor, Aulakh, & Ray, 2019).

2. Theoretical background

Due to the weak nature of the labor quality and mobility in emerging markets (Khanna & Palepu, 1997) and the appointment of board members based on family ties (Silva, Majluf, & Paredes, 2006), appropriate board-level human capital becomes a strategic resource for the firm. Elaborating the importance of human capital resource management, Ployhart et al. (2014: 373) argued that "KSAOs may combine into different resources via interactions and contextual demands…human capital resource combinations on performance are indicative of both competitive parity and competitive advantage outcomes". We focus on the relationship between board's aggregate education and professional experience and internationalization in the direct model, and on the role of knowledge heterogeneity and skill heterogeneity as moderators in the contingent model. These human capital resources together represent the depth (aggregate education and professional experience) and breadth (knowledge heterogeneity for aggregate education; skill heterogeneity for aggregate professional experience) of the resources that are available to the firm that combine to construct and alter the firm's capabilities (Mahoney & Kor, 2015; Sirmon et al., 2007). The board's aggregate education, aggregate professional experience, knowledge heterogeneity, and skill heterogeneity are individual-level resources that are based on individual KSAOs that are accessible for unit-relevant (or firm-level) competitive advantage.

Although agency theory and resource dependence theory have linkages with the composition and characteristics of the board of directors of a firm (Sanders & Carpenter, 1998; Zahra & Pearce, 1989), prior research mostly treated the board's agency cost reduction role and resource augmentation role as two separate research streams (Hillman & Dalziel, 2003). While the empirical evidence for the resource provisioning logic is compelling, studying the influence of the board's human capital resources without considering how capable a board is in monitoring and controlling the management in the organization would lead to incomplete research conclusions.

On the one hand, the board members' aggregate education and professional experience along with knowledge heterogeneity and skill heterogeneity, respectively, are valuable, rare, inimitable, and non-substitutable resources (Barney, 1991) that supplement management with vital advice and counsel Hillman, Withers, & Collins, (2009). Empirically, the resource provisioning role Pfeffer & Salancik, (1978) of board members can be measured as the industry-specific managerial experience of the board members that helps the international diversification (Barroso et al., 2011) or IPO (Baker & Gompers, 2003) of the firm.

On the other hand, due to the separation of the controlling and management activity, the firm needs to rely on external managers to formulate and implement strategic decisions. This creates an opportunity for the management to adopt an international expansion strategy that might not be aligned with the core competence of the firm or might not meet the shareholders' goal of profit maximization (Prahalad & Hamel, 1990). To minimize the moral hazard arising out of the principal-agent contract, the board has the legal authority to ratify and monitor managerial initiation, and to evaluate and reward or even penalize the management (Li, 1994). The board members' intellectually richer background makes the top executives engage in behaviors that are consistent with the stockholders' interests (Eisenhardt, 1989). Hence, board members with appropriate human capital resources can help to reduce agency costs by monitoring and controlling any misaligned strategic decisions that are made by the management team, including international expansion. We build upon the theoretical contributions of Hillman and Dalziel (2003) who stated that the agency role of the board in monitoring and controlling might prevail over the board's resource augmentation role with an increase in the board's human resources, especially when the resource stock is at the lower level.

Internationalization is a complex phenomenon because there are institutional differences between the home market and the host market, there is regulatory heterogeneity across different markets, and there is psychic distance between the home location and the foreign location (Ghemawat, 2001). Internationalization compounds agency issues in the firm due to the information asymmetry that arises from far-flung operations that are characterized by localized knowledge and multiple decision options in global operations (Sanders & Carpenter, 1998). The complexity and resulting information-processing requirements arising from internationalization increase the demands that are placed on the firm (Hitt, Bierman, Uhlenbruck, & Shimizu, 2006). Therefore, firms need to overcome the liability of foreignness (Zaheer, 1995) arising out of the institutional and cultural differences between the home and host locations before entering the international market. The challenges of internationalization are greater for EMFs because these firms often internationalize into emerging and developed markets rapidly and simultaneously (Purkayastha, Kumar, et al., 2021; Ramamurti, 2012). Thus, in the face of disproportionate risk exposure due to international expansion, the board might need to monitor and control the management's growth plan. In parallel, the higher liability of foreignness (Gaur et al., 2011) and unique liability of emergingness (Madhok & Keyhani, 2012) necessitate a change in the prevailing cognitive process within the organization. Consequently, EMFs require strategic resources for internationalization. Though EMFs might have accumulated strategic resources such as the capability of working in institutional voids (Khanna & Palepu, 1997) or domestic strategic networks (Gulati, Nohria, & Zaheer, 2000), these resources are often deeply embedded in domestic institutions, and hence, are not easily portable to a foreign location. Hence, EMFs need to locally develop or acquire relevant strategic resources to expand internationally in the absence of conventional firm-specific assets such as established brand and patented technology (Hennart, 2012; Landau, Karna, Richter, & Uhlenbruck, 2016; Ramamurti, 2012). Because the factors that govern board composition "are not random or independent factors, but are, rather, rational organizational responses to the conditions of the external environment" Pfeffer, (1972: 226), in this study, we integrate these dual roles of the board in reducing agency costs by restricting international expansion and augmenting knowledge resources for expanding internationally.

Hence, the relationship between the board members' human capital resources (or the board's aggregate education and professional experience, and its knowledge heterogeneity and skill heterogeneity) and internationalization might be dependent upon both agency cost reduction and resource provisioning forces. To build a comprehensive understanding of the board's strategic role in the global strategy of EMFs, we adopt a comprehensive approach that integrates the agency and resource dependence mechanisms to develop our main and contingent hypotheses. The conceptual model of the hypothesized relationship is presented in Fig. 1.

3. Hypotheses development

3.1. International expansion and the board's aggregate education and professional experience

From the agency theory perspective, the primary function of the board is to protect the interests of the principals by monitoring the strategic decisions of the firms and by ensuring that the management team operates in the interests of the shareholders (Filatotchev & Wright, 2011; Jensen & Meckling, 1976). Internationalization creates complexity and increases information-processing demand because the foreign entity builds a unique knowledge base and operational model that are based on different institutional norms (Berry, Guillén, & Zhou, 2010). This is especially applicable for internationalizing EMFs as they venture into institutionally distant developed markets to learn (Kumaraswamy, Mudambi, Saranga, & Tripathy, 2012; Purkayastha, Kumar, et al., 2021) and sell optimal products or services (Luo & Tung,
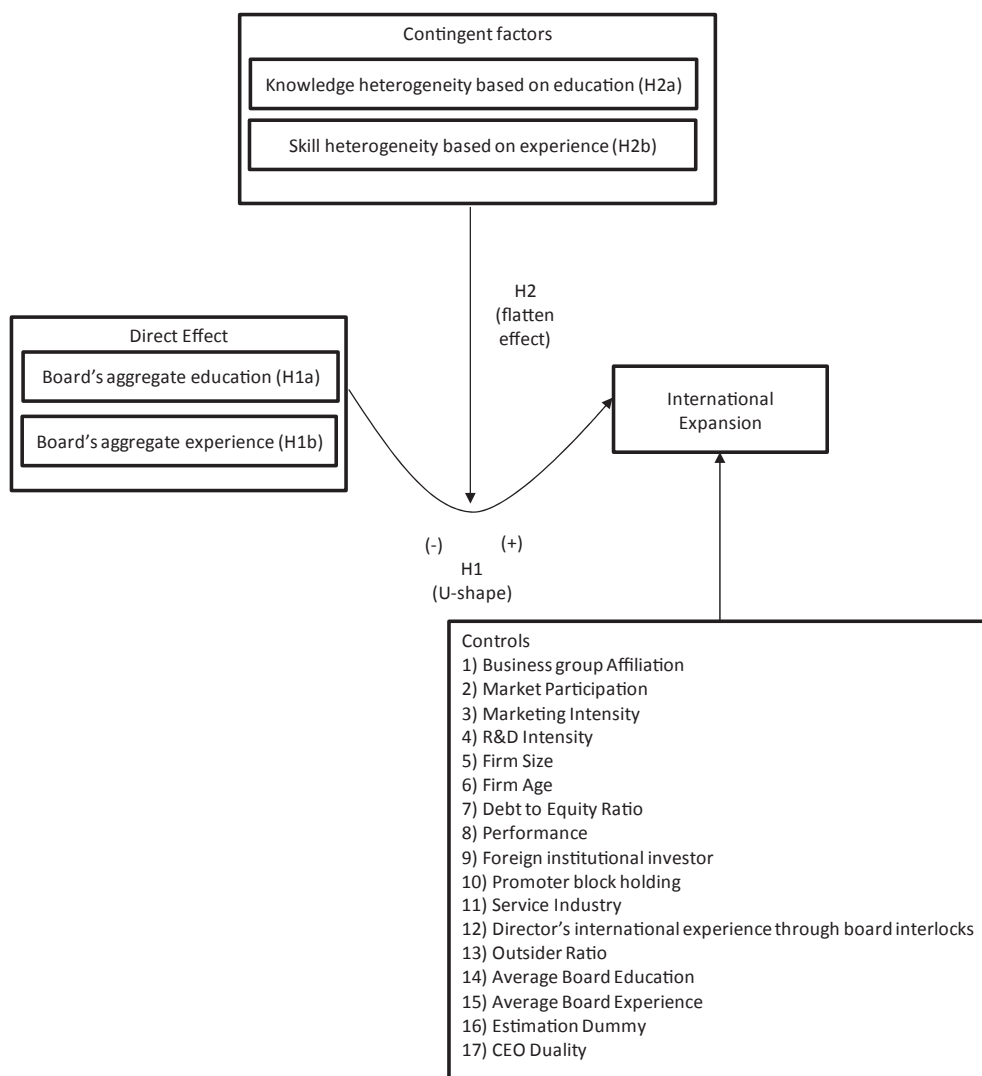
Fig. 1. Conceptual model for the hypothesized relationships.

2018). Under this condition of information-asymmetry between the principal and the agent, EMF boards with a lower level of aggregate education and professional experience are likely to perceive international expansion for their firm as a risky proposition because they might not be able to play an effective corporate governance role in the internationalized entity and fulfill their obligation of safeguarding the interests of the shareholders. As the aggregate level of education and professional experience increases from the lower level to the medium level, the board members accumulate an increasing level of human capital, which enables them to monitor and control the management's misplaced growth strategy via internationalization. Therefore, we expect to see a decline in the level of internationalization in EMFs as the aggregate education and professional experience increases to a critical point.[6]

Internationalization increases ambiguity around the decision-outcome relationship because the firm faces multiple options in the global market. Thus, at the lower to medium level of aggregate education and professional experience, the board members might dissuade the firm from expanding internationally in order to avoid potential

principal-agent discord that is associated with the discretion available to the managers in charge of international expansion. This pattern can also be explained from the behavioral risk-taking theory perspective as the nature of risks (due to international expansion) undertaken is dependent on the prevailing governance mechanisms and stakeholder characteristics (Carpenter et al., 2003; Sanders & Hambrick, 2007). Boards with lower levels of human capital resources are more inclined to exert a controlling influence on inherently risk-taking managers (Jensen & Meckling, 1976), who might otherwise opt for internationalization as a growth strategy. Because EMFs typically face a lack of strategic resources, the board allows the firm to venture into the international market only when it can effectively and efficiently manage such risks (Chittoor, Aulakh, et al., 2015). As the board accumulates human capital resources, it exerts greater controlling power over the management, and therefore, restrains international expansion. We expect to see this negative association in EMFs in particular because these firms require investment for building the capabilities to manage the newer risks associated with internationalization. As described by Teece (2007: 1335), any such reconfiguration of resources is a costly affair since a "departure from routines will lead to heightened anxiety within the organization". At this stage, agency cost reduction becomes the dominant focus of the firm when the board does not have adequate human capital resources to monitor the agent (the management, in this context) effectively. Therefore, increasing levels of aggregate education and

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[6] We are grateful to the reviewers who pointed out this important mechanism that lowers the degree of internationalization as the aggregate education and professional experience increases from low to medium level.

professional experience provide board members greater influence over the management, and minimize international expansion in the firm. We expect this negative association between aggregate education and professional experience and the degree of internationalization to continue until the board's aggregate education and professional experience reach a critical point.

We argue that the negative effect that the board's aggregate education and professional experience has on international expansion in EMFs in an attempt to reduce agency costs will be outweighed by the resource provisioning role of the directors (at a higher level of the board's aggregate education and professional experience) in two ways. First, the capability view of internationalization (Yiu, Lau, & Bruton, 2007) emphasizes the distribution of innovation spending across the globe through the active management of R&D investment (Chesbrough, 2003). The role of partnership in innovation has become more important as it requires the creation of a panoply of partners in an ecosystem (Teece, 2014). The global distribution of R&D for the creation of capabilities in different geographies is even more critical for internationalizing EMFs as these firms face higher levels of liability of foreignness (Barnard, 2010) and stereotyping due to their country of origin (Elango & Sethi, 2007). The extant literature reports that EMFs counter such challenges at host locations by venturing into global R&D markets to learn through a reverse innovation process (Govindarajan & Ramamurti, 2011), and they improve their capabilities to reconfigure strategic resources to become more innovative. Building further on the resource provisioning role of the board as proposed by the resource dependence theory (Pfeffer & Salancik, 1978), we argue that a board with high aggregate education and professional experience will be a more effective gatekeeper for strategic proposals such as global expansion. They will have the capabilities required to guide the decision-making process and to gauge how the management team is managing the resources of the EMFs to make these firms more innovative through global expansion (Carpenter & Westphal, 2001). Further, we argue that the level of the board's aggregate education and professional experience inorganically augments (Ingley & Van der Walt, 2001) the management team's ability to sense, seize, and reconfigure the innovation resource base (Teece, 2007). This is likely to help EMFs to orchestrate R&D investments efficiently to expand into international markets (Kor & Leblebici, 2005).

Second, Luo and Rui (2009) argue that EMFs should be ambidextrous, i.e., they should pursue the simultaneous fulfillment of two disparate—and sometimes seemingly conflicting—objectives on multiple fronts to offset their late-mover disadvantages in the global market. This is because unlike advanced economy firms, EMFs need to manage environmental and institutional differences between the home and host country locations while simultaneously balancing their survival and growth in the international market. In contrast, advanced economy firms tend to possess intangible assets such as brands, technology, managerial capability, and formal governance, which enable them to overpower their competitors across the globe (Hernandez & Guillén, 2018). Developing the capabilities required to sense challenges in handling the different culture and institutions in the host markets (Peng, Wang, & Jiang, 2008) and to seize opportunities due to changes in the global context for internationalization (Ramamurti, 2012) are key factors for EMFs to expand internationally. Teece (2014: 26) echoed a similar argument that the "most important global asset orchestration function" is the generation and leverage of "local capabilities onto the global stage". Based on the resource dependence theory, we argue that greater levels of directors' knowledge from education or skills from professional experience enhance the management team's managerial resources (Pfeffer & Salancik, 1978) to handle an ambidextrous strategy while internationalizing. This is because a higher level of aggregate education and professional experience improves the board's resource stocks, and helps the firm's ability to manage ambidexterity. In this process, the board members become reliable and effective partners with the firm's management team, and help them formulate and implement an ambidextrous strategy (Hillman & Dalziel, 2003; Westphal, 1999).

Given that the incremental cost of international expansion reduces in the presence of higher levels of capability (Teece, 2014), we can expect that higher levels of the board's aggregate education and professional experience will be beneficial for EMFs to internationalize.

In summary, we propose that the monitoring and controlling role of the board negatively affects internationalization when the board's aggregate education or professional experience is at a lower level, while the resource provisioning role of the board facilitates internationalization at higher levels of the board's aggregate education or professional experience in EMFs. Thus, we hypothesize:

Hypothesis 1a (H1a). *The relationship between the board's aggregate education and the internationalization by EMFs takes a U-shape, such that the slope is negative at low levels of aggregate education, and is positive at higher levels of aggregate education.*

Hypothesis 1b (H1b). *The relationship between the board's aggregate professional experience and the internationalization by EMFs takes a U-shape, such that the slope is negative at low levels of aggregate professional experience, and is positive at higher levels of aggregate professional experience.*

3.2. Moderating role of the knowledge and skill heterogeneity of board members

The knowledge or skills heterogeneity of the board captures the degree of diversity in the knowledge or skills that the board members bring to the firm (Goodstein, Gautam, & Boeker, 1994; Haxhi & Aguilera, 2017). The board's human capital heterogeneity is seen to have a mixed effect, as is clear from Johnson, Schnatterly, and Hill (2013: 242) observations that "while heterogeneous experiences appear to affect board processes, questions about how, when, and why they do so remain unanswered". For this reason, we expect that the heterogeneity of task-relevant knowledge and skills will play an important contingent role in the agency and resource dependence arguments of how board members perceive the challenges and opportunities that are presented by the available aggregate education and professional experience.

Scholars have argued that human capital heterogeneity might be beneficial in accessing resources Siciliano, (1996), and greater diversity is associated with higher firm value (Kim & Lin, 2010). Heterogeneous knowledge and skills provide boards "with access to a broader set of data sources in the information seeking process *and allows*…the board to draw upon a larger number of reference points in the decision making process" (Rivas, 2012: 549). Extending the argument that resource orchestration is "critical to developing and implementing a range of firm strategies" (Sirmon et al., 2011: 1394), we argue that knowledge heterogeneity and skill heterogeneity counter the negative effects of the lower levels of the board members' aggregate education and professional experience, respectively. This might be more relevant to the foreign expansion growth strategies for EMFs, as these firms are particularly fraught with risks and uncertainty due to their greater liability of foreignness (Ramamurti, 2012) and liability of emergingness (Madhok & Keyhani, 2012). Knowledge heterogeneity serves as a surrogate for aggregate education, and helps board members to explore international expansion as their risk-taking capability improves. We also argue that skill heterogeneity compensates for the lower level of aggregate professional experience, and provides adequate resources to navigate the risks associated with the international expansion process. One can expect that in the presence of knowledge heterogeneity, the board is in a better position to reduce the agency cost created due to information asymmetry and to choose from multiple decision options in global expansion. Also, when there is skill heterogeneity, the board is better equipped to handle the agency problem as the board members can guide the management in the firm's global expansion decision. Thus, the negative effect that the aggregate education and professional experience of the board members has on international expansion will be flattened or weakened in the presence of knowledge heterogeneity and skill

heterogeneity, respectively.

A heterogeneous set of board members increases the managerial cognitive capabilities that enable the board to perform more complex mental activities (Helfat & Peteraf, 2015). An increase in heterogeneity in knowledge or skill provides the absorptive capacity (Cohen & Levinthal, 1990) required to process, integrate, and apply new and external resources. Resource orchestration (Sirmon et al., 2011) among board members with a higher aggregate education-knowledge heterogeneity combination or aggregate professional experience-skill heterogeneity combination helps a firm to explore more options in addition to international expansion. Therefore, we can expect a substitutive effect of knowledge heterogeneity and skill heterogeneity on the role of aggregate education and professional experience, respectively, on firm's internationalization. A similar relaxation of the assumption of the resource dependence theory that resources will benefit the whole organization is observed in the recent research on board capital (Sun, Hu, & Hillman, 2016). In addition, knowledge heterogeneity improves the board's quality of knowledge capability from education, and influences the management team to consider a wider variety of growth strategies for the firm other than internationalization. Similarly, skill heterogeneity augments the board's information processing capability from professional experience, and enables them to encourage the management team to explore alternative growth strategies other than internationalization (Boivie, Jones, & Khanna, 2017). This is because a board with heterogenous knowledge and skill possesses "more breadth of knowledge, creativity, and experiences, as well as more access to valuable resources outside the firm" (Haynes & Hillman, 2010: 1149). Hence, such a board would consider a wider set of options. In summary, knowledge heterogeneity and skill heterogeneity flatten (or weaken) the positive resource provisioning effect that aggregate education and professional experience have on the EMFs' international expansion as the board members need to consider more varied and heterogeneous sets of information while mentoring and monitoring the management team's decision on internationalization.

In line with these arguments, we believe that knowledge heterogeneity and skill heterogeneity flatten the U-shaped relationship between a board's aggregate education and its international expansion strategy and between a board's aggregate professional experience and its international expansion strategy, respectively. Even though the presence of heterogeneity within the board increases the board's ability to explore various growth options other than internationalization (hence, reducing the positive resource provisioning effect), it also helps to enhance the board's risk-taking ability to address the challenges that are associated with internationalization, thus limiting the negative consequences of the board's low level of aggregate education and professional experience (thereby addressing some part of the agency costs). Hence, we hypothesize:

Hypothesis 2a (H2a). *Knowledge heterogeneity (negatively) moderates the U-shaped relationship between the board's aggregate education and the internationalization of emerging market firms in such a way that the slope of the relationship is flatter (less negative at lower levels of aggregate education, and less positive at higher levels of aggregate education) in firms that have higher knowledge heterogeneity compared to firms with lower knowledge heterogeneity.*

Hypothesis 2b (H2b). *Skill heterogeneity (negatively) moderates the U-shaped relationship between the board's aggregate professional experience and the internationalization of emerging market firms in such a way that the slope of the relationship is flatter (less negative at lower levels of aggregate professional experience, and less positive at higher levels of aggregate professional experience) in firms that have higher skill heterogeneity compared to firms with lower skill heterogeneity.*

4. Methods

4.1. Sample

We sampled data from large Indian firms to test our hypotheses. Following the economic liberalization carried out in 1991, Indian firms have made considerable progress in improving corporate governance practices (Stucchi, Pedersen, & Kumar, 2015), and have made inroads into international markets Chittoor & Aulakh, (2015). Hence, the data from Indian firms provide suitable 'learning laboratories' Hitt, Li, & Worthington, (2005) to investigate changes in the strategic governance of EMFs. Further, corporate governance practices in India are at a nascent stage compared to developed markets. However, the board members exert significant influence on the strategic decisions made by EMFs, as reflected in Contractor, Kumar, and Dhanaraj (2015: 164)'s observation that "ultimate control in Indian companies rests in very few hands". Therefore, the Indian context provides an ideal opportunity to explore the role of board members in monitoring and guiding the management team's decision to internationalization.

To test our hypotheses, we randomly selected 201 large Indian firms spanning a period of five years (2008 to 2012) from the Prowess database of the Centre for Monitoring Indian Economy (CMIE). We confined our analysis to randomly selected 201 firms from the available set of 1062 large firms to keep the manual process of identifying the board member's education and professional experience within a manageable scale. A similar sampling strategy was followed earlier by Singla, Veliyath, and George (2014). We used the cut-off of $82 million or INR 5 billion in sales (provided by Prowess) to identify large firms. We focused on large firms because firms above a certain size are likely to demonstrate the meaningful engagement of board members in the internationalization decision-making process. The Prowess database has already been successfully used by other researchers to derive interesting findings about the internationalization of Indian companies (Chittoor, Aulakh, et al., 2015; Kumar et al., 2020; Lamin, 2013).

We sorted the names of the firms alphabetically and selected the first 201 firms. Because the dependent variable (degree of international expansion) is independent of the name of the sample firms, our sample selection process can be argued to be an effect of a randomized process (see Hair, Tatham, Anderson, and Black (2006) for a similar sampling strategy). We also controlled for the industry effects to ensure that our sample selection process is not skewed toward one or more specific industries. Historically, global strategy research for EMFs was mostly confined to specific industries that are more inclined to international expansion, such as the pharmaceutical and automobile industries (Bhaumik, Driffield, & Pal, 2010; Chittoor, Sarkar, Ray, & Aulakh, 2009; Kumaraswamy et al., 2012). To interpret the results in more generalized forms, we selected a sample of firms from multiple industries rather than from a particular industry (Kimberly, 1976), and controlled for industry (manufacturing vs. service) effect.

We obtained data for the dependent variable, control variables, and list of directors directly from the Prowess database. We prepared a list of 10,423 directors from 201 firms, spanning five years. We then obtained the educational details and number of years of professional experience for each of the directors from four sources: (i) bloomberg.com, (ii) the company's website, (iii) moneycontrol.com (Indian business news and online trading website), and (iv) linkedin.com (business-oriented social networking platform) to create the independent and moderating variables. Based on the information gathered, we obtained 906 observations (firm-years) from 201 firms.

4.2. Measures

4.2.1. Dependent variable

A significant number of firms from India are in the early stage of international expansion. Hence, exports and sales through foreign subsidiaries are the dominant forms of international expansion (Chittoor &

Aulakh, 2015). We measured international expansion as the ratio of foreign sales to total sales (FSTS) (Chittoor et al., 2009). Foreign sales included both exports and sales of foreign affiliates Contractor, Kumar, & Kundu, (2007).

4.2.2. Independent variables

We measured the board's aggregate education (BEdu) as the sum of each individual director's number of years of schooling, with the lowest value of 12 representing a high school (or secondary) education. This captures the board's overall resource stock in terms of the education part of KSAO (Ployhart & Moliterno, 2011).

We measured the board's aggregate professional experience (BExp) as the sum of each individual director's number of years of professional experience in their career (Khanna, Jones, & Boivie, 2014). This captures the overall professional experience of the board based on the board members' professional experience in the focal firm and in other firms.

To test the two independent hypotheses (H1a and H1b) based on the board's aggregate education and aggregate professional experience, we ran the analyses separately for the direct effect of the board's aggregate education (BEdu) and aggregate professional experience (BExp).

4.2.3. Moderating variables

We adopted Knight et al. (1999)'s measurement of age and education diversity to capture the board's knowledge and skill heterogeneities. We measured knowledge heterogeneity (HKnld) as the coefficient of variation of the number of years of post-secondary education across the board members. Similarly, skill heterogeneity (HSkill) was measured as the coefficient of variation of the number of years for which each board member had been employed. We ran the analyses separately for the moderating effect of knowledge heterogeneity and skill heterogeneity for the board's aggregate education and professional experience, respectively.

4.2.4. Control variables

We used a large set of control variables for firm-level and board-level characteristics, and any other attributes that might influence our dependent variable (international expansion). For the firm-level control variable, we used business group affiliation (BGAffiliation) to control for the effect of the emerging market's corporate governance structure (such as group-level available resources that might help in internationalization) (Purkayastha, Pattnaik, et al., 2021). The BGAffiliation variable takes the value 1 if the firm is affiliated to a business group, and 0 otherwise, i.e., for non-affiliated firms (Chittoor, Aulakh, et al., 2015). To control for the effect of capital market participation, which might then lead to international expansion (Purkayastha & Kumar, 2021), we included capital market participation (MktPar) as a dummy variable that takes the value 1 if the firm is listed on the Bombay Stock Exchange (BSE) under the categories A, B, or T firms that are regularly traded on the market, and takes the value 0 otherwise. We controlled for the effect that investments into intangible resources and innovation have on international expansion through marketing intensity (MktInt), using the sum of advertisement and marketing expenses divided by total sales and R&D intensity (RDInt), which is the ratio of R&D expenses and total sales, respectively. We controlled for the effect of firm-specific slack resources through firm size (FirmSize), using the natural log of sales and the availability of tacit knowledge through firm age (FirmAge), which is measured as the number of years since incorporation. We controlled for the effect that the capital structure of a firm has on its ability to expand internationally through the debt-to-equity ratio (DtE), using the ratio of total debt to equity (net worth) of a firm. We included the performance of the firm as well (ROA), calculated as profit before interest and tax divided by total assets to control for the effect of prior performance on international expansion. To control for the possible positive influence of foreign ownership on the degree of internationalization, we added the percentage of shares owned by foreign institutional investors as non-promoters (FII) as a control variable. We also controlled for the effect

of family ownership by using the controlling percentage of shares owned by the promoters (PBH). To control for industry-specific effects on international expansion, we used a dummy variable ServiceIndustry, which takes the value 1 when the firm is from the service industry, and 0 otherwise.

Lastly, we controlled for board characteristics using five different variables that might influence the extent of international expansion: (i) experience of internationalization from other firms through board interlocks (MaxAvgDOI), measured as the average of each of the board members' maximum international experience through the interlocking firm's degree of internationalization; (ii) board size (BSize), measured as the total number of board members (Goodstein et al., 1994); (iii) outsider ratio (ORatio), measured as the ratio of the number of outside directors to the total number of directors on the board (Kang, Cheng, & Gray, 2007); (iv) average board education level (AvgBEdu), measured as the average of the board's post-secondary education level; and (v) average board professional experience (AvgBExp), measured as the average of the board's total professional experience. These variables helped us to control for (i) the board members' international experience through interlocking membership; (ii) the inflation of human capital due to the size of the board; (iii) the influence on how the board functions or the board's ability to influence the management's decisions, especially those decisions that are associated with high risk; (iv) the effect of the average level of education of the board members; and (v) the effect of the average level of professional experience of the board members, respectively. In some cases, because of missing data, we used the average of the available data for the directors' education (16.1% of the data points were missing) and years of professional experience (28.6% of the data points were missing) for a specific firm-year. To ensure that this manual correction did not bias our analysis, we included a dummy variable (DEstData), coded as 1 when the education and/or professional experience data for one or more directors on a focal board was estimated, and 0 otherwise in all the models (Khanna et al., 2014). To control for the effect of the alignment of leadership between the management and the board on the international expansion decision, we added CEO duality (CEODuality) that takes the value 1 when the firm's CEO and the board chairman are the same person, and 0 otherwise. We also included four time dummies to control for the effect of the study period (2008–2012). Table 1 provides the formal definitions of all the variables used in this study.

4.3. Model specification

Similar to other studies that looked into the strategic implications of the board of directors (Tuschke, Sanders, & Hernandez, 2014; Wintoki, Linck, & Netter, 2012), our sample selection suggests that there is a possibility of self-selection of bias. This is because educated and experienced directors might self-select into certain boards to achieve strategic goals. For instance, a firm might deliberately select directors with higher levels of education and professional experience to increase the firm's human capital resources. In other words, a firm might invite a board member to join the board due to their human capital resources (Mizruchi, 1996). Such an alternative explanation might be particularly feasible in the cases of those firms that have greater latitude in selecting directors to their boards. This might be the case for our sample of large firms, considering their economic size and significance in the Indian economy.

To address this possible endogeneity problem due to sample selection bias, we implemented a two-stage treatment regression model (Tuschke et al., 2014). In the first stage, we estimated the hazard (inverse Mills ratio) of having board members with higher levels of education and professional experience. The inverse Mills ratio removes any potential sample selection. Since treatment regressions require the endogenous variable to be binary, we create four dummy outcome variables: (i) the dummy outcome variable used for H1a takes the value 1 if the firm's board's aggregate education is above the average of the

Table 1
Definition of variables.

Variable	Definition
Dependent variable	
International expansion (FSTS)	The ratio of foreign sales to total sales (multiplied by 100 to be expressed as a percentage)
Independent variables	
Board's aggregate education (Bedu)- *used for H1a*	Aggregate value of each individual director's number of years of schooling, with the lowest value of 12 representing a high school (or secondary) education
Board's aggregate professional experience (Bexp)- *used for H1b*	Aggregate value of each individual director's number of years of professional experience
Moderating variables	
Knowledge heterogeneity based on education (HKnld)- *used for H2a*	The coefficient of variation of the number of years of postsecondary education across board members
Skill heterogeneity based on experience (HSkill)- *used for H1b*	The coefficient of variation on the number of years each board member had been employed
Control variables	
Business Group Affiliation (BGA)	Takes a value of 1 if the firm is affiliated to a business group, else 0 for non-affiliated firms
Market participation (MktPar)	Takes a value of 1 if a firm is listed on Bombay Stock Exchange under the categories A, B, or T, which include firms that are regularly traded on the market; otherwise, it takes a value of 0
Marketing intensity (MktInt)	The sum of advertisement and marketing expenses divided by total sales
R&D intensity (RDInt)	R&D expenses divided by total sales
Firm size (FirmSize)	Natural logarithm of net sales revenues of a firm in each year
Firm age (FirmAge)	Number of years since incorporation
Debt to equity ratio (DtE)	The ratio of total debt to equity (net worth) of a firm
Last year's performance of the firm (ROA)	Profit before interest and tax divided by total assets
Foreign institutional investor (FII)	Percentage of shared owned by foreign institutional investors as non-promoters
Promoter block holding (PBH)	Percentage of shares owned by the promoters
Service Industry (ServiceIndustry)	Takes a value of 1 if the firm is from service industry, else 0
Director's international experience through board interlocks (MaxAvgDOI)	Average of each of the board members maximum international experience through interlocking firm's degree of internationalization
Board size (BSize)	Total number of board members
Outsider ratio (ORatio)	The ratio of the number of outside directors to the total number of directors
Average education of board members (AvgBEdu)	Average of board's post-secondary education level
Average professional experience of board members (AvgBExp)	Average of board's total professional experience
Dummy variable (DEstData)	Coded as 1 when education and/or professional experience data regarding one or more directors on a focal board was estimated, 0 otherwise in all models
CEO Duality (CEODuality)	Coded as 1 when CEO and Board Chairman are same, 0 otherwise
Four time dummies	0 or 1 for the study period (2008–2012)
Instruments for first stage estimation	
Metro Indicator (MetroInd)	'1' if the registered office of the firm is in one of the six Indian metro cities or else '0'
Population of HQ location (LnPopulation)	Natural logarithm of total population of the city where HQ of the firm is located

aggregate education of all the boards, and 0 otherwise; (ii) the dummy outcome variable used for H1b takes the value 1 if the firm's board's aggregate professional experience is above the average of the aggregate professional experience of all the boards, and 0 otherwise; (iii) the dummy outcome variable used for H2a takes the value 1 if the firm's board's knowledge heterogeneity is above the average of the knowledge heterogeneity of all the boards, and 0 otherwise; and (iv) the dummy outcome variable used for H2b takes the value 1 if the firm's board's skill heterogeneity is above the average of the skill heterogeneity of all the boards, and 0 otherwise. The inverse Mills from the stage 1 probit model was then inserted into a stage 2 model. In the second stage, international expansion was estimated through a truncated regression analysis that included the inverse Mills ratio as one of the independent variables.

Following Tuschke et al. (2014), we reasoned that certain attributes of a firm's registered office or headquarter (HQ) city would partially explain the ability of the firm to attract incoming directors but would be unrelated to the firm's ability to expand internationally. Similar instruments based on locational characteristics are becoming common in board-related corporate governance research (Ang, Benischke, & Hooi, 2018). Based on the contextual intelligence (Khanna, 2014) of Indian firms, we posited that the location (metro or non-metro) and population of the registered office (or board meeting location) of the focal firm would at least partially explain the focal firm's ability to attract board members with higher human capital resources, although these factors are not related to the focal firm's ability to expand internationally. We considered six major Indian cities (population in million and area in sq. km. for each city are included in parentheses), namely, Mumbai (12.4; 600), Delhi (11.0; 1484), Bengaluru (8.4; 709), Chennai (4.7; 426), Hyderabad (6.8; 650), and Kolkata (4.5; 205) as the preferred location for an individual to accept an invitation to join the board of directors of a firm. We used a binary variable (MetroInd) to capture whether the registered office of the focal firm is in an Indian metro city (MetroInd = 1) or not (MetroInd = 0), and the natural logarithm of the total population (LnPopulation) of the city where the firm's HQ is located (Shaver, 1998). In the Results section, we report the second stage regression model that includes the inverse Mills ratio and the board's human capital resources. Empirically, these instruments proved to be both significant (Education: F = 7.183, p = 0.00081; Professional Experience: F = 4.390, p = 0.0127) and exogenous, producing a non-significant Sargan test result (Education: p = 0.1359; Professional Experience: p = 0.2753) (Semadeni, Withers, & Trevis Certo, 2014). The first-stage estimation is reported at the bottom of the regression results.

For the stage 1 model, we used the following probit models: (1) $BEduInd_{i,t+1} = \alpha + \lambda_1 * MetroInd_{i,t} + \lambda_2 * LnPopulation_{i,t} + \varepsilon_{i,t}$ (H1a); (2) $BExpInd_{i,t+1} = \alpha + \lambda_1 * MetroInd_{i,t} + \lambda_2 * LnPopulation_{i,t} + \varepsilon_{i,t}$ (H1b); (3) $HKnldInd_{i,t+1} = \alpha + \lambda_1 * MetroInd_{i,t} + \lambda_2 * LnPopulation_{i,t} + \varepsilon_{i,t}$ (H2a); and (4) $HSkillInd_{i,t+1} = \alpha + \lambda_1 * MetroInd_{i,t} + \lambda_2 * LnPopulation_{i,t} + \varepsilon_{i,t}$ (H2b), where $BEduInd_{i,t+1}$, $BExpInd_{i,t+1}$, $HKnldInd_{i,t+1}$, and $HSkillInd_{i,t+1}$ are the four dummy outcome variables. For the stage 2 model, we used: (5) H1a/H1b: $FSTS_{i,t+1} = \alpha + \beta^T * X_{i,t} + \lambda_1 * A_{i,t} + \lambda_2 * (A_{i,t})^2 + IMR_i + \varepsilon_{i,t}$; and (6) H2a/H2b: $FSTS_{i,t+1} = \alpha + \beta^T * X_{i,t} + \lambda_1 * A_{i,t} + \lambda_2 * (A_{i,t})^2 + \lambda_3 * H_{i,t} + \lambda_4 * A_{i,t-1} * H_{i,t} + \lambda_5 * (A_{i,t})^2 * H_{i,t} + IMR_i + \varepsilon_{i,t}$. The subscripts refer to firm *i* at time *t*; α is the intercept; β^T is the regression coefficient matrix for the control variables; $X_{i,t}$ is the control variable, $A_{i,t}$ is the board's aggregate education (H1a/H2a) or aggregate professional experience (H1b/H2b); $H_{i,t}$ is the knowledge heterogeneity (H2a) or skill heterogeneity (H2b); λs are the regression coefficients; IMR_i is the inverse Mills ratio; and $\varepsilon_{i,t}$ is the error term. We tested the hypothesized models for the dependent variable at time *t* + 1 with the independent, moderating, and control variables at time *t* (lagged model) to address concerns related to cross-sectional relationships (Hitt, Bierman, Shimizu, & Kochhar, 2001).

5. Results

5.1. Descriptive statistics

We report the descriptive statistics and Pearson product-moment correlations for all the variables in Table 2. A high correlation between the board's aggregate education and professional experience ($r = 0.87$, $p < 0.001$) conveys that either of them can be used as a proxy for the board's human capital resources. This finding supports our approach of separating the hypotheses about the board's human capital resources into the board's education (and knowledge heterogeneity based on education) and professional experience (and skill heterogeneity based on professional experience). We found that board size is highly correlated with aggregate education ($r = 0.99$, $p < 0.001$) and aggregate professional experience ($r = 0.88$, $p < 0.001$). Following Gubbi, Aulakh, Ray, Sarkar, and Chittoor (2010), we dropped the board size variable (BSize)

from our model to avoid issues with high correlations. All other correlations are generally on the lower side (correlations in excess of 0.7 are reported in bold font), and are unlikely to be of concern as far as multicollinearity is concerned. To test for the presence of multicollinearity, we checked variance inflation factors (VIFs) for all the variables. The VIF values in our data range from a minimum of 1.02 to a maximum of 3.82 with a mean VIF of 1.47 for Education, and a minimum of 1.02 to a maximum of 3.80 with a mean VIF of 1.49 for Professional Experience, which indicates that multicollinearity is not an issue in our models (O'brien, 2007). We note that on average, 18.45% of the firms' revenue comes from foreign sales in our sample. This is very close to the average internationalization (18.06%) of the 1062 firms that constituted our full dataset. Also, ROA (0.15 vs. 0.14), FirmAge (36.42 vs. 30.03), and DtE (1.29 vs. 1.76) are comparable between the sample set of 201 firms and the full dataset of 1062 firms. These comparative results give us confidence that the sample of 201 firms was randomly selected from the full

Table 2

Means, standard deviations (S.D.), maximum, minimum, and correlations (n = 201).

	Mean	S.D.	Max.	Min.	(1)	(2)	(3)	(4)	(5)
(1) FSTS	18.45	23.48	98.30	0.00					
(2) BGAffiliation	0.72	0.45	1.00	0.00	0.06				
(3) MktPar	0.91	0.29	1.00	0.00	−0.03	−0.02			
(4) MktInt	0.02	0.03	0.22	0.00	−0.07*	0.15***	0.06		
(5) RDInt	0.00	0.01	0.13	0.00	0.27***	0.04	0.05	0.28***	
(6) FirmSize	9.50	1.02	13.36	6.34	−0.05	0.28***	0.05	0.12***	0.08*
(7) FirmAge	36.42	22.61	133.00	8.00	−0.09**	0.26***	0.04	0.13***	0
(8) DtE	1.30	1.52	18.49	0.00	0	−0.04	−0.02	−0.15***	−0.14***
(9) ROA	0.15	0.08	0.91	−0.07	0.03	0.03	−0.02	0.15***	0.07*
(10) FII	7.03	8.44	41.80	0.00	0.01	0.14***	0.26***	0.25***	0.16***
(11) PBH	48.65	21.23	95.01	0.00	−0.01	−0.08*	0.68***	0.09**	0
(12) ServiceIndustry	17.33	0.38	1.00	0.00	−0.08*	0.08*	−0.19***	−0.03	−0.12***
(13) MaxAvgDOI	181.69	2182.33	43957.94	0.00	0.02	0.04	0.02	−0.01	−0.01
(14) BSize	10.93	3.07	21.00	1.00	−0.02	0.29***	0.19***	0.18***	−0.01
(15) ORatio	0.46	0.17	0.86	0.00	0.07*	0.08*	0.58***	0.03	0.13***
(16) AvgBEdu	17.29	0.79	21.00	15.25	0.09**	0.14***	0.01	0.12***	0.31***
(17) AvgBExp	36.56	6.52	61.00	14.00	−0.03	0.31***	0.05	0.03	−0.05
(18) DEstData	0.36	0.21	1.00	0.00	−0.05	−0.17***	−0.30***	−0.19***	−0.09**
(19) BEdu	189.24	54.10	382.00	16.00	−0.01	0.30***	0.19***	0.20***	0.04
(20) BExp	402.01	135.47	893.00	14.00	−0.03	0.38***	0.17***	0.15***	−0.03
(21) HKnld	0.08	0.03	0.19	0.00	0.01	0.08*	0.26***	0.09**	0.09*
(22) HSkill	0.25	0.10	0.51	0.00	0.13***	−0.13***	0.17***	0.15***	0.13***
(23) CEODuality	0.07	0.26	1.00	0.00	0.05	−0.01	0.01	0.04	0.02
	(6)	**(7)**	**(8)**	**(9)**	**(10)**	**(11)**	**(12)**	**(13)**	**(14)**
(6) FirmSize									
(7) FirmAge	0.22***								
(8) DtE	−0.07*	−0.11**							
(9) ROA	0.09**	0	−0.33***						
(10) FII	0.37***	0.06	−0.25***	0.09**					
(11) PBH	−0.03	−0.09**	0.03	0	0.05				
(12) ServiceIndustry	0.04	−0.11***	−0.06	−0.01	0.03	−0.14***			
(13) MaxAvgDOI	0.01	0	−0.01	−0.01	−0.01	−0.07*	−0.03		
(14) BSize	0.31***	0.13***	−0.10**	0.05	0.22***	0.08*	−0.03	0.07*	
(15) ORatio	0.05	0.09**	−0.03	−0.04	0.18***	0.44***	−0.10**	0.01	0.04
(16) AvgBEdu	0.20***	0.12***	−0.09**	0.10**	0.19***	−0.14***	0.03	−0.04	0.07*
(17) AvgBExp	0.12***	0.35***	−0.07*	−0.06	0	0.03	−0.12***	0	0.11***
(18) DEstData	−0.24***	−0.07	0.07*	0.04	−0.32***	−0.18***	0.01	0	−0.18***
(19) BEdu	0.34***	0.15***	−0.11***	0.06	0.24***	0.06	−0.03	0.06	**0.99***
(20) BExp	0.30***	0.27***	−0.12***	0.02	0.17***	0.08*	−0.07*	0.05	**0.88***
(21) HKnld	0.18***	0.05	−0.09**	−0.06	0.21***	0.14***	−0.06	−0.06	0.17***
(22) HSkill	0.04	−0.05	−0.04	0.01	0.10**	0.16***	−0.01	0	0.14***
(23) CEODuality	0.06	0.01	0.03	0.06	0.07*	−0.02	0.06	−0.02	0.06
	(15)	**(16)**	**(17)**	**(18)**	**(19)**	**(20)**	**(21)**	**(22)**	
(15) ORatio									
(16) AvgBEdu	0.05								
(17) AvgBExp	0.20***	0.01							
(18) DEstData	−0.23***	−0.27***	−0.07*						
(19) BEdu	0.05	0.22***	0.11***	−0.22***					
(20) BExp	0.11***	0.06	0.54***	−0.15***	0.87***				
(21) HKnld	0.24***	0.18***	0.13***	−0.36***	0.19***	0.18***			
(22) HSkill	0.05	−0.02	−0.31***	−0.36***	0.13***	−0.04	0.36***		
(23) CEODuality	−0.07*	0	−0.04	−0.14***	0.06	0.02	0.06	0.14***	

* p < 0.05, ** p < 0.01, *** p < 0.001

dataset of 1062 firms. Our data also portrays that innovative firms (those with high R&D intensity) are associated with international expansion ($r = 0.27$, $p < 0.001$), whereas older firms from emerging markets are associated with internationalization ($r = -0.09$, $p < 0.01$). We also observe that capital market participation is significantly correlated with education ($r = 0.19$, $p < 0.001$) and professional experience ($r = 0.17$, $p < 0.001$). A possible explanation for this finding is that because capital market participation requires firm-level capabilities, the board members' education and professional experience play a role in forming such capabilities. We notice that outsider ratio and aggregate professional experience are significantly and positively correlated ($r = 0.11$, $p < 0.001$). This result indicates that the board's aggregate professional experience is related to the number of outsiders in the board, and a board with a higher number of outside members is expected to have a larger professional experience base.

5.2. Tests of hypotheses

Tables 3 and 4 present the results obtained from fitting the regression models. In the first step, we considered only control variables (model 1). Adjusted R-squared is 21.6%. To test H1a, both the linear and square terms of the board's aggregate education are added in model 2. Adjusted R-squared is 23.26%. The regression coefficient in model 2 for the linear term is statistically significant and negative ($\beta = -1.0150$, $p = 0.0007$), and the squared term is statistically significant and positive ($\beta = 0.0019$, $p = 0.0009$). Hence, we infer a U-shaped relationship such that the slope is negative when the board's aggregate education is at low to moderate levels, and is positive when the board's aggregate education is at higher levels, as hypothesized in H1a. We then include linear and quadratic terms for the board's aggregate professional experience in model 3. Adjusted R-squared is 24.11%. The regression coefficient in model 3 for the linear term is statistically significant and negative ($\beta = -0.5666$, $p = 0.0000$), and the squared term is statistically significant and positive ($\beta = 0.0005$, $p = 0.0000$). Hence, we infer a U-shaped relationship such

that the slope is negative when the board's aggregate professional experience is at low to moderate levels, and is positive when the board's aggregate professional experience is at higher levels, as hypothesized in H1b.

We also find 267 and 567 as turning points (calculated as $-\lambda_1/2\lambda_2$ from the fitted curve using Eq. (5) for the board's aggregate education and professional experience, respectively). These values are well within the maximum and minimum data range for the board's aggregate education (Max: 382, Min: 16) and aggregate professional experience (Max: 893, Min: 14) in our sample. Supporting our U-shaped hypothesis, we find that the slope ($\lambda_1 + 2\lambda_2$) is negative (Education: -0.9542, Professional Experience: -0.5526) and positive (Education: 0.4366, Professional Experience: 0.3264) at the minimum and the maximum value of the data range, respectively (Lind & Mehlum, 2010).

To test H2a and H2b, we added interactions between the board members' aggregate education (model 4) and aggregate professional experience (model 5) with knowledge heterogeneity and skill heterogeneity, respectively, to test the moderating effect. The adjusted R-squared of model 4 is 15.99%, and that of model 5 is 16.63%. The interaction effects in model 4 between the board's aggregate education and knowledge heterogeneity are significant and positive ($\beta = 11.8500$, $p = 0.0320$), while the interaction effects between the square of the board's aggregate education and knowledge heterogeneity are significant and negative ($\beta = -0.0309$, $p = 0.0190$). Supporting H2a, the result indicates that the U-shaped relationship between the board's aggregate education and international expansion flattens in the presence of knowledge heterogeneity. The interaction effects in model 5 between the board's aggregate professional experience and knowledge heterogeneity are significant and positive ($\beta = 2.2170$, $p = 0.0075$), while the interaction effects between the square of the board's aggregate professional experience square and knowledge heterogeneity are significant and negative ($\beta = -0.0024$, $p = 0.0223$). The result supports H2b as the U-shaped relationship between the board's aggregate professional experience and international expansion flattens in the presence of skill

Table 3
Results of regression model using FSTS as dependent variable (Hypotheses H1a and H1b).

Model	Model 1 (Control)			Model 2 (H1a)			Model 3 (H1b)		
	Beta	S.E.	p-value	Beta	S.E.	p-value	Beta	S.E.	p-value
Constant	52.1500	32.3800	0.1076	189.4000	51.6800	0.0003	198.7000	40.8000	0.0000
BGAffiliation	7.0230	3.0500	0.0215	8.0850	3.0400	0.0080	5.0040	2.9840	0.0939
MktPar	−14.8900	6.9480	0.0323	−14.3800	6.9260	0.0381	2.7000	7.1490	0.7057
MktInt	−128.4000	32.4700	0.0001	−111.1000	32.1600	0.0006	−49.6600	30.3000	0.1015
RDInt	625.7000	90.7400	0.0000	610.4000	88.7800	0.0000	724.8000	110.3000	0.0000
FirmSize	−1.7530	1.0390	0.0920	−2.0710	1.0700	0.0532	−0.8831	0.9762	0.3659
FirmAge	−0.1226	0.0483	0.0113	−0.1005	0.0479	0.0363	−0.0557	0.0409	0.1737
DtE	1.3340	0.8451	0.1149	1.4570	0.8365	0.0819	0.7557	0.7888	0.3383
ROA	28.6800	12.9300	0.0268	27.5700	12.8800	0.0326	−18.3700	12.3800	0.1383
FII	0.1975	0.1420	0.1647	0.2020	0.1408	0.1516	−0.0217	0.1339	0.8711
PBH	0.0743	0.0715	0.2990	0.0601	0.0708	0.3960	−0.0457	0.0629	0.4680
ServiceIndustry	−16.8200	2.9800	0.0000	−18.7200	3.0300	0.0000	−12.4200	2.5540	0.0000
MaxAvgDOI	0.0001	0.0004	0.7373	0.0002	0.0004	0.5889	0.0003	0.0003	0.3263
ORatio	7.7960	8.4890	0.3587	6.2780	8.4390	0.4571	14.3200	8.5460	0.0941
Average education of board members	0.6918	1.5540	0.6562	0.9701	1.5510	0.5317	0.5766	1.5310	0.7065
Average professional experience of board members	−0.1606	0.2183	0.4622	−0.2370	0.2176	0.2764	−0.0530	0.2108	0.8017
DEstData	4.7980	6.1890	0.4384	4.5120	6.0040	0.4526	7.1830	5.3430	0.1792
CEODuality	−4.5510	3.8850	0.2417	−5.9370	3.8480	0.1233	−3.8850	3.9880	0.3302
invMillsRatio	−27.6277	15.6020	0.0769	−35.9360	17.1080	0.0360	−45.7000	15.8800	0.0041
Board's aggregate education				−1.0150	0.2976	0.0007			
Board's aggregate education square				0.0019	0.0006	0.0009			
Board's aggregate professional experience							−0.5666	0.0984	0.0000
Board's aggregate professional experience Square							0.0005	0.0001	0.0000
No. of observations	906			906			906		
No. of firms	201			201			201		
Adjusted R-squared	21.6%			23.26%			24.11%		
First stage estimation (DV = dummy outcome variable that equals 1 or 0 based on above or below the average of the total education or experience of board members)									
Constant	0.7058	0.4959	0.1550	0.7058	0.4959	0.1550	1.4878	0.4984	0.0029
MetroInd	−0.1664	0.1158	0.1510	−0.1664	0.1158	0.1510	0.0165	0.1159	0.8869
LnPopulation	−0.0449	0.0361	0.2140	−0.0449	0.0361	0.2140	−0.1032	0.0362	0.0045

Table 4
Results of regression model using FSTS as dependent variable (Hypotheses H2a and H2b).

Model	Model 4 (H2a)			Model 5 (H2b)		
	Beta	S.E.	p-value	Beta	S.E.	p-value
Constant	90.2600	68.2000	0.1860	43.4000	62.5500	0.4880
BGAffiliation	−1.5050	2.8860	0.6021	10.2400	2.7540	0.0002
MktPar	−7.4460	7.4280	0.3164	−7.4790	7.2310	0.3013
MktInt	−136.3000	35.0900	0.0001	−190.7000	37.0100	0.0000
RDInt	556.7000	81.2300	0.0000	392.7000	80.6600	0.0000
FirmSize	−1.6120	1.1900	0.1758	−2.4790	1.2940	0.0558
FirmAge	−0.0245	0.0534	0.6470	−0.0910	0.0542	0.0932
DtE	−0.1662	0.8518	0.8454	0.8098	0.8211	0.3243
ROA	19.1700	15.4800	0.2161	38.6700	15.6700	0.0138
FII	0.0657	0.1616	0.6844	−0.0500	0.1629	0.7590
PBH	0.0851	0.0766	0.2668	−0.0483	0.0831	0.5616
ServiceIndustry	−1.9130	3.1480	0.5435	3.2110	3.1810	0.3131
MaxAvgDOI	0.0109	0.0062	0.0788	0.0002	0.0004	0.5773
ORatio	20.5600	9.7210	0.0347	30.3400	8.9230	0.0007
Average education of board members	−1.2890	1.7390	0.4588	3.0290	1.5920	0.0574
Average professional experience of board members	−0.4656	0.2108	0.0275	0.1795	0.2793	0.5206
DEstData	13.3200	5.5840	0.0173	14.1900	6.4230	0.0274
CEODuality	0.8638	3.6410	0.8125	5.7470	3.6510	0.1159
invMillsRatio	43.6310	30.8900	0.1580	30.6837	28.3728	0.2800
Board's aggregate education	−0.9024	0.5622	0.1088			
Board's aggregate education square	0.0025	0.0013	0.0653			
Board's aggregate professional experience				−0.6047	0.2699	0.0253
Board's aggregate professional experience Square				0.0007	0.0003	0.0536
Knowledge heterogeneity based on education	−992.8000	540.3000	0.0665			
Skill heterogeneity based on professional experience				−391.1000	153.8000	0.0112
Board's aggregate education * Knowledge heterogeneity based on education	11.8500	5.5190	0.0320			
Board's aggregate education square * Knowledge heterogeneity based on education	−0.0309	0.0132	0.0190			
Board's aggregate professional experience * Skill heterogeneity based on professional experience				2.2170	0.8275	0.0075
Board's aggregate professional experience square * Skill heterogeneity based on professional experience				−0.0024	0.0011	0.0223
No. of observations	906			906		
No. of firms	201			201		
Adjusted R-squared	15.99%%			16.63%		
First stage estimation (DV = dummy outcome variable that equals 1 or 0 based on above or below the average of the total education or professional experience of board members)						
Constant	−0.7339	0.4958	0.1392	−0.6518	0.4954	0.1886
MetroInd	−0.2249	0.1163	0.0535	−0.2210	0.1161	0.0574
LnPopulation	0.0588	0.0361	0.1035	0.0543	0.0361	0.1326

heterogeneity.

We ran similar models after winsorizing the dataset at the 1st percentile and 99th percentile. The results [H1a (Bedu squared): β = 0.0028, p = 0.0008; H1b (Bexp squared): β = 0.0003, p = 0.0366; H2a (Bedu squared* HKnld): β = −0.0455, p = 0.0094; H2b (Bexp squared* Hskill): β = −0.0027, p = 0.0135] are robust after removing the outliers from the data.

To visually analyze the hypothesized direct effects in H1a and H1b, we plotted the polynomial graph of the direct effects. In Fig. 2, we observe that the effect of the board's aggregate education on international expansion is U-shaped, and in Fig. 3, we observe that the effect of the board's aggregate professional experience on international expansion takes an inverted U-shape. To gain more insights about how knowledge heterogeneity (HKnld) and skill heterogeneity (Hskill) moderate the relationship between international expansion (FSTS) and the board's aggregate education (Bedu) and aggregate professional experience (Bexp), respectively, we plot both the moderating relationships in Figs. 4 and 5 as a polynomial function to visualize the fitted response surfaces (Aiken, West, & Reno, 1991). The graphical representation of the moderating effects conveys a more complex and interesting relationship among the board's aggregate education and professional experience, knowledge and skill heterogeneity among the board members, and firm-level international expansion. The interaction plots indicate that firms with high knowledge and skill heterogeneity exhibit an inverted U-shaped relationship between international expansion and the board's aggregate education and professional experience. Hence, at higher levels of knowledge and skill heterogeneity, the

board's aggregate education and professional experience facilitates the international expansion of the firm. As the board's aggregate education and professional experience increase beyond a threshold, the benefits in terms of increased international expansion are likely to diminish, and higher aggregate education and professional experience of the board can even hinder a firm's ability to expand internationally. Interestingly, with low knowledge and skill heterogeneity, the board's aggregate education and professional experience and international expansion seem to be in a U-shaped relationship. This indicates that the detrimental effect of a low level of board's aggregate education and professional experience on international expansion is more prominent in the absence of knowledge and skill heterogeneity. In summary, we observe a 'shape-flip phenomenon' (Haans, Pieters, & He, 2016), because the board's aggregate education and professional experience and international expansion continue to have a U-shaped association pattern at lower levels of knowledge and skill heterogeneity, which transforms into an inverted U-shaped pattern at higher levels of knowledge and skill heterogeneity.

5.3. Robustness tests

We ran multiple robustness tests to verify the results obtained from the main models. First, we used random effect generalized least-squares (GLS) panel regression procedure to test our hypotheses while removing firm-level idiosyncratic characteristics (Wooldridge, 2012). GLS models provide corrections for the presence of autocorrelation and heteroskedasticity in pooled time series data (Baltagi, 2005). Due to the presence of time-invariant variables such as business group affiliation
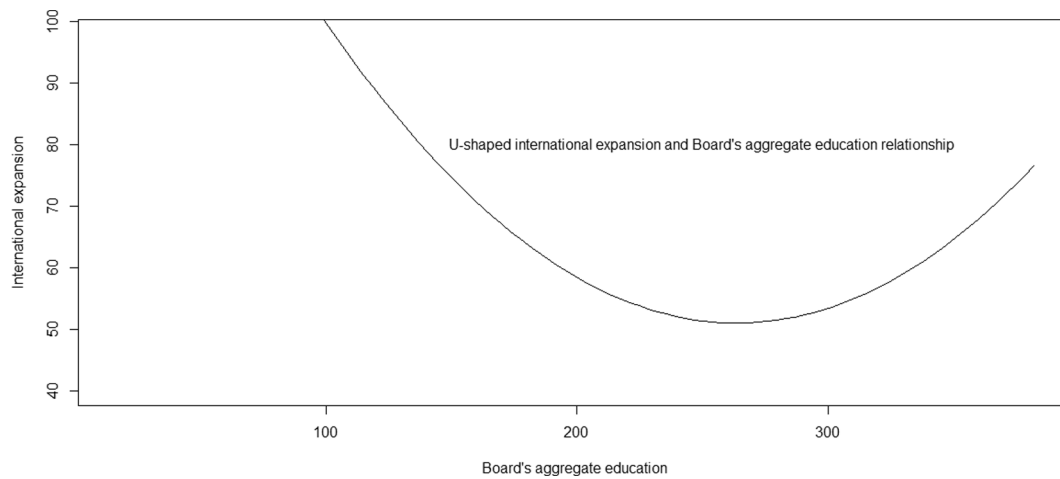
Fig. 2. The U-shaped relationship between international expansion (FSTS) and Board's aggregate education (BEdu).
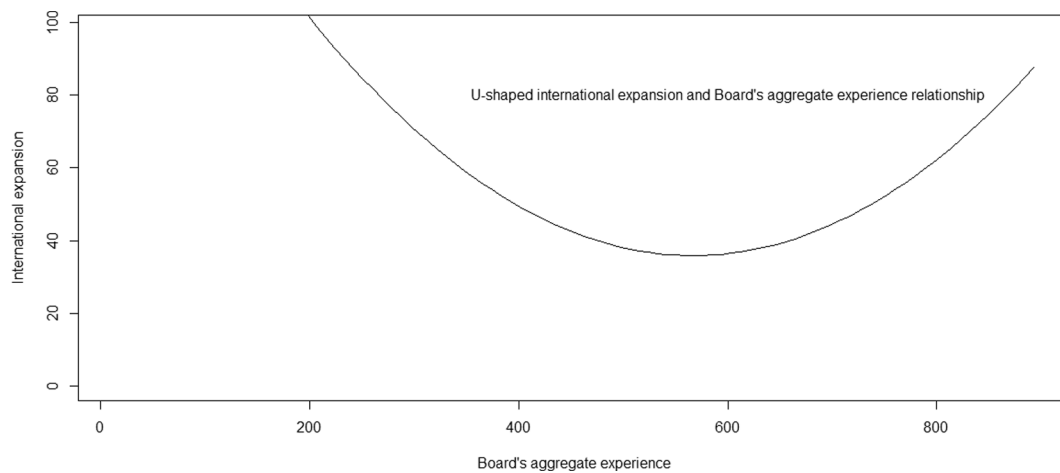

Fig. 3. The U-shaped relationship between international expansion (FSTS) and Board's aggregate professional experience (BExp).

and industry dummies in our model, we opted for a random effects procedure (Kennedy, 1998). We received expected results for all the hypotheses [H1a (Bedu: $\beta = -0.13875$, $p = 0.0030$; Bedu square: $\beta = 0.0003$, $p = 0.0090$); H1b (Bexp: $\beta = -0.0645$, $p = 0.0007$; Bexp square: $\beta = 0.0001$, $p = 0.0022$); H2a (Bedu*HKnld: $\beta = 5.1865$, $p = 0.0000$; Bedu square*HKnld: $\beta = -0.0123$, $p = 0.0001$); and H2b (Bexp*Hskill: $\beta = 0.4475$, $p = 0.0007$; Bexp square*Hskill: $\beta = -0.0004$, $p = 0.0069$)]. Hence, the random effects panel regression model supports the finding that the board's aggregate education (H1a) and aggregate professional experience (H1b) have a U-shaped relationship with international expansion for EMFs, and higher knowledge heterogeneity (H2a) and skill heterogeneity (H2b) invert this relationship.

Second, we tested our hypothesized models using the Feasible Generalized Least Squares (FGLS) approach, which jointly estimates the fixed effects coefficients and residual variance-covariance matrix in a generalized least squares model by minimizing the (multivariate-normal) negative log likelihood. FGLS is a two-step estimation process: first, an OLS model is estimated; then, its residuals are used to estimate an error covariance matrix that is used in the next step (Petersen, 2009). The results from the FGLS estimation confirm the robustness of our findings that the board's aggregate education (Bedu: $\beta = -0.1063$, $p = 0.0202$; Bedu square: $\beta = 0.0002$, $p = 0.0383$) and professional experience (Bexp: $\beta = -0.0551$, $p = 0.0041$; Bexp square: $\beta = 0.0001$, $p = 0.0076$) have a U-shaped relationship with international expansion for EMFs, and that higher knowledge heterogeneity (Bedu*HKnld: $\beta = 5.6679$, $p = 0.0000$; Bedu square*HKnld: $\beta = -0.0139$, $p = 0.0000$) and

skill heterogeneity (Bexp*Hskill: $\beta = 0.4612$, $p = 0.0009$; Bexp square*Hskill: $\beta = -0.0005$, $p = 0.0035$) reverse this relationship.

Third, we acknowledge that our measurement of the board's aggregate education does not distinguish between (i) attendance of a 1-year advanced management program by 12 board members, and (ii) the addition of one more board member with only 12 years of formal education or high school education. But cognitively, attending the additional 1-year advanced management college education by the 12 board members might have a differential effect on international expansion compared to the addition of a new board member with 12 years of basic education. To verify the effect of this qualitative aspect of education, we tested our hypothesized models using the board's aggregate education based on only college-level education (detailed results are available upon request). Similar to the earlier findings, these results show that the board's aggregate college-level education had a U-shaped relation with international expansion (Bedu: $\beta = -0.3678$, $p = 0.0069$; Bedu square: $\beta = 0.0024$, $p = 0.0202$), and at higher levels of knowledge heterogeneity, the relationship between the board's aggregate education and international expansion becomes inverted U-shaped (Bedu*HKnld: $\beta = 16.2850$, $p = 0.0000$; Bedu square*HKnld: $\beta = -0.1237$, $p = 0.0001$).

Fourth, conceptually, human capital has two dimensions, namely, education and professional experience. Prior research has indicated that these dimensions have a partial overlap (Ployhart et al., 2014). Hence, we tested the hypothesized models with a construct based on the combined (sum) effect of aggregate professional experience-education and knowledge-skill heterogeneity. The results show that the board's
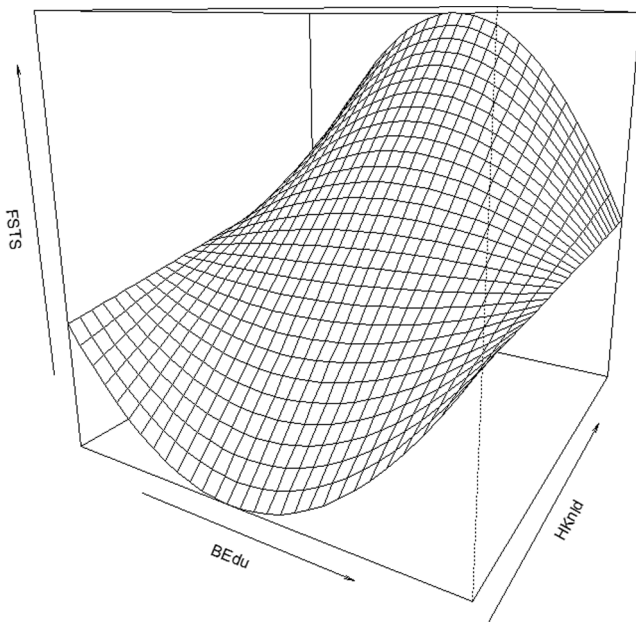
Fig. 4. The moderating effect of knowledge heterogeneity of board members (HKnld) for the relationship between aggregate education of board members (BEdu) and international expansion (FSTS).
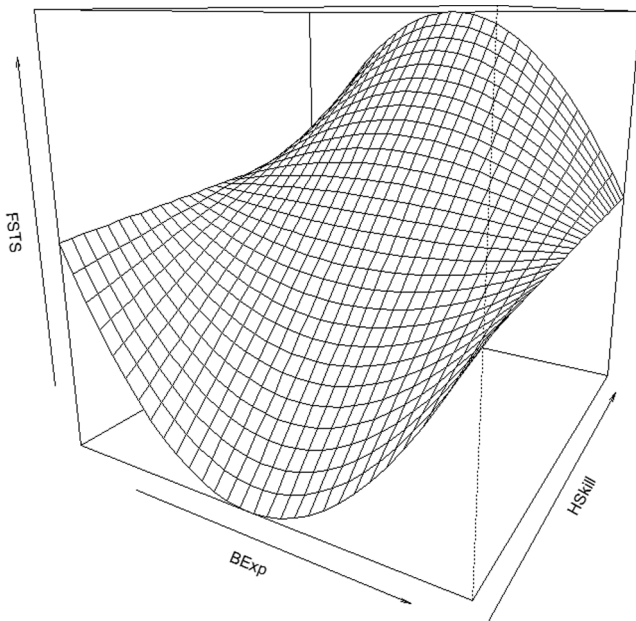

Fig. 5. The moderating effect of skill heterogeneity of board members (HSkill) for the relationship between aggregate professional experience of board members (BExp) and international expansion (FSTS).

combined aggregate education- professional experience had a U-shaped relation with international expansion (linear term: $\beta = -0.0475$, $p = 0.0007$; square term: $\beta = 0.00003$, $p = 0.0022$), and at higher levels of combined knowledge-skill heterogeneity, the relationship between the board's combined aggregate education-professional experience and international expansion becomes inverted U-shaped (linear interaction term: $\beta = -0.3420$, $p = 0.0000$; square interaction term: $\beta = 0.0002$, $p = 0.0009$).

Fifth, as an alternative measurement of the dependent variable, we used the number of overseas subsidiaries as a proxy of the extent of international expansion. Two-stage least squares Heckman model using

alternative measurement supports the hypothesized relationship [H1a: (Bedu: $\beta = -0.1542$, $p = 0.000$ and Bedu square: $\beta = 0.0003$, $p = 0.0000$); H1b: (Bexp: $\beta = -0.0750$, $p = 0.0000$ and Bexp square: $\beta = 0.0001$, $p = 0.0002$); H2a: (Bedu*HKnld: $\beta = 1.1670$, $p = 0.0101$; Bedu square*HKnld: $\beta = -0.0031$, $p = 0.0047$); and H2b: (Bexp*Hskill: $\beta = 0.2156$, $p = 0.0003$; Bexp square*Hskill: $\beta = -0.0003$, $p = 0.0007$)].

Sixth, we used same instruments – (i) the location (metro or non-metro) and (ii) population of the registered office (or board meeting location) of the focal firm to test potential endogeneity issue in our model. Theoretically, they are exogenous instruments as they would at least partially explain the focal firm's ability to attract board members with higher human capital resources whereas these factors are not related to the focal firm's ability to expand internationally. To allay the endogeneity concern, we conducted Wu-Hausman test our models. The results (Education: F = 0.643, p = 0.422; Professional Experience: F = 1.686, p = 0.194) indicate that our model with the current sample does not have endogeneity problems arising due to endogenous independent variable.

6. Discussion

In recent years, EMFs have experienced a steady growth in internationalization (Purkayastha, Kumar, et al., 2021; UNCTAD, 2017), necessitating the development of appropriate governance mechanisms to ensure the creation of shareholder value (Aguilera & Crespi-Cladera, 2016). Through our investigation of the relationship between the board's human capital resources and the international expansion of EMFs, we highlight the emergingness of corporate governance standards in such economies. In this study, we take a combined view of the agency and resource dependence perspectives of board governance in the context of EMFs. In doing so, we contribute at the intersection of international business and resource management research in strategic management literature (Filatotchev & Wright, 2011; Gubbi & Elango, 2016; Ramamurti, 2012). Through empirical analysis, we find that in the emerging markets context, the board's aggregate education and professional experience independently have a U-shaped relationship with international expansion. The shape flips to an inverted U-shape in the presence of knowledge heterogeneity and skill heterogeneity, respectively.

The findings reported in this study contribute to the debate on the nature of the strategic factors that enable the internationalization of EMFs (Cuervo-Cazurra & Ramamurti, 2014; Kumaraswamy et al., 2012; Luo & Tung, 2018) from the perspective of agency theory and resource dependence theory. The support for hypothesis 1a and 1b (U-shaped relationship between the board's aggregate education and professional experience and internationalization) substantiates that EMFs are likely to internationalize more either when there is very less monitoring and controlling by the board (at very low levels of aggregate education and professional experience of the board members), or when there is an abundance of resources provisioned by the board (at high levels of aggregate education and professional experience of the board members). The U-shaped relationship, therefore, is clear evidence that either the EMFs have very high levels of internationalization due to a lack of oversight, or internationalization is supported when the board is highly resourceful and is able to provide higher degree of support for internationalization.

Second, given the strategic nature of the internationalization decision for EMFs (Cuervo-Cazurra, 2012; Ramamurti, 2012), and the likely involvement of the board in ratifying the firm's global expansion plans (Johnson et al., 2013; Rindova, 1999), we provide evidence that the board's aggregate education and professional experience serve as firm-specific assets for internationalizing EMFs. Our findings support Ramamurti (2012: 42) argument that EMFs "do possess ownership advantages, but these are different from the ones we have been trained and conditioned to see" in advanced economy multinational corporations. In the absence of conventional firm-specific assets, such as cutting-edge

technology or global brands similar to what advanced economy multi-national corporations have, prior studies suggested that institutional transformation (Stucchi et al., 2015) and strategic response (Chittoor et al., 2009) serve as facilitators of international expansion. Board's human capital in the form of education and professional experience is valuable to any firm's growth strategy. One of the critical questions that has been hitherto unanswered is the form and effect of the board's human capital resources on international expansion in the context of EMFs. Instead of a linear positive effect of the board's human capital on a firm's internationalization (that one could expect to observe in developed market firms), our results indicate that board members can leverage their understanding of organizational context and accordingly encourage (or discourage) EMFs to expand globally, based on the available human capital resources. The board's aggregate education and professional experience as the determinants of international expansion emphasize that the board members' involvement in EMFs is beyond just monitoring and controlling (as suggested by agency theorists) because they provide strategic resources (as proposed by the resource dependence theory and as expected in any firm) to the firm (Hillman, Nicholson, & Shropshire, 2008). This finding also advances the research stream that examined the role of board members in the global strategy of firms (Barroso et al., 2011; Chen et al., 2017; Singh & Delios, 2017).

Finally, our findings provide support to the research emphasizing the strategic significance of resource management (Helfat et al., 2007; Sirmon et al., 2007) in EMFs. The shape-flip phenomenon (Haans et al., 2016) between the 'board's aggregate education and knowledge heterogeneity' and the 'board's aggregate professional experience and skill heterogeneity' as presented in Figs. 2 and 3, respectively, provides interesting insights and supports the theory of resource orchestration (Sirmon et al., 2011). The orchestration of human capital resources helps EMFs to achieve new combinations of their monitoring and controlling role (to reduce agency costs) and resource provisioning functions (to improve resource position), which in turn, influences the management team to expand their firm into the global arena. In the context of emerging markets, resource orchestration of internal resources in the form of board's human capital resources is especially important in a 'thin market' (Helfat et al., 2007) or in the absence of conventional firm-specific assets (Ramamurti, 2012). At low levels of knowledge and skill heterogeneity, the board's aggregate education and professional experience need to reach a critical point to positively influence the international expansion of EMFs. As the board's aggregate education and professional experience need a certain level of resource stock to effectively sense and seize an international opportunity (Teece, 2007), we observe a U-shaped relationship between the board's aggregate education and professional experience and international expansion at low levels of knowledge and skill heterogeneity, respectively. The relationship between the board's aggregate education and professional experience and international expansion changes to an inverted U-shape at high levels of knowledge and skill heterogeneity. Due to a intertwined relationship between these resources, the board's aggregate education and professional experience enable EMFs to reconfigure strategic resources (Teece, 2007) in the presence of higher knowledge and skill heterogeneity, even at low levels of education and professional experience. When education and professional experience cross certain levels, the cost of resource management affects international expansion. We believe that at this stage, the combined effect of high level of education and professional experience and high level of knowledge and skill heterogeneity slows down the decision-making process within the firm, making it difficult to expand internationally.

Prior research on the effect of heterogeneity among board members was limited to the effect of the heterogeneity of vital knowledge resources on strategic decision-making (Heyden, Oehmichen, Nichting, & Volberda, 2015), the influence of gender and ethnic heterogeneity on firm value (Carter, D'Souza, Simkins, & Simpson, 2010), and the effect of diversity on performance under conditions of environmental turbulence (Goodstein et al., 1994). We found that the shape of the

relationship between the board's aggregate education and professional experience and international expansion is contingent on the extent of knowledge and skill heterogeneity among the board members (Carpenter & Westphal, 2001; Johnson et al., 2013; Singh & Delios, 2017). Our findings suggest that the heterogeneity of knowledge and skills not only increases the costs of coordination among diverse ideas, but also provides more choices for growth beyond internationalization. Therefore, we believe that knowledge heterogeneity and skill heterogeneity enable EMFs to internationalize in the absence of adequate aggregate education and professional experience of the board, whereas they have a negative effect on internationalization in the presence of higher level of aggregate education and professional experience of the board. Theoretically, this signifies the need and importance of resource orchestration (Sirmon et al., 2011) between multiple aspects of firm-specific human capital resources (Johnson et al., 2013).

Our findings also provide individual-level human capital explanation for firm-level internationalization variations (Nyberg & Wright, 2015; Ployhart & Moliterno, 2011). We provide empirical support for the theoretical link between human capital (i.e., an individual's KSAOs that are relevant for achieving economic outcomes) and human capital resources (i.e., individual-level or unit-level capacities based on individual KSAOs that are accessible for unit-relevant purposes) (Wright et al., 2014). The U-shaped (*curvilinear relationship*) effect of the board members' characteristics (or *board capital*) on the internationalization (or *distal outcome*) of EMFs (*context dependent*) with the help of human capital resource arguments supports Johnson et al. (2013: 243) observation that "the impact of board capital on distal outcomes may be difficult to assess, measurement difficulties may confound analysis, and relationships may be curvilinear or context dependent".

6.1. Managerial implications

For managers, our findings imply that adding a few members to the board of an EMF is not adequate to build human capital resources that can help and guide the management team to expand EMFs internationally. EMFs need to build human capital resources up to a critical point to be able to positively leverage such capabilities for international expansion. The results indicate that an appropriate balance between the different dimensions of the board's characteristics ('education and knowledge heterogeneity' or 'professional experience and skill heterogeneity') is critical for international expansion. At low levels of knowledge or skill heterogeneity within the board's human capital resources, the board's aggregate education and professional experience become critical in deciding the impact of board-level influence on international expansion. At high levels of knowledge or skill heterogeneity within the board's human capital resources, the board's aggregate education and professional experience are beneficial for EMFs until they cross a certain threshold level, because beyond that threshold, firms are unable to handle the combined effect of too many board members with high and varied education or professional experience.

6.2. Limitations and directions for future research

This study has some limitations, some of which provide further research opportunities. First, our measurement of the board's aggregate education does not distinguish the quality of education. As per our operationalization, a commerce graduate with an advanced professional degree (such as a chartered financial accountant) is at par with an engineering graduate with an MBA degree (both with 16 years of formal education). Considering the variety of education (Goodstein et al., 1994) as an alternative operationalization of heterogeneity in human capital might identify interesting facts regarding the effect of knowledge-skill heterogeneity on international expansion. Second, the addition of a new director with very high professional experience and/or education might not increase the costs of resource orchestration, but it increases the education and/or professional experience at the aggregate level. Our

measurement considers such scenarios as exceptions. We encourage researchers to adopt an inductive research design to capture the effect of such nuanced changes in the characteristics of the board's human capital resources as an extension of our research. Third, prior research examined the effect of institutional development on internationalization, especially in the context of emerging markets (Stucchi et al., 2015). In this study, we confine ourselves to the human capital literature (Ployhart et al., 2014; Ployhart & Moliterno, 2011; Wright et al., 2014), and build our argument exclusively based on the effect of human capital resources on international expansion. Considering the significant role of institutional development in emerging markets (Cuervo-Cazurra & Ramamurti, 2014), the interaction between institutional characteristics with human capital resources might present an interesting research agenda. Fourth, we created our dataset specifically using larger firms to ensure reliability and future replicability. In the recent past, emerging markets have observed phenomenal growth in entrepreneurial ventures (Bruton, Filatotchev, Si, & Wright, 2013). Hence, research on the role of human capital resources in the context of emerging market small and new firms would be a significant contribution to the human capital literature. Further, the board's professional experience could be measured in a more nuanced manner. Fifth, the global expansion strategy of EMFs is different compared to that of developed market firms because EMFs use alliances and acquisitions more frequently as entry modes, adopt less bureaucratic organizational structures, and do not integrate foreign acquisition targets (Hernandez & Guillén, 2018; Kale & Singh, 2017). Therefore, the effect of the board's human capital resources on the entry mode choice could be another area of research. Future research might also benefit by including the international experience of the CEO as an additional factor. Sixth, it is becoming increasingly common for board members to be located in various regions of the same country, and even in different countries. The board's geographical dispersion might influence the board's international knowledge and appetite for internationalization risk. We do not control for the geographical dispersion of board members due to the absence of any reliable data about the board members' location for Indian firms.[7] Lastly, non-linear relationship between the board's aggregate education and professional experience on international expansion in the context of EMFs opens up scope for similar research in the context of developed market corporate governance setup. There are possibilities of observing similar U-shaped relationship or inverted U-shape relationship (effect of initial resource dependence and subsequent diseconomy of scale effect) which will be an interesting research extension.

7. Conclusion

We develop a model that investigates the effect of the board's aggregate education and professional experience on international expansion in the context of EMFs. We find that the board's aggregate education and professional experience are detrimental to international expansion up to a certain level; thereafter, they facilitate international expansion. These relationships are contingent upon knowledge heterogeneity and skill heterogeneity, respectively. Our findings indicate the evolving role of the board of directors as the custodian of shareholders in EMFs (Young, Peng, Ahlstrom, Bruton, & Jiang, 2008). We find that similar to their counterparts in developed markets, the board members in EMFs play a strategic role in influencing strategic decisions such as internationalization. Considering the recent improvements in corporate governance practices (Gibson, 2003), increased levels of international propensity (UNCTAD, 2017), and the continuing importance of board members in EMFs (Young et al., 2008), we integrate the agency and resource dependence perspectives to improve our understanding of the importance of the board in monitoring and advising the management team in facilitating international expansion.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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