WHOSE EXPERIENCE MATTERS IN THE BOARDROOM? THE EFFECTS OF EXPERIENTIAL AND VICARIOUS LEARNING ON EMERGING MARKET ENTRY

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Using an organizational learning perspective, we develop arguments about vicarious learning through board interlocks and its relation to experiential learning. Although it is well established that firms learn from board interlocks, little attention has focused on which types of interlocks are most consequential and why. We distinguish between the relative advantages of various tie attributes such as experience, authority, and credibility and argue that these distinctions lead to measureable differences in learning outcomes. We further demonstrate that whether vicarious learning substitutes or complements focal firm experiential learning depends upon the type of interlock involved. After accounting for the endogeneity of ties, we find support for our framework in a longitudinal analysis of foreign investments by German firms in emerging economies between 1990 and 2003. Copyright © 2013 John Wiley & Sons, Ltd.

INTRODUCTION

Board interlocks are established when an individual affiliated with one firm serves on the board of another firm, and function as one of the most important sources of learning regarding strategic issues. Interlocks have been shown to influence key decisions such as acquisitions (Beckman and Haunschild, 2002), organizational structure (Palmer, Jennings, and Zhou, 1993), business group affiliation (Khanna and Rivkin, 2006), and strategic persistence (Geletkanycz and Hambrick, 1997). Most studies implicitly assume that all interlocks matter relatively equally regardless

of the characteristics of the individual establishing the tie (Shropshire, 2010). Yet individuals creating board interlocks vary along important dimensions likely to affect learning such as the nature of their experience (e.g., first- or second-hand), their credibility as transmitters of knowledge, and the influence they have over focal firm decisions. As a result, we expect that some ties matter more than others in helping firms learn vicariously about strategic opportunities and thus have varying degrees of impact on the strategic actions of firms.

In addition, we have a limited understanding about how experiential learning (the firm's internal knowledge acquisition) relates to the vicarious learning that can be obtained via board interlocks—which represents a key limitation in the organizational learning literature more generally (Argote and Miron-Spektor, 2011). Yet there is good reason to believe that the outcomes from vicarious learning, including which types

of interlocks are most influential, are dependent on how much experience the focal firm has with the issues on which interlocks provide knowledge (Levitt and March, 1988).

We argue that differences in learning outcomes arise from two important points of distinction across individuals forming board interlocks. First, directors differ in the type of experience they possess regarding specific domains of knowledge (Carpenter and Westphal, 2001). Some directors have developed knowledge about particular strategies through first-hand action (Kroll, Walters, and Wright, 2008), while others have more coarse-grained knowledge acquired from second-hand observations of other firms' strategies (Geletkanycz and Hambrick, 1997; Haunschild, 1993). Those with first-hand experience are likely to be better transmitters of knowledge due to the primacy of their experience, the vivid caselike descriptions they can provide, and the credibility they have with other board members. Second, some directors who create board ties are CEOs with ultimate decisional authority in the focal firm or in their home organization, while others are non-CEO top managers lacking this ultimate authority. This difference in hierarchical authority may affect the credibility of the director and the potential he or she has to influence the focal firm's adoption of novel strategies (Kroll *et al*., 2008). We build upon these dimensions to present a theoretically derived model of interlock influence that helps us to study *which* ties matter most. We further demonstrate that experiential learning substitutes the vicarious learning from some types of interlocks but complements the learning from others, depending on the nature of knowledge brought by the individual forming the interlock. By addressing this issue, we make an important theoretical contribution by demonstrating *when* vicarious and experiential sources of learning function as substitutes or complements.

Another important contribution comes from empirically accounting for the potential endogeneity of interlocks. Extant literature in this domain has not addressed the possibility that interlocks may influence firms' actions because of selection rather than learning. That is, it could be that certain individuals are simply easier to attract to a focal firm's board or have more attractive characteristics to begin with—making interlocks influential not because of learning but due to differential selection. We find support for our learning propositions while directly accounting for the possibility of selection in our analysis.

Emerging market entry as the learning context

Our empirical context provides a unique opportunity to test our hypotheses. We examine German firms' foreign direct investments into 21 former Warsaw Pact countries between 1990 and 2003. After the sudden fall of communism in 1990, an entire new set of markets was made available to foreign investors. However, uncertainty regarding the viability of such investments was particularly high because Western firms were virtually nonexistent in countries behind the Iron Curtain. It was rare to find individuals or entities with rich, first-hand experience operating foreign businesses in those countries. This setting makes the need for external information sourcing from board interlocks particularly salient, allowing us to assess the differential impact of different kinds of board ties and their relation to first-hand experience. Moreover, we can observe the gradual build-up of firms' own investment experience in the region under study without the concerns of left censoring and thus credibly assess the interaction of vicarious and experiential learning.

One of the central questions in the FDI literature pertains to where firms choose to invest and what influences location choice (Dunning, 1998). Existing research emphasizes an experiential learning theory of foreign expansion, in which firms learn from their experiences with prior investments in related countries or markets, which reduces the uncertainty that would otherwise preclude or significantly reduce the likelihood of entry (Delios and Henisz, 2003; Johanson and Vahlne, 1977). However, when firms possess little or no experience in a particular region, prior investment experience provides little guidance. This seems to be the case when it comes to emerging or transition countries, which present firms with unique challenges—including unusually rapid growth, political turmoil, institutional voids, liberalization and privatization, and lack of developed markets (Hoskisson *et al*., 2000). These challenges make prior experience in nonemerging markets less useful when evaluating opportunities in such highly risky locations. Consequently, vicarious learning from connections to experienced interlock partners should be especially valuable in helping firms in the process of entering emerging foreign countries.

THEORY AND HYPOTHESES

Organizational learning is the systematic change in knowledge or behavior deriving from prior experience (Argote, 1999). Argote and Miron-Spektor (2011) argued that the most fundamental dimension of experience is whether it is acquired directly by the focal organization or indirectly from others. Learning can arise from first-hand experience, generally referred to as experiential learning (e.g. Levitt and March, 1988). For instance, firms can learn to perform better at acquisitions by engaging in multiple acquisitions, especially of a similar nature (Baum, Li, and Usher, 2000). In addition, organizations learn vicariously by observing the behaviors and experiences of other organizations (e.g. Kim and Miner, 2007).

However, organizations vary in their ability to learn from other organizations (Cohen and Levinthal, 1990). Heterogeneity in organizational learning is a function of firm experience and the nature of ties to other organizations in the environment (Ahuja, 2000). Research suggests that in some contexts firms seem unable to benefit from the knowledge and experiences of other firms in their environment, which might be caused by their own lack of experience (Baum *et al.*, 2000). Consequently, the interplay of direct experience and vicarious experience has drawn increased attention (e.g. Argote and Miron-Spektor, 2011). Experiential learning and vicarious learning may be substitutes or complements, an issue about which research is equivocal (Bresman, 2010; Haas and Hansen, 2005). In fact, Argote and Miron-Spektor (2011) suggested that understanding when these two sources of learning are complements or substitutes is one of the key frontiers in the field of organizational learning.

One important context in which organizations' own experiences intersect with external experiences is in the boardroom (Westphal, 1999). The corporate governance milieu brings together members of the corporate elite from a variety of other organizations into a formal setting where they interact with senior managers of a focal firm. These formal ties between organizations can function as important sources of knowledge transfer and vicarious learning regarding strategic choices (Kalnins, Swaminathan, and Mitchell, 2006). The information flowing through board interlocks is relatively inexpensive, reliable, and focuses on high-level strategic issues (Haunschild

Figure 1.   Outgoing, incoming, and indirect interlocks

and Beckman, 1998)—exposing the focal firm to the actions, processes, and reasoning behind other firms' choices. Such connections are particularly useful when firms are facing novel and uncertain decisions, as demonstrated by a volume of empirical work (e.g. Beckman and Haunschild, 2002; Palmer *et al.*, 1993). We thus take as a starting point the proposition that the more interlocks to other firms with experience in emerging markets the more likely the focal firm is to learn vicariously and enter the same markets as its interlock partners.

Heterogeneity of interlock influence

Our key point of departure from prior research is in relaxing the implicit assumption that all board interlocks provide equal opportunities for learning. Extant work has recognized different types of board interlocks (e.g. Haunschild, 1993; Palmer *et al.*, 1993) but has generally treated these as equally influential both theoretically and empirically. Building on this literature, we distinguish between three ways in which focal firm managers and outsiders create board connections to companies with relevant knowledge about specific emerging markets (as depicted in Figure 1). *Outgoing ties* are created by managers of the focal firm who serve on the board of other companies that have already entered particular emerging markets. *Incoming ties* are established by managers of firms with market entry experience who serve on the focal firm's board. *Indirect ties* are formed by individuals who serve on the board of the focal firm as well as on the board of another experienced firm but are managers neither of the experienced firm nor of the focal firm. Prior literature has used various labels for these different types of interlocks (e.g. 'sent' for outgoing, 'received' for incoming, 'neutral' for indirect).

The individuals forming outgoing, incoming, and indirect ties are distinct in two important ways: in the nature of the experience (first- or second-hand) they bring to the focal firm, and in whether they serve as CEOs or play other roles (e.g. top manager) in the focal or another firm. We argue that these two characteristics lead to differences in the relative strength of learning from directors forming outgoing, incoming, and indirect ties—which become manifested in the strategic decision to invest in a foreign country. Thus, our first set of hypotheses focuses on *how much* each type of tie matters for learning. After our hypotheses regarding this heterogeneity of influence, we shift our focus to *when* each type of tie matters most by exploring the moderating effect of the focal firm's own prior experience. Table 1 provides a brief outline of the key arguments behind each hypothesis.

Discussions in the boardroom revolve around applying board members' relevant knowledge in a strategic domain—in our case, entry into formerly communist countries—to the strategic needs of the focal firm. Research on advice seeking from network partners suggests that when the focal firm lacks its own expertise in a domain of knowledge, the most important criteria in learning from another source is the expertise and credibility of the informant (Nebus, 2006). The nature of experience possessed by an incoming tie is fundamentally different from that possessed by an outgoing or indirect tie. An incoming tie is created by a focal firm director with first-hand experience with evaluating, directing, and overseeing emerging market investments. Consequently, she brings her experiences to the focal firm directly, without an intermediary. This first-hand experience gives such a director fine-grained knowledge, which increases the quality and credibility of the information transferred relative to the third-party learning provided by directors forming indirect ties. For example, incoming directors can bring rich stories and accounts of personal experiences formulating and implementing an emerging market entry strategy. The credibility of these directors' opinions to the focal firm should be especially high because vivid case-type information is of high fidelity and more influential than abstract recounting of someone else's experience (Nisbett and Ross, 1980).

Alternatively, the information or knowledge brought to the focal firm by individuals forming outgoing or indirect ties is second-hand in nature.

A manager creating an outgoing tie brings back second-hand information obtained while supervising another firm with on-the-ground experience. Similarly, an indirect tie is formed by a director who brings second-hand knowledge obtained in a supervisory role as a director of an experienced company. In this capacity, individuals creating outgoing or indirect ties are able to learn vicariously and absorb relevant information. Nevertheless, such second-hand knowledge is not as rich as that of a manager who orchestrates a strategy and oversees its daily operations. As a result, the first-hand information possessed by incoming experienced directors is likely to have a greater influence on the focal firm's decisions than the second-hand information provided by directors forming outgoing or indirect ties—especially for such an uncertain and unprecedented decision as entering an emerging country. This logic leads to the following hypothesis:

> *Hypothesis 1a: Incoming interlocks formed by board members with first-hand experience entering a particular foreign market have a stronger effect on the focal firm's entry into the same foreign market than outgoing or indirect interlocks formed by board members with second-hand experience obtained supervising another firm's entry into the same market.*

As just reviewed, incoming ties possess first-hand knowledge, which has significant learning advantages in boardroom discussions of the focal firm. Alternatively, both outgoing and indirect ties bring second-hand knowledge to boardroom discussions. While outgoing and indirect ties are on similar footing in that regard, the individuals forming these ties differ in one important respect that may affect their relative influence on the focal firm: whether they are insiders or outsiders. Outgoing directors are insiders in the focal firm, thus more intimately aware of its operations, capabilities, and needs because they oversee its ongoing operations. As such, they have superior understanding of the relevance to the focal firm of second-hand knowledge they acquire in their experiences as directors of other firms (Haunschild, 1993). Individuals forming indirect ties lack this insider perspective compared to those forming outgoing ties. As outsiders without direct experience, they may be less in tune with the potential application of the experiences of another firm to the strategic needs of

Table 1. Summary of learning mechanisms for outgoing, incoming, and indirect interlocks

	Type of board interlock		
	Incoming	Outgoing	Indirect
Type of vicarious experience	High level of expertise and credibility due to first-hand information (H1a,b)	Second-hand information but insider familiarity (H1a,b)	Second-hand information with outsider perspective (H1a,b)
CEO vs. TMT	Outsider CEO has greater status and credibility in board discussions than outsider non-CEOs (H2b)	Focal firm CEO has greater decisional authority than internal TMT members (H2a)	Not applicable
Focal firm experience	External knowledge from outgoing and incoming ties substitutes for lack of focal firm knowledge. Once focal firm gains experience, external knowledge becomes redundant, less influential (H3b,c)		External knowledge from Indirect ties is weak but less likely to overlap with direct learning by focal firm, becomes complementary as firm gains first-hand experience (H3a)

the focal firm. Consequently, the distinguishing feature of outgoing and indirect ties—which both lack the first-hand knowledge possessed by incoming ties—is that the individual forming outgoing ties is an insider in the focal firm. Thus,

Hypothesis 1b. Outgoing interlocks formed by board members with second-hand experience obtained supervising another firm's entry into a particular foreign market have a stronger effect on the focal firm's entry into the same foreign market than indirect interlocks formed by board members with second-hand experience obtained supervising another firm's entry into the same market.

Formal authority: CEOs vs. non-CEOs

The differences in interlock influence established so far consider the nature of directors' experience regarding emerging markets. However, organizational learning from board ties could also be a function of the formal authority possessed by managers of the focal or of the experienced firm—who ultimately serve as the carriers of vicarious knowledge to the focal firm and make the case for implementing a given set of actions. Those forming indirect ties do not possess formal authority at either firm, so the arguments in this section apply only to outgoing and incoming interlocks.

While all outgoing and incoming interlocks are established by directors who serve as top managers at either the focal or partner firm, they differ in their potential to utilize that knowledge in ways to shape the focal firm's strategy. Some executives are likely to have significantly greater discretion to put their knowledge to use and to shape the focal firm's actions proactively (Hambrick and Finkelstein, 1987). While multiple forces affect executive discretion, we focus on the formal authority vested in CEOs relative to non-CEO executives. CEOs are more likely to be persuasive when bringing their knowledge to bear on the firm's existing strategy and to affect the course of the firm in ways that other executives cannot (Kroll *et al.*, 2008). The mechanisms are slightly different for CEOs of the focal firm creating outgoing interlocks and CEOs of other firms creating incoming ties. We discuss each in turn.

Managerial characteristics vary between members of the top management team who serve externally on other firms' boards. While these managers are well acquainted with the strategy and decision making process of the focal firm, formal authority gives some executives the ability to establish policies, procedures, and long-term objectives directly. Within a top management team, a CEO clearly has formal authority and power to shape consequential decisions such as entry into emerging markets. Non-CEO managers creating outgoing ties have similar opportunities as the CEO to learn from

other firms, but they have a disadvantage with respect to authority and discretion to use their learning to redirect the focal firm's strategy. Consequently, we expect that CEOs creating outgoing interlocks will be in the best position to utilize the knowledge gained about other firms' emerging market entry decisions and integrate such knowledge into the focal firm's strategic planning in the future, suggesting

H2a: Outgoing interlocks formed by CEOs who supervise other firms with experience entering a particular emerging market have a stronger effect on the focal firm's entry into the same foreign market than outgoing interlocks formed by non-CEOs.

Focal firm managers seek for help on strategic matters from other firms' top managers. Access to executives of other firms is valuable in part because they can provide an outsider's more independent and objective perspective on issues facing the firm (Geletkanycz and Hambrick, 1997). While research identifies external directors as one key source of outside advice, director experience is often treated without regard for the identification of the director who possesses the valuable experience. However, the acceptance of advice is largely based on who is providing it (Berlo *et al.*, 1969). Advice givers, even advisors on boards of directors, are not uniformly viewed as credible on all issues.

Source credibility is *the* most potent means of persuasion and is a function of expertise, veracity, and benevolence (McCroskey and Young, 1981). In as much as firms are unlikely to appoint board members who are untruthful or malevolent, we focus our discussion on expertise. Credibility is the assessment of believability of an information source and whether that source is a reliable guide to belief and behavior (O'Keefe, 2002). The credibility of a board member's expertise with emerging markets may vary based on the degree to which the director is perceived as the architect of the market entry strategy. Because CEOs are ultimately responsible for the formulation, implementation, and performance of their company's strategies, they are likely to be perceived as having a higher level of expertise than other incoming board members who are not CEOs. This logic suggests that incoming ties established by CEOs

of other firms are likely to be more influential than incoming ties established by non-CEOs. Thus:

H2b: Incoming interlocks formed by CEOs of firms with experience entering a particular emerging market have a stronger effect on the focal firm's entry into the same foreign market than incoming interlocks formed by non-CEOs.

When each type of tie matters most: the role of focal firm experience

Having argued for varying degrees of interlock influence, we now turn to the important issue of how experiential learning may modify which sources of vicarious learning are most relevant and thus change the impact of different interlocks. Haunschild and Beckman (1998) reported that alternative external sources of information—for example, industry associations—are substitutes for the vicarious learning gained from board interlocks. We build upon this finding but focus instead on a more direct and accessible source of knowledge residing inside the firm: its own experiential learning. As firms learn from their own experiences with previously unexplored emerging markets, their informational needs are likely to change. This shift in strategic needs should affect the way in which different types of interlocks influence a firm's decisions. We argue that prior experience enhances the impact of some interlocks on firms' actions while diminishing the importance of others.

What remains unclear is whether experiential and vicarious information are substitutes or complements. On the one hand, board interlocks may be most valuable for strategic decision making when they transfer information not available elsewhere (Haunschild and Beckman, 1998). According to this logic, interlocks become less critical and influential if equivalent information is available inside the firm due to knowledge redundancy, leading firm experience to substitute for learning from interlocks. On the other hand, the concept of absorptive capacity suggests that internal and external sources of knowledge may be complementary (Cohen and Levinthal, 1990). A firm with some experience in a particular domain gains at least a rudimentary level of expertise, putting managers in a better position to judge the relevance of an interlock partner's experience. The key to solving this apparent paradox may lie in considering who creates the interlock.

Related experience as a complement to interlocks. Research has shown that, compared to more direct relationships, firms connected through indirect ties obtain relatively weaker, less specific, but nonredundant information from each other about any single issue (Hansen, 1999; Lin, 2001). This observation resonates with existing fieldwork regarding the value of indirect interlocks, which suggests that they serve as conduits of broader knowledge about 'what's out there' regarding the latest actions being taken by firms in the market (Useem, 1984). Information obtained from indirect ties seems thus most valuable when combined with the firm's own experience.

Because of its nonredundancy and second-hand nature, knowledge provided by indirect ties most likely comes to the firm more obliquely than that stemming from direct requests for information regarding specific issues on which the firm seeks advice from experienced individuals. Consequently, knowledge from indirect ties becomes potentially complementary to a firm's internal experiences. Importantly, however, a focal firm lacking absorptive capacity developed through first-hand experience is not likely to benefit much from this broad but less-specific information because it is harder to relate to existing knowledge and to apply to the firm's current concerns. However, once the firm begins gaining its own experience in the general domain on which those creating indirect ties are advising it, its ability to translate that novel information into actionable strategies increases. This suggests that indirect ties will complement firm experience.

> *Hypothesis 3a. As the focal firm gains experience with similar emerging markets, the impact of directors forming **indirect** ties to experienced partners on emerging market entry becomes **stronger**.*

Related experience as a substitute to interlocks. In contrast, scholars have found that direct ties, such as outgoing and incoming interlocks, are more conducive to the 'thick' transfer of tacit knowledge relative to indirect ties (Hansen, 1999). Specifically, the information is rich, first-hand, and specific because of the directness of the connection between informant and receiver. Because the information from incoming and outgoing ties is more self-contained and comes through a richer medium, it is more likely to be applicable in cases in which the focal firm lacks direct experience (Daft and Lengel, 1986). Such pointed information will be especially valuable for firms lacking first-hand experience.

However, as the focal firm gains related first-hand experience, this specific information becomes somewhat redundant and internal information may often be sufficient to meet the needs of the firm's local search when engaging in additional foreign entries. Consequently, an inexperienced firm may be influenced more by vicarious learning opportunities provided by incoming and outgoing ties than an experienced firm. This is consistent with observations of scholars who report that after the transfer of highly specific knowledge, direct ties are less appropriate for firms seeking more general and nonredundant information (Hansen, 1999; Lin, 2001). This logic suggests that outgoing and incoming ties function as substitutes for focal firm experience. Thus, we posit:

> *Hypothesis 3b. As the focal firm gains experience with similar emerging markets, the impact of directors forming **incoming** ties to experienced partners on emerging market entry becomes **weaker**.*

> *Hypothesis 3c. As the focal firm gains experience with similar emerging markets, the impact of directors forming **outgoing** ties to experienced partners on emerging market entry becomes **weaker**.*

DATA AND METHODS

We study the effect of domestic board interlocks on German firms' foreign direct investments into 21 former Warsaw Pact countries between 1990 and 2003. We first describe in more detail the context of German corporate governance as it pertains to board structure and ownership. We then detail the particulars of the data, analysis, and findings.

Institutional setting

Compared to the U.S., the institutional context in Germany shows some important similarities and differences. Of relevance for our analysis are the two-tier board system with worker co-determination, the prevalence of cross-shareholdings among firms, and the prominent

role of large domestic banks and insurance companies. We describe each of these in turn.

The German corporate governance code mandates a two-tier board system consisting of a management board and a supervisory board. Akin to the top management team in U.S. firms, the management board is responsible for strategic and operational decisions. It reports to the supervisory board, which is similar to the board of directors in the U.S. According to the German Corporate Governance Code (2002: 1), 'the supervisory board appoints, supervises and advises the members of the management board and is directly involved in decisions of fundamental importance to the enterprise'.

In line with this mandate, members of both boards are expected to work together, exchange information, and coordinate the firm's strategy. The German Corporate Governance Code also states that the chairman of the supervisory board is especially supposed to keep close contact with the management board and to consult with the chairman of the management board on 'strategy, business development, and risk management' (2002: 9). An important difference between the one-tier board structure of Anglo-American firms and the two-tier board structure in Germany is that members of the management board, including the CEO, are not allowed to serve on their own firm's supervisory board.

To ensure that internationalization strategies are indeed discussed in the boardroom, we conducted interviews with several directors of German firms. These interviews revealed that entries into the newly developing markets in the former Warsaw Pact area were strategic issues of importance. For instance, the chairman of the supervisory board of one firm stated:

> *'Overall, firms' regional strategies are often discussed in the boardroom. Regional strategies are very important, they are tangible, and board members can provide input. Often, board members have experience with running operations in specific regions—and they can provide helpful input on opportunities and risks. Product strategies are discussed less often. [. . .] It is much easier to provide input on regional strategies.'*

A peculiarity of the German two-tier board structure is mandatory worker co-determination.

Rooted in the Co-determination Law (*Mitbestimmungsgesetz*) and tracing back to the Cooperative Management Law (*Montanmitbestimmungsgesetz*) of 1951, the supervisory board consists not only of shareholder representatives but also of employee representatives. These may be employees or trade union representatives. The number of seats assigned to shareholder and employee representatives depends on the size of the firm. In large stock corporations such as the ones in our sample, employee representatives are ensured half of the seats in the supervisory board. However, the chairman of the supervisory board is always a shareholder representative and is allotted two votes in case of a tie in the voting.

A widely discussed characteristic of German corporate governance is the prevalence of cross-shareholdings between firms compared to countries with more dispersed ownership such as the U.S. or the U.K. La Porta, Lopez de Silanes, and Shleifer (1999) describe the case of Allianz—a large insurance company—that had cross-shareholdings with most of its large corporate shareholders. Large sample studies have found that it is not uncommon for German companies to own substantial minority stakes in other German firms, with majority stakes also being prevalent, though not nearly as common (Franks and Mayer, 2001; Windolf and Beyer, 1996). Sometimes referred to as 'Germany Incorporated,' this system of cross-shareholdings arose partly to offer protection against hostile takeovers by relying more on internal mechanisms of control rather than on external capital market interventions. With increasingly global capital markets, cross-shareholdings started to diminish in the mid-1990s.

The largest corporate owners in Germany have traditionally been large domestic banks and insurance companies (e.g. La Porta *et al*., 1999). These companies were among the most important financiers of industrialization in the late 19th century and helped to rebuild the economy after World War II. Besides providing equity, the relationship between banks and other stock corporations was strengthened through long-term credit agreements that are typical of the German governance system (Shleifer and Vishny, 1997). Reflecting this strong influence in financial matters, managers of these influential financial companies often served as directors on other firms' supervisory boards.

In sum, the institutional characteristics of the German governance system present important

similarities and differences with the U.S. setting—which has been the context of most prior work studying learning via interlocks. From our review of prior literature and our interviews of German directors, we conclude that learning about foreign market opportunities seems to occur in this setting. At the same time, the foregoing description suggests a need to account empirically for the influence of several unique features of German corporate governance. We explain our efforts to do so next.

Data and variables

The sampling frame was comprised of firms listed in the index of the 100 largest stock corporations in Germany (the DAX 100). This index represents a broad spectrum of the German economy, with the largest firm equivalent to a company in the top five of the Fortune 500, and the smallest firm falling in the range of mid-caps in the U.S., allowing us to observe a great deal of variance in firm size within the sample. Similar samples of the largest German companies have been used in prior organizational studies (e.g. Sanders and Tuschke, 2007). We removed seven firms that were subsidiaries of other organizations. For the remaining firms, we obtained panel data on their entries into 21 former Warsaw Pact countries for the 14-year period between 1990 and 2003. The target countries in our sample include Armenia, Azerbaijan, Belarus, Bulgaria, Czech Republic, Estonia, Georgia, Hungary, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Romania, Poland, Russia, Slovakia, Tadzhikistan, Turkmenistan, Ukraine, and Uzbekistan. The period of observation helped us avoid left censoring, as direct investments of Western firms in countries behind the Iron Curtain were virtually nonexistent before 1990.

Information on foreign investments in former Warsaw Pact countries is difficult to obtain for German firms. While some firms provide a complete list of foreign properties in their annual reports, large firms tend to restrict their disclosures to investments that exceed a certain percentage of equity. Thus, to obtain complete information we followed three procedures. First, we referred to the 'list of share properties' in the firms' annual report. Second, we contacted each firm's IR department and asked them to provide detailed information on entries into the countries under study or to send the respective 'list of share properties' for the period

1989–2003. If we could not obtain an answer from a firm's IR department, we searched LexisNexis for press reports that contained the name of the company combined with terms related to foreign entry. Furthermore, we referred to information on the firm's foreign investment in the *Handbook of German Listed Companies*. We then contacted the firms again and asked them to confirm or correct our information. Third, we contacted the registration offices of the respective district courts and looked at the firms' original filings to correct inconsistencies and reduce missing data. Our exhaustive effort resulted in complete data for 82 firms. There were several reasons that data were unavailable for the remaining DAX 100 firms, but approximately 80 percent of the missing cases occurred because the firm was delisted during the study's time frame (e.g., acquired by another firm), making it impossible to obtain reliable records of investment in the countries under study. In a few other cases, firms became newly listed in the DAX toward the end of our time frame and did not have complete historical records of market entry.

Ownership data were collected from the annual Hoppenstedt directories, the most authoritative listing of equity ownership in Germany. Data on the economic, political, and demographic characteristics of the 21 countries were collected from statistics published by the United Nations, the International Labor Organization, and the World Bank. Data on the business climate in the countries under study were obtained from BERI S.A. Firm-level variables were collected from annual reports.

Variables

Dependent variable

Our dependent variable, $entry_{jit}$, is an indicator coded as 1 if firm j entered host country i in year t. Following the definition of direct investment of the Organization for Economic Co-operation and Development (OECD) and of the International Monetary Fund (IMF), we ascertained market entry if a firm established a wholly owned facility or acquired at least 10 percent of the ordinary shares of a host country firm. The same measure has been used in other studies on international market entry decisions (e.g. Gimeno *et al*., 2005).

Independent variables

All independent and control variables are lagged (year $t − 1$) with respect to the dependent variable

(year *t*). Our theory focuses on how ties to experienced partners affect firms' market entry choices. Accordingly, we measure interlocks by counting ties to other firms that have previously entered former Warsaw Pact countries. Importantly, we measure interlock experience on a market-by-market basis. Thus, the number of ties depends on partners' prior market entries into specific host countries because a partner may, for example, have experience in Poland but not in Bulgaria. We update the interlock variables annually for each focal firm-target market combination.

The variable *aggregated ties* captures the count of all ties to experienced partners, regardless of the type of tie. This variable is used in a baseline model for the purpose of establishing a general effect for interlocks. In models testing our hypotheses, we disaggregated board network ties into counts of *outgoing ties* created by the focal firm's managers who serve on the board of other experienced firms, *incoming ties* formed by managers of experienced firms who serve on the focal firm's board, and *indirect ties* representing focal firm's board members who are directors of another firm with experience in a particular emerging market but play no managerial role in either firm. To test H2a and H2b, we further distinguished between ties that are created by a CEO (*outgoing CEO* and *incoming CEO*) and by other members of the top management team of the focal firm (*outgoing non-CEO*) or another experienced firm (*incoming non-CEO*), respectively. We again note that indirect ties are not distinguished as CEO or non-CEO because the individuals creating them do not have a managerial responsibility in the focal or the experienced firm.

To capture a firm's *related experience*, we measured each firm's general regional experience with running operations in former Warsaw Pact countries as the number of years since a firm's first market entry in any of the 21 countries (e.g. Henisz and Delios, 2001). In robustness checks, we used an alternative measure capturing the number of countries a firm had entered as of year *t−1*, and our results remained consistent.

Control variables

We included control variables at the country, industry, year, and firm levels. Empirical studies have revealed a positive correlation between the market size of a host country and a firm's propensity for market entry (e.g. Coughlin, Terza, and Arromdee, 1991). Firms prefer to invest in countries with larger market size in order to compensate for the risks and resource requirements associated with foreign market entry. To capture the size of the host country's market we used *GDP*. *Growth in GDP* per capita serves as proxy for market growth and customer purchasing power (Ford and Strange, 1999). These two controls reflect the attractiveness of a host country for market seeking foreign direct investment. The availability of labor is also seen as influencing the attractiveness of a specific host country, especially for factor seeking FDI. In countries with a comparatively high rate of unemployment, the workforce is expected to have a higher level of job appreciation and thus a willingness to accept lower wages and longer work hours (Billington, 1999). To capture this notion, we included the yearly rate of *unemployment* for each country. We also included a control for the *geographic distance* to each emerging market, measured as the distance between the firm's headquarters in Germany and the capital of the host country (log of kilometers). As one moves deeper into Eastern Europe, differences in the languages, cultures, and historical relationships between Germany and the former Warsaw Pact countries increase, and distance imposes higher logistical costs, which should make entry less likely.

To account for the risk and uncertainty associated with a firm's entry in an emerging market, we included information on the business climate in each target country. We used an annually updated index of *market risk* that measures the favorability of the operating climate for foreign business in each country. We obtained this measure from BERI S.A., which surveys a panel of 105 experts who evaluate the overall quality of the business climate (including bureaucratic barriers, stability of government policies, and the degree to which national firms are given preferential treatment). As provided by BERI, market risk scores range from 0 to 100, with risk decreasing as scores increase. For ease of interpretation, we reverse scored this measure by subtracting the raw value from 100 so that higher values correspond to higher levels of risk.

At the firm level, we controlled for firm size by including the log of *employees*. Firm size is related to the ability to enter foreign markets because larger firms tend to have greater financial and social resources. Additionally, we controlled

for profitability by including the firm's *ROA*. Profitable firms are deemed to be more capable of absorbing the costs and risks involved with entering a foreign emerging market. In addition, firms with strong general international orientation may be more likely to enter newly emerging markets in former Warsaw Pact countries, which we captured by controlling for its *foreign sales ratio* (Sullivan, 1994).

Informal interactions and trust created by board interlocks may also have an important impact on firms' actions (McDonald, Khanna, and Westphal, 2008). One way to capture mutual trust is to account for *reciprocated ties*. We do this by summing the number of cases in which the focal firm simultaneously had an outgoing and incoming tie with another firm. Such multiplexity of connections should increase the chances of informal encounters that may produce opportunities to learn and transfer tacit knowledge in settings not bound by some of the legal restrictions of formal meetings and interactions. We also controlled for learning from interlock partners' experience entering other countries in the region. For instance, a firm contemplating entering the Czech Republic might be influenced by an interlock partner's experience in the surrounding region. We include three control variables to account for this. *Regional outgoing ties, regional incoming ties*, and *regional indirect ties* were measured as the number of board ties to companies with prior experience entering any country in the region except the host country in question.

Our hypotheses focused on learning through board interlocks. Given the unique institutional attributes of the German governance system, an alternative hypothesis might be that interlocks simply are reflective of coordination and control among firms bound by ownership links or dominated by influential stakeholders. Thus, we include several controls to account for the influence of particularly powerful actors. To get at the strong role played by financial organizations in Germany, we control for two types of ties. *Ties to influential financial firms* was measured as the number of outgoing board ties to banks and insurance companies. *Ties from influential financial firms* was measured as the count of incoming board linkages from such firms. We directly address the issue of cross-holdings by including a measure of *equity owned by experienced firms*, captured as the total percentage of the focal firm's equity

owned directly by other firms in the sample that have experience in a particular emerging market. Finally, Windolf and Beyer (1996) suggested that intra-industry board ties can be mechanisms of coordination in Germany. Consequently, we also included two controls for ties within broad industry sectors: consumer, machinery, automotive, chemical and pharmaceutical, building and construction, banking, health care, steel, energy, and insurance. *Within sector outgoing ties* was measured as the count of direct board ties to other firms within the same industry sector. Likewise, *within sector incoming ties* was measured as the number of direct board ties from other firms within the same industry sector.

To control for unobserved industry effects, we included a dummy variable for nine of the ten broad industry categories just described. These categories came from an adapted version of the classification of the Deutsche Boerse Group, an equivalent of the SEC in the U.S. To account for unobserved, idiosyncratic factors making entry more or less common in some years, we also included year dummy variables. For clarity of presentation, the effects of the industry and year dummies are not reported in our tables, but they are included in all models.

Analysis

We used a discrete-time logit specification of event history with each spell corresponding to a year and obtained the results through maximum likelihood estimation (Allison, 1984). This method allows us to estimate the propensity of foreign entry for the same organization at multiple intervals and accounts for right-censored observations for firms that never engaged in foreign entry during the period of observation. Because each spell corresponds to a year, we have a total of 14 spells between 1990 and 2003. The model has the following form:

$$\log \frac{P_{jit}}{1 - P_{jit}} = a_t + b_1 X_{1ji} + b_2 X_{2ji,t-1}$$

where $\log \frac{P_{jit}}{1-P_{jit}}$ represents the logarithmic odds that firm j will enter foreign country i at any point during time t; a represents the baseline hazard rate of entry occurring at time t and allows the hazard rate to be different in each of the 14 years

under study when all other time-variant and time-invariant variables are held constant; b_1 represents the change in the log-odds for each one-unit increase in a time-invariant covariate X_{1ji}; and b_2 represents the change in the log-odds for each one-unit increase in a time-varying covariate $X_{2ji,t-1}$.

Each year (beginning in 1990) represents a spell in which firms may potentially engage in foreign investment. If a firm did not enter a particular market throughout the observation period, the spell was right censored by the end of 2003. Spells were updated at the end of each year to accommodate the annual time-varying covariates. Once a firm entered a specific country in any given year, the next year's risk set was diminished by the firm-country spells for which a market entry had already occurred. This yielded a total of 19,882 firm-country-years spells (had no entries occurred by any firms in any market in any year, the total firm-country-year spells would have been 24,108). We accounted for the correlation between investment decisions by the same firm in the same country across different years by using a robust variance estimator clustered by firm-country combinations. In robustness tests, described later, we used several alternative event history estimators and our results remained unchanged.

RESULTS

Table 2 presents descriptive statistics and correlations. The mean of *entry* (0.02 or 2%) reported in the table was calculated by dividing the 404 investments in the sample by the 19,882 firm-country-year spells created for the event history analysis. Thus, investment in any given country *in any given year* was relatively infrequent, but 404 investments throughout the period is appreciable given the number of firms in the sample and the risk associated with transition economies. The average values for the interlock measures were also small (e.g. 0.79 for aggregated ties). Such small averages are driven partly by the rarity of such experience and also by the fact that for many country-year combinations there were no entries by any firm. We note that the interlock variables show significant variance across firms and countries, which is partly masked by the crude summary statistics shown in Table 2.

Table 3 contains the results of our main analyses. The coefficients represent the effect of each

variable on the log-odds of foreign entry. Model 1 reports the findings for only the control variables. In Model 2 we included the measure of *aggregated ties*. In line with prior research on board interlocks, we found that interlocks to experienced firms increased the likelihood that the focal firm would enter that same market ($p < 0.001$). Hypothesis 1a suggested that incoming interlocks formed by board members with first-hand experience would have stronger effects than outgoing or indirect interlocks, while Hypothesis 1b suggested that outgoing interlocks would have stronger effects than indirect interlocks. In Model 3 we disaggregate the interlocks into outgoing, incoming, and indirect. Incoming ties had the strongest influence on the focal firm, followed by outgoing ties, and indirect ties. To verify that the effects were significantly different in magnitude, we conducted a Wald test based on the marginal effects for incoming, outgoing, and indirect ties. The three-way test rejects the null hypothesis that the magnitudes of all three types of ties were equal ($p < 0.01$). Two-way tests revealed that incoming ties had a significantly stronger effect than outgoing ties ($p < 0.05$) and indirect ties ($p < 0.001$), and the difference between outgoing ties and indirect ties was also marginally significant ($p < 0.1$). Thus, the findings are consistent with H1a and H1b.

Hypotheses 2a and 2b predicted that ties created by CEOs would have stronger effects than ties created by managers who were not CEOs. As revealed in Model 4, we found support for both hypotheses. Whereas outgoing CEO ties (H2a) had a positive influence on the focal firm's market entry decision ($p < 0.01$), the coefficient for outgoing non-CEO ties was not significant. In addition, the effect of incoming CEO ties (H2b) was greater than the effect of incoming non-CEO ties per a comparison of their marginal effects ($p < 0.05$).

Hypotheses 3a–3c predicted that experiential learning would moderate the effect of vicarious learning in different ways depending on the nature of the tie. Hypothesis 3a argued that focal firm experiential learning would complement indirect interlocks, while H3b and H3c conjectured that experiential learning would be a substitute for incoming and outgoing ties. We tested these hypotheses by assessing the interaction of outgoing, incoming, and indirect ties with the focal firm's prior experience in Models 5 and 6. Scholars have recently shown that in nonlinear models,

Table 2. Descriptive statistics and correlations

Variable	Mean	SD	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
1 Entry	0.02	0.14	0	1																										
2 Aggregated ties	0.79	2.18	0	23	0.19																									
3 Incoming ties	0.18	0.57	0	7	0.15	0.73																								
4 Outgoing ties	0.09	0.57	0	17	0.12	0.51	0.24																							
5 Indirect ties	0.57	1.62	0	18	0.17	0.94	0.56	0.43																						
6 Outgoing CEO ties	0.05	0.30	0	7	0.12	0.46	0.24	0.76	0.41																					
7 Outgoing non-CEO ties	0.04	0.39	0	14	0.08	0.40	0.17	0.88	0.32	0.36																				
8 Incoming CEO ties	0.07	0.31	0	6	0.13	0.57	0.69	0.22	0.44	0.27	0.12																			
9 Incoming non-CEO ties	0.11	0.42	0	6	0.11	0.58	0.85	0.17	0.44	0.14	0.14	0.21																		
10 Related experience	3.70	3.83	0	14	0.00	0.11	0.11	0.07	0.11	0.09	0.03	0.06	0.11																		
11 GDP (in millions)	1.67	1.44	0.1	9.0	0.15	0.39	0.30	0.16	0.36	0.15	0.13	0.22	0.25	−0.01																	
12 Growth in GDP	−1.33	10.10	−44.9	17.8	0.01	0.09	0.08	0.04	0.09	0.04	0.02	0.06	0.06	0.34	0.18																
13 Unemployment	5.24	4.82	0.08	20	0.09	0.30	0.24	0.13	0.27	0.11	0.10	0.17	0.21	0.19	0.31	0.14															
14 Market risk	62.72	4.43	51	74	−0.11	−0.28	−0.22	−0.11	−0.25	−0.11	−0.08	−0.16	−0.18	−0.26	−0.66	−0.36	−0.24														
15 Employees (log)	9.54	1.48	4.8	13.1	0.05	0.22	0.14	0.16	0.24	0.16	0.11	0.14	0.09	0.17	−0.06	0.00	−0.03	−0.29													
16 Geographic distance (log)	24.37	14.63	1.8	51.1	−0.13	−0.29	−0.23	−0.12	−0.27	−0.12	−0.09	−0.17	−0.19	0.11	−0.64	0.02	0.02	−0.29	−0.03												
17 ROA	0.04	0.05	−0.3	0.4	0.00	−0.06	−0.06	−0.06	−0.06	−0.06	−0.04	−0.06	−0.04	−0.01	0.00	0.04	0.04	−0.07	−0.07	0.01										
18 Foreign sales ratio	0.46	0.26	0	0.9	0.02	0.05	0.06	−0.01	0.05	0.02	−0.02	0.05	0.04	0.38	−0.03	0.11	−0.02	0.00	0.27	0.04	0.10									
19 Reciprocated ties	0.04	0.21	0	2	0.01	0.04	0.01	0.10	0.04	0.15	0.04	0.04	−0.01	0.04	0.00	0.03	0.06	−0.06	0.17	0.01	−0.03	0.07								
20 Regional incoming	1.52	3.03	0	33	0.00	0.19	0.30	0.03	0.15	0.03	0.02	0.19	0.27	0.12	−0.02	0.04	0.02	−0.01	0.21	0.01	−0.11	−0.10	0.02							
21 Regional outgoing	0.75	2.91	0	45	0.01	0.13	0.04	0.32	0.12	0.28	0.26	0.05	0.02	0.07	−0.03	−0.01	−0.01	−0.06	0.25	0.02	−0.10	−0.10	0.06	0.15						
22 Regional indirect	5.50	10.17	0	103	0.01	0.27	0.17	0.10	0.29	0.11	0.07	0.16	0.11	0.10	−0.02	0.02	0.06	0.03	0.34	−0.01	−0.01	−0.02	0.05	0.06	0.39					
23 Within sector incoming	0.10	0.31	0	2	0.01	0.01	0.05	−0.02	0.01	−0.02	−0.01	0.09	0.01	−0.08	0.00	−0.03	−0.02	0.04	0.01	−0.01	−0.02	−0.01	0.09	0.05	−0.02	0.01				
24 Within sector outgoing	0.09	0.35	0	3	0.01	0.02	0.00	0.05	0.02	0.05	0.03	0.02	−0.01	0.02	−0.03	−0.03	−0.04	0.07	0.23	0.02	−0.09	−0.02	0.07	0.07	0.07	0.01	−0.06			
25 Ties from financial firms	0.79	0.94	0	4	0.04	0.19	0.20	0.04	0.17	0.05	0.02	0.15	0.16	−0.03	−0.05	−0.07	−0.06	0.04	0.48	0.01	−0.08	−0.09	0.14	0.06	0.06	0.30	0.03	−0.04		
26 Ties to financial firms	0.25	0.65	0	5	0.02	0.09	0.01	0.19	0.10	0.23	0.10	0.07	−0.03	0.09	−0.05	−0.01	−0.05	0.07	0.48	0.12	−0.04	−0.11	0.05	0.06	0.29	0.12	−0.04	0.18	0.27	
27 Equity owned by experienced firms	0.01	0.06	0	1	0.05	0.28	0.32	0.06	0.23	0.06	0.05	0.19	0.31	0.04	0.17	0.04	0.13	−0.10	0.00	−0.12	−0.04	−0.01	−0.01	0.06	−0.01	0.03	0.03	−0.02	0.06	−0.02

N = 19,882; correlations greater than —0.02— are significant at $p < 0.05$.

Table 3.   Discrete time event history analysis

	Model 1 Controls only	Model 2 Aggregated ties	Model 3 Disaggregated ties	Model 4 Hierarchical position	Model 5 Experience low	Model 6 Experience high	Model 7 Experience low	Model 8 Experience high
Constant	−3.060†	−2.831†	−2.955†	−3.114†	−2.876	−7.054**	−2.924	−7.123**
	(1.71)	(1.71)	(1.71)	(1.72)	(2.78)	(2.71)	(2.79)	(2.72)
GDP (in millions)	0.122†	0.056	0.067	0.072	0.317*	0.063	0.316*	0.068
	(0.07)	(0.07)	(0.07)	(0.07)	(0.13)	(0.09)	(0.13)	(0.09)
Growth in GDP	0.020*	0.020*	0.020*	0.020*	0.014	0.022	0.013	0.022
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)
Unemployment	0.072***	0.058***	0.060***	0.060***	0.072***	0.061***	0.072***	0.061***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
Geographic distance (log)	−0.076***	−0.074***	−0.073***	−0.073***	−0.064***	−0.070***	−0.064***	−0.068***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.02)
Market risk	−0.089***	−0.077***	−0.077***	−0.077***	−0.084**	−0.014	−0.084**	−0.014
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)
Employees (log)	0.300***	0.232***	0.244***	0.245***	0.198**	0.261*	0.203**	0.255*
	(0.05)	(0.05)	(0.05)	(0.05)	(0.11)	(0.07)	(0.07)	(0.11)
ROA	1.880†	1.901†	2.054†	2.089†	1.148	2.756†	1.219	2.728†
	(1.09)	(1.12)	(1.11)	(1.12)	(1.69)	(1.49)	(1.69)	(1.48)
Foreign sales ratio	1.002**	0.958**	0.922**	0.899**	0.870*	−0.003	0.865†	−0.022
	(0.32)	(0.32)	(0.32)	(0.32)	(0.44)	(0.51)	(0.44)	(0.51)
Reciprocated ties	0.090	0.121	0.099	0.021	−0.559	1.015**	−0.611	0.976**
	(0.27)	(0.28)	(0.28)	(0.30)	(0.44)	(0.35)	(0.46)	(0.37)
Regional incoming ties	−0.026	−0.020	−0.060*	−0.053†	−0.090†	−0.054	−0.094†	−0.045
	(0.03)	(0.02)	(0.03)	(0.03)	(0.05)	(0.04)	(0.05)	(0.04)
Regional outgoing ties	−0.020	−0.021	−0.040†	−0.044*	−0.075†	−0.067†	−0.072†	−0.071*
	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)
Regional indirect ties	0.000	−0.009	0.004	0.003	0.008	0.016	0.009	0.013
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Within sector incoming ties	0.280†	0.296†	0.247	0.244	−0.060	0.534†	−0.054	0.514†
	(0.16)	(0.16)	(0.17)	(0.17)	(0.23)	(0.28)	(0.23)	(0.30)
Within sector outgoing ties	0.171	0.208	0.208	0.209	0.066	0.430†	0.080	0.433†
	(0.14)	(0.14)	(0.14)	(0.14)	(0.18)	(0.24)	(0.18)	(0.24)
Ties from influential financial firms	0.147*	0.069	0.047	0.062	0.054	−0.037	0.051	−0.012
	(0.06)	(0.07)	(0.07)	(0.07)	(0.10)	(0.11)	(0.10)	(0.11)
Ties to influential financial firms	−0.144	−0.114	−0.119	−0.142	0.068	−0.345†	0.057	−0.365*
	(0.10)	(0.10)	(0.10)	(0.10)	(0.15)	(0.18)	(0.15)	(0.18)
Equity owned by experienced firms	0.860†	0.252	0.146	0.267	0.296	−0.565	0.364	−0.518
	(0.51)	(0.60)	(0.61)	(0.62)	(0.84)	(1.01)	(0.86)	(1.04)
Year dummies	Y	Y	Y	Y	Y	Y	Y	Y
Industry dummies	Y	Y	Y	Y	Y	Y	Y	Y
Related experience	0.062*	0.063*	0.060†	0.061*	0.249***	0.093	0.243***	0.098
	(0.03)	(0.03)	(0.03)	(0.03)	(0.07)	(0.06)	(0.07)	(0.06)
Aggregated ties		0.101***						
		(0.02)						
Incoming ties			0.311***		0.371***	0.296**		
			(0.08)		(0.12)	(0.10)		
Outgoing ties			0.127*		0.251***	−0.039		
			(0.07)		(0.08)	(0.09)		
Indirect ties			0.024	0.023	0.014	0.078*	0.010	0.083*
			(0.03)	(0.03)	(0.04)	(0.04)	(0.04)	(0.05)
Outgoing CEO ties				0.309**			0.367*	0.101
				(0.12)			(0.19)	(0.17)
Outgoing non-CEO ties				0.045			0.191*	−0.135
				(0.08)			(0.12)	(0.13)
Incoming CEO ties				0.408***			0.417**	0.406***
				(0.10)			(0.18)	(0.13)
Incoming non-CEO ties				0.208*			0.339*	0.190†
				(0.10)			(0.17)	(0.13)
N	19,882	19,882	19,882	19,882	11,133	8,749	11,133	8,749
Model Chi^2	594.22***	644.43***	648.26***	686.88***	551.30***	325.51***	555.09***	343.08***

Dependent variable: log-odds of foreign investment; coefficients reported with cluster-robust standard errors in parentheses.
† < 0.10; * < 0.05; ** < 0.01; *** < 0.001 (one-tailed hypothesis tests).

like those reported here, conventional interactions may lead to inappropriate conclusions because the coefficient of an interaction term does not always represent the correct sign or magnitude (Ai and Norton, 2003). Consequently, we tested the interaction hypotheses using the procedure suggested by Shaver (2007). Specifically, we split the sample into firms with experience levels below (Model 5) and above the mean (Model 6) and compared the effect of each kind of tie across subsamples through a test of significance. Comparing across models, we found that indirect ties had a stronger effect among experienced firms than among firms with little experience (H3a). In contrast, we found the opposite with respect to incoming and outgoing ties on market entry; these effects were higher for firms with low levels of experience than for those with high levels of experience (H3b, H3c). We conducted t-tests comparing the marginal effects of each kind of interlock across subsamples with high and low levels of prior experience. These tests confirmed that indirect ties had a stronger positive impact on the likelihood of foreign entry for firms with high levels of experience ($p < 0.001$). Incoming and outgoing interlocks, on the other hand, had a stronger positive effect on firms with low levels of experience ($p < 0.001$). The findings provide support for hypotheses H3a–H3c.

We examined the effect of CEO and non-CEO interlocks across low and high levels of focal firm experience (Models 7 and 8) as an additional way to assess the moderating effect of experiential learning, though we did not have formal hypotheses in this regard. Under low levels of experience, the coefficients for outgoing and incoming CEO ties were positive and significant. In addition, outgoing non-CEO ties and incoming non-CEO ties had a significant influence. For firms with high levels of experience, incoming CEO ties ($p < 0.001$) and incoming non-CEO ties ($p < 0.1$) remained significant. Comparing the respective marginal effects across subsamples we find that the effect of outgoing and incoming CEO ties and non-CEO ties was significantly stronger in firms with low levels of related experience ($p < 0.001$). This suggests that incoming and outgoing interlocks lose influence as firm experience increases regardless of the formal position of the manager establishing the interlock, though incoming ties remain significant. We note that indirect ties continue to increase in impact for firms with higher experience.

Additional tests

Endogeneity of incoming ties

Our theoretical explanation of the results centers on organizational learning. An alternative explanation for the hierarchy of interlock influence we find may be that the strong effect of incoming ties is driven by selection rather than learning. This may be plausible if firms have greater latitude in establishing incoming ties to experienced individuals than in forming outgoing ties, particularly because a focal firm has greater control over whom it invites to its own board than over procuring invitations for its managers to serve on the boards of other firms. In addition, firms may be likely to prefer direct incoming ties with experienced firms over indirect ties that do not bring an experienced individual directly into the boardroom. If this were the case, the stronger impact of incoming ties relative to outgoing and indirect ones could be driven by a higher propensity to choose incoming ties to experienced partners rather than by superior learning from incoming interlocks. While our arguments are not based on an assumption of such instrumentality in the selection of different types of interlocks[1], we believe it important to dismiss this possibility empirically.

The solution to this concern is to either control for factors that may allow firms to attract incoming experienced directors or to use an estimator that accounts for the endogenous selection of incoming ties. We have followed both approaches. We note that the models summarized in Table 3 include variables that get at attributes of firms that make them more attractive to incoming directors (firm size, profitability, links to other influential firms) or that suggest a need for external advice on foreign market strategies from experienced directors (foreign sales, prior experience in former Warsaw Pact countries). Nevertheless, to address the selection concern more carefully and directly, we implemented the two-step treatment regression model derived by Maddala (1983). In the first step, we estimated the hazard of establishing

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[1] In our interviews with German managers and board members, we found no evidence that interlocks of any type were established with the ex ante goal to learn about a very specific domain, with the exception of an occasional need for financial expertise. Rather, directors are appointed based on their general managerial experience, and learning about specific issues on which directors have expertise seems to arise *after* ties are formed.

an incoming interlock, and in the second stage estimated our main results controlling for the hazard.

To identify the hazard of forming incoming ties properly in the first stage, we included five instruments that affected the likelihood of having incoming ties but not the probability of entry in the second stage. We reasoned that certain attributes of firms' headquarters (HQ) city would partially explain the ability of firms to attract incoming directors but be unrelated to the choice to invest in Eastern Europe. The five instruments were the population of the HQ city, the number of cities within 50 kilometers of HQ, whether the HQ city had a first division (*Bundesliga*) soccer team, the yearly precipitation in the HQ region, and whether the HQ were located in a state that provided economic assistance to other German states. Since treatment regression requires the endogenous variable to be dichotomous, we created an indicator coded as 1 if the firm had one or more incoming ties and 0 otherwise. To be able to compare the effect of incoming ties to other types of ties, we also dichotomized outgoing and indirect ties[2]. The results are shown in Table 4.

In Models 9–11, we treat incoming ties (regardless of whether they are formed by CEOs or not) as potentially endogenous. Model 9 demonstrates that, after accounting for selection, the pattern of tie influence remains as predicted by H1a and H1b. Models 10 and 11 compare effects across firms with high and low experience in other Eastern European countries. As in H3a–H3c, indirect ties increase in influence whereas incoming and outgoing ties decrease in influence as firms gain their own experience ($p < 0.05$). In Model 12 we treat incoming CEO ties as potentially endogenous. Our reasoning is that firms would be especially desirous to invite CEOs of other firms to their boards to benefit from the status and experience of these individuals. We continue to find support for H2b ($p < 0.01$). Our hypotheses continue to be supported after accounting for the selection of incoming ties—providing further evidence that learning is the mechanism explaining these results.

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[2] We also attempted to estimate our models treating incoming interlocks as a continuous outcome in the first stage but found that identification was extremely weak or impossible because of the high prevalence of firms with no incoming interlocks to directors with experience in particular countries.

Other tests

The high correlation between incoming and indirect interlocks (see Table 2) raises a concern that multicollinearity may affect our results. We took two steps to address this concern. First, we estimated VIF scores for each variable and for the overall model (Allison, 1984). None of the scores approached problematic levels. Second, we ran our analysis excluding indirect interlocks, and our findings regarding incoming and outgoing interlocks were unaltered. Thus, the correlation between incoming and indirect interlocks is not biasing the results.

We also assessed the robustness of our results to alternative event history estimation procedures including the rare event procedure suggested by King and Zeng (2001), the Cox (1972) proportional hazard model, and piecewise exponential regression (Lee, 2007). In all cases, our findings remained robust.

DISCUSSION

Our paper has implications for research on the role of boards of directors on strategy formulation, on experiential and vicarious learning more broadly, and for work on FDI in emerging markets. We address each of these contributions in turn.

Prior work on the influence of board interlocks on strategy formulation has largely been agnostic with respect to attributes of the individuals creating the ties. The findings of this study clearly reveal that there are differences across types of ties that affect how influential their information might be for the focal firm. In line with our theoretical assumptions, outgoing, incoming, and indirect ties affect the focal firm's market entry strategy—but under different conditions and with differential impact. As expected, incoming ties exhibit the strongest effect, particularly when the focal firm lacks its own first-hand experience, followed by outgoing and indirect ties. In novel situations such as emerging market entry, the focal firm seems to be most likely to act upon rich and fine-grained information provided by top managers of other firms that bring first-hand experience. This type of rich knowledge appears to outweigh the knowledge gained by managers forming outgoing ties. In line with our hypotheses, indirect ties have

Table 4. Treatment regression results

	Model 9 Disaggregated ties	Model 10 Experience low	Model 11 Experience high	Model 12 Incoming CEO vs. incoming non-CEO
	Second stage estimation (DV = probability of foreign entry)			
Incoming ties	0.061**	0.097**	0.042**	
	(0.01)	(0.02)	(0.02)	
Outgoing ties	0.040**	0.067**	0.016*	
	(0.01)	(0.01)	(0.01)	
Indirect ties	0.009*	0.006	0.013*	0.012**
	(0.00)	(0.01)	(0.01)	(0.00)
Related experience	0.001*	0.004**	0.002†	0.001*
	(0.00)	(0.00)	(0.00)	(0.00)
Outgoing CEO ties				0.040**
				(0.01)
Outgoing non-CEO ties				0.026**
				(0.01)
Incoming CEO ties				0.057**
				(0.01)
Incoming non-CEO ties				0.026**
				(0.00)
Inverse mill's ratio	−0.019***	−0.032***	−0.015*	−0.015*
	(0.01)	(0.01)	(0.01)	(0.01)
	First stage estimation (DV = probability of having incoming ties)			
HQ in a donor state	−0.226**	−0.197**	−0.150*	−0.378**
	(0.05)	(0.07)	(0.08)	(0.07)
Yearly precipitation	0.000	0.000	0.000	0.001**
	(0.00)	(0.00)	(0.00)	(0.00)
Soccer team in HQ city	0.010	−0.300**	0.256**	0.300**
	(0.04)	(0.07)	(0.06)	(0.05)
Cities near HQ (50 km)	0.006†	0.025**	−0.011†	0.017**
	(0.01)	(0.01)	(0.01)	(0.01)
HQ city size (millions)	−0.068*	0.013	−0.113*	−0.431**
	(0.03)	(0.06)	(0.05)	(0.05)
N	19,615	10,848	8,767	19,615
Model Chi^2	4,747.56***	2,565.82***	2,213.70***	3,024.76***

†< 0.10; *< 0.05; **< 0.01; ***< 0.001 (one-tailed hypothesis tests).
For presentational simplicity, only the independent variables of interest and the excluded first stage variables are shown. Not shown, but included in these models, are all the control variables detailed in Tables 2 and 3.
Incoming ties is treated as endogenous in Models 9–11, and incoming CEO ties is treated as endogenous in Model 12.
Treatment regression requires the endogenous variable to be dichotomous. We thus created an indicator coded as 1 if the firm had one or more incoming ties and 0 otherwise. To be able to compare coefficients, we also dichotomized outgoing and indirect ties.

the least influence on the focal firm when focal firm experience is low, but the more subtle and abstract experiences of indirect ties become more influential once the focal firm acquires a baseline of experience that allows it to activate the insights brought by indirect ties.

Our understanding of which interlocks matter most becomes more nuanced when considering the formal authority of managers creating outgoing or incoming ties. Our results show that ties created by CEOs are more influential than those created by non-CEOs. Incoming CEO ties are

more influential than outgoing CEO ties—again suggesting that the first-hand experience of the incoming CEO is more impactful than the second-hand knowledge brought back to the firm by the outgoing CEO. The difference between incoming and outgoing non-CEO ties seems noteworthy. Whereas non-CEOs of other experienced firms influence the focal firm's market entry decisions, non-CEOs of the focal firm who serve on the boards of experienced firms have no significant influence. This suggests that only the CEO of the focal firm seems to have enough decision-making

authority to influence the firm's strategy based on what s/he vicariously learns in the process of serving as a director. Beyond the application to board interlocks in particular, this suggests that organizational learning is a function of not only the characteristics of the knowledge obtained vicariously—as many studies emphasize—but also of the authority possessed by boundary spanners who carry knowledge into the firm. These findings help to make sense of inconsistent findings in prior research. Some studies (while not comparing the effects of all types of interlocks) have reported significant effects for outgoing ties (e.g. Haunschild, 1993), while other studies have reported weak or no effect (e.g. Geletkanycz and Hambrick, 1997). Our results suggest that with respect to outgoing ties, the influence is driven by whether the outgoing manager is the focal firm CEO.

Prior research has suggested—but not empirically shown—that indirect interlocks have the weakest influence (Haunschild and Beckman, 1998). In fact, some recent studies go as far as excluding indirect (often called 'neutral') interlocks from analysis altogether (e.g. Beckman, Haunschild, and Phillips, 2004). Our findings suggest that indirect ties may be more influential than previously thought by highlighting *when* such ties are most influential. It appears that to fully exploit the coarse-grained information available from indirect ties, firms need a baseline of experience in order to have the absorptive capacity (Cohen and Levinthal, 1990). This insight echoes research on innovation that finds that firms investing in international R&D extract learning benefits only when they already possess a knowledge base in areas that are technologically related to the new venture (Penner-Hahn and Shaver, 2005). Interestingly, direct ties, which provide the most 'frontal' information to the firm, diminish in importance once the firm gains a baseline of first-hand experience. These findings challenge scholars to specify more carefully boundary conditions that clarify when they expect various interlocks to influence firms.

These results contribute to the field of organizational learning, which distinguishes between experiential and vicarious learning. An important tension in this literature pertains to whether the two types of knowledge are substitutes or complements, and reasonable arguments exist to support both effects. We propose that substitution or complementarity between the two sources of learning is contingent upon the type of vicarious knowledge brought by external ties such as interlocks. Prior focal firm experience and vicarious learning through direct ties to other experienced firms appear to function as substitutes because they both bring specific, pointed knowledge. In contrast, indirect ties affect firms more strongly only once a firm gains sufficient levels of prior experience. This finding may have applicability beyond board ties in particular, but future work must verify this implication.

The results of our study also have implications for the FDI literature, particularly as it applies to emerging market entry, which are particularly fraught with risk and uncertainty. Existing FDI theory suggests that firms learn from their experiences with prior investments in related markets, which reduces the uncertainty that might otherwise preclude or significantly reduce the likelihood of entry (Delios and Henisz, 2003; Johanson and Vahlne, 1977). The theoretical challenge has been that learning from first-hand experience may be impossible when the firm seeks to enter an emerging market so different or novel that prior foreign investments provide little guidance. We have built on a small but important body of literature that has begun to explore how vicarious learning from firms with relevant foreign market experience affects entry choices (Guillen, 2002; Martin, Swaminathan, and Mitchell, 1998). Our research suggests that characteristics of the individuals creating the tie, which have not been studied in this context, have a significant effect on firms' decisions to enter high-risk emerging markets.

An important contribution was to account empirically for two alternative explanations to learning: coordination or control, and endogenous selection. Besides fostering learning, board interlocks are mechanisms of coordination and control, and we included covariates related to the institutional context to account for this alternative mechanism of interlock influence. Recently scholars have recognized endogeneity of networks as one of the most critical issues in interorganizational studies (Ahuja, Soda, and Zaheer, 2012). To our knowledge, this is the first study to control for selection effects in interlock research. The need to address this issue arises because the effects of interlocks on firm learning may not be independent of the underlying processes the lead firms to appoint directors

to their boards in the first place. Addressing this issue becomes fundamental for scholars to distinguish between learning effects and those driven by omitted variables. While all interlocks may to some extent be subject to this concern, when comparing the influences of different types of ties the concern is particularly salient in the case of incoming interlocks (as we explained already). Notwithstanding this important empirical advance, we realize that ultimately we do not observe directly what is discussed in the boardroom—a limitation common to interlock research. Our interviews with German directors and executives go some way toward mitigating this concern, but future work could more systematically employ field work to shed light on the knowledge exchange dynamics in boards.

This research adds to an important and emerging emphasis on differences in learning from different types of sources of vicarious and experiential learning by focusing on the information communicated by individuals who differ with respect to the nature of experience they bring to the boardroom and their hierarchical position. We find that outgoing, incoming, and indirect ties transmit information with different vicarious learning impact. The differences are further accentuated when we take the hierarchical position (CEO vs. non-CEO) of the person creating the tie into account. In addition, we consider the interaction of these external sources of information with internal knowledge available from past experience. This allows us to explain not only the relative learning effects of different external sources, but also when each type will substitute or complement the firm's experiential learning.

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