Cooperative or Controlling? The Effects of CEO-board Relations and the Content of Interlocks on the Formation of Joint Ventures

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This study examines the influence of the social network of board interlocks on strategic alliance formation. Our theoretical framework suggests how board interlock ties to other firms can increase or decrease the likelihood of alliance formation, depending on the content of relationships between CEOs (chief executive officers) and outside directors. Results suggest that CEO-board relationships characterized by independent board control reduce the likelihood of alliance formation by prompting distrust between corporate leaders, while CEO-board cooperation in strategic decision making appears to promote alliance formation by enhancing trust. The findings also show how the effects of direct interlock ties are amplified further by third-party network ties.●

The board interlock network has been viewed as an ideal arena in which to develop and test the embeddedness perspective on interorganizational relations. The board of directors is a unique formal mechanism linking top managers of large corporations; it provides an opportunity for leaders to exchange information, observe the leadership practices and style of their peers, and witness firsthand the consequences of those practices. Thus, from this perspective, board ties to other firms should have a strong influence over corporate policy and strategy decisions. The empirical literature on board interlocks has extended research on the diffusion of innovations by specifying the social networks through which a variety of policies and practices are spread across firms (e.g., Mizruchi, 1992; Haunschild, 1993; Palmer, Jennings, and Zhou, 1993; Westphal and Zajac, 1997).

While interlock research has advanced our understanding of the consequences of interlocks for firms, significant concerns have also been raised that reflect more general concerns about the application of network theory to interorganizational relations (Mizruchi, 1996). Several authors have expressed concern about the consistency and magnitude of network effects (Stinchcombe, 1990; Fligstein, 1995). Weak or inconsistent findings may result from two limitations common to most prior studies. First, prior interlock research has not adequately specified the content of network ties (Hirsch, 1982; Pettigrew, 1992; Mizruchi, 1996: 288). Content here implies a specification of the nature of the relationship and behavioral processes underlying a connection between two actors. Although recent research in the governance literature suggests that relationships between top managers on corporate boards may be characterized by independence and distrust in some cases (Westphal, 1999), in the interlock literature all ties are generally treated as equally positive connections that facilitate social cohesion and the exchange of information between firms. This ignores heterogeneity that may exist among interlocks in the extent to which they channel information and engender trusting relations between board members.

Another concern with interlock research is its primary focus on the effect of direct ties or relational embeddedness on firm behavior to the exclusion of more distant network ties or structural embeddedness (Granovetter, 1992). While there is ample evidence in network research that both relational

and structural embeddedness can influence behavior (e.g., Burt, 1987; Gulati and Gargiulo, 1999), this has had limited application in interlocks research. Studies in the larger network literature have shown that indirect network ties between actors can strongly condition the effects of direct ties between them (Gulati, 1995b). Moreover, recent research also suggests that indirect network ties can amplify differences in the magnitude of the effect of direct ties, such that distrust between actors is exacerbated in the presence of indirect ties between them (Burt and Knez, 1995). Thus, it may be possible to uncover stronger interlock effects by modeling variation in the content of direct ties and examining how such ties are conditioned by the larger social structure.

The present study examines the influence of heterogeneous social processes that underlie interlock ties, and the moderating effects of indirect network ties, on the creation of strategic alliances between firms. Some ties may promote the creation of a new alliance, while others could actually reduce its likelihood, depending on the behavioral content of the tie. As a result, there may be both bright and dark sides to embeddedness in interorganizational relationships. Although recent studies have focused on how the network of prior alliances provides valuable information to potential partners about each other's reliability, capabilities, and needs (Kogut, Shan, and Walker, 1992; Gulati, 1995b; Powell, Koput, and Smith-Doerr, 1996), this literature has not considered the role of alternative networks such as board interlocks in guiding the formation of new alliances or in strategic cooperation between firms. In this paper, we examine the role of board interlocks, focusing on a subset of alliances known as joint ventures, which entail the creation of a separate legal entity in which the parent firms take equity, and use the term alliance to refer specifically to joint ventures. Such alliances typically entail a considerable outlay of resources and create enduring and irreversible commitments between partners, which can make the influence of the board interlock network on their formation even more important. Such a network can be an important source of information for top managers about the reliability and capabilities of potential venture partners.

CONTENT OF INTERLOCK TIES AND EFFECTS ON ALLIANCES

Empirical studies examining the consequences of interlocking directorates for the diffusion of innovations and the likelihood of strategic change have typically viewed interlock ties in broad terms as a mechanism for resolving uncertainty for top management decision makers (Galaskiewicz, 1985a). In discussing how interlock ties may facilitate the diffusion of an innovation, scholars have emphasized the value of direct communication between managers and directors in reducing ambiguity about the implications of adoption. From this perspective, information from fellow corporate leaders is particularly influential because it comes from a trusted source (Davis, 1991; Haunschild, 1993). Research on the consequences of interlocking directorates would also suggest that interlock ties could help resolve uncertainty for top manage-

ment decision makers about the implications of forming strategic alliances with another firm. Moreover, the question here relates not only to the adoption of strategic alliances in general, but also to the choice of a specific partner. While prior research has typically described interlocks as conduits of information about administrative innovations, it is reasonable to expect that board members also communicate information about their respective parent organizations. The social embeddedness created by interlock ties should help resolve uncertainty for top managers about the motives and management capabilities of other organizations as potential alliance partners.

Despite their explosive growth, strategic alliances are associated with a variety of risks and pitfalls that result in considerable uncertainty about the decision to enter such ties. This uncertainty stems from two main sources (Gulati, 1995a, 1995b). First, organizations have difficulty in obtaining information about the competencies and needs of potential partners. Such information is often confidential and may not be revealed outside a close relationship, but organizations must understand the needs and capabilities of potential partners if both organizations are to derive benefits from the alliance. The second source of uncertainty that affects strategic alliances stems from the paucity of information about the reliability of the potential partners, whose behavior is a key factor in the success of an alliance. Organizations entering alliances face considerable moral hazard concerns because of the unpredictability of the behavior of partners and the likely costs to an organization from opportunistic behavior by a partner, if it occurs (Kogut, 1989; Doz, Hamel, and Prahalad, 1989; Gulati, Khanna, and Nohria, 1994; Khanna, Gulati, and Nohria, 1998). A partner organization may either free ride by limiting its contributions to an alliance or may simply behave opportunistically, taking advantage of the close relationship to use resources or information in ways that may damage the partner's interests.

Recent research builds on Granovetter's notion of embeddedness (1985) and suggests that organizations address the potential hazards associated with building alliances by relying on information provided through existing interorganizational networks (Gulati, 1998). While the focus of this research has been on the role of the network of prior alliances (e.g., Gulati and Gargiulo, 1999), board interlocks may also channel information between firms and thus serve as a catalyst for the creation of new alliances between firms. Beyond allowing top managers to form relationships with managers of prospective alliance partners, board ties may also enable directors to acquire firsthand knowledge about another firm's capabilities, activities, and plans through their communications with top management and their involvement in the decision-making process. Top managers can identify and pursue alliances by jointly discovering opportunities for collaboration in ongoing discussions. Networks can also provide information in a timely manner, which can be important when a firm seeking attractive alliance partners must approach them at the right juncture and preempt their seeking alliances elsewhere. This suggests an initial, baseline hypothesis on the effect of interlock ties on alliance formation:

Hypothesis 1: An interlock tie between two firms will increase the likelihood of subsequent alliance formation between them.

The discussion thus far has assumed that interlock ties indicate positive social contact between top managers and outside directors of the focal firm. A similar rationale has been used in much prior research on board interlocks and the diffusion of organizational innovations. As interlock researchers have generally recognized, however, there is considerable variation in the nature of management-board relationships, though the consequences of this heterogeneity have yet to be systematically examined (Herman, 1981; Johnson, Hoskisson, and Hitt, 1993; Mizruchi, 1996). The form of management-board relationships can range from a positive and relatively cohesive relationship between top managers and outside directors to a negative and independent one, with very different consequences for the likelihood of venture formation.

Independent Board Control and Alliances

According to agency perspectives, while top managers are responsible for ongoing decision management, the board of directors is responsible for decision control, which involves monitoring and evaluating management decision making and performance (Fama and Jensen, 1983). In effect, the board is viewed as an efficient control device that can help align management decision making with shareholders' interests (Beatty and Zajac, 1994). For instance, to the extent that managers' personal preferences regarding executive compensation, corporate diversification, or other strategy and policy issues conflict with the interests of shareholders, boards can intervene to ensure that shareholders' interests are protected (Hermalin and Weisbach, 1988; Hill and Snell, 1988). Moreover, from this perspective, outside directors in particular are critical to the board's ability to exercise control, because as non-employee directors they are formally independent from management and thus better able to evaluate management decisions and actions objectively on behalf of shareholders' interests.

In prior years, this agency model of the relationship between the chief executive officer (CEO) and the board could be dismissed as an anomaly. Organization theorists have typically suggested that while outside directors are in a position to exercise independent control over management, various behavioral factors effectively limit the social independence of outsiders, impairing their ability or willingness to exert control. For instance, given evidence that CEOs traditionally dictate the selection of new directors, several authors have suggested that CEOs can appoint personal friends or other individuals with whom they have preexisting social ties (e.g., Finkelstein and Hambrick, 1988; Wade, O'Reilly, and Chandratat, 1990; Cannella and Lubatkin, 1993). Such ties are thought to inhibit the board's willingness to contradict management's preferences on behalf of shareholders. Moreover, organization theorists have long maintained that generalized norms of support among managerial elites enforce a passive role for outside directors in strategic decision making (e.g., Herman, 1981; Whisler, 1984). From this perspective, boards have little potential to serve as independent agents of con-

trol and, supporting the assumption of interlock theorists, management-board ties are characterized by social cohesion.

The recent literature on boards of directors, however, has provided some evidence that widespread norms about the role of corporate boards may be changing. Useem (1993) and Westphal and Zajac (1997) have documented the spread of changes in board structure, composition, and executive compensation that appear to indicate increased board control over management among large corporations over the past fifteen years. This trend may have originated in response to external criticism from institutional investors and other stakeholders and the threat of lawsuits over perceived negligence in protecting shareholders' interests (Kesner and Johnson, 1990; Davis and Thompson, 1994). External constituents have demanded evidence that boards are willing to challenge management's decisions on their behalf. For instance, boards have been told to expand the search for new directors beyond the CEO's close circle of personal friends and to alter board structure and processes in ways that diminish the CEO's direct control over board meetings (Kaplan and Harrison, 1993; Daily, 1996). In effect, boards have been pressured to adopt a role characterized by more independent monitoring and control over management. Nevertheless, while there has been a general move toward more assertive boards that assert greater control over CEOs, there remains considerable variance across boards in the extent to which they have adopted a controlling orientation.

The consequences for alliance formation. There are several possible consequences of independent board control on the prospects of alliance formation between the focal firm and manager-directors' home companies. On one level, a CEO-board relationship characterized by monitoring and control simply entails lower cohesion between the CEO and the board, or the absence of a strong tie, but it may go further than that. Independent board control over management may actually produce a negative relationship between the CEO and the board characterized by a lack of mutual understanding and distrust. When benevolence and support toward the CEO is replaced with independent control over the CEO, leaders of the firm can become effectively divided into separate groups: decision managers (i.e., the CEO and other top managers) and decision controllers (i.e., outside directors) (Fama and Jensen, 1983), where they were previously common members of a mutually supportive, inner circle of elites (Useem, 1982). The literature on intergroup relations has provided consistent evidence, in both laboratory and field settings, that dividing a single group of individuals into two or more separate groups has a variety of negative effects on relations between members of the different groups (Miller and Brewer, 1996). Empirical studies have demonstrated that when individuals are divided into separate groups, attitudes about the out-group members become significantly more negative (Gaertner et al., 1989; Messick and Mackie, 1989). In particular, group categorization has been shown to foster distrust toward out-group members while also creating the perception of intergroup conflict (Kramer, 1996; Miller and Brewer, 1996; Labianca, Brass, and Gray, 1998).

Out-group categorization, which in the case of interlocks occurs when CEOs view outside directors as controllers rather than supporters or fellow managers, can promote distrust both with respect to the capabilities of the other party (task-based trust) and the risk that they might limit their contributions to the relationship (relational trust) (Creed and Miles, 1996), thus prompting negative evaluations of the perceived capability and personal reliability of the other party. This out-group bias occurs even when the basis for group categorization is arbitrary or minimal (Brewer, 1979). Moreover, Kramer (1994, 1996: 224) and others (Fenigstein and Vanable, 1992) have found evidence that when individuals are subjected to "evaluative scrutiny" or control by out-group members, "a pattern of exaggerated mistrust" may develop.

Applying research on intergroup relations to the CEO-board context, we expect that when outside directors assert themselves as an independent group of controllers accountable to shareholders rather than management, distrust can arise between top managers and outside directors. Whereas outside directors on passive and supportive boards are effectively insiders with regard to their orientation toward management, on controlling boards such directors adopt the perspective of an independent outsider. As a result, the perception of a division between insiders and outsiders can reinforce "a generalized sense of distrust" across groups and lead to "escalating cycles of distrust" when out-group members are exercising control (Sitkin and Stickel, 1996: 199). A behavioral manifestation of distrust is "reduced cooperative efforts of all kinds" and enhanced competition for resources and status between groups (Brewer and Kramer, 1985; Gaertner et al., 1989; Creed and Miles, 1996: 27). Thus, intergroup bias would lead each party of the management-board relationship to view members of the other group as less trustworthy in both professional and personal terms, reducing interest in various forms of cooperation.

The literature on strategic alliances suggests that trust plays a critical role as an enabling condition of alliance formation (Ring and Van de Ven, 1992; Gulati, 1995a, 1995b; Dyer, 1996; Gulati and Singh, 1998). Trust fundamentally entails a willingness to put oneself at risk (Barney and Hansen, 1994; Mayer, Davis, and Schoorman, 1995), and several authors have emphasized the potential for opportunistic behavior to derail joint ventures (e.g., Doz, Hamel, and Prahalad, 1989; Gulati, Khanna, and Nohria, 1994). In the presence of trust, managers will be less concerned about the incentive of a partner to cheat or free ride in cooperative relations by limiting its contribution to the joint enterprise. Since intergroup bias resulting from independent board control can diminish both task-based trust and relational trust, one might expect that when directors have asserted themselves as an independent group responsible for controlling managers rather than supporting them, CEOs may view them as less trustworthy alliance partners. Board independence can also prevent top managers and manager-directors from becoming familiar with each other's management and decision-making styles and developing a professional rapport, and managers tend to believe that teamwork and rapport between them is a critical factor in the success of alliances (Alster, 1986;

Borys and Jemison, 1989). Moreover, given that distrust toward an independent, controlling group is a basic and powerful human response (Kramer, 1994, 1996; Fenigstein and Vanable, 1992), independent board control may have a particularly strong, negative effect on alliance formation between top managers and manager-directors:

Hypothesis 2: The greater the board's control over the CEO, the lower the likelihood of subsequent alliance formation between the focal firm and outside directors' home companies.

CEO-board Cooperation and Alliances

While empirical research on boards has typically assumed that board involvement in corporate affairs entails independent monitoring and control by outside directors (Johnson, Hoskisson, and Hitt, 1993), the larger literature on boards has suggested another form of involvement. In his classic qualitative study, Mace (1971: 179) concluded that, while boards often did not challenge management's final decisions, they may nevertheless provide "advice and counsel" to management on strategic issues during the decision-making process. Pfeffer and Salancik (1978: 170) also distinguished the provision of advice and counsel from board control as two different forms of board administration (see also Mintzberg, 1983). In a recent large-sample empirical study, Westphal (1999) found support for this general classification. Factor analysis showed that CEO-board relationships could be classified into three categories: independent monitoring and control, close cooperation (i.e., advice and counsel), or inaction. Moreover, qualitative and survey evidence suggests that advice and counsel is typically provided at the CEO's request (Lorsch and MacIver, 1989; Demb and Neubauer, 1992). Thus, rather than remain independent of top managers to permit objective monitoring and evaluation of managerial decision making, some boards enter closer working relationships with CEOs by providing advice and counsel at the CEO's request. In such cases, CEOs direct a cooperative form of board involvement in which boards work together with them to govern the firm, rather than separately in a principal-agent relationship.

The consequences for alliance formation. Cooperative CEO-board relationships may influence alliance formation between the focal firm and manager-directors' home companies in several ways. On one level, CEO-board cooperation should enhance trust between top managers and outside directors through social interaction alone. Simmel's (1964) theory of trust emphasized how the mere occurrence of social interaction builds trust or the expectation of faithfulness, and other theorists have suggested that more frequent interaction increases trust by enhancing mutual affect and familiarity (Laumann, Galaskiewicz, and Marsden, 1978; Gulati, 1995a; Creed and Miles, 1996). Accordingly, the heightened social interaction that results when there is greater CEO-board cooperation (i.e., advice seeking) should reinforce relational trust between CEOs and outside directors.

The connection between cooperative interactions in CEO-board relationships and the extent of trust between managers can also be understood by considering some of the evidence from research on intergroup relations. According to

this literature, cooperative interactions between group members make common goals more salient, which builds mutual trust and respect (Gaertner et al., 1990, 1999). Thus, while independent board control may reduce trust by effectively dividing top managers and outside directors into separate groups, the CEO's seeking advice from the board should enhance trust by drawing outside directors into a collective decision-making team. In effect, just as negative affect and distrust toward an independent, controlling group is a basic and powerful human response, cooperation between group members can engender in-group biases that lead to positive affect and higher, even excessive levels of trust between individuals (Fenigstein, 1979; Kramer, 1996). Given the importance of intermanagement trust in facilitating alliance formation, cooperative CEO-board relationships should promote alliances between a focal firm and those of outside directors by enhancing confidence in each other's reliability and managerial capability and lowering the perceived risk of opportunism:

Hypothesis 3: The greater the cooperation between the CEO and the board, the higher the likelihood of subsequent alliance formation between the focal firm and outside directors' home companies.

The Role of Indirect Ties

While little empirical research has examined how social structural factors such as indirect ties moderate the effects of dyadic interlock ties between firms, qualitative evidence suggests that managers may have access to indirect information about directors through their appointments on other boards (Useem, 1984; O'Neal and Thomas, 1993). An indirect or third-party tie could provide top managers with an important source of information about outside directors who sit on their board. For example, a top manager A is exposed to second-hand information about outside director B on his or her board when A has a common appointment on another board with a third director C, who sits on B's board. These indirect ties are particularly relevant to the present study, in light of recent evidence suggesting that third-party ties can affect the level of trust between individuals or organizations (e.g., Raub and Weesie, 1990; Burt and Knez, 1995; Gulati, 1995b; Gulati and Gargiulo, 1999).

It is typically supposed that third-party ties will enhance trust between parties to a relationship by increasing the reputational costs of noncooperative behavior (Van de Ven, 1976). For instance, if A is cheated by relationship partner B, and A has third-party ties to B through C, A can impose reputational costs on B by spreading the word to C that B cannot be trusted. Given this threat, A can trust B not to defect from cooperative exchange (Kreps, 1990). The claim that third-party ties enforce cooperation through reputational effects assumes that noncooperative behavior is illegitimate or non-normative, like cheating a friend (Granovetter, 1992). In many cases, however, noncooperative behavior involving competition or control is not normatively proscribed in the larger social structure, or the related norms are ambiguous. As several authors have noted, norms governing CEO-board relationships have become uncertain: it is not clear whether independent board control is more or less normative or legiti-

mate than CEO-board cooperation (Lorsch and MacIver, 1989; Useem, 1993). Accordingly, noncooperative behavior, such as exercising independent control, does not necessarily have negative reputational consequences for the participants; it does not necessarily damage a director's career, as empirical research on director selection has shown (Zajac and Westphal, 1996). Thus, third-party ties between a CEO and his or her board members may not necessarily reduce the likelihood of noncooperative behavior in CEO-board relationships.

While traditional perspectives on indirect network ties may not apply to board interlocks, recent research on the effects of third-party ties suggests a more germane perspective. Burt and Knez (1995, 1996) have extended existing theories on how social structure affects trust by proposing that third-party ties amplify existing trust or distrust in professional relationships (see also Labianca, Brass, and Gray, 1998). They showed empirically that when the immediate relationship between managers tended to foster trust between them, third-party ties further enhanced trust in the relationship. At the same time, third-party ties amplified any distrust that already existed in the relationship. They concluded that third-party ties influence the intensity but not the direction of trust in managerial relationships; that is, indirect ties make managers more certain of their trust (or distrust) in another. In developing their theory, Burt and Knez suggested that managers exchange information or gossip with third-party ties about other managers, and the social dynamics underlying such interactions lead third parties to reaffirm whichever predisposition managers have toward their colleagues. This is consistent with anthropological and social psychological research on network gossip, which suggests that people gossip with third parties in a search for affirmation of their feelings and beliefs about other individuals in their network; in the process, gossip also serves to reaffirm the values that underlie those beliefs (Cox, 1970; Haviland, 1977; Besnier, 1989). Moreover, by validating ego's trust or distrust in alter, a third party strengthens his or her relationship with ego (Byrne, Clore, and Worchel, 1966). Such behavior can be motivated by political self-interest or simply by the desire to maintain social cohesion for its own sake (Cox, 1970; Burt and Knez, 1995).

We can extend our previous hypothesis by considering the possibility that third-party ties between a CEO and his or her board members resulting from appointments on other boards may amplify the effects of these different relationships on trust between CEOs and outside directors. As noted above, qualitative research on boards suggests that the relationship between top manager A and outside director B is influenced by third-party ties when A has a common appointment to another board with a third director, C, who sits on B's board. From the third-party gossip perspective, when A and C discuss B (or A's relationship with B), the social dynamics underlying such interactions will lead C to confirm A's predisposition by drawing on his or her prior experience with B. For example, if A expresses doubt to C about whether B can be trusted to support A's decisions, C will tend to affirm A's distrust, either by providing explicit infor-

mation or "replicating accounts" of B's behavior or through more subtle affirmations (e.g., "that doesn't surprise me") or nonverbal signals (Cox, 1970; Burt and Knez, 1995: 260). Such interactions are especially likely in that top managers have become increasingly concerned in recent years about whether they can count on the loyalty and support of their outside directors (Lorsch and MacIver, 1989). This suggests additional hypotheses, predicting that indirect ties between CEOs and outside directors through third-party directors in the interlock network will tend to amplify the relationship between each kind of CEO-board tie and the likelihood of alliance formation:

Hypothesis 4: Indirect interlock ties between the CEO and outside directors through third-party directors will interact with the content of the focal CEO-board tie to predict alliance formation between the focal firm and outside directors' home companies.

Hypothesis 4a: The more indirect interlock ties there are between the CEO and outside directors through third-party directors, the stronger the negative relationship between board control over the CEO and the likelihood of subsequent alliance formation between the focal firm and outside directors' home companies.

Hypothesis 4b: The more indirect interlock ties there are between the CEO and outside directors through third-party directors, the stronger the positive relationship between CEO-board cooperation and the likelihood of subsequent alliance formation between the focal firm and outside directors' home companies.

METHOD

Sample and Data Collection

The sample frame for this study included 600 firms selected from the Fortune and Forbes 500 indexes of U.S. industrial and service firms. We collected both archival and survey-based information on these firms. Archival information was collected on alliances formed, board interlocks and other board characteristics, strategic variables, and financial data. To measure board control and CEO-board cooperation, a questionnaire survey was distributed in April 1995 to all CEOs of the 600 firms. In addition, to assess interrater reliability, another questionnaire was sent to individuals serving as outside directors at one or more companies whose CEO responded (N = 1,312 directors).

Surveys of top managers have been plagued by low response rates. To ensure the highest possible response in this case, the following steps were taken (Forsythe, 1977; Fowler, 1993; Groves, Cialdini, and Couper, 1992): First, an in-depth pre-test was used to refine the format and length of the survey. Second, the cover letter linked the present study with prior surveys on top management issues conducted by a major business school, while noting that hundreds of their peers had responded to the prior surveys; the letter also highlighted the need for research on CEO-board relations, which also engages respondents' natural interest in the topic (see Groves, Cialdini, and Couper, 1992). Third, nonrespondents were sent a second letter with a new questionnaire about 21 days after the initial mailing. As a result of these efforts, 263 of the 600 CEOs in the sample frame responded, a response rate of 44 percent. Moreover, 564 of the 1,312 outside directors responded, yielding a response

rate of 43 percent. These response rates are high compared with other top management surveys (Pettigrew, 1992).

To check for nonresponse bias, respondents and nonrespondents were compared across a variety of firm characteristics using the Kolmogorov-Smirnov two-sample test (Siegel and Castellan, 1988). This assesses whether significant differences exist between the distribution of respondents and nonrespondents for a given variable. As shown in table 1, the results of this test consistently suggest that respondents and nonrespondents come from the same population. We also assessed nonresponse bias according to the presence or absence of specific board structures and practices thought to indicate board control (cf. Hoskisson, Johnson, and Moesel, 1994; Belliveau, O'Reilly, and Wade, 1996). These analyses provided further evidence that nonresponse bias is not present in our data. In particular, a series of difference in proportions tests showed that respondents and nonrespondents were not significantly different with respect to the existence of (1) an executive committee on the board (D = .018; p = .260); (2) a nominating committee composed of outsiders (D = .011; p = .585); or (3) a management development and compensation committee (D = .009; p = .649). Moreover, respondents were not significantly different in their use (vs. non-use) of stock compensation for directors (D = .019; p = .212), and CEOs of responding firms were neither more nor less likely to serve as an ex-officio non-voting director on the board (D = .016; p = .435).

We collected data on all alliances initiated by firms in the sample frame from 1970 to 1996. This sample includes all interfirm partnerships that entail the creation of a new legal entity in which both partners hold equity, also referred to as joint ventures. We coded these data manually from the *Funk and Scott Predicasts Index of Corporate Change* and from *Lexis/Nexis*. We recorded only joint ventures that had actually been formed and excluded reports of probable joint ventures that never materialized. We made an effort to ensure

Table 1

Results of Kolmogorov-Smirnov Difference Test for Nonresponse Bias*

Variables†	Largest positive difference	Largest negative difference	p-value
Size	.073	−.037	.499
Performance	.037	−.069	.510
Solvency	.067	−.023	.544
Liquidity	.030	−.100	.149
Outsider ratio	.048	−.035	.911
Joint tenure	.052	−.013	.882
Constraint	.058	−.029	.763
Number of interlock ties	.002	−.059	.754
Prior alliance activity	.041	−.091	.216
Institutional ownership	.025	−.082	.361

* N = 218 respondents and 274 nonrespondents. Differences indicate the largest positive/negative deviations observed when the cumulative frequency distribution (i.e., step function) for nonrespondents is subtracted from that of respondents.
† This test could not be applied to board leadership structure, but respondents and nonrespondents did not differ significantly on the portion of firms with separate CEO and board chair positions (.29 versus .27).

that these data were comprehensive in covering all alliances during the time period. We predict alliance formation over the two-year period following the survey date (1995–1996), and we used the remaining historical alliance data to compute some key control variables described below. We collected data on board interlocks and board structure for the period 1994–1995 from *Standard and Poor's Register of Corporations, Directors, and Executives* and the *Dun and Bradstreet Reference Book of Corporate Management*. To calculate measures of market constraint (discussed below), we obtained input-output data from the database created by the Interindustry Economics Division of the Bureau of Economic Analysis (cf. Burt, 1992; Mizruchi, 1992). Data on financial characteristics and other firm attributes were obtained from COMPUSTAT.

Measures

Alliance formation was measured with a dichotomous variable, coded 1 if the two firms in a dyad entered into an alliance during the two-year period following the survey date (i.e., 1995–1996). We also conducted two separate analyses with alliance formation measured for different time periods. In one analysis we measured alliance formation over one year (1996), and in the second analysis, we observed alliances formed over the period 1993–1994, using retrospective measures of board control and CEO-board cooperation in 1992. For each of these separate analyses, results for the hypothesized relationships were very similar to the results presented below, suggesting that our findings are robust for different time periods.

We measured board interlocks as directional ties, which are created by individuals who are principally affiliated as officers or owners with the firms they connect (Davis, 1991; Haunschild, 1993; Palmer, Jennings, and Zhou, 1993). Thus, two firms, A and B, are coded as having an *interlock tie* when at least one officer or owner from firm A serves as an outside director at firm B, or vice versa.

A pre-test involving in-depth pilot interviews with 22 top managers and board members was used to refine and reword the survey items (cf. Fowler, 1993: 102). *Board control* and *CEO-board cooperation* were measured with two multi-item scales from the CEO survey that were carefully validated with responses from the outside director survey and also with archival measures of board characteristics. Items in the control scale assessed key behavioral elements of board control that have been theorized to entail board independence from management, including the board's tendency to monitor and evaluate CEO decision making and performance and the frequency with which directors challenge the CEO's position on strategic issues, rather than deferring to the CEO's judgment. Items in the cooperation scale were based on prior qualitative research about how CEOs may engage in ongoing collaboration with outside directors by seeking their advice and counsel on strategic issues, as discussed above.

We conducted a confirmatory factor analysis using LISREL. The chi square for the measurement model comprising the control and cooperation constructs was not significant (*p* value = .48), suggesting that the model provides an ad-

484/ASQ, September 1999

equate fit to the data (Bollen, 1989). Thus, we proceeded to estimate cooperation and control factors using the Bartlett method.[1] Interitem reliability was acceptable for both scales, with alphas of .89 for the cooperation items and .88 for the control items (Nunnally, 1978).[2]

We also assessed interrater reliability by comparing CEOs' and outside directors' responses on the board control and cooperation items. We used the kappa correlation coefficient, which corrects for the level of correlation that would be expected by chance. The results of this analysis and a brief description of the questions used for each construct are provided in table 2. Values exceeding .75 are typically thought to indicate excellent agreement, and values between .40 and .75 indicate fair to good agreement (Landis and Koch, 1977; Fleiss, 1981). Kappas exceeded .75 for all items but one, and the overall value was .82. The sample for this analysis included companies with a responding CEO and at least one responding outside director (N = 188). As discussed further below, we ran separate analyses in which control and cooperation were measured with directors' responses rather than CEOs' responses.

We also conducted tests of convergent validity for our measures of board cooperation and control. First, we developed archival measures of each construct. The archival measure for control includes multiple aspects of board structure and practice that are thought to facilitate controlling behavior by boards: the use of stock to compensate directors, institutional ownership, and the presence or absence of the specific committees listed above (Hoskisson, Johnson, and Moesel, 1994; Belliveau, O'Reilly, and Wade, 1996; David, Kochhar, and Levitas, 1998). Institutional ownership was measured as the percentage of total common stock held by pension funds, banks and trust companies, savings and loans, mutual fund managers, and labor union funds (Hansen and Hill, 1991). The dichotomous measures were combined into a Guttman scale and then combined with institutional ownership using principal components (Jackson, 1991).

The archival measure of cooperation is a composite of three variables: joint tenure of the CEO and directors, complementary functional backgrounds of the CEO and directors, and CEO stock ownership. The organizational demography literature has provided consistent evidence that higher joint tenure increases the level of task-related communication and problem-solving behavior among group members (Zenger and Lawrence, 1989; O'Reilly, Snyder, and Boothe, 1993; Smith et al., 1994; Williams and O'Reilly, 1997). Moreover, the upper echelon perspective would suggest that directors are more valuable to CEOs as a source of strategic advice and counsel if they have a complementary base of functional expertise and experience (e.g., if the CEO has a financial background and directors have marketing backgrounds) (Hambrick, Cho, and Chen, 1996). Functional background was measured using Hambrick and Mason's (1984) classification, calculated as the percentage of directors who had functional backgrounds complementary to the CEO. Finally, given that stock ownership aligns CEOs' interests with shareholders' interests, it may motivate CEOs to engage the cooperation of board members in the strategic decision-mak-

1
This method differs from the ordinary regression method for estimating factors by minimizing the sum of squares of the unique factors over the range of items, rather than minimizing the discrepancies between the true and estimated factors. The Bartlett method produces less biased estimates than the regression method for moderate to large samples, although it may also produce less accurate estimates (Harman, 1976). In this case, however, separate analyses confirmed that the results were identical when factors were estimated using the regression method rather than the Bartlett method.

2
These measures effectively assume that boards engage in control or cooperation as a group (Fama and Jensen, 1983; Alderfer, 1986), so that the effects on the CEO's relationship with each director should be similar across directors, leading to similar effects on the likelihood of alliance formation between the focal firm and each of the outside directors' home companies. While this assumption is consistent with the prior literature on CEO-board relationships, in separate models we measured the individual participation of directors in control and cooperation activities with responses to separate questions in the director survey. These additional results are discussed further below.

485/ASQ, September 1999

Table 2

Results of Interrater Reliability Assessment (*N* = 188)*

Items†	Agreement (%)		Kappa‡
	Observed	Expected	
Board control			
1. To what extent does the board monitor top management strategic decision making?	86.50	24.86	.82
2. To what extent does the board formally evaluate your performance?	85.65	21.16	.82
3. To what extent does the board defer to your judgment on final strategic decisions?	87.76	25.82	.84
4. *Over the last twelve months* in how many *board meetings* have one or more directors challenged your position on a strategic issue?	88.19	27.40	.84
CEO-board cooperation			
1. To what extent do you solicit board assistance in the formulation of corporate strategy?	79.32	24.00	.73
2. To what extent do you use outside directors as a "sounding board" on strategic issues?	87.34	23.43	.83
3. How often have you sought the advice and counsel of outside directors in discussions outside of board/committee meetings (by telephone *or* in person)?	86.50	24.93	.82
Overall kappa			.82

* *N* = 188. When multiple outside directors responded for the same company, directors' responses were averaged to ensure that reliability estimates were not inflated by common perspectives derived from holding the same position.
† The phrasing of each item is taken from the CEO survey; most items were altered appropriately for the director survey (e.g., "To what extent does *the CEO* . . ."). For purposes of comparison across items, kappas were calculated for continuous-scale items by converting them into categorical variables (i.e., divided into quartiles).
‡ Z-statistics for all kappas are highly significant.

ing process (Murphy, 1986; Jensen and Murphy, 1990). These three variables were combined into a composite measure using principal components.

The archival measure of control was significantly correlated with the survey measure of control ($r = .42$), while the archival measure of cooperation was significantly correlated with the survey measure of cooperation ($r = .34$). Moreover, the survey measure of cooperation was not significantly correlated with the archival measure of control, while the survey measure of control was not associated with the archival measure of cooperation. This analysis provides further evidence for the construct validity of the survey measures.

We also examined the correlation between our archival measures of board cooperation and control and a survey measure of trust in the CEO-board relationship. This measure is a multi-item scale included in both the CEO and director surveys; specific items in the CEO scale assess, for instance, the degree to which the CEO feels that he or she can trust the board and the extent to which his or her relationship with outside directors is characterized by distrust. This measure showed high interitem reliability (alpha = .91), as well as high interrater reliability (kappa = .85). Moreover, the trust measure is positively associated with the measure of cooperation ($r = .47$) and negatively correlated with the measure of board control ($r = -.41$). This further supports the convergent validity of the survey measures.

Indirect ties between CEOs and outside directors through third-party directors (*third-party ties*) were measured for each dyad as the number of board appointments shared by the CEO and board members of the outside director's home company board, excluding the focal board. We tested the hypothesized interaction effects between third-party ties and the focal CEO-board ties using the product-term approach (Jaccard, Turrisi, and Wan, 1990).

Control variables. To ensure the robustness of our results, we included a number of control variables considered to influence the formation of ventures between firms. Resource dependence perspectives suggest that firms may use cooperative strategies to manage their dependence on other firms (for a review, see Oliver, 1990). According to this view, firms that are particularly dependent on each other may choose to form an alliance to secure future access to needed resource flows. To capture the role of resource considerations in promoting joint ventures, we built on Burt's (1983, 1992) measure of market *constraint* to capture the degree of resource interdependence between firms. Data on market constraint are available only at the industry level and have typically been used to compute aggregate constraint scores for firms. Burt (1983) defined constraint as the proportion of industry A's total transactions that involve B, multiplied by the four-firm concentration of B. This measure indicates the extent to which firms in industry A are dependent on resources provided by firms in industry B. Burt's firm-level measure of constraint was based on the dependence of the firm's primary industry (i.e., the firm's primary two-digit SIC code). Galaskiewicz (1985b) modified this measure by calculating the median constraint score across all industries in which the two firms participated. Palmer, Friedland, and Singh's (1986) measure involved summing the number of significant constraint relations between industries in which the firms participated. We followed Mizruchi (1992) in reducing these three operationalizations to a single variable using principal components analysis. Mutual interdependence between firms in a dyad is then measured as the total amount of constraint between them. This measure is highest when both firms are in highly concentrated industries with a heavy flow of transactions between them.

Since constraint is measured at the industry level, we also controlled for *industry overlap,* measured as the percentage of total sales between the two firms that are made to the same industry, to assess strategic complementarity at the firm level (Mowery, Oxley, and Silverman, 1996). This dyad-level measure allows us to assess the extent to which every specific pair of firms overlaps in the industries in which they operate. This measure has some limitations in that it treats all industries as equivalent and does not take into account the characteristics of the industries in which the overlap occurs.

We included a number of measures that prior research would suggest may be important strategic and economic drivers for the creation of new ventures: (1) *size,* measured as the log of total sales; (2) *performance,* measured as a composite of return on assets and market-to-book value, which were combined using principal components analysis; (3) *solvency,* measured as the total amount of long-term

debt divided by current assets; (4) *research and development (R&D) intensity,* measured as research and development expense divided by total sales of the focal firm; (5) *advertising intensity,* measured as advertising expense divided by total sales of the focal firm; and (6) *diversification,* measured with the entropy variable, which takes into account the number of segments in which a firm operates and weights each segment according to its contribution to total sales (Palepu, 1985). Each variable was measured in the prior year.[3]

We also controlled for the firms' prior alliance history. Firms may acquire unique information about other firms through their prior alliances with them, while developing routines that are specifically adapted to cooperation with those firms. Such investments may increase the likelihood that firms will continue to ally with the same firms over time (Gulati, 1995a, 1995b; Powell, Koput, and Smith-Doerr, 1996). Thus, we controlled for the number of prior alliance ties between firms in the dyad (*prior alliance ties*). To control for the historical propensity of each firm to initiate alliances, we also included variables indicating the total number of prior alliances initiated by each firm in the dyad (*prior alliance activity*) (Gulati, 1999).[4] To compute this measure as accurately as possible, we observed alliance activity from 1980 to 1994, since alliances became more common among large firms in the early 1980s. In separate analyses, we measured alliance activity over several different time periods, including longer periods (e.g., from 1970), as well as shorter periods (e.g., since 1990 or 1993), and the results for the hypothesized relationships were substantively unchanged from the results presented below. These two sets of measures serve as useful controls for unobserved heterogeneity that results from unobserved propensities by the actor to engage in those activities in the future (Heckman and Borjas, 1980).

We also controlled for two other kinds of board ties that could influence CEO-board relationships and alliance formation. First, we controlled for common board appointments (*common appointments*) held by the CEO and the outside director on other boards. A common tie exists if CEO A and an outside director B on the focal board both serve as outside directors on another board. Social cohesion resulting from common membership as directors on another board could enhance the potential for trust and cooperation between CEOs and directors on the focal board. Second, we controlled for the total number of appointments (*total appointments*) held on other boards by the CEO and the outside director. As discussed above, our measure of third-party ties effectively includes indirect ties with a distance of two links: if CEO A sits on another board with C, who sits on outside director B's board, A and B are separated by two links. When this measure is held constant, the control variable for total appointments captures the effect of indirect ties of greater length (i.e., three links or more). We controlled for such ties because they could amplify trust or distrust in the focal CEO-board relationship, although we would expect them to have a weaker effect than ties to third parties that are directly connected to both members of the CEO-board relationship.

3
In our primary analyses, we measured these variables at the focal firm level, but these variables might also be specified at the dyad level; several authors have suggested that alliances form between firms with complementary needs and capabilities (e.g., Aiken and Hage, 1968; Richardson, 1972; Paulson, 1976; Burgers, Hill, and Kim, 1993). Thus, for instance, poorly performing firms may seek alliances to gain access to capabilities of high-performing firms, while the latter seek to leverage those capabilities. Similarly, small firms may enter into alliances with large firms to gain access to economies of scale and scope, while large firms seek to spread the risks associated with new ventures. To measure each attribute at the dyad level, we divided the smaller value by the larger value. Larger values of this measure indicate greater similarity on the given attribute. In separate analyses, we included these dyad-level measures with the firm-level measures, but the results were not substantively different from those presented below. We also conducted analyses in which separate variables were included for each firm in the dyad, and again, the results were substantively unchanged. Finally, the results were robust to inclusion of additional measures of diversification, including the percentage of sales made to global markets.

4
The effects of prior alliance activity were weaker when this variable was measured only for the focal firm or at the dyad level. This was not true for the economic/strategy variables, as noted above, perhaps because alliance activity of one firm in the dyad was not correlated with activity of the other firm, while the strategy variables were significantly correlated between firms in the dyad, such that adding a separate economic/strategy variable for each firm in the dyad had little effect on the results.

488/ASQ, September 1999

Given that alliance formation could also be influenced by the content of sent interlock ties (i.e., relationships between top managers and manager-directors at the latter directors' home company boards, which are not included in measures of cooperation and control), we controlled for *reciprocated appointments,* coded as 1 if a top manager serves on the home company board of an outside director who is on the focal firm's board.

Further, we controlled for several other possible exogenous influences on management-board relationships. Several authors have speculated that personal friendship ties between top managers and outside directors could influence professional relationships on the board. Mace (1971), Finkelstein and Hambrick (1988), and others have suggested that friendship ties reduce the board's tendency to independently monitor management, although recent evidence suggests that such ties may enhance cooperation without reducing the level of monitoring activity (Westphal, 1999). There is also anecdotal evidence that friendship ties between top managers may facilitate the formation of strategic alliances (Alster, 1986). Thus, we included a survey measure of *friendship ties,* indicating the portion of the board composed of the CEO's personal friends. In separate analyses, described below, in which cooperation and control were measured for each CEO-director dyad, friendship ties were also measured at the dyad level. Descriptive statistics and bivariate correlations are provided in table 3.

Analysis

We used maximum-likelihood logit regression analysis to test the effect of interlock ties on the likelihood of alliance formation (Aldrich and Nelson, 1984; Hosmer and Lemeshow, 1989). Because the appropriate risk sets to test each of the hypotheses differ somewhat, we conducted a number of additional analyses to ensure consistency across our findings. Since hypothesis 1 examined the effect of interlock ties on alliance formation, the risk set for this analysis included all possible dyadic combinations between each of the focal firms in the final survey sample and all firms in the total sample frame (73,510 dyads). Since hypotheses 2–4 assume that an interlock tie exists, because board control or cooperation only occur when there is an interlock, the risk set narrows here from all possible dyads to only those dyads for which there was an interlock tie between the two firms. Thus, to test the effects of board control vs. cooperation on alliance formation, as well as the moderating effects of third-party ties, we conducted an initial set of analyses using logit regression on the sample of dyadic combinations between the focal firm and each of the home companies of CEO-directors on the board (N = 898). Moreover, for the sample of possible dyadic combinations that included a responding outside director, we also examined whether individual CEO-board-member relationships mattered by estimating separate models using each responding director's assessment of his or her individual relationship with the CEO (N = 412 dyads).

In addition, we estimated Heckman selection models to ensure that logit estimates were not biased by any unmeasured differences between the smaller sample of CEO-direc-

Table 3

Descriptive Statistics and Pearson Correlation Coefficients for Analyses of Board Control and CEO-Board Cooperation*

Variable	Mean	S.D.	1	2	3	4	5	6
1. Alliance	.15	.36	—					
2. Interlock tie	.01	.11	.06					
3. Board control	.00	.88	−.26	—				
4. CEO-board cooperation	.00	.82	.31	—	−.16			
5. Third-party ties	2.79	2.03	.12	.16	.05	.06		
6. Prior alliance activity, firm 1	5.98	5.57	.29	.05	.07	.09	.11	
7. Prior alliance activity, firm 2	6.35	5.94	.34	.07	.08	.09	.11	.02
8. Prior alliance ties	.09	.31	.23	.18	−.17	.21	.14	.17
9. Constraint	.00	1.33	.17	.17	.18	.13	−.02	.12
10. Size	7.69	1.50	.02	−.05	−.04	−.08	.03	.06
11. Performance	.00	1.01	−.23	.05	−.08	−.04	−.01	−.13
12. Solvency	.38	.31	−.08	−.01	−.05	−.01	.01	.02
13. R&D intensity	.02	.02	−.18	.06	−.03	.00	.04	−.11
14. Advertising intensity	.02	.03	−.14	.02	.02	.06	.02	−.05
15. Diversification	.74	.56	−.05	.08	−.12	−.17	.00	−.04
16. Industry overlap	.09	.25	.22	.25	−.10	.20	.04	.03
17. Common appointments	1.23	1.01	.09	.15	−.08	.07	.18	.04
18. Total appointments	8.21	5.31	.07	.11	−.05	.02	.37	.01
19. Reciprocated appointments	.11	.31	.03	.29	−.09	.17	.03	.02
20. Friendship ties	.37	.34	.16	.02	−.18	.21	.04	.03

* Descriptive statistics and correlation coefficients are calculated for the sample of interlocked firms ($N = 898$), except statistics for interlock ties, which are calculated for the larger sample of all possible dyads ($N = 73,510$).

tor dyads and dyads in the larger sample frame used for testing hypothesis 1. This approach uses the larger risk set to assess hypotheses 2–4 (i.e., N = 73,510). The Heckman model is essentially a two-stage procedure that estimates the likelihood of interlock ties with probit regression and then incorporates estimates of parameters from that model in a second-stage regression model to predict alliance formation among dyads with an interlock tie; the second-stage model is also estimated with probit regression (van de Ven and van Praag, 1981).

Formally, the Heckman model assumes that a potential observation is observed if $x_1 B_1 + u_1 > 0$, where u_1 has a standard normal distribution. In addition, there is another regression equation, $y = x_2 B_2 + \sigma u_2$, where u_2 also has a standard normal distribution but is potentially correlated with u_1 with correlation p. In our case, the latter equation represents alliance formation while the former represents the likelihood of interlock ties between CEOs in a dyad. When p is significantly different from 0, standard regression techniques applied to the second equation yield biased results, to the extent that error terms in both equations contain some common omitted variables (van de Ven and van Praag, 1981). For example, if firms that form interlock ties are more responsive to a given level of resource dependence or more sensitive to the need for trust between top managers in forming alliances than those firms not forming an interlock tie, then specification error would be present. Heckman's procedure generates consistent, asymptotically efficient estimates for such models, allowing us to generalize results to the larger sample frame (cf. Heckman, 1979).

RESULTS

Table 4 provides the results of the logistic regression analysis of alliance formation, and table 5 gives the Heckman se-

Table 3 *(continued)*

Variable	7	8	9	10	11	12	13	14	15	16	17	18	19
8. Prior alliance ties	.15												
9. Constraint	.10	.14											
10. Size	.03	.01	−.08										
11. Performance	−.08	.03	−.04	−.06									
12. Solvency	.05	.04	−.11	.36	.17								
13. R&D intensity	−.10	−.12	.03	−.31	.14	.27							
14. Advertising intensity	−.08	−.05	.01	−.09	.10	.05	−.18						
15. Diversification	−.07	−.06	−.09	.26	−.03	−.12	.16	.15					
16. Industry overlap	.03	.14	−.32	.18	−.03	−.06	.02	−.02	−.09				
17. Common appointments	.03	.16	.05	.08	.01	.10	.07	.00	.13	.16			
18. Total appointments	.03	−.01	−.04	.04	−.02	.00	.05	.45	.08	−.11	.45		
19. Reciprocated appointments	−.01	.04	.19	.06	.05	.04	.06	−.01	.03	−.02	.01	.00	
20. Friendship ties	−.02	.17	.10	−.04	.09	.06	.03	.10	.04	.01	.06	−.07	.05

lection model results. The hypothesized effects are in bold. Model 1 in table 4 tests hypothesis 1, that an interlock tie between two firms will increase the likelihood of subsequent alliance formation between them. The results in model 1 do not support this hypothesis: after controlling for the extent of market constraint (i.e., resource interdependence) between firms, as well as other financial and strategic factors, the existence of an interlock tie is not significantly related to subsequent alliance formation.

Model 2 in table 4 tests hypotheses 2 and 3, which address the influence of management-board relationships on subsequent alliance formation between the focal firm and outside directors' home companies. The results for board control and CEO-board cooperation shown in model 2 provide strong support for these hypotheses. Consistent with hypothesis 2, board control over the CEO is negatively related to the likelihood of forming an alliance between the focal firm and outside directors' home companies. The results also support hypothesis 3: CEO-board cooperation is significantly and positively related to subsequent alliance formation. The hypothesized effects of board control and cooperation were also supported in Heckman selection models of alliance formation, as shown in model 1 of table 5.

In summary, the first set of results indicates that the mere presence of a board interlock tie between firms does not predict the formation of strategic alliances between firms; instead, such ties may either increase or decrease the likelihood of alliance formation, depending on the nature of the CEO-director relationship that underlies the tie. The greater the extent to which an interlock tie results in cooperation between top managers of different firms in strategic decision making (i.e., at the focal firm), the greater the likelihood of subsequent strategic cooperation between the focal firm and the outside director's home company. At the same time, the greater the extent to which an interlock tie results in an independent control relationship between top managers of different firms, the lower the likelihood of subsequent strategic cooperation between them.

The next set of results tests hypothesis 4, that third-party ties resulting from appointments of focal-firm CEOs on other boards amplify the effects of independent board control and

Table 4

Logistic Regression Analysis of Alliance Formation*

Independent variable	1	2	3
Interlock tie	0.44 (.047)		
Board control		−.391• (.149)	−.589• (.203)
CEO-board cooperation		.575• (.183)	.757• (.249)
Third-party ties	.006 (.005)	.094 (.080)	.098 (.080)
Third-party ties × board control			−.199• (.074)
Third-party ties × CEO-board cooperation			.227• (.073)
Prior alliance activity, firm 1	.002• (.0005)	.037• (.009)	.037• (.010)
Prior alliance activity, firm 2	.003• (.0007)	.041• (.009)	.040• (.009)
Prior alliance ties	.057• (.018)	1.678• (.552)	1.701• (.555)
Constraint	.022• (.008)	.289• (.109)	.290• (.109)
Size	.002 (.004)	.034 (.092)	.045 (.092)
Performance	−.013• (.005)	−.292• (.132)	−.288• (.132)
Solvency	−.032 (.021)	−.463 (.442)	−.491 (.438)
R&D intensity	−.323• (.161)	−9.490 (4.837)	−8.682 (4.850)
Advertising intensity	−.377• (.159)	−10.389• (4.169)	−10.507• (4.176)
Diversification	−.013 (.011)	−.177 (.257)	−.195 (.256)
Industry overlap	.047• (.017)	1.330• (4.92)	1.356• (4.95)
Common appointments	.010 (.007)	.139 (.127)	.168 (.127)
Total appointments	.002 (.002)	.053 (.036)	.051 (.036)
Reciprocated appointments	.011 (.050)	.018 (.428)	.008 (.428)
Friendship ties		2.839• (1.022)	2.906• (1.029)
Constant	.041 (.045)	1.977 (1.011)	1.928 (1.017)
N	73,510	898	898
Chi square	104.18•	118.44•	140.36•

• $p < .01$.
* Standard errors are in parentheses. Hypothesized effects are in bold.

CEO-board cooperation on alliance formation. The interaction effects in model 3 of table 4 support this hypothesis. Consistent with hypothesis 4a, the results show that as the number of third-party ties between the CEO and outside directors increases, the negative relationship between board control over the CEO and the likelihood of subsequent alliance formation between the focal firm and outside directors' home companies becomes stronger. The results also support hypothesis 4b: as the number of third-party ties between the CEO and outside directors increases, the positive

Cooperative or Controlling?

Table 5

Heckman Selection Models of Alliance Formation (N = 73,510)*

Independent variable	1	2
Board control	−.480*	−.678*
	(.184)	(.266)
CEO-board cooperation	.581*	.767*
	(.201)	(.270)
Third-party ties	.142	.139
	(.114)	(.113)
Third-party ties × board control		−.259*
		(.097)
Third-party ties × CEO-board cooperation		.268*
		(.092)
Prior alliance activity, firm 1	.034*	.035*
	(.010)	(.010)
Prior alliance activity, firm 2	.037*	.036*
	(.010)	(.010)
Prior alliance ties	1.627*	1.594*
	(.564)	(.567)
Constraint	.312*	.311*
	(.116)	(.116)
Size	.044	.041
	(.096)	(.096)
Performance	−.342*	−.333*
	(.138)	(.138)
Solvency	−.419	−.424
	(.460)	(.460)
R&D intensity	−10.756	−9.383
	(5.718)	(5.760)
Advertising intensity	−11.085*	−10.691*
	(4.881)	(4.893)
Diversification	.156	.179
	(.267)	(2.70)
Industry overlap	1.330*	1.346
	(.492)	(.494)
Common appointments	.071	.089
	(.134)	(.137)
Total appointments	.050	.052
	(.040)	(.040)
Reciprocated appointments	.018	.011
	(.428)	(.428)
Friendship ties	2.799*	2.882*
	(1.101)	(1.113)
Constant	2.446	2.386
	(1.077)	(1.081)
Chi square	132.45*	151.22*

* $p < .01$.
* Standard errors are in parentheses. Hypothesized effects are in bold.

5

In these models, board control and CEO-board cooperation, which we assume to be group variables, are measured at the board level (Fama and Jensen, 1983); thus, effects on alliance formation should be similar across dyads on the same board. To check this assumption, we estimated separate models using measures of the individual participation of directors in control and cooperation activities (N = 412). The results for these models were consistent with the results in tables 4 and 5.

relationship between CEO-board cooperation and the likelihood of subsequent alliance formation between the focal firm and outside directors' home companies also becomes stronger. The hypothesized interaction effects were also supported in Heckman selection models of alliance formation, as shown in model 2 of table 5.[5]

Results for several of the control variables provide further insights. For instance, the degree to which firms are mutually constrained by resource interdependence, as indicated by resource flows between their respective industries, is positively associated with subsequent alliance formation, consistent with the traditional resource dependence perspec-

493/ASQ, September 1999

tive on alliance formation. While this effect has previously only been observed at the interindustry level, our results demonstrate that such effects for resource dependence occur at the dyad level as well. Results also show that friendship ties between CEOs and outside directors are positively and significantly related to subsequent alliance formation between the focal firm and outside directors' home companies in each of the models. In contrast, common appointments to other boards are not significantly associated with alliance formation, nor are the main effects of third-party ties significant. In general, the various network variables do not have independent effects on alliance formation; instead, network effects are contingent on the content of CEO-director relationships.

We conducted several additional analyses to examine the robustness of our findings to alternative independent variables and different samples. First, we conducted analyses of alliance formation using the archival measures of cooperation and control discussed above. As shown in table 6, the results of these analyses are very similar to the results of analyses using the survey measures: model 1 shows that the archival measure of board control is significantly and negatively related to subsequent alliance formation, while the archival measure of cooperation has a significant and positive effect on alliance formation. Model 2 shows that these effects are amplified by third-party ties, as hypothesized.

To further assess the robustness of our findings, we conducted separate logistic regression analyses with the full sample of dyads by estimating the interaction effects between the presence of an interlock tie and board control or cooperation. Results are shown in table 7. As shown in model 2, there are significant interaction effects between an interlock tie and both cooperation and control. These results indicate that, while the mere presence of an interlock tie between firms does not affect the likelihood of alliance formation (as shown in model 1), the effect of an interlock tie becomes significantly more positive as the level of CEO-board cooperation increases and significantly more negative as the level of control increases. These results again suggest that the effect of board interlock ties on alliance formation is contingent on the nature of the CEO-board relationship. We would not expect significant main effects for board control or cooperation, since these relationships should only increase or decrease the likelihood of alliance formation between two specific firms provided an interlock tie exists between them, which is not necessarily the case with this larger dataset. We also examined interaction effects using the individual, continuous-scale indicators of cooperation and control, to identify the level of cooperation and control at which interlock ties decreased the likelihood of alliance formation. The results of these analyses showed, for instance, that interlock ties have a negative effect on alliance formation when a minority of directors have the same functional background as the CEO. In addition, the results showed that

494/ASQ, September 1999

Table 6

Supplementary Heckman Selection Models of Alliance Formation ($N = 73{,}510$)*

Independent variable	With Archival Measures of Cooperation/Control		With Measures of CEO-board Trust	
	1	2	3	4
Board control	−.322*	−.339*	−.252	−.330
	(.120)	(.123)	(.185)	(.266)
CEO-board cooperation	.603*	.568*	.311	.433
	(.230)	(.233)	(.203)	(.268)
CEO-board trust			.605*	.599*
		(.167)	(.167)	
Third-party ties	.139	.126	.141	.139
	(.113)	(.113)	(.114)	(.114)
Third-party ties × board control		−.161*		−.173
		(.073)		(.097)
Third-party ties × CEO-board cooperation		.268*		.119
		(.100)		(.094)
Prior alliance activity, firm 1	.034*	.035*	.035*	.036*
	(.010)	(.010)	(.010)	(.010)
Prior alliance activity, firm 2	.036*	.037*	.037*	.037*
	(.010)	(.010)	(.010)	(.010)
Prior alliance ties	1.566*	1.590*	1.589*	1.601*
	(.565)	(.569)	(.565)	(.571)
Constraint	.310*	.306*	.309*	.311*
	(.116)	(.115)	(.116)	(.117)
Size	.053	.047	.045	.049
	(.093)	(.094)	(.094)	(.092)
Performance	−.290*	−.332*	−.339*	−.330*
	(.137)	(.138)	(.137)	(.139)
Solvency	−.427	−.431	−.436	−.434
	(.453)	(.460)	(.463)	(.462)
Research and development intensity	−10.729	−9.384	−10.192	−9.150
	(5.724)	(5.772)	(5.745)	(5.788)
Advertising intensity	−10.937*	−10.625*	−11.677*	−11.392*
	(4.845)	(4.875)	(4.911)	(4.909)
Diversification	.164	.186	.169	.185
	(.268)	(.268)	(.270)	(.270)
Industry overlap	1.333*	1.351*	1.358*	1.380*
	(.494)	(.497)	(.500)	(.503)
Common appointments	.071	.093	.070	.091
	(.133)	(.136)	(.134)	(.136)
Total appointments	.041	.051	.050	.051
	(.039)	(.040)	(.040)	(.040)
Reciprocated appointments	.022	.019	.019	.019
	(.427)	(.429)	(.425)	(.426)
Friendship ties	2.804*	2.886*	2.810*	2.877*
	(1.103)	(1.114)	(1.103)	(1.113)
Board approval	.124	.116	.118	.114
	(.208)	(.208)	(.208)	(.209)
Ingratiation	.052	.053	.057	.062
	(.174)	(.074)	(.077)	(.074)
Constant	2.500	2.363	2.565	2.366
	(1.071)	(1.077)	(1.083)	(1.094)
Chi square	125.16*	139.38*	130.01*	148.15*

* $p < .01$.

* Standard errors are in parentheses. Hypothesized effects are in bold.

interlock ties decrease alliance formation when the CEO owns less than 1 percent of outstanding common stock.

While our theoretical argument suggests that trust in the CEO-board relationship can explain how control and cooperation affect alliance formation, our primary analyses did not explicitly model the mediating effect of trust. Thus, one

Table 7

Supplementary Logistic Regression Models of Alliance Formation ($N =$ 73,510)*

Independent variable	1	2
Interlock tie	.043	.039
	(.047)	(.046)
Board control	−.002	−.002
	(.004)	(.004)
CEO-board cooperation	.002	.003
	(.008)	(.008)
Interlock tie × board control		−.409●
		(.125)
Interlock tie × CEO-board cooperation		.331●
		(.111)
Third-party ties	.006	.005
	(.005)	(.005)
Prior alliance activity, firm 1	.002●	.002●
	(.0005)	(.0005)
Prior alliance activity, firm 2	.003●	.002●
	(.0007)	(.0006)
Prior alliance ties	.057●	.051●
	(.017)	(.016)
Constraint	.021●	.022●
	(.008)	(.008)
Size	.002	.003
	(.004)	(.004)
Performance	−.012●	−.013●
	(.005)	(.005)
Solvency	−.029	−.028
	(.021)	(.021)
R&D intensity	−.320	−.307
	(.160)	(.160)
Advertising intensity	−.371●	−.364●
	(.158)	(.156)
Diversification	−.013	−.014
	(.011)	(.010)
Industry overlap	.045●	.042●
	(.016)	(.016)
Common appointments	.009	.008
	(.007)	(.006)
Total appointments	.002	.002
	(.002)	(.002)
Reciprocated appointments	.010	.010
	(.050)	(.049)
Constant	.042	.033
	(.046)	(.042)
Chi square	102.97●	128.20●

● $p < .01$.
* Standard errors are in parentheses. Models are analyzed for the full sample using archival measures of board control and CEO-board cooperation. Hypothesized effects are in bold.

might question whether other, related social processes mediate these relationships. For instance, cooperation might be associated with political influence processes such as ingratiation, which could affect the likelihood of alliance formation between the focal firm and manager-directors' home companies by enhancing directors' affect toward the CEO, without necessarily enhancing trust in the relationship. Similarly, cooperation could increase the board's approval of the CEO's performance and thus increase the likelihood of alliance formation independent of CEO-board trust. To assess the rela-

496/ASQ, September 1999

tive importance of these different social processes in explaining how control and cooperation affect alliance formation, we conducted further exploratory analyses using survey measures of trust, political influence (ingratiation), and board approval of the CEO.[6] As shown in models 3 and 4 of table 6, CEO-board trust has a strong and positive relationship with alliance formation, while the effects of ingratiation and board approval are nonsignificant. In addition, when trust is added to the models, the effects of cooperation and control become nonsignificant, suggesting that CEO-board trust mediates the effects of cooperation and control on alliance formation (Baron and Kenny, 1986). Moreover, the effects of ingratiation and board approval of the CEO are insignificant in all models.

The results are not consistent with the view that preexisting trust in the CEO-board relationship led to cooperation, which then facilitated alliance formation through some other mechanism. The findings suggest that trust mediates the effects of cooperation/control, and not the reverse. We also measured trust using responses to the director survey, and results were substantively unchanged from results presented in table 6. While researchers have typically viewed trust and distrust as one bipolar construct, Lewicki, McAllister, and Bies (1998) recently suggested that distrust is a distinct construct from trust. Thus, we conducted further analyses using only items that refer to distrust. Our results were nearly identical: distrust was strongly (and negatively) associated with alliance formation, and the control and cooperation variables became nonsignificant when distrust was added to the models, suggesting that distrust mediates the effects of control and cooperation on alliance formation. Thus, even if trust and distrust are viewed as distinct concepts, the results suggest that both predict alliance formation and mediate the effects of cooperation and control. Moreover, the CEO-board relationship appears to satisfy several of Lewicki, McAllister, and Bies' (1998) conditions for a high (negative) correlation between trust and distrust, including high value congruence and interdependence between the parties.

DISCUSSION

This study shows how board interlock ties can have qualitatively different effects on the formation of joint ventures between firms depending on the behavioral processes that underlie CEO-board relationships. The first set of results suggested that the mere presence of a board interlock tie between two firms does not appear to increase (or decrease) the likelihood that they will enter into a strategic alliance with one another. Further results showed that these aggregate effects of board interlock ties appear to mask more specific effects that depend on the content of the tie. Specifically, the results suggest that there can be dark and bright sides to the presence of a board interlock tie between two firms depending on the underlying relationship. Higher levels of independent board control over management actually decreased the likelihood of subsequent alliance formation between them, while higher levels of CEO-board cooperation in strategic decision making raised the likelihood that the two firms would enter into an alliance. These results

6
We measured trust in our survey as described in the method section above. Prior research has measured ingratiation as a unidimensional construct composed of multiple behaviors (Jones and Wortman, 1973; Kipnis and Schmidt, 1988). Our ingratiation measure is based on Kumar and Beyerlein's (1991) scale, which taps key aspects of ingratiation such as flattery, favor-doing, opinion conformity, and impression management; while prior evidence for the reliability of this scale is mixed (e.g., Kacmar and Valle, 1997), the eight items used in the present study were adapted to the CEO-board context, and the scale showed acceptable inter-item reliability (alpha = .86) and interrater reliability (kappa = .81). Factor analysis clearly indicated that CEO advice and counsel did not load on the ingratiation factor (loadings were less than .2 for the cooperation items), suggesting that CEO-board cooperation is distinct from ingratiation (i.e., advice and counsel is not an aspect of ingratiation). Moreover, the results presented in table 6 were unchanged when ingratiation was measured using any combination of the four behaviors assessed with the scale (e.g., opinion conformity and flattery, favor-doing and flattery, etc.). Board approval was measured with two survey items that assessed the board's apparent overall satisfaction with the CEO's leadership.

were confirmed with both survey-based and archival measures of board cooperation and control, and they hold after controlling for a variety of economic and strategic variables that could influence alliance formation. Thus, the first set of results demonstrated how the consequences of board interlock ties for strategic cooperation depend critically on the behavioral content of the tie.

Our theoretical framework goes beyond looking at the influence of dyadic ties and their content to address whether the indirect ties in which parties to an interlock tie are embedded could influence interorganizational action. The findings are consistent with the perspective that third-party ties primarily amplify whatever relational dispositions already exist among directly connected actors—they not only appear to amplify trust resulting from cooperative interaction in CEO-board relationships, but they also amplify distrust resulting from independent board control. At the same time, such indirect ties did not have significant main effects on alliance formation. Thus, the results appear to support the proposition developed by Burt and Knez (1995) that third-party ties tend to reaffirm or amplify whichever predisposition managers have toward their colleagues (see also Labianca, Brass, and Gray, 1998).

Our finding that the effects of third-party connections are strongly contingent on the behavioral content of immediate, professional ties between top managers is not consistent with the view that such ties uniformly enhance trust between individuals by increasing the reputational costs of noncooperative behavior (Kreps, 1990; Raub and Weesie, 1990). Third-party ties are not effective in promoting cooperation when noncooperative behavior is normatively acceptable in the larger social structure, such that individuals do not incur reputational costs for noncooperative behavior. In our context, the reputation of an outside director is not necessarily damaged by noncooperative behavior (i.e., exercising independent control over CEOs). Instead, directors may even be increasingly rewarded for exercising independent control in the market for corporate directors; some evidence suggests that directors on controlling boards gain more subsequent appointments on other boards with relatively high levels of control over management, although they may also gain fewer appointments on cooperative boards (Zajac and Westphal, 1996). As a result, in the absence of reputational costs from noncooperation, third-party ties do not necessarily enforce such behavior. Future research conducted in other contexts might examine explicitly whether the effects of third-party ties on trust between individuals are contingent on the normative status of cooperation vs. control in the larger social structure.

The results on trust offer additional support for our theoretical argument by providing evidence that CEO-board cooperation and control influence alliance formation through their effects on CEO-board trust. That is, the results are consistent with the view that cooperation increases the likelihood of alliance formation by increasing trust between top managers and manager-directors, while board control lowers the likelihood of alliance formation by reducing trust between them. Nevertheless, these additional analyses are merely

exploratory, and further research is clearly needed that uses alternative measures of trust and sociopolitical influence to verify more conclusively the social mechanism by which CEO-board interaction affects alliance formation. This could be further supplemented with studies that use alternative measures of cooperation and control. While this research is perhaps unique in demonstrating support for hypotheses about CEO-board relationships with both archival and survey measures of key constructs, there is a great need for research that uses alternative approaches to measuring cooperation, control, and other forms of CEO-board interaction.

The results for control variables included in our analysis also provide some valuable insights. Looking across the logit regression and Heckman selection model results, we found that previous ties between dyad members increase the likelihood of the firms entering an alliance. This is consistent with research highlighting the importance of the social network of prior alliances in influencing subsequent alliance formation (Kogut, Shan, and Walker, 1992; Gulati, 1995b, 1998; Powell, Koput, and Smith-Doerr, 1996; Gulati and Gargiulo, 1999). Variables indicating prior alliance activity also capture any unobserved propensities of the firms to enter into alliances that are not captured by the independent variables and further attest to the robustness of our results (Heckman and Borjas, 1980). We also found that some of our measures of resource dependence were significant, indicating that resource dependence was indeed an important consideration for the creation of new alliances. Our measure for dyadic constraint was positive and significant as expected: the greater the constraint, the greater the likelihood of alliance formation. Moreover, the significant effect of friendship ties between CEOs and manager-directors provides further evidence that positive ties between CEOs and board members encourage alliance formation.

In delineating the critical role of tie content in moderating network effects and then showing how it may be moderated further by third-party ties, this study makes several related contributions to research on interorganizational networks. First, as several authors have noted, very little empirical research has examined when network ties may lead to more negative relations between individuals or between organizations (Brass and Burkhardt, 1992; Burt and Knez, 1995; Labianca, Brass, and Gray, 1998; Westphal and Zajac, 1997). By exploring how the content of network ties might diminish mutual trust between individuals, thus impeding alliance formation, this study investigates what Burt and Knez (1995: 261) called the "dark side" of social networks. This is further developed by showing that both negative and positive ties between dyads of firms are amplified by third-party connections in which firms are embedded. This of course assumes that alliances are a beneficial strategy that are somehow preempted by negative connections between firms.

Second, research on social networks has typically treated network ties as exogenous; relatively little empirical research has examined the origin of organizational networks (Gulati, 1998; Gulati and Gargiulo, 1999). It is important to recognize that both interlocks (our key independent variable) and joint ventures (our dependent variable) are interorganizational rela-

tionships that accumulate into a social network. This study considers how the creation of interorganizational networks of strategic alliances may be influenced in significant ways by the social networks of board interlocks in which firms are placed. As a result, this study examines the multiplexity of ties in which firms are embedded and the relationship between those ties: new social networks result from a social process in which preexisting ties may shape their creation. This is also distinctive because these two networks exist at different levels of analysis: the relationships between corporate leaders that make up board interlocks are individual level ties, while strategic alliances occur across firms. Very little empirical research has considered how social ties between individuals can influence a different kind of network tie at the interorganization level (for exceptions, see Galaskiewicz, 1985b; Zaheer, McEvily, and Perrone, 1997). Thus, the findings have implications for cross-level perspectives on the formation of interorganizational networks by showing how the micro-content of network ties between individual leaders can play an important role in the development of organization-level ties.

The findings of this study may also have important implications for the corporate governance literature, as well as the literature on interorganizational cooperation. Surprisingly little empirical research has considered how boards of directors may influence strategic cooperation between firms. In the corporate governance literature, resource dependence theorists have viewed interlocking directorates and joint ventures as two independent and alternative mechanisms for resolving environmental uncertainty (Pfeffer and Salancik, 1978). Moreover, research on CEO-board relationships has also not considered how such ties may influence cooperative strategies. This literature has tended to examine how CEO-board relationships characterized by board independence from management affect competitive strategy, such as diversification strategy, and the propensity for boards to discipline managers for poor performance that affects shareholders (Walsh and Seward, 1990; Gibbs, 1993; Hoskisson, Johnson, and Moesel, 1994). The findings of this study suggest that an unintended side effect of CEO-board relationships characterized by independent board control is to reduce the likelihood that firms will identify and pursue strategic alliance opportunities with certain other companies (i.e., the home companies of outside directors on the board). The findings are consistent with recent evidence that independent board control tends to politicize the CEO-board relationship, prompting CEOs to devote more time and attention to building political support among directors rather than identifying new strategic opportunities (Westphal, 1998).

Research on alliances has primarily considered their formation as resulting from critical resource contingencies and has only recently paid attention to some of the social structural elements that may influence their formation (Gulati, 1998). Yet there is a growing stream of research in economic sociology that suggests that organizational actions are strongly influenced by the social ties in which organizations are embedded (Gulati, 1995b; Gulati and Gargiulo, 1999). This study builds on the embeddedness perspective and specifies

some of the ties that may influence the alliance behavior of firms. It shows how organizational decisions, such as entry into joint ventures, can be influenced in important ways by the social networks of board interlocks in which organizational decision makers are placed. Moreover, it demonstrates that there may be a dark side to embeddedness that can influence the alliance decisions of firms.

The findings of this study suggest avenues for future research. One might examine, for instance, whether prior cooperative or controlling relationships between top managers on boards might affect not only the likelihood of forming strategic alliances with specific other firms but also the subsequent success of those strategies (Gulati and Lawrence, 1999). In an insightful study, Baker (1984) suggested that distinct social structural patterns in the stock options market can alter the direction and magnitude of option price volatility. Similarly, in this instance, the social structure of board interlocks in which alliances are created can influence the relative terms of trade of the agreement and also dampen the volatility that usually occurs in such partnerships. On one hand, good rapport between top managers resulting from prior involvement in cooperative relationships on other boards may lead to more successful alliances by facilitating efforts to flexibly adjust the roles and responsibilities of alliance partners as environmental conditions change over time (Ring and Van de Ven, 1992; Doz, 1996). On the other hand, in-group biases resulting from CEO-board cooperation may lead to excessive levels of trust between top managers, so that each party becomes overly optimistic about the capabilities and likely contributions of the other. Thus, empirical research is clearly needed to determine how initial relationships between corporate leaders moderate the consequences of alliance formation.

Another area for future research would be to explore more thoroughly the full array of economic and organizational imperatives that might motivate two firms to enter into a joint venture. There has been considerable work on this question, much of which has been incorporated in the control variables included here, but there is still room to explore these issues further. One such example is our measure of industry overlap, which assesses the extent to which two firms in a dyad operate in overlapping industries and captures the resultant opportunities for collaboration that may occur for two firms. This measure implicitly treats all industries as equivalent and does not take into account the characteristics of the industries in which the overlap occurs. It would be useful to consider industry heterogeneity on important dimensions such as concentration ratio and geographical dispersion of capabilities that could result in greater or fewer alliances. Along the same lines, it would also be fruitful to consider the role of other possible determinants of alliance formation, some of which may even be associated with board cooperation and control. Our comprehensive efforts to include a variety of economic and strategic variables that have been considered to predict alliance formation, while also using the Heckman selection model to control for the effects of sample selection bias, is a first step in this direction.

This study confirms that board interlocks can be influential for the creation of new strategic alliances between firms. This effect is strongly conditioned, however, by the behavioral processes that underlie the connection between firms, and these cohesion effects are moderated, in turn, by the third-party ties in which they are situated. Thus, the findings show how the creation of alliances between firms is shaped by the social context in which they are embedded, contributing to a richer, socially informed account of organizational action.

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