

More Than Adopters: Competing Influences in the Interlocking Directorate

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This study explores the competing influences of different types of board interlocks on diffusion of a strategic initiative among a population of firms. We examine a broad social network of interlocking directors in U.S. firms over a period of 17 years and consider the likelihood that these firms will adopt a strategy of expansion into China. Results show that ties to adopters that unsuccessfully implement this strategy have a nearly equal and opposing effect on the likelihood of adoption as do ties to those that successfully implement the strategy. Ties to those that do not implement the strategy also have a suppressive effect on the likelihood of adoption. Furthermore, we examine a firm's position in the core-periphery structure of the interlocking directorate, finding that ties to adopters closer to the network core positively affect the likelihood of adoption. We discuss the implications of our study for social network analysis, governance, and internationalization research.

Key words: social networks; board of directors; governance; interlocks; diffusion

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Introduction

When managers consider complex strategic decisions in an uncertain environment, they often look for clues from the actions of other firms. They obtain information from other managers, observe their actions, and learn from their successes and failures in order to reduce uncertainty about strategic decisions (Borgatti and Cross 2003). A growing consensus in the literature about the importance of social context in strategic decisions has prompted researchers to examine the social networks that managers use when making their decisions (Borgatti and Foster 2003, Burt 2005b). Such a network is created when managers are elected to the boards of directors of other firms, thus forming an interlock, or network tie (Carpenter and Westphal 2001, Mizruchi 1996). These board interlocks effectively embed decision makers and their firms in a set of relationships that affect firm strategies and other outcomes (Geletkanycz et al. 2001). A manager's social network may be particularly important in identifying and evaluating emerging strategies, or those strategies that recently appeared and are on the rise in the business community (Washington and Ventresca 2004). Scholars have examined the transmission of corporate ideas through a firm's social network, establishing a general relationship between the presence of interlocks

and new strategies a firm undertakes (e.g., Geletkanycz and Hambrick 1997, Mizruchi 1996, Westphal et al. 2001). However, whereas some board interlocks facilitate diffusion of strategic initiatives, other relatively unexplored interlocks may impede it. How these opposing forces vie with one other to influence firms to adopt, or not adopt, an emerging strategy remains underdeveloped in the literature.

For example, there is growing evidence that once managers implement a new strategy, they influence managers of other firms to which they are tied to adopt a similar strategy (Geletkanycz et al. 2001, Rogers 1995, Young 2001). However, not all strategies succeed. The relative persuasive influence of board ties to firms that successfully or unsuccessfully implement a strategy is still unclear in the literature (Abrahamson 1991, Strang and Soule 1998). Similarly, managers of some firms may intentionally decide not to adopt an emerging strategy. Board ties to these firms may have a suppressive effect on adoption of the strategy. Such effects remain unexplored, though some have suggested these ties may affect how various phenomena spread throughout a social network (e.g., Krackhardt 1997, Valente 2005). Exploring the tension between board ties to firms that *successfully*

adopt, *unsuccessfully* adopt, or *do not* adopt a strategic initiative is therefore a meaningful inquiry for research.

Furthermore, scholars examining social networks are increasingly incorporating more complex network structures into their explanatory frameworks (Davis et al. 2003, Newman 2002). For instance, Davis and Greve (1997) show that a firm's position in the overall interlocking directorate determined its relative influence on firms to which it was connected. This suggests that network structures may provide an added layer of explanation for how strategic initiatives spread throughout the network of interlocking directors (Cowan and Jonard 2004, Davis et al. 2003). At the network level, a set of concentrated firms that are well connected with each other constitutes a network core. Peripheral firms, in contrast, are connected to the core but are more sparsely connected to each other. One might imagine that an interlock to a firm that is located more toward the network core could perhaps be more influential than an interlock to a firm that resides somewhere on the network periphery. These ideas hold the potential of further characterizing the nature of ties that may aid or obstruct diffusion of a strategic initiative.

A firm's social context may be instrumental to the implementation, or circumvention, of a wide range of strategic initiatives (Abrahamson 1991). One way a firm's social network affects the strategies it undertakes is by providing information and experience that reduce uncertainty (Geletkanycz and Hambrick 1997). Establishing a subsidiary in a foreign country, especially one with a culture and institutional system fundamentally different from the home country, is an example of such potentially rewarding but risky decisions that top managers commonly make (Sanders and Carpenter 1998). Opening a foreign operation increases organizational complexity in the areas of logistics, communication, and human resource management, and it introduces uncertainty relating to the institutional environment of host countries, cultural differences, and unfamiliar business practices (Hitt et al. 2006).

In this study, we explore the competing effects of different types of board ties to adopting firms (i.e., successful/unsuccessful, core/peripheral) and nonadopting firms on the likelihood that a firm will adopt one of the most salient strategic decisions facing managers of U.S. firms in recent years: expansion into China. We test the likelihood of establishing a subsidiary in China for U.S. firms during the period 1988–2004. Economic reforms in China at the end of the 1980s allowed firms from other countries, including the United States, to enter its markets for the first time (Luo 2000). Few regions of the world presented U.S. managers with such complexity of business practices, cultural differences, and changing institutions as China (Hitt et al. 2004). The interlocking directorate is likely to be an important tool by which managers gain information to mitigate risk as they seek

to leverage opportunities in China. We therefore examine how board interlocks to firms that have been successful in China, those that have been unsuccessful, those that have chosen not to expand into China, and those that are closer to the network core affect the likelihood of establishing a subsidiary in China.

Conceptual Development

Interlocking directorates have been considered an appropriate means to study the organizational implications of interfirm relationships (Mizruchi 1996). Researchers typically define an interlock between two firms as any director—officer director as well as outside director—who serves on the boards of two firms. The web of interlocking boards of U.S. companies forms an important social network through which timely and pertinent information flows (Carpenter and Westphal 2001). Board members typically meet face-to-face several times a year and communicate between meetings about the most important strategic decisions of their firms (Zajac and Westphal 1996). In fact, managers often establish ties with the express purpose of learning about emerging strategies, observing the decision-making processes of other firms, and witnessing the consequences of those decisions (Useem 1984).

An important aspect of the interlocking directorate is that board interlocks allow firms to observe the behavior of other firms and reduce uncertainty associated with strategic initiatives that they undertake (Borgatti and Foster 2003, Mizruchi 1996). This happens in several ways. First, by allowing directors to participate in the decision-making processes of other firms, board interlocks help firms to identify emerging strategies, discover new possibilities, and learn new ways of approaching problems (Mizruchi 1996). Second, board interlocks provide a means to study the efficacy of the strategies of other firms (Strang and Soule 1998). This kind of information may lead to improved control, reduced resource dependence, and competitive advantage. Third, firms may be able to reduce the uncertainty associated with new strategies via information they gather from interlocked boards (Beckman et al. 2004). These mechanisms combine so that strategic initiatives diffuse throughout the network of interlocked firms.

Membership in the interlocking directorate may benefit firms by acting as a channel for communicating information between external organizations and the firm. In our research context, when firms consider operating under uncertain and complex environmental conditions, they may search for information from those firms that can provide them with a glimpse of what to expect. Interlocks to firms that have experience implementing a strategic initiative make the focal firm more likely to engage in the process itself (Geletkanycz et al. 2001). For example, this may involve witnessing how the

experienced firm approached implementation, learning about its objectives and rationale, understanding potential stumbling blocks, and gaining information about costs and benefits of the strategy (Rogers 1995).

However, the decision to adopt or not adopt an emerging strategy may depend on more than the extent to which a firm is connected to other firms that have adopted the strategy; it may also be a function of how successful the other firms were in doing so.¹ Strang and Soule (1998), for instance, not only describe how diffusion occurs by observing the practices of those to whom an actor is connected but also illustrate how diffusion may be influenced by observing the *outcomes* of those practices. Exploring ties to those that have successfully or unsuccessfully adopted a strategy moves away from passive actors and improves the validity of assumptions about decision making. This is a particularly important distinction in our context because directors connected to adopting firms may observe not only the decision of whether to implement a strategy but also the consequences of doing so. These considerations resemble what Kimberly and Evanisko (1981) describe in their study on the adoption of innovations among hospitals. They suggest that when organizations see successes among other organizations that have adopted a change, it prompts them to consider implementing similar changes.

Directors of firms that are considering implementing a strategy that is on the rise among firms in their network may behave in the same way, attempting to gain an inside look at the major accomplishments and setbacks those firms encounter after they have adopted the strategy. Given the competitive environment in which firms operate, directors are likely to be aware of the performance of major firm initiatives, particularly those that carry with them potentially high risks and high rewards. When they encounter a new strategy in one firm and see compelling evidence of its success, they will be more supportive of adopting the strategy in firms to which they are interlocked. Adoption of the emerging strategy, therefore, is likely to be positively affected when directors are connected to firms that successfully implement the strategy.

HYPOTHESIS 1. *The greater the number of successfully adopting firms with which a firm shares one or more board interlocks, the greater the likelihood that firm will also adopt the strategy.*

The effect of direct ties to firms that have *unsuccessfully* adopted a strategy is less obvious. Some research suggests that these interlocks may increase the likelihood a firm would follow suit and also attempt to implement the strategy, despite the fact that the venture was not successful. For example, Abrahamson and Rosenkopf (1997) find in computer simulations that success is not always a prerequisite for diffusion of innovation or change. O'Neill et al. (1998, p. 101) develop

conceptual arguments in favor of this view, suggesting that “firms may adopt inefficient innovations based on their fear that other firms will use them successfully. Also, firms may conclude that the cost of adopting an inefficient innovation is less than the cost of not adopting.” Although directors might have access to information about the success with which a firm is implementing a strategy, it may be intentionally ignored or just become lost in the vast sea of information available at that level.

Other research, however, points to the potentially negative effects of unsuccessful adopters. For example, related research in sociology shows that the consequences of adoption, successful or unsuccessful, may be an indicator of the likelihood of undertaking an action (Conell and Cohn 1995). Greve (1998) appears to support this perspective, arguing mimicry is less likely to occur when outcomes are negative. In view of the uncertainty associated with emerging strategies, directors interlocked with firms that clearly experience problems implementing the strategy may be reluctant to allow it to be implemented in their own firm. Greve (1998, p. 969) points out that a firm “seeking to resolve the uncertainty around the benefits of using a new practice wants hard data on the benefits of adopting, such as the performance of prior adopters.” These arguments suggest that board interlocks to firms that are unsuccessful at implementing an emerging strategy may influence a firm to not adopt the strategy itself, thereby hindering diffusion. Therefore, we suggest the following.

HYPOTHESIS 2. *The greater the number of unsuccessfully adopting firms with which a firm shares one or more board interlocks, the lower the likelihood that firm will also adopt the strategy.*

Diffusion from a network perspective typically describes movement from a source to those who implement the practice (adopters) using information or influence. One of the most important issues in this stream of literature is identifying the source of diffusion in a population. External source models emphasize the influence of mass media and other institutions (Strang and Soule 1998). In studies using contagion models, the primary source of diffusion is internal influence (Burt 1987). Previous studies investigating the role of board interlocks in the adoption of a particular strategy have primarily relied on a contagion perspective of diffusion (e.g., Haunschild 1993). Scholars working from this perspective generally examine how adopters affect nonadopters. In our context, this suggests that board interlocks to firms that have adopted an emerging strategy will make a firm more likely to adopt that strategy, and we have expanded this to suggest that directors also consider the consequences of adoption in firms to which they are connected. However, scholars have yet to examine the potentially important effect of nonadopters on other nonadopters within the interlocking directorate.

The positive influence of successful adopters is analogous to viral diffusion, in which ties to infected people affect healthy people (i.e., nonadopters), but additional ties to healthy people have no bearing on the likelihood that a healthy person would become infected (e.g., Sanders and Tuschke 2007). Diffusion of internationalization through the interlocking directorate, however, works differently from viral diffusion because ties to nonadopters may exert a suppressive effect (McGrath and Krackhardt 2003). We cannot drop from consideration firms that have not adopted the strategy because such firms may be important if they hold the potential of slowing diffusion. Computer simulations of network diffusion models in the social network analysis literature have proposed such mechanisms (e.g., Krackhardt 1997).

When strategies spring up and gain momentum among major U.S. firms, they gain the attention of managers and are of particular interest if the strategies involve potential for high rewards and high risk. Therefore, firms that do not adopt the strategy are likely to have a rationale for doing so, a rationale that may figure into the decision making of firms to which they are connected. This is especially true of an emerging strategy that appears on the scene and rapidly takes hold in many firms, because such strategies typically capture significant managerial attention and are not easily ignored (Abrahamson 1991). In most diffusion research there is a fundamental assumption that adopters are the most likely candidates to proselytize status quo-oriented nonadopters (Krackhardt 1997). However, this is not a safe assumption in our context. Instead, we assume that a firm's decision to not adopt an emerging strategy is a result of purposeful decision making and not simply because the idea never occurred to its directors. Nonadopting firms that interlock with many other nonadopters are thus provided with information validating their own decision making. In our context, in the same way adopters may affect firms to which they are connected, nonadopters may also affect interlocked firms, affirming and confirming their decision to not adopt. Therefore, we suggest the following.

HYPOTHESIS 3. *The greater the number of nonadopting firms with which a firm shares one or more board interlocks, the lower the likelihood that firm will adopt the strategy.*

Besides corroborating each other's strategic decisions, ties between firms serve other functions as well. Firms may use board interlocks as co-optive mechanisms through which they can stabilize their existence (Burt 1992). For example, firms with large debts may develop board ties to the managements of financial institutions to gain access to capital. Some evidence also suggests that firms may engage in anticompetitive behavior or collusion when directors serve simultaneously

on multiple boards. Still others have described board interlocks as social networks of managerial elites that help firms maintain status and legitimacy (Burris 2005, Useem 1984). Establishing high-status ties, for instance, can garner prestige and send positive signals to organizational stakeholders. A firm's position in the overall structure (i.e., topology) of its social network may be an important indicator of status orderings among firms in the network, a status ordering that stands apart from attributes of the firms (Burt 1997, Podolny 1993).

Recent developments in the social network analysis literature have explored this structure and have begun to identify some topological regularities of the interlocking directorate (e.g., Newman 2002, Watts 1999). One particular concept that has garnered appreciable research attention is the core-periphery structure of the network (Borgatti and Everett 1999, Dodds et al. 2003). Core-periphery structures evolve in such a way that densely interconnected and central groups of actors are surrounded by peripheral actors who are connected to the core but are only sparsely connected to one another. Researchers have long alluded to core-periphery concepts in describing the interlocking directorate (Abrahamson and Rosenkopf 1997, Mintz and Schwartz 1981). Heinze (2004) used a block model analysis (Wasserman and Faust 1994) to identify a core-periphery structure among interlocked directors in German firms. Similarly, Burt (2005a) has shown that the U.S. board interlock network is a core-periphery structure, which may also be characterized by several regional interconnected network cores. However, empirical studies have not yet considered how a firm's position in this core-periphery structure might influence diffusion of a strategy among firms in the network. Being close to the core implies something more than most traditional conceptions of network centrality. Firms at the core are tied to other densely interconnected firms, implying a form of embeddedness indicative of power and activity. Thus, a firm's position in the core-periphery structure, and the position of firms to which it is connected, may be an important indicator of status and have a unique effect on diffusion.

In addition to serving as the circuitry over which information flows, network structure also determines and reflects a firm's status within the population of firms (Burt 1997, Podolny 1993). Relative status differences interact with attributes of the decision or strategy to predict diffusion, whether it is from higher- to lower-status actors or the reverse (Vedres 2000). In networks composed of relationships created by mutual agreement, occupying a core position signals social desirability and higher status (Burris 2005). Status is further heightened by being linked to firms that are themselves at the core. Useem's (1984) use of "inner circle" is descriptive in this regard, connoting a cohesive core of corporate elites.

Moving toward the periphery of the network, firm status decreases to “middle status” as social connections to the core diminish (Phillips and Zuckerman 2001). These firms are still connected, but they occupy a more peripheral position in the overall network. The lowest status firms are those that are disconnected, with little or no means to tie in to the social network. This parallels the description of Phillips and Zuckerman (2001) of low-status actors as “nonplayers,” middle-status ones as “peripheral players,” and high-status ones as “players.”

Adoption of an emerging strategy by high-status firms is more likely to influence the “strategic agenda” of the corporate community (Abrahamson 1991), raising the salience and legitimacy of the firm’s strategy. High-status organizations may also have “a halo of approval quite apart from their actual merit” (Davis and Greve 1997, p. 15). Thus external evaluators may regard major strategic actions that fall within broadly defined cognitive and normative constraints as legitimate by virtue of the organization’s relative status. Middle-status firms in particular are the most likely to conform to those of higher status (Phillips and Zuckerman 2001) and will confer legitimacy on the strategies of those firms. In contrast, conformity is less likely to occur at either end of the status order. Therefore, organizations with ties to adopters that are relatively closer to the network core (i.e., middle-status firms with connections to those that they perceive to be of higher status) will confer legitimacy to strategies that firm has adopted. That is, ties to firms that have adopted a strategic initiative and are closer to the network core increase the likelihood that a firm will also adopt the strategy.

HYPOTHESIS 4. *The greater the number of adopting firms closer to the network core with which a firm shares one or more board interlocks, the greater the likelihood that firm will also adopt the strategy.*

Methods

Research Context

To test the competing influences of different types of board interlocks on diffusion, we chose a strategy that involved considerable uncertainty and that emerged and took hold during the 1990s: expansion into China. An increasing number of studies shows that the opportunities and risks associated with foreign direct investment (FDI) are commonly subject to board decisions in U.S. corporations. Sanders and Carpenter (1998), for example, found an association between board structure and internationalization. Directors are likely to be interested in opportunities offered by foreign markets, and concerns about excessive risk levels in the international environment may prompt their involvement. Prior research, using the example of political risk, demonstrates that the board of directors is sensitive to international risk (e.g., Ellstrand et al. 2002). FDIs are complex

decisions for boards of directors that likely require support from different levels of the organization. The following excerpt shows the organizational complexity of FDI decisions:

An executive at one of the 10 largest overseas investors admits: “Asking us to describe the process by which we make FDI decisions is like asking us to plot the route a tennis ball travels during the Wimbledon tournament. It is not straightforward. Decisions go back and forth between any number of departments before they are ready for board approval. This is not something for which you can create a flow diagram or organization chart.” (Piggott 2002)

Thus we expect that investing in China is a consequential, corporate-wide decision that is of considerable interest to the board of directors. In fact, our data collection process uncovered a considerable number of firms that added directors to their board owing specifically to their experience in China.²

Of the many motivations to enter foreign markets, large U.S. firms tend to seek opportunities in China to find new markets or reduce their costs (Li and Park 2006, Shaw and Meyer 1993). Another excerpt summarizes the decision by Jeff Immelt, General Electric’s (GE) Chief Executive Officer, to increase GE’s presence in China and how this high-profile decision affects the entire organization:

GE is one of the best examples of the difficulties involved for large multinational, multi-business companies to coordinate their investments from the centre So if you ask whether decisions are made by the businesses, or are they made by the corporate centre, the answer is yes to both. The corporate business development group may identify target markets and acquisitions by region or sector from which the businesses can benefit, but so may the individual business development groups at the business level. A good example of this is China. Our chairman has publicly announced that we will be very active in China and yesterday GE Plastics announced that it is moving its Asian headquarters from Japan to China. (Piggott 2002)

Expansion into China is a particularly suitable research context insofar as it began and gained momentum during an observable period of time and captured the attention of managers. Far-reaching economic reforms by the Chinese government combined with macroeconomic factors led to rapid expansion of FDI in China during the 1990s (Lemoine 2003). This caused most firms to face the issue of whether they should try to gain a foothold in that country (Gupta and Wang 2007, Welch and Welch 2006). Expansion into China is also an appropriate context because it involves a high degree of uncertainty and risk, making it likely that executives would look to their social network to help reduce uncertainty and mitigate risk. Despite China’s progress with its macroeconomic transition, researchers agree the country has represented a mixed bag for FDI

(Huang 2003, Shaw and Meyer 1993). On the one hand, China offers exceptional opportunities for those seeking increases in efficiency, valuable resources, and even untapped markets (Engardio 2005, World Bank 2006). On the other hand, China's extensive system of personal connections and lack of infrastructure have long served as barriers to FDI by U.S. firms (Luo 2000, Nee 1992). Many firms that are not familiar with the complex local business practices and powerful institutions are concerned about their ability to effectively expand into China.

Sample

The sample for this study included publicly traded U.S. industrial and service firms listed at least once in the Forbes 500 and Fortune 1000 indexes from 1988 through 2004. The Fortune 1000 captures the largest firms in the United States by revenue and provides a suitable sample for testing network effects involving board interlocks (Davis 1991, Westphal et al. 2001). Because this index is weighted toward distributors, we added firms listed in the Forbes 500 index, which uses a balanced mix of revenues, income, assets, and market cap to identify America's largest firms. Most of the firms listed in the Forbes index for any given year are also listed in the Fortune index for that year, but about 30% of those listed in the Forbes index are unique, and these come from a broad range of industries. Firms that were ranked in either of the Fortune or Forbes indexes at any point between 1988 and 2004 were considered for inclusion in the sample.

From this set we selected firms that were autonomous and publicly listed for at least five contiguous years during the sample window and for which board, financial, and subsidiary data were available. We imposed these restrictions to eliminate firms with poor reporting and to control for firms appearing ephemerally. This strategy yielded a sample of 1,930 firms. We collected archival data for each of these firms for each year they appeared in the sampling window 1988 through 2004. To maintain consistency in view of differing report dates between firms, we collected data as of October for each year. Firms entered the data set in 1988 or in the year they first appeared as autonomous publicly traded entities. They dropped out of the data set if they were acquired, failed, or delisted for some other reason. This yielded a firm-year structure to the data that is appropriate for event history analysis. Firms were able to potentially experience the event (i.e., establish a subsidiary in China) for an average duration of 10.3 years (with an SD of 4.1 years).³

Our data source for subsidiary establishment in China was a combination of disclosure and, where necessary, the firm's Security and Exchange Commission (SEC) 10-K annual and 10Q quarterly filings. SEC rules mandate that firms report all "significant subsidiaries." SEC

regulations about what constitutes a significant subsidiary are intentionally broad but, in general, are tied to a threshold such that subsidiaries whose assets, income, and/or proportionate share exceed 10% of the parent firm are significant. However, it is common practice for firms to report all majority-owned subsidiaries because investors use these filings to make informed decisions.

Measures

Some of the variables in our study were calculated using UCINET 6.0 (Borgatti et al. 2002). We constructed a directed, two-mode network of board interlocks from which we developed a firm-by-firm dichotomous adjacency matrix for each year in the database. A tie exists between two firms if one or more directors sat on the board of each firm.⁴ Because firms entered and exited the sample each year, the size of the adjacency matrixes varied somewhat from year to year, with an average matrix size of 1,282 and a standard deviation of 117 nodes. The size and duration of our sample allowed for examination of diffusion through an expansive social network rather than focusing primarily on egocentric data and measures (Valente 2005).

Dependent Variable. The dependent variable is the *rate of transition from one state to another*. In this case, the transition of interest is establishment of a subsidiary in China. Event history data representing this transition consist of two variables (Cleves et al. 2004). The first is a dummy variable showing for each firm whether the event occurred during the observation period. The second is an integer variable measuring the number of years elapsed from the first observation to the event.

Independent Variables. We operationalized *ties to nonadopters* as a count variable of the total number of interlocks with firms that have not established a subsidiary in China (Zajac and Westphal 1996). *Ties to successful adopters* and *ties to unsuccessful adopters* are also count variables, measured as the total number of interlocks to firms in which subsidiary establishment in China has been clearly successful or clearly unsuccessful, respectively. Financial ratios to measure success at the subsidiary level are often distorted by transfer pricing and other international accounting practices and are largely unavailable for subsidiaries in developing countries (Thun 2006). Therefore, we count a subsidiary as successful in the focal year if the firm has expanded to establish another subsidiary within China. Given the vast number of large cities in China, firms with a foothold in one city would likely want to exploit their country presence by expanding to other major metropolises in China. By contrast, we count a subsidiary as unsuccessful if it was divested within its first three years of operation. Other firms that have neither expanded nor divested in China represent a middle ground whose success is as yet indeterminate. This approach is conservative insofar as

we create three groups and only use the two extremes in our analysis: unsuccessful adopters are indisputably unsuccessful, successful adopters are clearly successful, and an indeterminate group is not counted as successful or unsuccessful.

The next independent variable, *ties to core adopters*, captures the number of adopters that are closer to the core of the network than those to whom they are connected. Burt (2005a) and others (e.g., Mintz and Schwartz 1981) have shown that the interlocking directorate fits the description of a core-periphery structure. We relied on a continuous measure of firm-level “coreness,” proposed by Borgatti and Everett (1999), which reduces to eigenvector centrality (Bonacich 1972) in network structures that conform to an overall core-periphery topology. This approach measures each firm’s closeness to the core, which Borgatti and Everett (1999, p. 387) describe as the “distance from the centroid of a single point cloud.” We calculated coreness scores for each firm on the adjacency matrix for each year and used the resulting measures to identify ties wherein alters that had adopted the strategy were closer to the network core than ego (i.e., ties wherein a connected adopter had a higher coreness score than the focal firm). The independent variable *ties to core adopters* is then a count of these ties for each firm-year.

All independent variables are lagged behind the dependent variable by one year (Beckman et al. 2004, Carpenter and Westphal 2001). Several of our measures rely on interlock counts, which is a commonly used approach to operationalizing the influence of direct ties (e.g., Geletkanycz et al. 2001, Haunschild and Beckman 1998). However, we conducted an alternative analysis using a relative proportions measure of ties. This analysis accounts for the possibility that, for example, a firm having a tie to a single adopter could constitute a large portion of its network, whereas it might constitute just one of many ties for a different firm. Therefore, we also calculated the variables listed above as proportions relative to the total number of ties the firm maintained in any given year. The results proved substantively the same.

Control Variables. Prior literature on FDI lists several additional factors that may affect the likelihood and timing of firms’ subsidiary establishment in China (Hitt et al. 2006). Greater firm size is likely to yield increased market power, simplifying the establishment of a subsidiary. Therefore, we controlled for *firm size* as the natural logarithm of total firm sales. Firms that are performing well may have more resources available to them to explore international investment options, whereas firms performing poorly may need to lower labor cost or gain market share by operating in China. Therefore, we control for *firm performance* with a measure of the firm’s net income. Prior research has shown *board size* to influence firm-level strategic outcomes, so

we control for this with a count of the number of directors. Similarly, board composition may affect the likelihood of subsidiary establishment in China. As boards add more inside officers, they are less likely to take on the risk of investing in foreign markets (Ellstrand et al. 2002). We control for *board independence* with the total number of insiders on the board.

During the initial years of our sampling window, the Chinese government restricted subsidiaries of service industries by imposing limits on foreign service firms in the areas of licensing, equity participation, geographic location, and business scope. The Chinese government relaxed or removed these restrictions in preparation for its membership in the World Trade Organization in 2001. To control for the impact of China’s policies toward service firms, we included a *service industry* dummy variable coded as 1 for all firms whose dominant four-digit Standard Industrial Classification (SIC) code is service oriented.

There is a well-established empirical record supporting mimicry among firms within an industry (Sanders and Tuschke 2007). We therefore controlled for *industry precedence* as a count variable of the number of firms within the focal firm’s primary SIC that have invested in China. Because the sizes of SIC categories vary widely, we relied on the most specific three-, two-, or one-digit code that contained at least 10 firms for each of the firms in the network. More generally, firms may encounter other forms of external influence that either foster or hinder expansion into China, such as social influences of their more immediate geographic locale (Greve 2009). All firms in the sample are headquartered in the United States, but differences in external influence may exist between regions, so we control for *local external influence* by coding the region of each firm’s headquarters as Northeast, Southeast, South, Midwest, or Far West.

Because international operations often consist of diverse experiences, firms interested in establishing a subsidiary in China may benefit from previous experience in other Asian emerging markets. India is a particularly apt control because its economic emergence and market size parallel that of China (Gupta and Wang 2007). As one author notes, “Never has the world seen the simultaneous, sustained takeoffs of two nations that together account for one-third of the planet’s population” (Engardio 2005). In fact, some U.S. firms may prefer establishing a subsidiary in India before operating in China if perceived market uncertainty is lower for India. Therefore, we control for *prior international experience (India)* using a dummy variable.

Firms’ presence in China may be influenced by prior international experience in Asia beyond emerging country characteristics and market size. A subsidiary in Taiwan, for example, may provide important cultural experience to U.S. firms for subsequent subsidiary establishment in mainland China. We control for *prior international experience (Taiwan)* using a dummy variable.

The source of both prior international experience variables was disclosure. We also control for firms' prior experience in the form of strategic alliances. Our *prior alliances in China* variable is measured as the number of prior strategic alliances in China by each firm since 1987, a count variable. Strategic alliance information comes from Thomson's SDC Platinum database. Another control variable pertaining to international experience captures the overall *international diversification* of the firm. We measure this as the total number of countries in which the firm maintains subsidiaries during the focal year.

Furthermore, there are different strategic motivations that may explain why firms might establish a subsidiary in China. Nachum and Zaheer (2005) delineate the major strategic motivations that researchers have identified in the literature. Following these categories, a firm's *motivation* for expanding overseas may be broadly understood as market seeking, resource seeking, export seeking, knowledge seeking, or efficiency seeking. We coded each firm based on information the firms provided in SEC 10-K annual reports. Motivation is, therefore, a categorical control variable based on effects coding.

We also control for a number of factors that derive from our social network analysis. For example, the final hypothesis addresses the issue of relative coreness. This could be confounded by the extent to which the focal firm is itself close to the core or more toward the periphery. Therefore, we control for *firm coreness* as the eigenvector centrality of the focal firm. Also, using the information from the core-periphery analysis, we measured *ties to periphery adopters* as the count of interlocks with more peripheral firms that have established a subsidiary in China and *ties to core nonadopters* as the count of interlocks with firms closer to the network core that have not expanded into China. These three control variables (firm coreness, ties to peripheral adopters, and ties to core nonadopters) pertain only to the final hypothesis, so they are included only in the final model.

Local network structures rich in structural holes will provide access to a more cosmopolitan population of firms with a wider range of experience in China (Burt 2007). Although structural holes theory has not yet been empirically tested in the network of interlocking directors, we expect the information gained through structural holes may confound our examination of various types of ties. The extent to which actors have access to structural holes that could provide unique informational advantages is a function of the efficiency of their ties. Efficiency describes how much the focal firm's network consists of nonredundant interlock ties (Burt 1992). We calculate *efficiency* as the effective network size divided by the number of firms to which the focal firm is connected. The resulting variable ranges from 0 (all alter firms are interlocked with one another) to 1 (no alter firms are interlocked). Conceptually, efficiency captures

the extent to which information a firm receives from its network is recapitulated and reinforced by redundancy among its ties.⁵

A final control variable considers the potentially confounding effects of board interlocks that existed in the past but do not exist in the focal year. Specifically, if a firm was interlocked with another firm that established a subsidiary in China, but then it broke that tie, there may still be learning effects that could reduce the uncertainty of establishing a Chinese subsidiary. Therefore, we control for *broken ties to adopters* as a count of interlocks to firms operating in China that existed within the past three years but that do not exist in the focal year.

All control variables are lagged behind the dependent variables by one year, with a few exceptions (Beckman et al. 2004, Carpenter and Westphal 2001). Service industry was not lagged because it varies between firms but not between years. Industry precedence, prior international experience (India and Taiwan), and prior alliances in China were not lagged because they already represent constructs derived from years preceding the focal year. All variables represent firm-level data with the exception of *industry precedence* and *service industry*, which are industry-level variables.

Analysis

Table 1 shows descriptive statistics and correlations for all measures. Multicollinearity is of limited concern in event history analysis. When covariates in a single Cox model are highly correlated, Tabachnick and Fidell (2001) recommend that analyses uphold squared multiple correlations (SMCs = 1 – tolerance) below 0.90 for all covariates to avoid sensitivity to multicollinearity. The highest SMC in our analyses was 0.68, suggesting that multicollinearity was not a problem for any of the models.

We tested our hypotheses using continuous-time event history analysis with partial-likelihood estimation and time-varying covariates (Yamaguchi 1991). Because event histories model the rate of occurrence of an event during some period of time, they are useful for examining the rate of diffusion (Valente 2005). In this case, the transition of interest is establishing a subsidiary in China and the time period is synonymous with the observation period. The observed rate of subsidiary establishment in China varied by year, calculated as the number of firms with a subsidiary in China divided by the total number of firms in the data set that do not yet have a subsidiary in China. The rate did not fit into one particular parametric distribution, making partial-likelihood estimation the correct method (Yamaguchi 1991). This has become a well-established technique in the social sciences; the most commonly used method is the Cox model (Singer and Willet 2003, Young et al. 2001), which takes the form:

$$PL = \Pi_i (\exp[\sum_k b_k X_{ik}(t_i)] / \sum_{j \geq i} \exp[\sum_k b_k X_{jk}(t_i)])^{\delta_i},$$

Table 1 Means, Standard Deviations, and Correlations

Variable ^{a,b}	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Firm size (ln)	14.28	1.22																		
2. Firm performance	0.17	0.70	0.39																	
3. Board size	10.66	4.10	0.23	0.16																
4. Board independence	2.31	1.75	0.01	0.04	0.31															
5. Service industry	0.44	0.49	-0.11	0.03	0.21	0.07														
6. Industry precedence	4.02	8.73	0.01	-0.01	-0.08	-0.06	-0.14													
7. International diversification	3.11	6.61	0.22	0.18	0.04	-0.01	-0.13	0.14												
8. Prior intl experience (India)	0.03	0.16	0.06	0.03	-0.01	-0.02	-0.02	0.05	0.21											
9. Prior intl experience (Taiwan)	0.04	0.19	0.11	0.07	0.01	0.01	-0.06	0.08	0.24	0.21										
10. Prior alliances in China	0.13	0.81	0.22	0.19	0.04	-0.01	-0.05	0.07	0.11	0.01	0.11									
11. Efficiency of ties	0.68	0.35	0.27	0.09	0.19	-0.04	-0.04	0.03	0.12	0.04	0.06	0.06								
12. Broken ties to adopters	0.13	0.50	0.23	0.12	0.05	-0.05	-0.02	0.10	0.14	0.08	0.07	0.16	0.10							
13. Ties to successful adopters	0.27	0.47	0.39	0.19	0.16	-0.05	-0.03	0.11	0.21	0.11	0.12	0.16	0.22	0.27						
14. Ties to unsuccessful adopters	0.10	0.39	0.19	0.11	0.11	-0.01	0.01	0.03	0.09	0.05	0.04	0.11	0.10	0.17	0.25					
15. Ties to nonadopters	5.54	6.52	0.47	0.21	0.39	0.01	-0.02	-0.05	0.18	0.03	0.10	0.10	0.30	0.10	0.34	0.17				
16. Coreness	0.01	0.02	0.49	0.29	0.29	0.01	-0.04	0.01	0.21	0.07	0.12	0.17	0.20	0.24	0.46	0.27	0.67			
17. Ties to peripheral adopters	0.32	0.99	0.39	0.28	0.21	-0.01	-0.01	0.03	0.20	0.07	0.09	0.22	0.15	0.29	0.56	0.39	0.47	0.68		
18. Ties to core nonadopters	2.18	2.03	0.31	0.09	0.27	-0.01	-0.08	-0.04	0.13	0.01	0.08	0.04	0.34	0.01	0.16	0.04	0.69	0.39	0.14	
19. Ties to core adopters	0.45	0.80	0.35	0.16	0.16	-0.05	-0.04	0.09	0.19	0.08	0.08	0.15	0.20	0.24	0.67	0.35	0.32	0.39	0.29	0.15

^aCorrelations greater than 0.02 or less than -0.02 are significant at $p < 0.05$.

^bThe number of firms that did not yet have a subsidiary in China varied by year, with a peak of $N = 1,448$ firms in 1994.

where $X_i(t_i)$ is a vector of covariates, b is the vector of coefficients corresponding to the covariates, and δ is a dummy variable that takes 1 when the i th subject experienced the transition event and 0 otherwise. An important characteristic of this equation is that it is solely a function of covariate parameters, so there is no need to specify the parametric form of time dependence for the transition rate. Another advantage is that covariates, $X_i(t_i)$, may be time dependent, as is the case for most of our independent and control variables.

Scholars have frequently employed Cox models to study adoptive behavior in organizational settings (e.g., Young et al. 2001). The dependent variable captures both whether an event occurred and when it occurred. Cox models impose a window of opportunity during which the event could take place, in our case a period of 17 years, to produce likelihood. An important consideration, then, is the likelihood that the event may have occurred before or after the chosen window,

or censoring. Before 1988, FDI in China remained at low levels because the regulatory framework was not well developed (Lau and Bruton 2008, Lemoine 2003). In fact, China was essentially a closed economy for U.S. subsidiaries before the late 1980s (Nee 1992). We uncovered 28 firms in our sample that had established subsidiaries in China at some point before our sampling window began. Regarding these firms, we followed Allison (1984, p. 57), who suggests that “the safest approach is simply to discard the initially censored intervals. While this represents a loss of information, it should not lead to any biases.” Right censoring was more prevalent, in two forms: 854 firms did not have a subsidiary in China by the end of the observation period, and 796 firms fell out of the data set before they had a subsidiary in China, likely because of acquisition or failure. However, estimates provided by the Cox model are robust, approximating those that would be achieved without right censoring (Allison 1984).

Table 2 Results of Cox Model Continuous-Time Event History Analysis

Variable	Controls	Model 1	Model 2	Model 3	Model 4
<i>Firm size</i>	0.12 (0.06)	0.07 (0.06)	0.08 (0.06)	0.14* (0.07)	0.11 (0.07)
<i>Firm performance</i>	-0.14* (0.06)	-0.16* (0.06)	-0.14* (0.06)	-0.15* (0.06)	-0.15* (0.06)
<i>Board size</i>	-0.02 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.01 (0.02)	-0.01 (0.02)
<i>Board independence</i>	0.04 (0.04)	0.04 (0.04)	0.04 (0.04)	0.02 (0.04)	0.03 (0.04)
<i>Service industry</i>	-0.49** (0.17)	-0.48** (0.17)	-0.46** (0.17)	-0.48** (0.17)	-0.50** (0.17)
<i>Industry precedence</i>	0.01* (0.01)	0.01* (0.01)	0.01* (0.01)	0.01* (0.01)	0.01* (0.01)
<i>International diversification</i>	0.04*** (0.01)	0.04*** (0.01)	0.04*** (0.01)	0.04*** (0.01)	0.04*** (0.01)
<i>Prior intl experience (India)</i>	0.69*** (0.21)	0.64*** (0.21)	0.67*** (0.21)	0.66*** (0.21)	0.68*** (0.21)
<i>Prior intl experience (Taiwan)</i>	1.17*** (0.16)	1.16*** (0.16)	1.15*** (0.16)	1.20*** (0.16)	1.16*** (0.16)
<i>Prior alliances in China</i>	0.11*** (0.03)	0.11*** (0.03)	0.12*** (0.03)	0.11*** (0.03)	0.11*** (0.03)
<i>Efficiency of ties</i>	0.79*** (0.25)	0.74*** (0.26)	0.74*** (0.26)	0.76*** (0.24)	0.81** (0.25)
<i>Broken ties to adopters</i>	0.09 (0.08)	0.04 (0.08)	0.07 (0.08)	0.07 (0.08)	0.05 (0.08)
<i>Ties to successful adopters</i>		0.45*** (0.12)	0.51*** (0.12)	0.59*** (0.12)	0.36* (0.16)
<i>Ties to unsuccessful adopters</i>			-0.36* (0.16)	-0.33* (0.16)	-0.44* (0.17)
<i>Ties to nonadopters</i>				-0.04** (0.01)	-0.07** (0.02)
<i>Firm coreness (control)</i>					10.4* (4.9)
<i>Ties to periphery adopters (control)</i>					-0.03 (0.07)
<i>Ties to core nonadopters (control)</i>					-0.04 (0.04)
<i>Ties to core adopters</i>					0.17* (0.08)
<i>Local external influence (effects coded)</i>	Included	Included	Included	Included	Included
<i>Internationalization motivation (effects coded)</i>	Included	Included	Included	Included	Included
Chi-square	418	434	440	451	459
df	21	22	23	24	28

Note. Standard errors are in parentheses.
 * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Results

Table 2 reports the results of event history analyses of subsidiary establishment in China for our sample firms. The Kaplan–Meier probabilities of not establishing a subsidiary in China step down consistently to a final value of about a 75% chance of not expanding to China at any time during the entire observation period. Schoenfeld residuals tests showed that none of our covariates violated the proportional transitions assumption of the Cox model.

The first model tests firm-level control variables, with several covariates being significant predictors of subsidiary establishment in China. Well-performing firms were less likely to establish a subsidiary in China during our observation window, presumably because they had less motivation to undertake risk. Service firms were also less likely, which is consistent with the more stringent Chinese legal restrictions that exist for those firms. International diversification was a significant predictor of expansion into China, possibly demonstrating the

learning effects of broader internationalization efforts. The statistical significance of prior firm expansion to India and Taiwan points to the explanatory value of experience in establishing international subsidiaries in economically and culturally similar markets. Prior experience in the form of strategic alliances in China was significant, confirming that firms likely gain information from cooperative relationships with local businesses in China that can help them to subsequently establish a subsidiary there. The effect of industry precedence was also statistically significant. Results on the strategic motivation measures were consistent with previous literature and anecdotal reports on the motivations of U.S. firms in establishing their subsidiaries in China; although not delineated in Table 1,⁶ efficiency seeking (e.g., entering China to reduce labor cost or for other cost benefits) was a significant motivation for subsidiary establishment in China. Market seeking was significant and negative, possibly suggesting that firms seeking new markets may have other options available to them besides expansion into China (e.g., other countries in which to establish subsidiaries).

Hypothesis 1 suggested the number of interlocks with firms that successfully established a subsidiary in China is positively associated with the likelihood of establishing a subsidiary in China. Inclusion of this measure in model 1 significantly improved model fit, resulting in a chi-square of 434. The coefficient for successful ties to adopters was 0.45, which is commensurate with a hazard ratio of 1.57. This indicates that for each additional interlock to a firm with a successful subsidiary in China, the focal firm is 57% more likely to establish a subsidiary in China during our sampling window. Hypothesis 1 was supported.

Model 2 tested Hypothesis 2, which considered the number of interlocks to firms that have been *unsuccessful* in China. The results in model 2 indicate that not all ties to adopters make firms more likely to open a subsidiary in China; some ties to adopters make the firm less likely, depending on the success of the strategy. Specifically, each additional tie to a firm with an unsuccessful subsidiary makes the focal firm 43% less likely to establish a subsidiary in China. This provides evidence in support of Hypothesis 2. Accounting for the positive effect of ties to successful adopters and the negative effect of ties to unsuccessful adopters improved our model fit to a chi-square to 440, a significant improvement over the control variables alone.

Moving to model 3, we asked whether interlocks to firms that had *not* established a subsidiary in China might impede diffusion, as proposed in Hypothesis 3. Here, we again found a negative and significant relationship, this time between ties to nonadopters and the likelihood of expanding into China. For each additional interlock to another firm that is not in China, firms are 4% less likely to expand into China themselves. This is

especially important given that, on average, firms have about a half dozen ties to other firms with no Chinese subsidiaries. Hypothesis 3 was therefore supported.

Last, in model 4 we examined the likelihood a firm would expand into China when it was connected to an adopter positioned closer to the network core. Hypothesis 4 predicted these firms would be more likely to establish a subsidiary in China. We considered this hypothesis by including the vectored predictor variable, ties to core adopters. We also included several additional variables in this model to control for potential confounding effects. Ties to peripheral adopters tests for influence in the opposite direction (i.e., connections to adopters that are relatively further out toward the periphery), firm coreness controls for a firm's own position in the core-periphery structure, and ties to core nonadopters controls for other ties to higher core firms. Model 4 shows that ties to core adopters are significant, so Hypothesis 4 was supported. Firm coreness also proved to be a significant control variable, showing that a firm's absolute position is, by itself, an important indicator of adoption.

To further validate our results, we analyzed differences in entry mode decisions across our sample of firms. Firms considering entry into new international markets are concerned not only with whether to establish a subsidiary (Martin et al. 2007) but also with how they will do so. Previous studies on entry mode decisions most commonly studied the differences between decisions involving greenfield investments and acquisitions. We coded our firms for these two modes of entry. We then conducted a competing risks event history analysis to evaluate the likelihood that one of two entry mode outcomes would occur. Following the methodology outlined by Singer and Willet (2003), we established coefficients for each event type and tested the compound null hypothesis that coefficients associated with each predictor are the same for the different events. The sum of the goodness-of-fit statistics (i.e., 2LL) for each event type was not statistically different from the goodness of fit of the global model. Therefore, we concluded that there is no statistical difference in our sample between the predictors in our model for firms that establish a subsidiary in China by acquisition or greenfield investment.

Discussion

Our study explored the effects of interlocking directorships among Fortune and Forbes firms on the likelihood that they would adopt an emerging strategy—establishing a subsidiary in China. Our results suggest that when firms have already successfully implemented the strategy, it increases the likelihood that firms to which they are connected will do the same. However, firms that were unsuccessful reduce the likelihood that firms to which they are connected will adopt the strategy. We also found that ties to firms that decide to forgo the

opportunity to implement the strategy also influence the decisions of other firms considering adoption. Specifically, interlocks to firms in our sample that did not adopt the emerging strategy appear to impede diffusion. Furthermore, our results leverage recent findings about the topological structure of the interlocking directorate to find that when a firm is connected to an adopter that is closer to the network core, it is more likely to conform to the connected firm and also adopt the strategic initiative. These results both clarify and contribute to theory in several ways.

Our study contributes to the social network analysis literature by empirically examining previously unexplored network ties. Scholars have established the positive effect that ties to adopters have on the propensity to adopt a practice (Davis 1991, Rogers 1995, Haunschild 1993) but have generally not considered the important effects of those that do not adopt. This may be, in part, because of the predominantly held viral perspective wherein only ties to “infected” actors are important to the diffusion process. The results presented here suggest that when considering the diffusion of an emerging strategy, the viral perspective provides only a partial explanation. Firms that do not adopt the strategy may validate each other’s decision when they are interlocked. This highlights competing influences within the interlocking directorate of different types of board interlocks. A network tie to an adopter can be more than 10 times more influential than a tie to a nonadopter,⁷ explaining why they have dominated empirical studies in the past. However, only half the firms in our sample have even a single tie to an adopting firm, whereas firms average more than five connections to other nonadopters. Although the relative influence of a single nonadopter may be smaller than that of an adopter, the combined influence of multiple nonadopters increases as they work together to slow the process of diffusion.

We also found that not all adopters are created equal. Certain adopters, namely, unsuccessful adopters, actually decrease the likelihood of adoption in firms to which they are connected and thereby serve as an additional mechanism obstructing diffusion. This may occur because directors that are tied to unsuccessful adopters draw appropriate conclusions about the likely outcome of implementing the strategy. Although some studies in the sociology literature suggest that outcomes associated with adoption may be important to diffusion (e.g., Conell and Cohn 1995), these distinctions cannot be made in most empirical studies. Our approach moves the analysis from simple mimicry through passive actors closer to a social learning theoretic through which rational decision makers observe the consequences of a practice.

This study goes beyond many network studies insofar as we account for heterogeneous attributes of network alters, such as their adoption status, the success of

their adoption decision, and their centrality. Social network scholars sometimes argue, for example, that past collaborations with a potential alliance partner increase the probability of selecting it again, seemingly without regard for how well the collaboration worked the first time. Our study addresses this issue by incorporating outcome-based network connections. Scholars working on interfirm social networks typically know when potential adopters are brought into contact with a diffusing practice, but the results reported here indicate that potential adopters also pay attention to what happens after they are brought in contact. Simply stated, our study reveals actors that act. Welch and Welch (2006, p. 108, emphasis added our own) recognize this important distinction as they comment in their *Business Week* column that “the allure of China’s scale is enormous, and the competitive power of scale is real. But there is no point in going to China if you don’t know *how* scale is going to make your company better, more productive, and more profitable.”

In addition to our contribution to social network theory, this study has implications for the literature on corporate governance. Most importantly, we offer important evidence on the strategic role of boards of directors. We find that board interlocks appear to affect the likelihood that a firm will adopt a particular strategy, such as internationalization to China (e.g., Ellstrand et al. 2002). Our structural view of the interlocking directorate helps governance research move beyond dominant agency theoretic prescriptions. Governance models based on agency theory assumptions of superior information held by managers relative to the firm’s owners offer limited explanations for making strategic decisions in corporations. Shifting the focus from information asymmetry to the source of information in diffusion may provide a better understanding of such high-risk/high-return decisions. Our study thus builds on a tradition of research that sees governance structures as embedded in a broader social structure (Jones et al. 1997).

This study also extends international strategy research in three main directions. First, it underscores the complex nature of managerial decisions involving international strategies by highlighting the role of corporate governance. Consistent with recent developments in the literature (Ellstrand et al. 2002, Hitt et al. 2006), we argue that international subsidiary establishment in a major market is a corporate-level decision that needs careful consideration by boards of directors. Subsidiaries in unexplored international markets may provide value to shareholders that they are unable to replicate on their own. Second, subsidiary establishment in China provides an appropriate setting to test the interest of the firm’s directors in international expansion. China is an emerging economy with great prospects for FDI. However, China is also characterized by the many risks that multinational firms typically face in other developing

markets. Considering that growth opportunities in the decades ahead will largely come from these markets, studies on the diffusion of investment may help in understanding how managers and directors will make foreign direct investment decisions. Third, prior research on international subsidiary establishment has focused almost exclusively on firm and industry characteristics. Examining international subsidiary establishment as an essential managerial decision that utilizes information from a social network increases the validity of international business research.

Implications for Managers and Directors

Our results also have some important implications for managers and directors as we draw attention to the value of the firms' social context when it is considering adoption of an emerging strategy. Strategic decisions such as investment in R&D, entry into new markets, or establishment of subsidiaries in international markets, may provide significant benefits for firm growth. However, these decisions are often complex because of the high levels of uncertainty and risk of failure. Managers may be better able to make such decisions by relying on their social networks. Positive as well as negative experiences of managers of other firms can be used as indicators of the opportunities and risks that are associated with strategic decisions. Members of the boards of directors may form a useful social network for corporate decision makers because of their intimate knowledge of top-level issues and their similar levels of discretion in decision making.

While controlling for firm effects established in prior literature, our study envisions the interlocking directorate as a complex map through which information flows to facilitate, or hinder, managers' likelihood of adopting new strategies. Following this analogy, if board interlocks are the roads between firms, then our study identifies those roads that are most heavily traveled. For managers facing complex decisions in uncertain environments, this roadmap describes the important role of their interfirm social network and highlights the connections that may be most influential. When seeking to implement a particular strategy, managers may wish to consider the exposure their directors have had to the strategy so that they will have a better understanding of the extent to which the board will be sympathetic to the new strategy.

Limitations and Future Research

Our analysis explored an alter influence model using a measure of direct ties that counts the number of board interlocks between firms (Geletkanycz et al. 2001, Haunschild and Beckman 1998). We also conducted a relative proportions analysis to explore the possibility of relative influence on the board. Although we found similar results, a relative influence model may yield different

results when considering smaller firms with fewer overall ties. Also, there are likely to be thresholds that are worth exploring. For example, do particular types of ties become more important when there are at least three of them or when they represent a majority of the board? Is there another critical mass of ties or types of ties that would yield a stronger relationship with the final decision to adopt or not adopt a strategy? This could be considered as a moderating effect of ties to adopters, and other moderators are also worth exploring. For example, there may be an interaction between ties to successful and unsuccessful adopters, or between ties to adopters and nonadopters, that could yield differential results.

We draw some initial conclusions about the role of a firm's position within the overall network topology. There may, however, be more nuanced explanations of the role of coreness in diffusion. For example, core firms are generally larger ($r = 0.49$), share ties with successful adopters ($r = 0.46$), and also share ties with nonadopters ($r = 0.67$). These data may point to more complex underlying phenomena wherein coreness is a driving factor. Core firms appear to be higher performing, or at a minimum higher status, and may attract ties both from firms that have been successful and those that have been unsuccessful. Our results begin to uncover the role of network topology in diffusion and, we hope, serve as an initial step toward understanding possible mediating and causal processes associated with core and peripheral actors.

There are also some methodological limitations to our approach. For example, the data for this study were limited by our sampling window. We selected 1988 because it represented the start of China's openness to foreign direct investment and was prior to the wave of expansion into China that occurred in the early 1990s (Lau and Bruton 2008). Future research could explore the role of firms that predate our sample. As is true in any study of behavioral autocorrelation, there is the potential for endogeneity. In our study, this raises the question of whether firms are influencing each other to be similar or forming ties with those who are like themselves. We partially address this problem with the lagged structure of our variables, but future research might specifically explore some of these relationships in the reverse, comparing influence versus selection in the social network. Such a study would explore the question of whether adopting similar strategies forms the basis for the creation of network ties. Also from a methodological standpoint, we traded off a broad measure of subsidiary success in exchange for an expansive network with a large number of firms. Future empirical work might consider more complex and direct measures of subsidiary success, likely with a smaller sample of firms.

Future research might also consider the possibly unique influence of ties with multiple directors and tie strength. For example, interlocks that are formed by a

lead director may be stronger than other interlocks. Furthermore, those interlock ties formed by longer-tenured or otherwise more-influential directors, such as CEOs of other firms, may be stronger. Director experience specific to the decision may also be important. In our case, ties to directors with international business or China-specific experience might transfer relevant information about subsidiary establishment.

Conclusion

Prior research has suggested that strategies and organizational practices diffuse throughout the interlocking directorate (Mizruchi 1996), and this study has identified interlocks that both aid and obstruct this diffusion. We find that the traditional emphasis in the literature on ties to adopters belies forces within that group that compete with each other in their influence on firms to which they are connected. The results presented here also highlight the role of nonadopters that serve as confederates, influencing other nonadopting firms to which they are connected to retain their status. Furthermore, we draw on recent findings about the core-periphery structure of the interlocking directorate, showing that network-level characteristics also play a role in diffusion. In sum, this study has extended our understanding of diffusion of an emerging strategy through the interlocking directorate by incorporating rational actors, potentially suppressive influences, and network structural considerations.

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Endnotes

¹Board interlocks are shared between firms and are by themselves undirected. However, we incorporate heterogeneous attributes of network alters that imposes directionality to network ties. For example, if firm A is not in China and firm B is in China, then A's tie to B (i.e., tie to an adopter) is counted differently than B's tie to A (i.e., tie to nonadopter).

²For example, Composite Automobile Research added David Yue in June 2000, American Dairy appointed Kevin Tseng in March 2005, and Grand Power appointed Kim Oishi in December 2007. Press releases for these and other similar additions to boards of directors describe the new director's experience in China as a primary reason for his or her appointment.

³Consistent with event history analysis, firms were no longer at risk once they had experienced the event (i.e., once they had established a subsidiary in China).

⁴We conducted an alternative analysis to examine the unique effects of interlocks involving multiple directors sitting on the companies' boards, but the findings were not substantially different from the dichotomized data.

⁵We conducted an alternative analysis using effective size instead of efficiency, finding that it too was significant and provided the same overall results.

⁶More-detailed results of coefficients for each of the effect-coded variables are available from the corresponding author upon request.

⁷A single tie to a nonadopter decreases the likelihood of adoption by 3.9%. A single tie to a *successful* adopter increases the likelihood of adoption by 57% and to an *unsuccessful* adopter decreases the likelihood by 43%. Thus a tie to either a successful or unsuccessful adopter is at least 10 times more influential than a tie to a nonadopter.

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