PRE-ENTRY EXPERIENCE AND POST-ENTRY LEARNING OF THE BOARD OF DIRECTORS: IMPLICATIONS FOR POST-ENTRY PERFORMANCE

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Research Summary

In this paper, we examine how board of directors' expertise influences post-entry performance of startups and diversifying entrants that compete in an emerging market. Using a sample of firms in the U.S. wireless communications service industry from 1983 to 1998, we find that firms' post-entry growth increases with the *post-entry firm-specific* board experience of directors, but decreases with the inherited *pre-entry firm-specific* board experience of directors. To balance firm-specific board expertise, firms also need externally-developed director expertise. Here we find that outside directors' intra-industry *managerial* experience stimulates post-entry growth while their intra-industry *directorial* experience reduces it. Firms also benefit from having true industry outsiders who are experienced in other industry domains (but have no experience in the current industry domain). Thus, boards with a mix of directors with post-entry firm-specific board expertise and complementary other industry expertise are most fitting for the governance of post-entry venture growth.

Managerial Summary

In a context of an emerging market, i.e., the U.S. wireless communications service industry, we find that board governance and composition influence the post-entry performance of new entrants. Firms scale up their operations faster when they are governed by board directors with post-entry board experience in the venture. Growth is slower when ventures are governed by directors with prior board experience in parent firms. Outside directors add value when they have managerial experience in the focal industry, but their contributions diminish with directorial experience also in the focal industry. Firms can grow faster when their boards include true industry outsiders who are experienced in other industry domains, but have no experience in the current industry domain. When board composition shows a good balance of firm-specific expertise, industry expertise, and other-industry expertise, board governance delivers strong results in terms of post-entry new business growth.

Keywords: Market entry; Entrepreneurship; Board of directors; Experience; Learning-by-doing and learning from others; Post-entry performance; Startups and diversifying entrants

INTRODUCTION

New markets, particularly those triggered by new technologies, are often characterized by unclear, transitory, or non-existent industry structures, product definitions, and dominant logics (Aldrich and Fiol, 1994; Hargadon and Douglas, 2001; Rindova and Fombrun, 2001). New ventures in such environments are unsure about the nature and trajectory of the markets *ex ante,* and face great uncertainty in setting market strategies (Chen, Williams, and Agarwal 2012; Kaplan and Tripsas, 2008; Zahra and Bogner, 2000). These new ventures thus rely on experience to construct initial entry, and upon entry, continuously renew their product positions along with their organizational arrangement (Agarwal and Helfat, 2009; Navis and Glynn, 2010; Rindova and Kotha, 2001).

New ventures include corporate supported ventures, which are founded by established firms through diversification (i.e., diversifying entrants) or independent ventures, which are founded by individuals (i.e., startup entrants) (Daily *et al*., 2002; Helfat and Lieberman, 2002; Santarelli and Vivarelli, 2007). The research literature has suggested that both types of ventures benefit from their experiences accumulated prior to market entry. For example, diversifying entrants inherit experience and resources from their corporate parents and empirical studies on market entry have shown that these endowments are critical to venture survival rate, market share, and innovation (Agarwal, *et al.* 2004; Chatterji, 2009; Helfat and Lieberman, 2002; Klepper, 2009; Zahra, 1996; Zahra and George, 1999). Given that independent startup entrants do not have parent companies, the entrepreneurship literature has focused on founders' prior work experience and its impact on venture growth. However, prior research has also showed that experience accumulated before market entry has limitations, and the influence of initial resource endowments declines as markets evolve (Agarwal and Gort, 1996, 2002). Accordingly, ventures' post-entry learning-by-doing also plays an important role in determining venture growth (Bercovitz and Mitchell, 2007; Geroski, 1995).

In this study, we focus on pre- and post-entry experience of board of directors and analyze their impact on a firm's post-entry performance in a new market. A key issue in market entry research is how the nature of resources and capabilities varies by the type of entrants, and how such differences may affect post-entry performance (Helfat and Lieberman, 2002). To address these questions, past research focused on differences among entrants in areas of core technology knowledge and capabilities, complementary marketing and distribution capabilities, scale economies, and access to financial resources (Agarwal and Helfat, 2009; Bayus and Agarwal, 2007; Bercovitz and Mitchell, 2007; Nerkar and Roberts, 2004). What was neglected in this research is how differences in board governance capabilities of the market entrants (e.g., startups and diversifying entrants) may impact their post-entry performance. An entrant's board of directors can have a significant impact on the soundness of market entry and growth strategy through its monitoring and advisory functions, because a board works closely with the top management team at critical times and junctures that involve risk taking and making investment in emerging market domains (Certo, 2003; Forbes and Milliken, 1999; Kroll, Walters, and Wright, 2008). Boards provide strategic advice on decisions about market entry; and they discuss and approve decisions, budgets, and plans for market entry and growth (Carter and Lorsch, 2004; Conger, Lawler, and Finegold, 2001; Pearce and Zahra, 1992). Because boards have immediate effects on how a firm's critical resources are managed and governed, they constitute a vital governance capability that can shape the performance after market entry. However, the extant literature fails to offer specific insights or evidence on how different types of entrants vary in their board governance resources, and how director expertise credentials contribute to a board governance capability that delivers superior post market-entry performance. As startups and diversifying entrants were typically treated in separate studies in board research, it is also crucial to consider both types of entrants as they co-exist and compete in the new business domain.

Therefore, our study seeks to bridge the entrepreneurship and board governance literatures by developing and testing theory on how firms' board capital design choices impact post-entry performance. We have insufficient understanding of how directors' expertise profile influences post-entry growth as startups and diversifying entrants compete for a share of the emerging market. We examine these board governance effects on the firm's ability to generate post-entry growth. We use a panel data set of firms that entered the U.S. wireless communications service industry between 1983 (the birth of the industry) and 1998. This time period captures the early-stage development of the industry when entrants experienced changes in industry demand conditions, competition, and technology regimes (Chen *et al*., 2012).

Our study provides three specific contributions to the research literatures on entrepreneurship and board governance. First, by focusing on the consequences of new market entry, specifically *post-entry growth*, we are able to capture and assess the impact of an entrant's board capabilities on the post-entry strategy execution and scaling up. Rather than looking at the impact of board governance on a single choice variable (e.g., pricing strategy), we look at the aggregate effect of board governance on the ability of the firm to create a significant new market position through sustained business growth. High post-entry performance requires getting multiple critical decisions right; thus, our empirical specification enables us to capture this aggregate role of the board in terms of venture scaling up during the growth stage of the firm.

Second, we demonstrate that different types of market entrants may have different board resources with implications for post-entry performance. We show that the contribution of directors' firm-specific board experience depends on whether it is accumulated during the pre-market-entry phase or post-entry phase. When entering an emerging new market, directors' 'learning-by-doing' about this domain on the focal firm board (i.e., via post-entry firm-specific board experience) is far more valuable than prior board knowledge of the parent company. A board composition that emphasizes inherited board knowledge from parent firm puts diversifying entrants (that rely on parent firm board) at a disadvantage compared to startup firms. This important finding is in contrast with the insight from market entry research that inherited knowledge of the broader or related technology domain facilitates market entry. When it comes to board governance post-entry strategy execution and growth, inherited board experience is a governance liability rather than an asset. We show that post-entry performance is enhanced as directors accumulate firm-specific board experience post-entry, and yet, this effect is non-linear and gradually diminished. At very high levels, this experience produces a negative effect on the firm's ability to generate post-entry growth. Our empirical finding suggests that while both types of entrants benefit from accumulating this form of director expertise, they need to balance it with other forms of director expertise.

Third, for board research, our focus on new market entrants enables us to explore important nuances about the board governance capability in contributing to new ventures. New entrants face a unique challenge in learning the new business while distinguishing their own market space from industry incumbents/competitors and their parent firms. For addressing this challenge, our empirical evidence shows that firms can make use of 'learning from others,' i.e., experience gained outside the firm. Our findings indicate that while outside directors' *managerial* experience in the new industry domain may be considered as an asset for board governance, their *directorial* experience in this domain constitutes a governance liability. It is beneficial for outside directors to have first-hand managerial experience in the new market domain to provide effective governance. However, when it comes to directorial experience, it is preferred that outside directors have directorial experience in other industry domains, which adds to the diversity of experience and network access they bring to the board. Otherwise, outside directors may overly concentrate on the adoption of intra-industry practices by the board, which can hamper the ability of new entrants to create distinctive market positioning, thus placing them in direct competition with industry incumbents. We also show that boards can deliver higher post-entry performance when they include outside directors who are truly industry outsiders; i.e., outside directors who are exclusively experienced in other industry domains (without expertise in the current industry domain). These directors typically bring outside-the-box thinking, which is essential as new markets continue to evolve and take unexpected turns (Helfat and Lieberman, 2002).

Thus, boards with a mix of directors with industry expertise and complementary other domain expertise can be most apt for governance of post market entry as these boards can both leverage expertise of the current domain and also stay open to new possibilities and change.

THEORETICAL BACKGROUND

New market entry as a form of entrepreneurial action can be made by startups or by established firms through diversification (Daily *et al*., 2002; Helfat and Lieberman, 2002; Santarelli and Vivarelli, 2007). A firm's competitive advantage in the new market of entry is influenced by its learning-by-doing before and after the firm's market entry, as well as the experience transferred from others (Foster and Rosenzweig, 1995; Levitt and March, 1988).

The empirical literature on new market entry has focused on the entrant's pre-entry learning in related industries, highlighting the importance of prior firm-level and routine-based capabilities for post-entry performance (Helfat and Lieberman, 2002). This research stream suggests that compared to startups, diversifying entrants can perform better in the market of entry because of their inherited routines and resources from their corporate parents. Here the similarity between the entrant's pre-entry resources and capabilities and the required resource profile for the new market is critical to entry performance. Typically, the higher the similarity in these resource profiles, the more likely the entrant is to survive and grow in the market of entry (Bayus and Agarwal, 2007; Helfat and Lieberman, 2002). Research indicates that, in the U.S. diagnostic imaging industry, diversifying entrants with greater prior core industry experience achieved larger market shares and survived longer in the subfields of entry (Mitchell, 1989). In the U.S. disk drive industry, entrants with greater prior product generation experience in production and sales attained larger sales in new product generations (King and Tucci, 2002). Similarly, experienced radio manufacturing firms achieved higher innovation rates and market shares and survived longer in the U.S. television manufacturing industry (Klepper and Simons, 2000). Pharmaceutical firms' experiences in their technological and product-market domains also conferred greater initial success in new product introductions, resulting in higher initial sales levels (Nerkar and Roberts, 2004). Likewise, in the personal computer industry, entrants from related pre-entry businesses also survived longer (Bayus and Agarwal, 2007).

Besides pre-entry experience, the research literature also recognizes the importance of entrants' post-entry learning in affecting post-entry performance (Agarwal and Helfat, 2009; Helfat and Raubitschek, 2000). Empirical evidence suggests that post-entry organizational level learning (proxied by firm size and tenure in the industry) is positively associated with higher rates of survival and growth (Geroski, 1995). Bercovitz and Mitchell's (2007) study of U.S. medical firms also shows that business scale and scope enhance long-term survival in new markets.

However, the extant literature fails to provide insight on the potential performance effects of the entrants' board governance capabilities, and how this capability is shaped by where board directors conducted their 'learning' and built their repertoires of knowledge, expertise, and network connections. Through their monitoring and advice giving functions, boards are known to have impacts on planning, budgeting, approval, and implementation of strategic decisions on inter-nationalization, mergers and acquisitions, and R&D and innovation strategy (Barroso, Villegas, and P'erez-Calero, 2011; Hillman, Cannella, and Paetzold, 2000; Kor, 2006; McDonald, Westphal, and Graebner, 2008). As a key corporate governance mechanism, boards serve as a crucial source of guidance for managers when the firm is undertaking an entrepreneurial initiative (Certo, 2003; Kroll, Walters, and Le, 2007; Sundaramurthy, Pukthuanthong, and Kor, 2014). In serving its resource provision role, board director credentials matter. Through specific bases of expertise and connectivity, directors can provide resource access and meaningful advice to managers, and also question and critique their proposals (Carter and Lorsch, 2004; Hillman and Dalziel, 2003). However, board human and social capital credentials are not universally effective, and the context of the strategic decision making matters to the success of board governance (Kor, 2006; Zahra and Pearce, 1989). Currently, a research gap exists concerning our understanding of how different market entrants in an emerging industry vary in their board governance capabilities, and how these differences shape the post-entry performance.

In the context of market entry, a key variance in board director expertise involves how the directors acquired their expertise. Appointment of board directors constitutes an inflow of new market know-how into the focal board through two mechanisms: *learning-by-doing* and *learning from others*. Drawing from the organizational learning literature (Helfat and Peteraf, 2003; Levitt and March, 1988), *learning-by-doing* of the board involves directors building knowledge, skills, and relational capital that are specialized to focal firm and board context (Castanias and Helfat, 2001). This firm-specific board experience enables directors to accumulate tacit knowledge about the firm's strategy, its unique competencies and vulnerabilities, and the specific challenges that the firm faces in its environment. Through this experience, directors also gain familiarity about the board members and key executives. Therefore, this experience captures the directorial knowledge of the unique interactions between each firm and its business domain. However, directors' firm-specific board experience has different meanings for diversifying entrants versus startup firms. For diversifying entrants that share the same board with the parent firms after market entry, directors have inherited board experience from the parent company board prior to entry. Such knowledge reflects an understanding of the parent firm's strategies, competencies, and challenges in specific business environments. This experience will have an imprinting effect on them whereas in startups and diversifying entrants that have a new board independent from their parent firms, directors do not have such imprinting.

In addition, in both diversifying entrants and startup firms, directors will accumulate firm-specific board experience *after the entry*, and this firm-specific board experience will reflect on the interactions between the new business context and the firm's resources, capabilities, and weaknesses in the new environment (Helfat and Peteraf, 2003). Even for diversifying entrants that rely on the pre-existing board from their parent firms, directors will engage in venture-specific board learning after the market entry. Both pre- and post-entry firm-specific board experiences of directors can influence the capacity of the board to monitor and give advice to top management on growth strategy in the new market, which we will focus on in our theory development.

Further, board-level *learning from others* occurs through appointing outside directors who transfer external market know-how and know-who embedded in other firms and industries. Mobility of professionals across firms contributes to the transfer of encoded experience in the form of technologies, organizational routines, codes, and procedures (Dokko and Rosenkopf, 2012; Levitt and March, 1988), and outside directors in particular provide valuable *access* to new resources, skills, and connections outside the firm (Hillman and Dalziel, 2003; Pfeffer and Salancik, 1978). Outside directors who worked for competitors or outside the focal industry possess *intra-industry* and *other-industry* experiences that are new to the firm, which can influence the board's capacity in advising the top management. We now explore how these types of director expertise shape the firm's board governance capability to generate superior post-entry performance.

HYPOTHESIS DEVELOPMENT

In our effort to unpack the microfoundations of entrepreneurship in new market entry domain, we focus on the role of board of directors in guiding a firm's post-entry transition and success in a new business environment. Board of directors as a corporate governance mechanism serves two critical roles in the firm: (1) monitoring and control, and (2) service and resource provision (Fama and Jensen, 1983; Hillman and Dalziel 2003; McDonald, Westphal, and Graebner, 2008). The monitoring and control role refers to directors' responsibility to ensure that managements' actions are in the interests of stockholders, whereas the service and resource provision role of the board involves providing management with advice and guidance and helping the firm to obtain essential resources (Kor and Misangyi, 2008; Sundaramurthy and Lewis, 2003). The board governance research has also underscored the importance of experience-based skills of boards of directors in fulfilling these specific board duties (Hillman *et al.*, 2000; Kroll *et al*., 2007; Kor and Sundaramurthy, 2009; Westphal and

Fredrickson, 2001).

When firms venture into a newly emerging market domain, the experience-based expertise of directors can shape the quality of strategic advice they give concerning post-entry strategy execution and growth (Adner and Helfat, 2003; Castanias and Helfat, 2001). Directors equipped with relevant expertise can help reduce a firm's liability of newness in the new market, secure critical resources for growth, and support managers with strategic advice as the firm continues to make investments (Daily *et al*., 2002; Higgins and Gulati, 2003; Hillman and Dalziel, 2003).

In identifying the relevant sources of director expertise, our theoretical model captures the discontinuity in directors' learning within the board due to new market entry. Market entry events serve as a disruptive force (Amburgey, Kelly, and Barnett, 1993), pushing a firm to replicate, renew, or retire existing organizational capabilities, including its board governance capability (Helfat and Peteraf, 2003). Thus, we distinguish between directors' learning-by-doing in terms of before and after a firm's new market entry as they may have different implications for post-entry performance.

Learning-by-doing: Post-entry firm-specific board experience

Post-entry firm-specific board experience involves directors engaging in 'learning-by- doing' as they serve on the focal firm board *after* the new market entry. Because the nature and the trajectory of industry evolution are unknown ex ante, directors as a group learn about the emerging industry and contemplate the firm's market positioning and growth as the industry evolves. On the focal firm board, directors acquire the knowledge of the firm's unique resources and capabilities, critical choices made at the time of the entry, and specific challenges the firm faces in scaling up and generating growth. This specialized and tacit knowledge of the firm is likely to be critically linked to the board's ability to make governance decisions and to provide astute advice for the new venture (startup or the diversifying entrant) as it continues to build new competencies and grow its customer base. Because every firm (and venture) is unique in its bundle of resources and sources of competitive advantage (Kor and Mahoney, 2000; Penrose, 1959), it is crucial for directors to observe first-hand how the firm's investments and positioning in the market plays out as new rivals join the market. The post-entry learning period allows directors to contemplate and interpret the shifting realities of the industry and what these changes mean for the firm's growth trajectory and growth opportunities. Directors can observe and discern the industry trends, and as they develop insights about the firm's unique resource bases, they can serve as a sounding board for the management team in making growth decisions such as which technology paths to follow, or how to develop or scale up crucial marketing and distribution capabilities (Kimberly and Zajac, 1988; Zald, 1969). With the tacit knowledge of the firm's idiosyncratic conditions in the new market domain, the board can produce *specialized* governance prescriptions that enable the firm to increase its entrepreneurial growth capacity.[1] For a diversifying entrant that is subject to its parent firm's imprinting effect, post-entry firm-specific board learning is especially critical in creating and capturing its own boardroom 'space and time' that is not occupied by other businesses of the parent company (Navis and Glynn, 2010, 2011; Santos and Eisenhardt, 2009).

Further, through experience on the focal firm board, directors get to know each other's strengths, weaknesses, and habits, and develop internal social capital (Kim and Cannella, 2008; Kor and Sundaramurthy, 2009). This collective familiarity among board members improves the board decision making process (Eisenhardt and Shoonhoven, 1990), and enables the board to focus on the firm's specific strategic and governance issues (Westphal and Bednar, 2005). Directors develop a common language and routines that facilitate efficient knowledge sharing and communication with the management team (Finkelstein and Hambrick, 1996; Zenger and Lawrence, 1989). A collaborative

[1] A group of directors who worked in a different firm board will have shared team experience, but they will not possess the tacit knowledge of the focal firm. Because firms are unique in their resource bundles, history, and strategic commitments (Penrose, 1959), board experience gained in other contexts cannot substitute for the firm-specific board experience that captures the unique interactions between a firm and its business domain. We thank an anonymous reviewer for bringing this point to our attention.

relationship and open dialogue between directors and managers increases managers' propensity to seek strategy advice from directors, and directors' willingness to offer their counsel (Sundaramurthy and Lewis, 2003; Westphal, 1999). This type of close collaboration at the upper echelons can be very critical in the growth phase of the venture development when the firm is still honing its growth strategy and competency base and remains vulnerable to strategic mistakes under dynamic industry conditions.

However, the marginal impact of post-entry board experience may not always be positive. At very high levels, firm-specific board experience can give rise to bureaucratic routinization and inertia. Concentration of this type of experience may reduce the board's openness to outside information (Boeker, 1997; Oh, Labianca, and Chung, 2006) and reduce engagement in open discussions and debates (Tushman and Romanelli, 1985). As a result, directors may exhibit groupthink tendencies and suppress individual dissenting views (Janis, 1982; Marnet, 2004), which can inhibit the board from effectively fulfilling its functions (Forbes and Milliken, 1999; Hambrick and Mason, 1984). If the board is less aware of changes in the evolving new industry domain, it will fail to support the management team to adapt and renew the strategy to sustain business growth. Over time, the knowledge of the firm's development path may fade in relevance to the renewal of strategic positioning (Dierickx and Cool, 1989; Helfat and Peteraf, 2003), where concentration of firm-specific board experience can become a less valuable governance asset (Barroso *et al.*, 2011 ; Kor and Sundaramurthy, 2009) in the post-entry growth stage.

Thus, while post-entry board experience of directors within the focal firm improves the board ability to guide and support the venture in the new market domain, at high levels of this experience, it may stifle the firm's strategic renewal and adaptation, which is essential for sustaining post-entry growth. We, therefore, hypothesize that the post-entry firm-specific board experience of directors will increase a firm's post-entry growth at a decreasing rate.

Hypothesis 1: Post-entry firm-specific board experience of directors is positively related to an entrant's post-entry growth at a decreasing rate.

Learning-by-doing: Pre-entry firm-specific board experience

Pre-entry firm-specific board experience refers to directors' experience on the focal firm board *prior to* entry into the current industry. Entrants have no such experience when they are governed by a brand new board as in startups or in diversifying entrants that enter the market by setting up an entity independent from their corporate parents (which involves the use a new board). A pre-existing board of directors is relevant when diversifying entrants enter a new market by setting up a division inside the firm. In this case, the parent firm board monitors the newly entered business along with existing businesses.

While during post-entry board experience, directors obtain venture-specific knowledge such as idiosyncratic resources and capabilities of the firm, pre-entry board experience involves accumulation of knowledge about the parent firm and its opportunities and challenges in the existing businesses. When the board of directors is heavily embedded in the pre-entry businesses due to their service on the board prior to a firm's entry to a new market, they are likely to use an older (and potentially less relevant) cognitive map to navigate the new environment. Pre-entry experience in other business domains can hamper the board's learning in new business (Nystrom and Starbuck, 1984) because expertise is likely to become customized to serve these old businesses rather than the new business of entry (Bailey and Helfat, 2003). These directors may impose the group-based routines, norms, and knowledge that they had accumulated in pre-existing business on to the new market context. This limits the board of directors' ability to address the unique strategic challenges in the current market of entry and makes it harder for the new venture to distinguish its own market space from the parent (Hargadon and Douglas, 2001; Navis and Glynn, 2011; Santos and Eisenhardt, 2009). As a result, pre-entry firm-specific board experience of directors may serve as a liability, hampering the post-entry growth of the firm. When board directors are pre-immersed in governing parent firm's existing businesses, previously used cognitive maps and board decision routines may hamper strategy renewal to create a strong customer base and sustain growth in the market of entry.

Further, because these entrants share the same board resources with the parent firms' other existing businesses, they compete for the board's time and attention (Cyert and March, 1963; Pfeffer and Salancik, 1978). Directors' extended pre-entry firm-specific board experience strengthens their social capital with the managers of the pre-existing business units (Kim and Cannella, 2008), and this familiarity and socialization escalates the directors' commitments to these pre-existing business units (Shleifer and Vishny, 1989). As the new venture competes to receive attention from the parent board, it may suffer from insufficient board resource provision that hampers its business growth (Penrose, 1959). Accordingly, we hypothesize that:

Hypothesis 2: Pre-entry firm-specific board experience of directors is negatively related to an entrant's post-entry growth.

Learning from others through outside directors

Entry into a new industry requires the entrants to renew their capability and strategy to meet the unique and evolving challenges in the new market. Capability renewal at the level of board of directors occurs when the entrants use board design to acquire market know-how from both current and other industries. An internally developed board expertise highlights the firm-specificity of board governance capability, which is essential for board effectiveness. However, an internally developed board expertise needs to be enriched and balanced with an externally acquired board expertise. Without such balancing, an internally developed board expertise can be a negative force to the strategy renewal under dynamic conditions. Therefore, our next set of hypotheses discusses how entrants can recruit outside directors to gain access to external expertise and fresh thinking, thereby keeping the firm-specific governance capability up to date. Outside directors come from different organizations and industries. They have developed different sets of skills and social capital because their firms operate in different environments that serve different customers, collaborate with different supply chain partners, and compete in industries that may be more (or less) dynamic, competitive, or mature (Bailey and Helfat, 2003). Two key forms of 'outside the firm' expertise that outside directors can bring involve intra-industry experience (in competitors) and outside industry expertise.

Learning from competitors through outside directors

Outside directors accumulate intra-industry experience through their service in the managerial or the directorial position *within competitor firms* in the current industry of entry. Such experiences provide these directors not only with deep knowledge of certain rival firms, but also the overall competitive conditions, technology, and regulations specific to the industry (Boeker, 1997; Spender, 1989). Outside directors with such experiences can detect emerging opportunities in the industry and evaluate managers' proposals for growth (Castanias and Helfat, 2001; Schefczyk and Gerpott, 2001). In industries that involve complex technologies, regulations, and competitive uncertainty, directors with industry expertise can more effectively question management proposals and give valuable advice to managers (Carter and Lorsch, 2004; Zald, 1969). Empirical research in this area indicates that outside directors with industry-specific experience could add value as they offer specialized management expertise in this industry domain, provide access to external resources and capabilities, and strengthen external legitimacy of the focal firm (Kor and Misangyi, 2008; Kroll *et al*., 2008). Outsiders' intra-industry experience in acquisitions improves a firm's ability to evaluate current merger and acquisition deals, thereby increasing acquisition performance (McDonald *et al.*, 2008).

Consistent with prior research, we expect that the intra-industry experience of outside directors will enhance an entrant's growth in the market of entry. However, we focus on the value added by directors' intra-industry expertise to post-entry growth in a rapidly changing environment. We offer a more complete and nuanced understanding of the effect of this construct by distinguishing and separately capturing the source of directors' intra-industry expertise in the forms of prior *directorial experience* and *managerial experience* in the industry because the two types of experiences are different in skill development. Directorial experience in the industry involves experience in monitoring and strategic advice giving in a particular industry context, and this *board-level* working knowledge can help to address the focal firm's strategic and governance issues that are embedded in this context.[2] Managerial experience, in contrast, involves hands-on knowledge of the strategic and operational issues in the industry. This type of experience generates more *practice-based* knowledge, such as decision making and strategy execution skills in the industry context. These individuals not only observed industry dynamics but also lived through them, and accepted the inherent risks inextricably intertwined with the strategic decisions they made and implemented. Thus, compared with directorial experience, the skills gained during intra-industry managerial experience are more practice-based, and they require self-discovery and learning about context-specific strategic planning and implementation.

We expect both directorial and managerial experiences to add positive effects on the firm's post-entry growth. Intra-industry directorial experience enhances the board's ability to perform its monitoring and advisory functions, as directors more intuitively understand what drives success in this business, and thus are equipped with know-how to both give meaningful advice to managers and challenge their proposals when necessary. Directors' managerial experience in the industry gives them connections with industry players, which can be leveraged to create new business ties for the venture (Certo, 2003; Oh *et al*., 2006). Their insight on operational/implementation issues improves their ability to relate to CEO's ongoing challenges and managerial perspective (Sundaramurthy *et al*., 2014). The firm's managers may also more actively seek advice from outside directors with managerial experience in the industry due to their similarity in hierarchical positions and industry affiliation (McDonald and Westphal, 2003). A common base of industry expertise can increase conversations between directors and senior management, resulting in superior decision making that generate post-entry growth.

[2] Tasks of board of directors include: (1) identifying threats or opportunities to the company and shaping long-term strategy; (2) evaluating and monitoring strategy implementation; (3) advising during major decisions such as mergers and acquisitions; (4) building external relations and bolstering the company's image within the community; and (5) evaluating and rewarding senior management and planning for management succession (Hillman and Dalziel, 2003; Lynall, Golden, and Hillman, 2003).

Hypothesis 3a: The number of outside directors with intra-industry directorial experience is positively related to an entrant's post-entry growth.

Hypothesis 3b: The number of outside directors with intra-industry managerial experience is positively related to an entrant's post-entry growth.

Learning from industry outsiders through outside directors

Outside directors may also be endowed with *other-industry experience*, which they accumulated through their service through positions in other industries. Outside directors from established industries are important in linking and legitimizing ventures in a new market to external audiences (Certo, 2003; Hillman and Dalziel, 2003). Outside directors' external ties can help the new entrants to form partnerships (Beckman *et al.*, 2014) with already-established and prominent organizations, which signal the quality and legitimacy of both of these ventures, as well as emerging products/service categories (Baum, Calabrese, and Silverman, 2000; Navis and Glynn, 2010; Stuart, Hoang, and Hybels, 1999). Outside directors from established industries have network ties with customers and suppliers in various business domains; consequently, they can provide entrants with opportunities to expand the customer bases beyond the new market (Bailey and Helfat, 2003).

Further, including outside directors with other industry experience can enhance the board's ability to give astute and novel advice for new entrants to achieve growth in a competitive and changing environment. Their other-industry experience reflects the diversity of knowledge, connections, and mental maps that the outside directors can provide to the board (Adner and Helfat, 2003; Eisenhardt and Schoonhoven, 1990). Directors' knowledge of other industries is linked to their ability to think "outside the box" and have a cosmopolitan view in crafting strategy and governance solutions (Beckman and Haunschild, 2002; Useem, 1984). Such insights may help the firm to achieve differentiation and an innovative market positioning so that the firm can avoid direct competition with rivals. Directors' varied set of industry knowledge and connections are highly prized in changing industry environments that require adjustments in the firm's business model, capabilities, and strategic partnerships (Carpenter and Westphal, 2001). With other-industry experience on board, entrants should be able to see the focal industry from different perspectives and incorporate the wisdom of change from other industries.

It should be noted that genuine industry outsiders are not entrenched in the focal industry because they do not have focal industry experience, which ensures that they rely on mental maps, knowledge bases, and ideas from other industry domains. The fact that they are not focal industry experts is what enables them to make novel contributions and engage in outside-the-box thinking. Such fresh thinking matters because in the absence of industry outsiders, board decision making can be somewhat rigid when dominated by directors with extensive intra-industry experience (Busenitz and Barney, 1997). Having industry outsiders on the board ensures infusion of insights and methodologies from other domains into the current board setting. This outside view and fresh thinking in the board both challenges and balances the influence of firm-specific directorial knowledge that can entrench at concentrated levels. As the number of directors with an outside expertise increases, they can move from a minority director status (Westphal and Milton, 2000) toward providing more influence on market positioning and business development.

In sum, having more outside directors without any intra-industry experience can enhance the legitimacy of the new venture and can bring in knowledge, social ties, and cognitive maps that are new and revitalizing for the firm, preventing a lock-in to specific firm or industry recipes, and subsequently enhancing the firm's post-entry growth. Accordingly, we hypothesize:

Hypothesis 4: The number of industry-outsiders is positively related to an entrant's post-entry growth.

DATA AND METHODS

Sample and data sources

We empirically test our hypotheses on entrants into the U.S. wireless communications service industry from 1983, the birth of the industry, to 1998. During the period of 1983-1998, the industry evolved continuously and entrants faced great uncertainty, with constant changes in supply and demand conditions, recurrent progress in the underlying technology, active market entry and exit, and frequent corporate merger and alliance events (Chen *et al.,* 2012).

As identified by the Federal Communication Commission (FCC) licenses, a total of 88 entries occurred into the wireless communications service industry between 1983 and 1998, and 16 of them were startup entrants. Most of the 72 diversifying entrants were from the traditional landline or radio communications industries. Post-entry performance data were available for 64 entrants, and the collective market share of these 64 firms ranged from 87% to 100% from 1986 to 1998. After compiling data on entrants' industry entry and exit timing, post-entry performance, board composition, and management team and other firm-level control variables from the time of the entry until 1998 (or firms' prior exit), we arrived at the final sample of 262 firm-year observations from 38 entrants (29 *diversifying* entrants and 9 *startups*), which account for an average of 90% of the 64 entrants' market share over the study period.

Information for the sample and variable measurements is collected from a wide range of sources, including Corporate SEC filings (annual reports), Donaldson, Lufkin and Jenrette Securities' Cellular Communications Industry Reports, RCR News Reports, FCC's CMRS Reports, CTIA annual reports, Moody's Unlisted OTC Manual, OTC Manual and Industry Manual, Dun & Bradstreet Corporate Management, Phillips Wireless and Telephone Industry Directory, Telecom Factbook 1985-1988, Corporate Affiliations, Hoover's Online, Cellular Business, Communications (Englewood), Telephony, Mobile Phone News, and Lexis-Nexis.

Measures

Post-entry growth is the dependent variable in this study and refers to a firm's business growth in the wireless communications service industry. It is measured by the natural log of total number of new cell-phone service subscribers that are added to the focal firm in a specific year, which indicates the volume of new business growth achieved in the year. Growth is a relevant, common, and valid measure for gauging the performance of entrants in emerging businesses (Chandler and Hanks, 1993; Davidsson and Wiklund, 2000; Delmar, 1997; Robinson and McDougall, 2001). In technology environments, sales growth reflects the success of a firm's innovation strategy, because growth is generated by the product and service offerings that are increasingly accepted by customers (Kor, 2003; Lerner, 1999). In high-velocity environments, a firm's resources and capabilities yield growth if they are still applicable in their environment (Eisenhardt and Martin, 2000; Penrose, 1959). Business growth is also valued by shareholders because robust cash inflows sustain the continuity of operations and investments (Boeker and Karichalil, 2002; Kor and Sundaramurthy, 2009).

Our main explanatory variables concern the experience of board of directors. For firms that were created in the wireless communications service industry as a stand-alone venture firm (*startups*), directors are members on the brand new boards of the new venture. For established firms that entered the wireless communications service industry through creating a new business division (*diversifying entrants*), directors are members on the existing corporate board. If established firms set up an independent subsidiary, directors are members on the newly created subsidiary boards. We identify directors from the company's annual reports.

Post-entry firm-specific board experience of directors is measured by the average number of years that directors spent within the board of the focal firm since the firm entered the wireless communications service industry. Both inside and outside directors are considered since a team-specific experience without inside directors is unusual (Baysinger and Hoskisson, 1990).

Pre-entry firm-specific board experience of directors is measured by the average number of years that directors spent within the board of the focal firm up until the firm entered the wireless communications service industry. Both inside and outside directors are considered. Inside or outside directors have pre-entry firm-specific board experience if they have been a board member in the focal firm before the diversifying firm entered the focal industry.

Intra-industry experience through outside directors is measured in two ways to separate directorial experience from managerial experience. First, intra-industry *directorial* experience of outside directors is measured by the number of outside directors with board experience in a competing firm in the wireless communications service industry. Second, intra-industry *managerial* experience of outside directors is measured by the number of outside directors with managerial experience in a competing firm in the wireless communications service industry.

Industry outsiders is measured by the number of outside directors who possess experience only in industries that are outside of wireless communications service. These outside directors do not have focal industry expertise. This construct enables us to capture directors who are outsiders to both the firm and the industry in terms of their human and social capital (Finkelstein, Hambrick, and Cannella, 2009), and thus to incorporate representation of other industry knowledge and mental models in the boardroom (Eisenhardt and Schoonhoven, 1990). As the number of directors with an outside expertise increases, they can move from having a minority director status (Westphal and Milton, 2000) towards being more influential on decisions concerning market positioning and new business development.

Control variables*:* We include control variables at the board-, top management team (TMT)-, firm-, and industry- levels. For board-level controls, we control for the lack of board independence through '*total number of inside directors*' on the firm's board, and the duality of CEO and board chair positions (Coles, McWilliams, and Sen, 2001; Zajac and Westphal, 1994). For management team controls, we control for TMT size, industry experience, and shared-team experience. We include '*TMT size*,' the number of executives on the top management team, as larger groups may have greater problem-solving capabilities (Haleblian and Finkelstein, 1993). We also include '*Industry-specific managerial experience of TMT*,' as an indicator of industry-specific managerial capability (Bailey and Helfat, 2003), and '*Average team tenure of TMT*,' as an indicator for the TMT shared-team experience (Hambrick and Mason, 1984).

At the firm level, we control for prior firm performance, firm age, firm size, entry technology, and post-entry organizational level learning. Prior performance was captured by '*low firm performance at year t-1*,' a dummy variable that takes the value of 1 if the firm performed below the industry average in the prior year. To control for the effect of firm size, we include '*Firm size at year t-1*,' which is the total number of cell-phone subscribers of the focal firm in the prior year. '*Firm age*' is calculated as the number of years since the founding of the firm, and accounts for the accumulative organizational resources, routines and inertia since firm founding. We use '*firm tenure in the industry of wireless communications service*' to control for the organizational level learning-by-doing of the entrant after the industry of entry. Since product technology strategy affects entrants' survival (Bayus and Agarwal, 2007), we also control for '*firm enters with analog technology*,' which is equal to one if a firm enters the industry with the analog (first generation) transmission technology. To control for the resource endowments, following prior studies, we distinguish between startups created within the current industry and diversifying entrants entering from other industries. A firm is a diversifying entrant if it (or its corporate parent) operates in one or more businesses prior to entering the wireless communications service industry. It is a startup if it is an independent entrepreneurial firm.

Further, we include two industry-level variables to control for the increases in firm performance due to the industry-specific factors (Hansen and Wernerfelt, 1989). We include the four-firm concentration ratio '*CR4*' to account for the level of competition in the industry. To account for the firm growth driven by industry growth, we control the industry growth rate in the prior year, i.e., '*Ln (growth rate of industry subscribers)*.'

Data analysis

To test our hypotheses, we use the random-effects model with standard errors to incorporate time-invariant dummy variables in our model (such as diversifying entrant and firms that entered with analog technology), as the fixed-effects model does not allow estimation for such variables. We estimated our models both with and without clustered standard errors to account for possible heteroskedasticity and serial correlation within a cluster (Petersen, 2009) and attained consistent results. Table 1 summarizes the measurements and descriptive statistics for our variables. Table 2 provides the correlation matrix. There are no statistically significant differences in mean values of board characteristics between diversifying entrants and startups and these comparison test statistics are available upon request.

Insert Table 1 and Table 2 here

We also checked for potential endogeneity in our models (Greene, 2000) since post-entry performance may have an effect on the credentials of the directors a firm is able to attract and appoint to the board. We performed a Hausman (1978) test of endogeneity to examine if the five types of director experience in our models can be treated as exogenous, and found that endogeneity is an issue in our models. To address this issue, we utilized the instrument variable two-stage least squares (IV 2SLS) regression, which involves estimation of endogenous variables by using instrumental variables in the first stage, and the predicted values of the endogenous variables are then utilized in the second stage to produce the unbiased coefficient estimates that can be used for hypothesis testing. Following Semadeni, Withers, and Certo (2014), we used more than one instrument (per endogenous variable) and gave attention to the issue of relevance and exogeneity in choosing our instruments. We utilized twelve instrumental variables to predict each of the five types of director experiences. Instruments #1-5 capture specific gaps of expertise in the top management team, in which the firm is trying to recruit. These instruments include the number of executive positions open in the functions of (1) marketing, sales, and customer services, (2) technology, engineering, MIS, and networks, (3) administration and operations, (4) finance and accounting, and (5) legal and public relations at t-1, which are calculated by the number of newly appointed executives in each function at t. These managerial recruitment decisions can be linked to the current board director expertise profile, because directors' experience background and demographics are known to shape the recruitment choices of top executive background (Westphal and Fredrickson, 2001). Likewise, any shortage of industry experience in the firm's management team can drive the need for industry experience in the focal boardroom (Kor and Misangyi, 2008); thus, instrumental variables #6-7 capture the average years of managerial industry experience in *departing* and *existing* TMT members at t-1. We further included instruments (#8-9) of the percentage of existing managers hired from outside at t-1, and the percentage of inside directors on the board. These instruments are used because a firm's tendency to go outside for human capital at the upper echelons may influence the credentials of directors recruited and appointed to the board (Westphal and Zajac, 1995). In addition, the presence of outdated technology knowledge in the board or the firm may drive the need to appoint outside directors with new perspectives (Henderson, Miller, and Hambrick, 2006). Accordingly, we used the instruments (#10-11) of the percentage of directors appointed to the board during analog technology regime, and a dummy variable that captures if focal firm entered the wireless communications service market before 1991, which marks the start of the digital regime. Finally, the last instrument (#12) captures the calendar year that the firm entered the wireless communications service market, which may affect the specific (outside) directors available for recruitment from within the industry.

In the first stage regressions, all F-tests associated with the estimation of the five board experience variables were statistically significant, indicating that the chosen instruments are relevant and effective in capturing significant variation in predicted variables. For the five director experience constructs (post-entry firm-specific board experience, pre-entry firm specific board experience, intra-industry managerial and directorial experience of outside directors, and industry outsiders), the corresponding F-statistics and their p-values were 41.62, 4.11, 1.87, 4.96, 13.54, and 0.00, 0.00, 0.04, 0.00, 0.00. Significant p-values from these F-tests from the first-stage regression suggest that instrumental variables are highly correlated with the original director experience variables. In addition, we performed the Sargan-Hansen (1958) test to ensure that instruments did not introduce endogeneity into the regressions. P-values for the Sargan test were 0.2, 0.11, and 0.69 for Models 1-3 in Table 3. These p-values indicate that instruments are uncorrelated with the error term and are correctly included in the estimated equation.

RESULTS

Table 3 presents the IV 2SLS random-effect regression results for testing Hypotheses 1-4. In Table 3, Models 1 and 2 examine the effects of directors' firm-specific board experience and outside directors' intra- and other- industry experience on the growth in cell-phone service subscribers of entrants respectively. Model 3 includes all explanatory variables in the analysis.

Hypothesis 1 predicts that the post-entry firm-specific board experience of directors is positively related to post-entry performance at a decreasing rate. Both Models 1 and 3 show that the coefficient for the first order of post-entry firm-specific board experience of directors is positive and significant ($\beta = 1.12$, $p<0.05$ in Model 1 and $\beta = 1.32$, $p<0.05$ in Model 3) and the coefficient for the second order of this variable is negative and significant ($\beta = -0.09$, $p<0.05$ in Model 1 and $\beta = -0.10$, $p<0.05$ in Model 3). Thus, hypothesis 1 is supported. The mean and the standard deviation of post-entry firm-specific board experience of directors are 5.47 and 2.17 years, respectively. Within the data range of our sample, we plotted the relationship between post-entry firm-specific board experience of directors and post-entry performance in Figure 1, which illustrates an inverted-U shape curve and the peak value of post-entry firm-specific board experience of directors, is 6.6 years.

Hypothesis 2 predicts that pre-entry firm-specific board experience of directors is negatively related to post-entry performance. Models 1 and 3 in Table 3 indicate a negative coefficient for the pre-entry firm-specific board experience of directors (β= -0.19, p<0.01 in Model 1 and β= -0.16, p<0.05 in Model 3). Thus, hypothesis 2 is supported.

Hypotheses 3a and 3b predict that outside directors' *directorial* experience and *managerial* experience in competitors are positively related to an entrant's post-entry performance. Contrary to hypothesis 3a, Models 2 and 3 show that the coefficient of outside directors' *directorial* experience in competitors is negative (β= -0.77, p<0.05 in Model 2 and β= -0.72, p<0.10 in Model 3). Therefore, hypothesis 3a is not supported. Model 2 indicates that the coefficient of outside directors' *managerial* experience in competitors is significant and positively associated with post-entry performance (β= 0.48, p<0.05 in Model 2), but this variable is insignificant in the full model (β= 0.34 in Model 3). Thus, there is weak support for Hypothesis 3b.[3]

Hypothesis 4 predicts a positive relationship between the number of industry-outsiders and an entrant's post-entry performance. The coefficient of total number of outsider directors from other industries is positive in Models 2 and 3 (β= 0.09, p<0.01 in Model 2 and β= 0.08, p<0.05 in Model 3). Thus, the results corroborate hypothesis 4.

Insert Table 3 and Figure 1 here

DISCUSSION AND CONCLUSION

[3] The current paper's empirical findings are consistent with Williams, Chen and Agarwal (forthcoming), which examines the effects of executive team experience background on post-entry performance. While our paper differs from theirs in that ours focuses on the experience of board of directors and theirs focuses on the experience of top executives, both papers show that managerial industry expertise is valuable at the firm upper echelons whether it is provided by the board members or by the executives who previously worked in competitor firms. The current paper (in H3b) captures the overall effect of *human capital stock* of board directors in terms of intra-industry managerial expertise (the number of outsiders with such expertise) whereas Williams et al. (forthcoming) capture the effect of *human capital flow* into the executive team (i.e., the number of new additions with industry expertise). Williams et al. (forthcoming) also provide a nuanced finding that adding new seasoned executives from industry competitors to the executive team can be *less valuable* than adding rookie executives from industry competitors who are first-time senior executives. These rookie managers may have more flexible mental models and can better transition into the focal firm executive team. Both papers underscore the importance of experience-based human capital of executives and of board directors in driving post-entry performance outcomes.

The current study aims to join the entrepreneurship and board governance literatures by developing and testing theory on how a new market entrant's board capital design choices affect its ability to generate growth in the post-entry environment. We tested our theory in the context of the U.S. wireless communications service industry from the birth of the industry in 1983 to 1998. We find that directors' *post-entry firm-specific* board experience has a positive impact on the venture's ability to generate post-entry growth at a diminishing rate, and that this experience reaches its performance plateau around 6.6 years. In contrast, the inherited *pre-entry firm-specific* board experience of directors has a negative impact on the entrant's ability to generate growth. We attribute this negative effect to directors' entrenchment in cognitive maps and internal social capital within pre-existing businesses, which hinder learning and engaging with the new venture.

Outside directors with prior intra-industry board appointments in competitors have an unexpected negative effect on post-entry growth in subscribers. Although intra-industry directorial experience of outside directors can bring in the tacit knowledge of industry dynamics and industry network access, it is likely that such experience may also yield negative effects that outweigh its benefits. One such negative effect may be over-exposure of the focal firm's strategy to the rival firms as some of the directors may be highly entrenched in the industry networks (Pahnke, Katila, and Eisenhardt, 2015). These industry-expert directors may offer the entrant the same recipes used by industry incumbents, and thus fail to assist the entrants to build their own unique market positioning and expose the entrant to direct competition with the incumbents. In contrast, we find that outsiders' intra-industry managerial experiences contribute to post-entry growth, although this positive effect has weak support. Finally, we find that outside directors are a key source of strategic renewal for the board when they bring expertise acquired from other industry domains.

The current study makes the following contributions. First, our paper is one of the first to provide insight about how the differences among new entrants in their board governance capabilities can impact the entrants' ability to scale up and create a successful growth trajectory following entry. A board's contribution to a sound post-entry growth strategy is supported by the key forms of expertise and connections that directors accumulated within the firm or acquired externally.

Second, we demonstrate that different board expertise configuration and development patterns have implications for post-entry performance. When entering an emerging new market, directors' 'learning-by-doing' about this domain on the focal firm board (i.e., via post-entry firm-specific board experience) is far more valuable than prior (or inherited) board knowledge of the parent company. For board governance of post-entry venture growth, the inherited board experience (on the parent firm board) is a governance liability rather than an asset. Growth is enhanced as directors accumulate post-entry firm-specific board experience up to a point, but entrants need to balance it with director expertise acquired from external sources.

Third, the current study adds a nuanced understanding of how firms can benefit from having outside directors with focal industry experience. Our results show that while outside directors' *managerial* experience in the new industry domain may serve as an asset for board governance, their *directorial* experience in the industry weakens board governance capability. Thus, it is beneficial for outsiders to have directorial experience in other industry domains, which adds to the diversity of experience and network access they bring to the board. We further demonstrate that entrants are more successful in generating post-entry growth when they have true industry outsiders on the board who are exclusively experienced in other industry domains. Overall, our findings highlight that a mix of directors with firm-specific board experience and complementary other domain expertise can be most apt for governance of post-entry growth as these boards can both leverage expertise of the current domain and also stay open to strategic renewal and change.

Our paper provides managerial implications for board design in the context of post-entry growth and competitiveness. The empirical findings suggest that, for diversifying entrants, their new venture division is unlikely to receive the type of governance it needs from a pre-existing board which is likely to be deeply engaged with existing businesses. If the new market entry is a strategic investment for the parent firm, it is worth setting up a separate board of directors for the venture where directors are not linked with the parent firm board. In addition, for both startups and diversifying entrants, it is important to steadily build firm-specific board expertise, which means aiming to retain some of the initial recruits to the board so it can develop a critical mass of firm-specific expertise. At the same time, in order to renew board capability, firms should recruit outside directors with intra-industry managerial experience, but with directorial experience in other industries. Likewise, appointing genuine industry outsiders (with no experience in the focal industry) should inject fresh thinking into board governance, which is critical for renewal of the firm's growth strategy and market positioning over time. Outside sources of director expertise may be both related and unrelated industries. The advantage of related industry experience is that it should be easier to leverage and apply to the current domain; however, it may not introduce as novel of thinking as unrelated industry knowledge can. Unrelated industry expertise is likely to provide highly novel insights; however, due to the potential distance to the current domain, it may not be easily accessible to decision makers from a cognitive perspective.

Like most research, our paper has limitations. First, our data come from a specific industry during a specific time period (U.S. wireless communications service industry from 1983 to 1998). Such data may limit the generalizability of our empirical findings to other industries or other time periods within the same industry. Second, our sample construction is more inclusive of successful firms: 38 entrants in the sample account for about 90% of total market share, whereas the excluded 26 entrants account for 10%. Our inability to capture the latter group in the sample is a limitation of the paper. Third, our performance measure is not a profitability indicator, which is more commonly used for established firms. We used a growth-based indicator, which is a suitable performance indicator for the emerging and growth stages of the firm. Very few firms reported a positive return in the early years of the industry due to the high set-up cost of telecommunications equipment, making profitability comparisons noisy and indeterminate. We were also limited due to the fact that profitability indicators are typically disclosed only at the corporate level, which prevents getting data on the profitability of specific line-of-business for diversifying entrants. Fourth, for parsimony, we did not examine all potential types of director human and social capital, or consider the behavioral patterns associated with interlocking directorates, as they were beyond the scope of this paper. When examining directors' outside experience, it would have been useful to make a distinction between related versus unrelated industry experience, as they may have different performance implications. Fifth, due to data restrictions, we were not able to control for the level of diversification among firms, which may correlate with the number of industry outsiders on board, which is a limitation of the study.

Future studies can examine how board experience in a specific firm and industry can affect a firm's competitive behavior (He, Mahoney, and Wang, 2010). Our paper corroborates the view that board composition reflects organizational needs. Given that an organization's need for board services can change as it evolves (Lynall, Golden, and Hillman, 2003), future studies can further investigate the match between board composition and organizational life-stage (Kor and Misangyi, 2008). Future studies can also examine the fit between board composition and *industry* life-cycles and explore how firms adjust their board capital to match their environments (Aguilera *et al*., 2008). Finally, given the demonstrated advantages of having outside directors on the board (including true industry outsiders), future studies can investigate the industry origins of these outsiders.

In conclusion, our paper is at the intersection of research on venturing into a newly emerging industry as a form of entrepreneurship, and research on board governance. A simultaneous consideration of these literatures enabled us to develop and test a theory that provides the boundary conditions under which board governance capabilities serve as a source of competitive advantage. We welcome future research that further enhances our knowledge of how boards can facilitate market entry and contribute to superior post-entry performance.

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Table 1: Measures and descriptive statistics of variables

Variable	Measurement	Mean	Std. Dev.	Min	Max
1. Post-entry growth	*Natural log of new cell-phone service subscribers added to the focal venture in year t*	11.15	1.61	6.25	14.94
2. Post-entry firm-specific board experience of directors	*Avg. years of board tenure of "all" directors after the firm enters the wireless communications service industry*	5.47	2.17	1.38	11.67
3. Pre-entry firm-specific board experience of directors	*Avg. years of board tenure of "all" directors within its corporate parent prior to its entry to the wireless communications service industry*	2.19	3.79	0	16.86
4. Intra-industry *directorial* experience through outside directors	*Number of outside directors with board experience in other firms in the wireless communications service industry*	0.22	0.77	0	10
5. Intra-industry *managerial* experience through outside directors	*Number of outside directors with TMT experience in other firms in the wireless communications service industry*	0.24	0.68	0	5
6. Industry outsiders	*Total number of outside directors without managerial or directorial experience in the wireless communications service industry*	7.88	3.99	0	18
7. CEO chairman	*=1 if chairman is also the president or CEO*	0.71	0.56	0	2
8. Total number of inside directors	*Total number of inside directors on the board*	2.56	1.51	0	10
9. TMT size	*Total number of managers in the TMT*	8.96	4.96	1	31
10. Industry-specific managerial experience of TMT	*Avg. years of executive experience of TMT members in the wireless communications service industry*	4.72	1.79	1.67	12.14
11. Average team tenure of TMT	*Avg. years of team tenure of all TMT members*	4.56	1.77	1	12.14
12. Low firm performance at year t-1	*=1 if focal firm size is lower than the industry average in year t-1*	0.65	0.48	0	1
13. Firm size at year t-1	*=Natural log of firm cell-phone service subscribers in year t-1*	11.72	1.87	5.70	15.54
14. Firm age	*=Focal year-firm founding year+1*	38.42	37.79	1	118
15 Firm tenure in the industry of wireless communications service	*=Focal year-firm market entry year+1*	6.55	3.31	1	14
16. Firm enters with analog technology	*=1 if focal firm enters the wireless communications service industry with analog (first generation) technology*	0.95	0.22	0	1
17. *Diversifying* entrant	*=1 if focal firm operates in other industries before entering wireless communications service industry*	0.78	0.41	0	1
18. CR4	*Four-firm concentration ratio*	0.47	0.06	0.39	0.58
19. Ln(growth rate of industry subscribers)	*Ln(growth rate of industry subscribers)*	14.83	1.07	11.47	16.19

Table 2: Correlation matrix

	Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	Post-entry growth	1.00																		
2	Post-entry firm-specific board experience of directors	0.40	1.00																	
3	Pre-entry firm-specific board experience of directors	-0.35	-0.04	1.00																
4	Intra-industry *directorial* experience through outsiders	0.20	-0.07	-0.13	1.00															
5	Intra-industry *managerial* experience through outsiders	0.10	-0.10	-0.11	0.30	1.00														
6	Industry outsiders	0.27	0.25	0.10	-0.08	-0.20	1.00													
7	CEO chairman	0.21	-0.12	-0.18	0.04	-0.11	0.25	1.00												
8	Total number of inside directors	-0.08	-0.01	0.11	0.08	0.06	0.04	0.38	1.00											
9	TMT size	0.32	0.20	0.02	0.14	0.20	0.19	0.19	0.18	1.00										
10	Industry-specific managerial experience of TMT	0.22	0.49	-0.16	0.08	0.05	-0.02	-0.01	-0.06	-0.04	1.00									
11	Average team tenure of TMT	-0.01	0.46	0.05	-0.09	0.06	0.07	-0.11	-0.02	0.03	0.81	1.00								
12	Low firm performance at year t-1	-0.57	-0.14	0.24	-0.07	0.03	-0.36	-0.24	0.03	-0.23	0.11	0.12	1.00							
13	Firm size at year t-1	0.90	0.56	-0.30	0.18	0.02	0.30	0.22	-0.05	0.35	0.31	0.11	-0.62	1.00						
14	Firm age	-0.02	0.18	0.30	-0.13	-0.14	0.47	-0.09	-0.13	0.07	0.13	0.27	-0.05	0.04	1.00					
15	Firm tenure in wireless communications service	0.60	0.82	-0.22	0.06	-0.01	0.32	-0.02	-0.07	0.21	0.49	0.42	-0.30	0.73	0.13	1.00				
16	Firm enters with analog technology	-0.19	0.31	-0.08	-0.14	-0.02	0.19	0.07	0.18	-0.09	0.15	0.14	0.09	-0.10	-0.01	0.30	1.00			
17	*Diversifying* entrant	0.15	0.08	0.31	0.03	-0.25	0.46	0.10	0.08	0.02	-0.09	-0.07	-0.25	0.20	0.43	0.15	-0.12	1.00		
18	CR4	-0.25	-0.22	0.06	-0.17	-0.11	0.17	0.20	0.13	0.00	-0.24	-0.12	-0.10	-0.24	-0.04	-0.33	0.16	-0.01	1.00	
19	Ln(growth rate of industry subscribers)	0.37	0.53	-0.07	0.23	0.11	-0.12	-0.22	-0.08	0.08	0.47	0.29	0.08	0.44	0.04	0.63	-0.10	0.00	-0.56	1.00

Table 3. IV two-stage regression results for the effects of firm-specific board experience of directors and industry experience of outside directors on post-entry performance

	Dependent variable: Post-entry growth in subscribers Natural log of new subscribers added to focal firm at year t	**H**	**(1)**	**(2)**	**(3)**
	Post-entry firm-specific board experience of directors				
1	Directors' average years of board tenure within firm post-entry	**H1**	1.12* (0.51)		1.32* (0.61)
1^2	Directors' average years of board tenure within firm post-entry^2	**H1**	-0.09* (0.04)		-0.10* (0.04)
	Pre-entry firm-specific board experience of directors				
2	Directors' average years of board tenure within firm pre-entry	**H2**	-0.19** (0.07)		-0.16* (0.07)
	Intra-industry <u>directorial</u> experience through outside directors				
3	Number of outside directors with directorial exp. in competitors	**H3a**		-0.77* (0.30)	-0.72+ (0.37)
	Intra-industry <u>managerial</u> experience through outside directors				
4	Number of outside directors with managerial exp. in competitors	**H3b**		0.48* (0.23)	0.34 (0.35)
	Industry outsiders				
5	Total number of outside directors from other industries	**H4**		0.09** (0.04)	0.08* (0.04)
	Control				
	CEO chair		-0.18 (0.13)	-0.09 (0.15)	-0.29+ (0.17)
	Total number of inside directors		0.03 (0.05)	0.02 (0.05)	0.06 (0.05)
	TMT size		0.03* (0.01)	0.02 (0.02)	0.03+ (0.02)
	Industry-specific managerial exp. of TMT		-0.09 (0.12)	0.34** (0.10)	0.10 (0.14)
	Average team tenure of TMT		0.03 (0.12)	-0.40** (0.09)	-0.15 (0.13)
	Low firm performance at year t-1		0.16 (0.19)	-0.07 (0.19)	0.20 (0.22)
	Firm size at year t-1		0.67** (0.08)	0.62** (0.08)	0.72** (0.09)
	Firm age		0.00 (0.00)	-0.01+ (0.00)	-0.00 (0.00)
	Firm tenure in the industry of wireless communications service		-0.48 (0.31)	-0.05 (0.12)	-0.79* (0.40)
	Firm tenure in the industry of wireless communications service^2		0.03+ (0.02)	0.01 (0.01)	0.04* (0.02)
	Firm enters with analog technology		-1.02* (0.46)	-1.48** (0.44)	-1.18* (0.49)
	Diversifying entrant		0.15 (0.28)	-0.11 (0.22)	0.10 (0.35)
	CR4		-1.37 (1.09)	-1.46 (1.24)	-1.68 (1.39)
	Ln(growth rate of industry subscribers)		0.05 (0.13)	0.03 (0.12)	0.18 (0.15)
	Constant		2.88 (2.62)	5.32* (2.24)	0.74 (3.12)
	r2_w		0.74	0.64	0.67
	r2_b		0.82	0.89	0.83
	r2_o		0.76	0.76	0.74
	Wald chi2		795.25	726.75	679.31
	Instrumented variables		1,1^2,2	3,4,5	1~5
	P- value of Sargan-Hansen statistic		0.2	0.11	0.69

Standard errors in parentheses: + p<.10, * p<.05, ** p<.01; 38 firms with 262 firm-year observations; G2SLS random-effects IV regression

Figure 1: Predicted change in venture growth in subscribers at different levels of post-entry firm-specific board experience of directors (based on regression results in Model 3 in Table 3, other variables remain constant)