

Exploration in Board Networks: A Study of US Commercial Bank Interlocks

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Abstract

This paper proposes an organizational adaptation account of interlock formation where each incoming outside director is conceived of as either an exploration tie or an exploitation tie. By distinguishing between search across space and across industry, I formulate predictions explaining exploration decisions. A study of US commercial bank interlocks shows that banks whose performance exceeds both the sample-based aspirations and the geographic market-based aspirations are more likely to induce exploration ties than those who do not meet performance aspirations on either dimension or both. Results also show that market concentration has a negative effect whereas market deterioration has a positive effect on the propensity to appoint a non-local director. In addition, banks facing unique uncertainty or decreasing proportion of industrial and commercial loans to total outstanding loans refrain from non-local search along industry networks.

Key Words: Interlocks, networks, exploration, regulation, organizational learning, banks

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INTRODUCTION

Given that interlocking directorates among corporations seem to have been the norm for about a century (Mizruchi, 1983), it is no surprise that the antecedents of formation of inter-organizational board ties have long occupied an important place in organizational research. Thanks in large part to a large-scale data collection initiative that began in late 1960s at SUNY-Stony Brook, a small group of organizational sociologists has produced a large body of work explaining why and when organizations constitute interlocking ties (i.e. Burt, Christman, & Kilburn, 1980; Mariolis, 1975; Mizruchi and Stearns, 1988; Palmer, Singh, & Friedland, 1986). In the prevailing interpretations, interlocks are associated with inter-organizational resource dependence – they reflect mechanisms to co-opt sources of environmental uncertainty (i.e. Allen, 1974; Burt, 1980; Pfeffer, 1972), corporate control – they are devices for organizations to translate their power into some kind of influence and perhaps formal coordination (Mariolis, 1975; Mintz and Schwartz, 1985), or intra-class consolidation and integration – they are vehicles for upper-class elite to increase capacity for coordinated economic, social and political action (Palmer et al. 1986; Useem, 1979).

In this paper, I propose, articulate and test an organizational learning perspective of interlocking that complements the above explanations (Cyert and March, 1963; Levinthal and March, 1993; Nelson and Winter, 1982). The core thesis of this paper is that interlocking is a critical form of search activity by which firms can proactively initiate or adapt to changes in markets, competition and technology. I argue that the choice of whom to interlock with is a function of the type of learning that the firm embarks upon– exploitation on the one hand and exploration on the other (March, 1991). I therefore treat the director ties as signifying search attempts instead of exclusively a set of power relations based on resource exchanges. In doing so, I examine the tie formation behaviour by systematically distinguishing between two distinct search dimensions: search in physical space and search in industry networks.

The proposed theoretical framework and results obtained contribute to our understanding of the emergence and the evolution of board networks by addressing four fundamental problems in the literature. In the first place, most studies of interlocks have focused on the re-constitution of broken ties rather than on the initiation of new ties, while the few that did address the initiation of new ties treat them as independent of those that already exist (Mizruchi and Stearns, 1988). In fact, interlock research, like network research more generally, has failed to study change and risk, preferring to focus on stability instead. Thus it has supplied few insights into the forces inducing firms to form linkages with new partners or alter the network structure with new ties (Baum, Rowley, Shipilov, & Chuang, 2005; Beckman, Haunschild & Phillips, 2004). Second, earlier accounts of director linkages tend to assume that firms that co-locate in the same territory or compete in the same industry seek homogeneity through their interlock actions (i.e. hire from the same director pools). However, recent research has demonstrated persistent intra-space and intra-industry differences in firms' organizing strategies, internal structures and resource endowments (Furman, 2003; Ahuja and Katila, 2004) implying that firms conceive and implement actions to sustain heterogeneity. Third, even though interlocking is a spatial phenomenon, no one has explored the possibility that local and non-local interlocking might have different determinants (Kono, Palmer, Friedland, & Zafonte, 1998). Fourth, there has been no direct attempt to investigate the impact of institutional constraints on firm's choices of outside directors.

This paper thus seeks to broaden the debate in the interlock literature, while building on behavioural theories of the firm. The proposed models of adaptive change often do not consider "the effects of competition, imitation, or other interaction among organizations" (Levinthal and March, 1981:307) and overlook the importance of industry structure in shaping firms' actions and outcomes (Henderson and Mitchell, 1997). Following the lead of recent work (Greve, 1995; Baum and Ingram, 2002; Baum et al. 2005; Beckman et al. 2004),

I make an explicit link between organizational environments and attention allocation processes within the context of a specific inter-organizational arrangement. The paper also extends prior work on corporate governance. Scholars of governance have long shown interest in director ties yet they have taken board composition as a given, seeking to examine its implications rather than its determinants (Zajac and Westphal, 1996).

To lend quantitative backing, I utilize a large sample of US commercial banks that operated in well-defined geographic markets under diverse institutional regimes in early 1980s. This single industry inquiry extends the empirical base of research on interlocks – which has mostly been supported using cross-industry and Fortune 500-biased studies - to cover more populations to permit credible generalizations. The inclusion of commercial banking has additional benefits. Davis and Mizruchi (1999:224) remarked: “Although there has been considerable amount of research on how bank representatives come to be on the boards of non-financial firms, little systematic research has been done on the determinants of the presence of non-financial executives on bank boards.”

The remainder of the paper proceeds in five parts as follows. The next section briefly reviews resource dependence and power interpretation of interlocks, elicits counterarguments, contrasting positions and shortcomings. The subsequent two introduce the learning approach and build hypotheses in its light. Final two sections present the empirical model, findings, evaluate the weight and significance of the results and leave with an outline of theoretical and managerial implications, limitations and suggestions for future research.

THEORETICAL BACKGROUND

Interlocks as co-optation instruments stand out as one of the earliest and most strongly asserted motives for creation of inter-organizational director ties. Cooptation involves exchanging some degree of control and privacy of information for some commitment for continued support from the external organization (Pfeffer, 1972). Under this interpretation,

firms use their boards to partially absorb important external organizations with which they are interdependent in terms of resource exchange. Empirical studies usually conceptualise interdependence as a need by corporations to ensure sources of supplies or markets for their products (Mariolis and Jones, 1982). Thus the best predictor of board composition is likely to reflect the extent of uncertainties an organization is encountering in vertical or horizontal economic transactions (Zajac and Westphal, 1996), implying that interlocks between industries that are related through resource exchange should be more common than interlocks between firms in unrelated industries. For this reason, the cooptation scholars theorize that the most extensive involvement in co-optive interlocking is expected from large firms and those in capital-intensive industries (Burt, 1980; Pfeffer, 1972; Pfeffer and Salancik, 1978).

The power perspective posits that organizations tap board representation to exercise influence over other organizations. Influence may vary from more proactive forms where organizations aim at controlling strategic decision variables to more passive monitoring functions. Empirically though it is difficult to distinguish influence-driven interlocks from co-optation ones, as influence is also a function of resource flows (Mizruchi, 1996; Richardson, 1987). In quantitative studies, the difference is a matter of the directionality of tie. In resource dependence theory, organizations work towards minimizing their dependence on other organizations and maximizing the dependence of other organizations on themselves. While co-optation scholars focus on the first – uncertainty and market constraints emanating from transactions, power scholars concentrate on the influence an organization derives from the dependence of others upon it. Interlocks between pairs of financial and non-financial institutions are prime stages where these differences are visible. Co-optation scholars view financial capital as a scarce resource and argue that manufacturing firms will frequently invite members of banks onto their boards to co-opt them (Allen, 1974; Stearns and Mizruchi,

1993). By contrast, power theorists assert that interlocks represent outlets for banks to closely monitor the performance of industrial firms that borrow capital (Mintz and Schwartz, 1985).

Several theoretical criticisms have been raised against the interlock research ingrained in both perspectives. Some of which were already emphasized in the introduction. For our purposes, three additional drawbacks are worth stressing.

First, either interpretation can only illuminate some of the director ties as there are plenty of cases of large firms drawing upon non-profit organizations with which it might be difficult to envisage transactional flows. More compelling substantiation comes from studies of broken director-ties (i.e. Ornstein, 1984; Palmer, 1983) that showed that the majority of interlocks broken accidentally were not reconstituted within the four years after the break.

Secondly, these interpretations assume an atomistic environment in which information about other organizations with whom to interlock is widely available and freely accessible to all (Granovetter, 1985). Organizations are believed to be capable of perceiving the magnitude of interdependencies through exchanges. The effectiveness of interlocking in managing these interdependencies is presumed to be relatively apparent (Finkelstein, 1997).

Last but not least is the issue of variation, which precipitates the questions: When and how does the dominant coalition of the organization (Cyert and March, 1963) learn as well as develop skills to recognize new ideas, novel competitive situations and nascent opportunities and avoid making decisions pushing the organization into competence traps (Cohen and Levinthal, 1990; Levitt and March, 1988)? Similarly, network theorists might ask: If firms choose directors on the basis of transactional relations or influence motive, would they dismiss weak ties that allow for tapping into fundamentally different domains or pools of information (Burt, 1992; Granovetter, 1973)? These questions as such warrant further examination of the determinants of interlocking and form a cornerstone of current research.

EXPLORATION AND EXPLOITATION INTERLOCKS

The organizational learning model that I propose builds on three classical observations drawn from behavioural studies of organization: The first is that organizational environments change yet organizations are not inert and inflexible entities for which adaptive responses are difficult and infrequent (Cyert and March, 1963; March, 1981). The second is that organizations are experiential learning systems that are "...routine-based, history-dependent and target-oriented" (Levitt and March, 1988:319). The third asserts that organizational adaptation is a political and social process of change. It involves risk. Organizations are neither risk averse nor hold stable risk preferences (Cyert and March, 1963; March and Shapira, 1992).

In this framework organizations react to their environments in terms of existing or new routines – rules, operating procedures, structure of beliefs, strategies and technologies around which organizations are constructed and through which they operate (Levinthal and March, 1981; Levitt and March, 1988). One mechanism by which this occurs is organizational search. Search is a learning process that entails generation, acquisition and processing of information about alternative routines. It consists of decision processes where alternatives are evaluated by their expected outcomes for antecedent goals (March, 1991) under conditions of ambiguity and cognitive limitations (Cyert and March, 1963).

In this paper, I conceive of board appointments as search activities by which organizations attempt to achieve fit with the environment. Following March's (1991) seminal dichotomy, I argue that some interlocks may function as exploration ties to the extent that they are guided towards generating new routines for unique entrepreneurial ends and have the potential to expand organizational boundaries in previously uncharted markets. Others may be seen as exploitation ties where the organization seeks out to refine, extend and redeploy its current routines, which may, in turn, strengthen its economic activities in known domains. These conservative search processes maintain stable relations and reduce variation among

organizations (March, 1991). While exploration interlocks are conduits of second-order learning, exploitation interlocks give rise to first-order learning (Lant and Mezias, 1992).

Exploration implies that an organization searches “non-local”, that is, it moves beyond its current location in search space to prospect for alternatives that are likely to vary greatly in pay-offs from existing routines. In pursuit of exploitation, an organization draws from the pool of available solutions in the vicinity of its current position (March, 1991). Hence, an exploitation interlock occurs when an organization reinforces its existing connections either by reconstituting broken ties, increasing the density of ties with existing network members or forging ties with new firms that have a similar profile to those already present in its network.

Organizations often search in a multi-dimensional search landscape. In the model below, I define an organization’s position in search space in terms of the geographical scope of its economic activities and the extent of its board-level industry connections. Organizations explore by spanning either their geographic boundaries or the boundaries of their industry networks or both. These two trajectories capture what Granovetter (1973) saw as main determinants of the exposure to novel ideas, insights and opportunities in a dyadic relationship: partners do not co-habit the same environment or operate in the same contexts.

Search in Physical Space and Industry Networks

Organizations situate and coordinate their economic activities in physical space. They draw on common economic and social infrastructures (i.e. labour and capital markets) in spatial contexts. The locations in which an organization resides determine many elements of its business environments such as the degree and patterns of its intra- and inter-industry interactions (Sorenson and Baum, 2003). They influence organizations’ internal structures (Pfeffer and Salancik, 1978), choices regarding investments in routines and resources (Furman, 2003) and the mental models of its managers (Baum and Mezias, 1992).

Organizations explore in physical space to overcome “spatial myopia” that impedes their ability to adapt to exogenous environmental changes (Levinthal and March, 1991). Spatial myopia emanates from the continuous utilization of a localized routine base. Localization transpires if the organization develops routines through economic and social interactions confined to the territory in which it is embedded. Since geographic proximity amplifies observability, vicarious learning reinforces it (Levitt and March, 1988). However, by crossing geographic boundaries, organizations can stay abreast of developments and advances in external communities, enrich the variety in their repositories of routines and withstand strong spatial isomorphic pressures (Furman, 2003; Ahuja and Katila, 2004).

Organizations also explore through linkages to entities operating outside of their competitive fields to overcome the constraints of overembeddedness (Uzzi, 1996) and strategic conformity (Geletkanycz and Hambrick, 1997). Inter-industry networks provide flows of information from which organizations can identify promising growth options, question long-standing routines, and achieve cognitive reorientation (Lant and Mezias, 1992). Organizations that maintain linkages to diverse industries gain access to novel information and business opportunities to a greater degree than those without such ties (McEvily and Zaheer, 1996). More heterogeneous contacts make decision makers more likely to envision and implement strategic alternatives that deviate from the common tendencies in their respective industries and improve the decision quality (Geletkanycz and Hambrick, 1997). For instance, such organizations tend to pay less for their acquisitions and have better performing acquisitions than those with homogenous ties (Beckman and Haunschild, 2002).

HYPOTHESES

Performance and Aspiration

Organizations regularly set goals of performance and learn and adjust behaviour in response to deviations in actual performance from aspirations. The type of search behaviour is

conditional on performance feedbacks (Cyert and March, 1963; Levinthal and March, 1981). However, the literature presents paradoxical predictions on the nature of this relation. On the one hand, performance above aspiration is suggested to be conducive to exploration while performance that lags aspiration is singled out as the main source of local search. On the other hand, performance above aspiration is argued to erode the motivation to undertake exploration, whereas it is posited that a performance shortfall engenders a risk-seeking attitude. Besides, a reconciliatory view is emerging (e.g. Fleming and Bromiley, 2003). Baum et al. 2005, for instance, reported that Canadian investment banks experiencing performance differentials above and below their aspirations preferred syndicate partners outside their local networks. Only performance near reference points led them to reproduce prior relationships.

The first view holds that when organizations perform above their aspirations, they can afford to engage in experimenting with new routines in advance of actual needs. This conclusion rests in three observations. First, as organizations search in non-adjacent contexts, they face greater uncertainty and search cost. Besides, exploration returns are often remote in time (March, 1991). Performance attainment enables the organization to withstand the cost, failure and return setbacks of non-local search, which may otherwise disrupt its routine functioning. For example, firms that perform in excess of expectations are less vulnerable to proxy fights. As a result, board linkage choices are less likely to come under close scrutiny and there is less accountability for board actions (Ikenberry and Lakonishok, 1993). Secondly, organizational decision makers appear to become overconfident and overly optimistic in their ability to create value (Roll, 1986). Because past success leads them to overestimate their abilities and underestimate the risks (March and Shapira, 1987) they often believe they can compete with a wider range of competitors (Baum and Lant, 2003). Hubris and expansion of cognitive competitive sets may therefore propel search for new set of routines and prospects. Research has shown that these cognitive biases influence organizational decision makers to

undertake greater number and scale of radical initiatives (Hayward and Hambrick, 1997). Third, organizations compete and interact with each other under conditions, in which relative position matters (March, 1991). Linkage formation inherently requires that both the organization desires a linkage and that it is attractive to potential partners (Ahuja, 2000). Organizations tend to interact with others of similar status with higher status organizations are reluctant to partner with those of lower status since affiliations as such may diminish their prestige (Baum et al. 2005; Podolny, 1993). Interlocking is sensitive to performance led status because the directors face financial risks and reputation effects. Since board members are held accountable for the losses, directors of failure firms hurt their prospects in the labour market (Mizruchi, 1983; Carpenter and Westphal, 2001).

In the opposite end, organizations with performance discrepancies tend to concentrate their search locally, exploiting current routines for solutions (Cyert and March, 1963). Prior research suggests that decision makers responsible for poor performance outcomes attribute their failure to external causes and temporary phenomena (Lant, Milliken & Batra, 1992; Bettman and Weitz, 1983) and attempt to rationalize their failure through continued commitment to the behavioural course of action (Staw, 1980). They actively seek out supportive information that justify their past choices and undermine alternative approaches that might have been selected (Staw, 1980). In a study of executive search behaviour, McDonald and Westphal (2003), for instance, found that poor performance prompts decision makers not only to seek more advice in local networks but also to assign greater weight to information obtained through local search. This self-enhancement process, or confirmatory bias, is consequential to board choices. Organizational boards are perceptual systems. Individual board members enact environments by the way they interpret the stimuli (March, 1981). Through social interchange, boards produce a collective interpretation (Daft and Weick, 1984) and establish negotiated belief structures (Cyert and March, 1963). Non-local

appointments increase the differences in the way the board perceives issues confronting the organization and are likely to precipitate cognitive conflicts and result in slow decisions. Local ties on the other hand affirm managerial beliefs and signal commitment to earlier charted directions. Prior research has found that poor performance increases the homogeneity of upper management and that when exits occur dissimilar managers tend to leave first (Boone et al. 2006; Lant et al. 1992).

From this perspective, the perseverance of beliefs is reflected in the type of organizational responses. Performance gaps endorse actions with fewer margins for error and more predictable and immediate outcomes than those with uncertain, diffuse, long-term consequences. Efforts are directed at resource conservation and greater efficiency rather than the creation of new routines specific to new opportunities (Greenhalg, 1983; Staw, Sandelands & Dutton, 1981). In the process, organizations might attempt to improve their own position in networks by connecting with more central partners in their proximate environment and manifest less inclination to expand into distant networks (Podolny, 1993). Consistent with these arguments, Chang (1996) found that performance gaps did not stimulate entry into unrelated markets, but were a significant predictor of divestitures and exits. Similarly, in McNamara and Bromiley (1997), lending officers in poorly performing bank branches did not seem to make riskier commercial lending choices or exhibit less caution in their risk assessments of commercial borrowers.

Hypothesis 1a: The greater is the performance relative to the aspiration, the higher is the likelihood of appointing a non-local director.

In contrast, models of aspiration tend to posit a positive impact of meeting targets on satisficing behaviour (i.e. Greve, 2003; Lant, 1992). Most managerial actions are subject to interpretation and self-attribution that make a near success action to be a prominent basis for future decisions than actions to be performed or whose outcome feedback is slow or unclear (March, Sproull & Tamuz, 1991). Experiential learning implies that prior choices that have

led to what managers interpret as positive outcomes guide future action. Target achievement tends to result in reinforcement of the lessons drawn from organizations' past actions (March et al. 1991; Lant and Mezias, 1992). Success becomes causally linked with a routine in the minds of organizational decision makers (Cyert and March, 1963; Milliken and Lant, 1991). Therefore, it activates certain inertial biases in interpretive processes (i.e. more confidence in the correctness of current cognitive frameworks and less seeking of information that questions judgments) and influences organizations to make decisions that result in strategic persistence (Milliken and Lant, 1991; Audia, Locke & Smith, 2000). For example, organizations that achieve their aspirations have been found to recruit successors from inside more than those that are performing poorly (Dalton and Kesner, 1985; Boeker and Goodstein, 1993). The choice of internal executive successors over external successors represents a desire for maintenance of past cognitive frames and continuity of routines over willingness to breakdown the routines that served predecessors.

Scholars in this vein see poor performance as a catalyst for organizational reorientation in routines (Lant and Mezias, 1992). Performance downturns are evidence of the failure of decision makers' interpretations and hypotheses about the environments. Therefore new routines rather than existing interpretive schemes should provide points of reference for action. Along these lines, a string of studies has specified performance gaps as chief driver of organizational change (i.e. Bolton, 1993; Lant, Milliken & Batra, 1992). Greve (1998), for instance, showed that US radio stations were more likely to alter their market strategies when performance dropped below aspirations.

Hypothesis 1b: The greater is the performance relative to the aspiration, the lower is the likelihood of appointing a non-local director.

Market Growth

Markets do not exhibit unremitting prospects for growth. Search behaviour may vary depending on market demand. Growing markets enable the accumulation of slack and

connote low cost of securing external resources, vibrant opportunities for market expansion and new product launch and competitive variation (Cyert and March, 1963; Datta and Rajagopalan, 1998). Market contraction makes for slimmer profit margins, depresses the resources necessary for survival and causes a rise in organizational mortality (Barron, West & Hannan, 1994). Declining markets are often characterized by less managerial discretion and limited strategic degrees of freedom (Hambrick and Finkelstein, 1987).

The conjectured effect of market growth on search behaviour is not clear-cut. It has been argued that growth in demand generates satisficing effects, inhibits non-local learning and eventually leads to organizational stagnation (Hedberg, 1981). When markets grow, firms have no compelling need to search for new domains (Hofer, 1975) or use their resources for experiments and undirected searches (Hedberg, 1981). Since organizations form performance expectations based on their historical performance in addition to the performance of other comparable organizations in their environment (Lant, 1991; Greve, 1998), in a growing market, most organizations will face performance situations that are reasonably good most of the time. Consequently, a disproportionate number of organizations will be avoiding exploration (March, 1981). Kelly and Amburgey (1991), for instance, found that growth opportunities in airline industry were associated with a significant decrease in the probabilities of exploration at both the corporate and business levels. In addition, organizations have limited attention. They are selective in the stimuli that they attend to and most often immediate internal problems take precedence (Ocasio, 1997; Cyert and March, 1963). A rising market demand creates complex internal adaptation challenges that are likely to absorb scarce attention. For instance, the market growth may outgrow the scale of operations, impose capacity constraints and strain organizational structures (Barron et al. 1994), drawing attention to adjustments in, for example, production and inventory processes

(Cyert and March, 1963). These internal challenges may call for directors who have experience in managing the perils of growth processes and hence result in local choices.

Hypothesis 2a: Market growth is negatively related to the likelihood of appointing a non-local director.

Yet another line of thought observes that better economic conditions trigger entrepreneurial decision-making (Datta and Rajagopalan, 1998; Hambrick and Finkelstein, 1987). Since potential profit opportunities are present and movements between segments, niches or product markets are not constrained by resource barriers (Lawless and Finch, 1989), organizations can search for new alternatives. This results from a favourable external resource environment and an upward revision of aspirations. Studies of unrelated diversification – one form of exploration- empirically validate resource-induced search. It is the second component, the upward revision of aspirations that has more direct relevance. Levinthal and March (1981) noted that aspirations moved upward more rapidly than downward. During periods of economic growth, social aspirations (the component of aspirations that is derived by social comparisons) tend to be higher than during periods of economic stability or decline. An increase in social aspirations is likely to make managers set performance objectives higher. This can occur through decision makers' own enthusiasm. It can also be dictated by external coalitions whose own aspirations escalate due to increased mean performance in the market (Cyert and March, 1963; Milliken and Lant, 1991).

Hypothesis 2b: Market growth is positively related to the likelihood of appointing a non-local director.

It is important to note that the very same controversy exists between those who view a deteriorating market as an opportunity for organizations to institute reorientation (i.e. Lant and Mezias, 1992) and those who believe that search behaviour will be more cautious. For instance, Miller and Friesen (1983: 223) posited: “extensive risk taking, forceful proactiveness and a strong emphasis on novelty can be very hazardous when competitive or

economic conditions are becoming more taxing”. Empirical evidence is also mixed. It has been found that market decline is the primary cause of frequent administrative, personnel and strategic changes (Koberg, 1987) and shifts in strategic group membership (Mascarenhas, 1989). Nonetheless, in a study of organizational change within the California wine industry, wineries did not seem to respond to low level of wine consumption in the market through changes in product lines or brand portfolio (Delacroix and Swaminathan, 1991). Similarly, HMOs in environments characterized by low market demand appeared less motivated to convert into for profit-status than those in low saturation environments (Ginsberg and Bucholtz, 1990). Ocasio and Kim (1999) predicted that when faced with industry wide economic challenges, US manufacturers would adopt new CEO selection rules – alternative models that favoured CEOs with backgrounds that differ from those of incumbents. However, results were not supportive of their hypothesis. In Haveman, Russo and Meyer (2001), macroeconomic conditions were positively related to domain expansion by hospitals and investments in new lines of businesses by savings and loan associations.

To a certain extent these paradoxical expectations and conflicting findings can be attributed to the neglect of the contingent effect of firm level performance feedbacks on market growth. Though most prior analyses have decoupled firm performance from market performance and some have controlled for one or the other in models, rarely have their interactions been assessed (notable exception is Ocasio and Kim, 1999). March (1981), for instance, explicitly underlines the satisficing effect of good economic conditions on firms but hints that this should be more prevalent for firms that have good performance. Adherence to this view makes the following formulations plausible: when organizational performance is above (below) the reference point, organizations will make significantly more changes if the market is declining (growing) than it is growing (declining). However, the risk propensity of diagonal cases is controversial: Does an organization with performance adversity under

demand growth seek more risk than an organization that encounters a declining demand but still performs above expectations? There is also the ultimate debate that characterizes the adaptation literature: What if performance achievements boost exploration? In the previous section, I formulated two competing hypotheses to address this dilemma:

Hypothesis 2c: Performance greater than aspiration moderates the expected relationships in H2a and H2b positively (H1a) or negatively (H1b).

Market Concentration

Organizations make an array of strategic moves. The actions of one competitor become the environment or the outcomes of another (March, 1981). As a result, “even if learning by an individual organization were entirely internal and direct, it could be comprehended only by specifying the competitive structure” (Levitt and March, 1988: 333). Market concentration is crucial in understanding the processes and outcomes of competition, as it is both a consequence and a determinant of competitive rivalry. An organization’s adaptation success is interdependent with the dynamics of concentration (Ingram and Baum, 1996; Greve, 1998).

Market concentration produces two outcomes that are critical to our perspective. First and foremost, it reduces the extent of competitive heterogeneity, diminishes the degree of environmental scanning and lowers the information burden (Milliken and Lant, 1991). A fragmented environment is an information rich context where boards confront numerous bits of complex, scattered and unstructured information. Not all rivals are known and fully understood (Zajac and Bazerman, 1991). Information complexity limits the cognitive capacities of board members (Cyert and March, 1963) and keeps the board from having more differentiated cognitive structures. Non-local additions to the board ensure the variety of representations to match the variety of market contingencies. In these contexts, appointing directors with greater socio-cognitive distance to the focal board tend to result in greater director involvement in board discussions of strategic issues, whereas similarity in mental models seems to diminish directors’ contributions (Carpenter and Westphal, 2001).

Increasing concentration – which is transparent to all participants, narrows scarce managerial attention to a smaller sample of more homogeneous rivals and homogenizes board members' perceptions (Staw et al. 1981). It reduces the need to develop routines to compete in multi-faceted ways. Even the sheer number of rivals increases the possibility of novel reactions to standard strategic actions (Nelson and Winter, 1982). As the number increases, search strategies for increasing the mean through increased effort or greater knowledge become less attractive relative to strategies for increasing variability (March, 1991). Concentration prevents decision makers from broadening their knowledge about many different forms of rivalry. It simplifies competitive repertoires (Miller and Chen, 1996).

Secondly, concentration leads those firms with the largest market share to recognize their mutual dependence and establish implicit understandings with each other. This prompts organizations in a market to collaborate rather than compete with one another in order to defend and solidify the barriers defining the central area (Dobrev, Kim & Carroll, 2002). Collective efforts are expended to strengthen direct (when permitted) or indirect ties between co-located dominant organizations in order “to devise and negotiate an environment so as to eliminate uncertainty...and make the environment controllable” (Cyert and March, 1963:120). Eventually this can lead to the development of what the social class perspective calls “elites”. An empirical endorsement of this thesis was offered in Lang and Lockhart's (1990) study of director networks in the airline industry where an increase in the extent of head-to-head competition between firms was found to stimulate indirect interlocking.

Hypothesis 3: The greater the concentration of the market, the lower is the likelihood of appointing a non-local director.

Regulatory Constraints

Adaptation scholars acknowledge that regulation affects strategic choice (e.g. Haveman et al. 2001). However, there have been few attempts to examine the nature of its influence on search or network behaviour. Inter-organizational network research is particularly germane to

the issue of regulation as most networks span multiple industries as well as distinct geographically bounded institutional environments. Regulatory shocks can, for instance, dismantle the structure of industry networks for some firms while bestowing opportunities for others (Madhavan, Koka & Prescott, 1998). Nonetheless, network scholars have generally considered it to be a minor determinant of why and how networks form and evolve.

Regulations can impel or impede the course, scale and breadth of search. In the study at hand, our focus is on regulations governing the scope of operations. It is tempting to argue that restrictions on boundary expansion may reduce incentives to conduct non-local search whereas unregulated markets drive firms to replicate their activities elsewhere. Through exploration interlocking, organizations facing unlimited scope of operations can assess the potential of new domains, find out the required competencies to be successful, get connected to local elites and make sound expansion decisions. Then there is also the useful coordination function of regulations. Unregulated markets tend to be fraught with more exogenous and uncontrollable factors, high variability and uncertainty as to competitor's actions. Such environments require diverse channels of information and a wide range of cognitive representations so that the board can observe environmental stimuli on multiple fronts. Regulations tend to dampen motivation for rivalry and induce more tacit cooperative arrangements among interdependent organizations (Lang and Lockhart, 1990)

Yet interlocking can also be used as a tool to circumvent regulatory barriers. For instance, within banking, branching restrictions did not necessarily prohibit banks doing non-retail business with individuals or organizations located in areas where they were barred from operating. Furthermore, anticipation for deregulation can serve as a powerful incentive to commence building new network resources ahead of legislative changes.

Hypothesis 4: The greater the limitation on the scope of an organization, the higher is the likelihood of appointing a non-local director.

METHODOLOGY

Sample and Procedures

I tested these hypotheses with cross sectional data drawn from the US commercial banking industry from 1975 to 1984. The industry was an ideal research ground to investigate search behaviour since it was characterized by firms with relatively homogenous product mixes that operated in well-defined geographic markets. Furthermore, regular and transparent feedback about competitor performance and behaviour allowed banks the opportunity to rapidly adjust their behaviour. Finally, throughout the study period the industry was subject to various regulations imposed on the geographic scope of bank activities. The fact that each state was in charge of regulating the activities of banks operating within its borders meant that there was a variety of institutional environments within the industry.

To form the population for the analysis, I restricted my consideration to only Federal Deposit Insurance Corporation (FDIC) insured commercial banks and bank holding companies (BHCs). Thus, I omitted non-insured commercial banks, investment banks and mutual banks with no capital stock. I took 1977 and 1984 as cut-off points to minimize the exogenous distortions prompted by large-scale regulatory changes introduced before and after this period. Between 1972 and 1976, some states (i.e. New Jersey and Florida) enacted laws allowing greater intra-state branching freedom. On the other hand, the passage of inter-state banking legislations in one state after another from 1984 forward spurred a wave of merger and acquisition activities that fundamentally altered the industry structure.

Secondly, given immense fragmentation of the industry¹ and the difficulty of procuring interlock data for small banks, I had to impose a size limit. To do so, I defined the banking universe by banks and BHCs appearing on the American Banker's deposit-based rankings – Top 300 Banks in the US (1980). This list covers the industry more comprehensively than the only other alternative, Fortune Magazine's Annual Scoreboard of 200 Banks. Nonetheless,

unlike the Fortune Magazine, the American Banker also ranks the affiliates and thus the rankings contain different banks that are owned by the same BHC. From these 300 banks, I had to exclude private banks for which SEC filings were not available. Foreign-owned affiliates and BHCs had to be eliminated as well because the majority of board members were representatives of the parents. For example, Bank of Tokyo Trust Co. had 10 directors on its board, 7 of which were Japanese and 2 others were insiders. Finally, I dropped Hawaii-based and Porto Rican banks because of geographical remoteness and a large Californian bank - Union Bancorp - because Standard Chartered Ltd. of England acquired it in 1979. Two small Virginia BHCs that merged in 1979 and subsequently formed a new board had to be discarded, too. Michigan's Bank of Commonwealth was also precluded as the board underwent charges related to fraud and accounting disorders. The final sample included 214 banks located across 38 states. They collectively commanded assets accounting for over 74% and 82% of total US banking assets in 1977 and 1983, respectively.

Measures

Once the sample was finalized, I went on to identify board linkages using a method that has become conventional in the interlock literature: an exhaustive search through SEC filings, press releases and Moody's Bank and Finance Manuals.

Having specified the inter-organizational ties through primary affiliations of board outsiders, the next step involved coding the 4-digit primary, secondary and tertiary SIC-codes for the organizations that these directors represented in order to define their industry experience and the reach of their social capital. Prior studies have used industry relatedness measures constructed mostly at 2-digit SIC code level (i.e. Burt et al. 1980; Beckman and Haunschild, 2002; Westphal and Milton, 2000). The presence of diversified firms in our sample necessitated the inclusion of secondary and tertiary SIC codes whenever applicable. To that end, I utilized S&P's Register of Corporations, Directors and Executives, D&B

Million Dollar Directory, Ward's Directories of 51,000 Largest US Corporations and Private US Companies and Directory of Corporate Affiliations.

Dependent Variables. I tested for three types of exploration interlocking: Non-local industry interlocking, non-local spatial interlocking and the combination of these two dimensions, which might be seen as the ultimate form of exploration.

I defined non-local industry interlocking by examining the primary, secondary and tertiary SIC distribution of boards in the three financial years preceding the appointment of the new director. The three-year window seems appropriate in the sense that it conforms to the "knowledge" and "tie" depreciation norm in studies of inter-organizational collaborations (i.e. Baum et al. 2005). A firm is then said to have appointed a non-local industry director if it has not had a director from an organization sharing either the primary, secondary or tertiary SIC codes with the focal director's principal affiliation in the previous three years.

Non-local spatial interlocking was constructed by merging data on the branch/loan office and the location for directors' principal affiliations. The first variable was collected at the county level, which is the normal practise in studies of the banking and finance industries (Haveman and Nonnemaker, 2000; Heggstad and Rhoades, 1978). As a unit of analysis, the alternative measure of standard metropolitan statistical area (SMSA) is inconvenient due to the fact that some SMSAs cross state lines. SEC filings, Moody's bank descriptions and Call Reports provided the data. Data for principal affiliation location came from the same sources as SIC codes and from Martindale-Hubbell directories for law firms. Spatial exploration was defined to be the case when two conditions were held: the absence of a branch/loan office in the focal county and the absence of an outside director from the same county in the past three years. The latter is necessary since even a bank that is not physically present in a particular area may have directors from there perhaps as the outcome of an earlier exploration attempt.

At this point, two important remarks must be made. First, these measures respond to a major critique of literature by capturing the historical experience of tie-formation: new ties are treated independently of existing ones (Mizruchi and Stearns, 1988). Secondly, these measures differ from Beckman et al. 2004's study of the impact of market versus firm uncertainty on interlocking behaviour. In their research, an exploration tie occurs when a focal firm receives from or sends a director to another firm where no interlock existed during the year prior to the observed year. Hence, the tie-receiving firm might essentially choose a partner from an industry that is already represented by its existing directors. Moreover, a one-year window may not be sufficient to write-off the presence of prior interlocking since, for example, it takes more than a year to reconstitute accidentally disrupted ties (Palmer, 1983).

Using 1977 as the base year I coded the director change for 1978-1983 and classified the incoming directors under the guidance of the above rules. Those that did not meet the requirements were regarded as exploitation interlocks.

Independent Variables. I constructed two performance-aspiration feedback effects with the same procedure - by assigning 1 if the difference between these two variables was positive and 0 if negative – and then the total was summed. While the performance components were identical, aspirations differed. An organization that outperformed (underperformed) both aspirations was assigned 2(0). In existing aspiration models, industry or sample means of some given performance metrics are assumed to form the base for all firms (Greve, 1998, 2003; Baum et. al. 2005). In this sample, markets are geographically delimited and therefore it makes sense to compute one aspiration based on the sample and another based on banks in the same geographic market. The difference is theoretically and empirically critical and provides a richer explanation as in the latter case banks are assumed to set their performance objectives with reference to their physically proximate competitors.

In order to do so, I used Greve's (2003: 691) model, which computes aspirations as a mixture of social and historical aspirations. Letting a_1 and a_2 be weights, the formulas are:

$$A_{ti} = a_1 H A_{ti} + (1-a_1) S A_{ti}$$

$$H A_{ti} = a_2 H A_{ti-1,i} + (1-a_2) P_{t-1}$$

Here i is the focal firm t is time period. The historical aspiration (HA) is a mixture of past-period historical aspiration and the previous performance of the focal firm (P). The first social aspiration (SA) is the average of other firms' performance (P), calculated as the mean of return on bank assets (ROA) of all firms in the sample except a focal firm. The second one replaces the sample mean with the mean ROA of all banks in the market except the focal firm. Following Greve (2003: 691), I estimated the weights by searching all parameter values by increments of 0,1 and took the combination giving the highest model log-likelihood.

During the period in focus, the banking industry faced state-controlled regulations that constrained banks in their ability to operate branches or form multi-BHCs. Branch banking laws limit the number of locations a bank may operate. They are classified into three types: Unit banking laws - banks are permitted to have only one location for their operations, statewide branching laws - banks are permitted to operate anywhere within their state and limited branching laws - banks are permitted to operate in more than one location within a state but with some restrictions - traditionally, restricted to a single county or to counties contiguous to the county in which the home office was located.

Ownership restrictions govern whether banking institutions can own multiple banks or not. A multi-BHC is an umbrella corporation that owns many legally distinct banks that operate in many different locations. It is important to consider ownership restrictions as a multi-bank structure can essentially allow circumvention of branching limitationsⁱⁱ. To construct this variable, I adopted the approach of Reger et al. 1992 and coded regulations as: 0=branching not permitted, 2=limited branching, 4= statewide unlimited branching, 2=multi-

bank holding structure unlimited, 0=not permitted. The level of deregulation was then calculated as the index sum of the values for branching and multi-bank holding.

In states other than Illinois, Indiana, Oklahoma, Kentucky and Louisiana, market concentration was computed through six firm concentration ratio (C6) of year-end statewide (domestic) deposits. FDIC historical statistics, Call Reports and Moody's banking manuals provided the data for this measure. For banks with overseas branches, I used the domestic deposit figures. For seven multi-BHCs whose affiliates span state bordersⁱⁱⁱ, I deducted the deposits collected elsewhere other than the focal state from the consolidated figures.

Under Illinois and Oklahoma laws, a state bank was prohibited from branching within and outside the county in which its principal office was situated. These unit-banking states also prohibited multi-holding structures. For sample banks from these states, the relevant markets had to be defined as the home county (Cook (IL), Oklahoma (OK) and Tulsa (OK)). In Indiana, Kentucky and Louisiana branch banking was permitted but restrained to the county of main office. Operations of sample banks from these states were restrained to Marion (IN), Jefferson (KY), Fayette (KY) and Orleans (LA). These counties and the contiguous counties formed the relevant markets^{iv}. To compute the C6 at that level of disaggregation, I turned to the Call Reports. These reports contain detailed information on all FDIC insured banks' locations, affiliations and results of their operations.

Market growth was measured through factor of the ratio of consumer loans, commercial and industrial loans and real estate loans extended in each market (note narrower definitions for IL, IN, LA, KY and OK) and the net income to banking assets in that market. To improve the reliability of scores, the factor analysis was run with data from 1972 to 1984. I also correlated market growth with the trends on branch opening/closure, new bank charters and bank mergers (data from FDIC) and macroeconomic factors such as business

expenditures for new plants and equipment and bankruptcies in each state (data from the US statistical abstracts and manufacturing censuses) and found the measure robust.

Control Variables. Board size and network (degree) centrality tended to correlate positively in a number of studies (i.e. Beckman et al. 2004; Haunschild and Beckman, 1994). For this reason, I controlled for the board size and the board openings (number of outsiders appointed in each year). Since larger firms may have a greater ability to change their networks (Beckman et al. 2004) and are also likely to be more desirable partners (Ahuja, 2000), I included total employees as a size control. I also added the market size measured by total banking assets to assess the influence of cross sectional differences on search behaviour. I chose natural logarithm as the functional form for all size measures.

Because a change in the chairman, president or CEO positions (as long as presidents and CEOs sit on the boards) could provide an important catalyst for the organization to search outside its established cognitive references and to learn and routinize new modes of actions (Boeker, 1997; Hedberg, 1981), I generated a dummy variable that takes the value of 1 if there was a change in either of these three positions in the previous over the year before. In McDonald and Westphal (2003), leadership duality was found to elevate the tendency of CEOs of firms with relatively poor performance to seek advice within local networks. Separation of the CEO/president and board chair positions was also controlled dichotomously; coded 1 if different individuals occupied CEO/president or board chair roles. To capture the possible effect of board independence on the extent of external tie formation I included the ratio of the number of employee directors (i.e. chairman, CEOs, affiliate presidents, retired officers) on a board to non-employee directors (Zajac and Westphal, 1996). I also controlled for the ratios of industrial and commercial loans and consumer loans to total outstanding loans. The former loans are extended to business organizations and the latter are granted to individuals for consumer products or services. I expected that non-local

interlocking was more likely when these ratios increased as this implied shifting organizational attention onto it. To eliminate any spurious effect due to unobserved heterogeneity, I controlled for fixed firm effects by entering a dummy variable for each firm.

Beckman et al. 2004 hypothesized that a firm facing unique uncertainty selects its network partners differently from a firm that faces collective uncertainty. In their view, the greater the uncertainty that a firm faces alone, the more likely that it will broaden its set of interlock ties with new organizations. In this paper, we need to test for firm-specific uncertainty for two reasons. First, three of our independent variables; market concentration, market growth and de-regulation produce uncertainty and unpredictability that are most often out of an individual organization's control and are shared across a set of firms. It is plausible to contend that H1a and H1b capture some of the firm specific uncertainty yet a direct measure can generate extra insights. Secondly, contrary to their prediction, Beckman et al. 2004 did not find any evidence for their hypothesis and thus we have a good opportunity to validate and extend their findings. In accordance with Beckman et al. 2004, I operationalize firm specific uncertainty as the standardized monthly volatility of the focal firm's stock in the previous year. The monthly volatility is calculated as the coefficient of variation for firm j 's annual monthly stock closing price; or ($i=1977\dots1981$):

$$\frac{\text{Standard Deviation (Firm's Monthly Closing Price, Year } i, \text{ Firm } j)}{\text{Average (Firm's Monthly Closing Price, Year } i, \text{ Firm } j)}}$$

Monthly stock price data were obtained from Datastream and from CRSP. All stock prices were split-adjusted. This measure should be interpreted more cautiously than its interpretation in Beckman et al. 2004 where it was connoted with performance issues. The measurement of uncertainty as above does not distinguish positive uncertainty (growth related) from negative uncertainty (decline related). Holding end of month prices identical, a stock that jumped from 10 to 100 would yield the same uncertainty as a stock that dropped from 100 to 10.

Data Analysis and Results

For our purposes, a negative binomial regression is appropriate as the dependent variables of interest in our panel data are count variables. In the models presented all independent and control variables were lagged over one-year intervals. Tables 1 and 2 provide means, standard deviations and correlations for the variables. Visual inspection of the correlation matrix shows several interesting relations that should be taken into consideration:

- The small negative correlation between market concentration and market decline confirms the idea that underlying structural attributes of industries do not co-vary significantly and their effects need to be assessed independently (Datta and Rajagopalan, 1998). Likewise, the small positive correlation between concentration and regulation is suggestive of the need to examine their impacts separately. Indeed, highly regulated markets were not the most concentrated markets. In fact, the highest concentration ratios in Table 1 were found in the least restricted banking environments.
- Banks in less regulated markets tended to have a lower share of commercial and industrial loans in their loan portfolio. Managerial attention seemed to be on consumer lending.
- Beckman et al. 2004 made an appeal to consider differential responses to uncertainty by organizations of different sizes. Our sample is characterized by significant size diversity. In most prior research, because board size was highly correlated with firm size (Burt, 1980; Pfeffer, 1972), researchers were unable to assess independent effects of either variable in the same model. Pfeffer and Salancik (1978) contended that larger organizations would have larger boards as they faced more complex environments. In this data, we see a small positive correlation between bank size and board size.
- In the co-optation thesis, poor performance leads to a large proportion of outside directors on boards. The proportion of inside directors will also be reduced if the organization is

regulated (Pfeffer and Salancik, 1978). The correlation coefficient signs hint at the possibility of a causal association of insider ratio to performance but not to regulation.

 Insert Table 1& 2 about here

Table 3 reports the results of negative binomial regression for geographic exploration (*) or exploration in industry networks (**) and the relationships between same predictor variables and the ultimate form of non-local interlocking (***). The third, sixth and the ninth columns are full models including the full set of dependent variables and controls.

 Insert Table 3 about here

Non-local Spatial Interlocking: Based on the full model, in line with the H2b and H3 we find that firms do search beyond the immediate geographical context of their physical presence when their primary market becomes more concentrated or when market revenues falter. H1b predicted that in the face of performance gaps, firms would shift strategy and seek to establish geographically distant ties. Results are supportive of its competing prediction, though very weakly. The hypothesized effect of regulations is disconfirmed.

Among control variables, both firm size and board size do not seem to impact the geographical scope of search but the size of the market does. The negative coefficient implies that non-local search takes place more often in smaller markets than larger markets. One possible interpretation could be that that there is a smaller suitable pool of directors to choose from. That is, smaller markets might exhaust their director resources more quickly. Alternatively, it might be that banks in smaller markets are more willing to capitalize on business opportunities outside their markets given limited potential. There is support for the increasing risky choices thesis made for firms facing greater unique uncertainty in Beckman et al. 2004. Insider-outsider ratio effect is statistically significant in the direction of

expectations. So it may be concluded that it is not the larger firms or boards that seem to render diversity but the degree of board independence. We don't observe a push for non-local search in the years following a change in the CEO, president or chairman positions. In contrast, the greater is the number of openings on board, the greater is the possibility of one or more new ties being a structural hole in geographical sense.

Non-local Industry Interlocking: In the full model, our data offer support for none of the hypotheses. Note however that this model encompasses the interaction effect. If we exclude the contingent effect of performance feedback on market growth – that is Model 4, the market growth becomes significant with the expected sign. Only three alternative explanations – firm-specific uncertainty, the number of board openings, and industrial loan ratio are significantly associated with interlocking of this type. As firm-specific uncertainty wanes, sample banks seem to establish more ties to industries with which they have not had any interlock relationship in recent past. While this result contradicts Beckman et al. 2004's hypothesis that higher firm-specific uncertainty was expected to generate more exploration interlocks, it lends credibility to the thesis that firms facing uncertainty become risk averse in their network partner selections. In a learning logic, the result concerning industrial and commercial loan ratio is intriguing, as it challenges the momentum behavior, in particular, repetitive momentum often observed in the literature (e.g. Kelly and Amburgey, 1992). Experiential learning out of lending implies that more loans should be channeled towards industries to which the banks are already tied to through directors.

Non-Local Spatial-Industry Interlocking: This type of interlocking represents the ultimate form of exploration. In the full model, the coefficients of performance exceeding aspiration, market concentration and market decline are statistically robust and observed in the direction of verifying H1a, H2b and H3. The interaction of performance achievement and market growth is statistically significant but has a positive sign. This means that in growing

markets, exploration is more likely if the firm performs above expectations. This contradicts to March's (1981) satisficing prediction. Another corollary of this result is that in declining markets, firms whose performance falls short of aspirations are more likely to explore than those whose performance exceed aspirations. Regulations seem to drive non-local search negatively but this effect is very weak ($p=0,78$). Insider ratio and firm specific uncertainty seem to affect non-local search. Market size has a positive albeit not a strong impact ($p=0,52$).

Post-Hoc Analysis

To examine the robustness of results, I made additional sensitivity testing. First, I ran the same models with firm size measured by logged assets or four-firm concentration ratios and obtained identical findings. I added real estate or agricultural loan ratios to the models. The results were substantively equivalent. To address whether inclusion of tertiary SIC codes distorted the results, I ran all the earlier-reported models with dependent variables defined on the back of primary and secondary SIC codes and found no notable difference in the statistical outcomes. In additional tests, I controlled the time effects by year dummies (Year 1980 was omitted category). This procedure improved the robustness of the models but left the findings unaltered. I carried out separate tests using a panel Poisson approach. Since the dependent variables in this sample are not overdispersed, Poisson regression is a suitable alternative. Poisson models produced coefficients similar in sign and in their statistical significance. In resource dependence and co-optation models, competitive uncertainty is predicted to have a positive relationship with local interlocking. In these models, competitive uncertainty is measured through industry concentration ratios with the assumption that it is highest when concentration ratios are intermediate (i.e. Pfeffer and Salancik, 1978; Palmer et al. 1986). I tested for an inverted U-shaped relationship between market concentration and the dependent variables by including the quadratic terms (non-logged). The sign of the coefficient was insignificant in all equations. All these results are available upon request.

DISCUSSION AND CONCLUSION

A central issue in organizational adaptation is the choice between the exploration of new possibilities versus the exploitation of old certainties (March, 1991). This study was motivated by the observation that studies of board interlocks as well as the partner selection branch of inter-organizational network theory have mostly concentrated on the latter. In these accounts, resource dependencies and the risks inherent in partnering are presented as factors causing firms to seek structural stability by reinforcing existing network relationships (Baum et al. 2005; Beckman et al. 2004). While not rejecting alternative explanations, in this paper I examined new tie formation from a learning perspective. In doing so, results shed light on two critical questions that have been unaddressed in the literature: What are the organizational and environmental determinants of interlocking outside existing networks? Do factors responsible for search outside geographical markets also account for search outside industry networks?

This study shows that firms rely upon exploration interlocking largely in response to performance feedbacks and market dynamics. Bank boards span network and geographic boundaries when the organization had an outstanding performance in the sense that it performed above aspirations not only based on its local competitors but also the largest banks in the US. In contrast, banks experiencing performance gaps did not attempt to establish non-local interlocking ties, instead persisted with established routines. This finding is in stark contrast to the evidence of increasing risk propensity reported in some studies (i.e. Baum et al. 2005; Greve, 1998). However, our results offer a more refined explanation than those in the adaptation research in light of the moderating effect of market growth. It seems that in a declining market, performance shortcomings fuelled non-local interlocking whereas banks with performance achievements stayed clear of exploration. This bears three important implications for our understanding. First, adaptation is contingent upon market dynamics, not merely performance feedbacks. Second, it seems that performance above aspiration in a

growth market allows the organization to forge links outside its domains. This is in line with the status based thinking in the literature (Baum et al. 2005; Podolny, 1993; Ahuja, 2000). Yet, results also document evidence that banks with poor performance in declining markets were able to find distant network partners. This calls the predicted impact of organizational status in tie formation into question and necessitates more comprehensive explanations. Third, firms with performance achievements operating in declining markets did not seem to alter their network structures in dramatic ways. Rather than searching for exit prospects, they seemed to cling onto their market positions by refining their routines. It is those banks with poor performance that instituted exploration initiatives at board connections. This finding corroborates results from competence-based studies of incumbent behaviour in declining industries. Market leaders tend to fight decline by exploitation, which eventually lead to their demise whereas firms with low market shares or profitability tend to explore in order to make the jump to the new industry or market.

An important message that comes from the findings of this study is that market dynamics matter for organizational adaptation and network structures and therefore more scholarly attention should be given to their consequences. This is especially true for behavioral studies that tend to furnish explanations without accounting for decision makers' linkages to other actors, institutional connectedness and the market structure within which adaptation processes unfold (Ocasio, 1995; Uzzi, 1997). On the other hand, it is possible to speculate that concentration is a prime source of consolidation of power and elite formation. This argument though requires fine-tuning considering our other result that non-local directors tend to come on board more often in smaller product/service markets than larger markets. If this is due to supply side constraints, that is, smaller markets exhaust their director pools more rapidly then the concentration might in fact make more directors redundant and therefore replenish the local pool for remaining organizations. However, if exploration occurs

because small markets are just too small and that firms are interested in luring customers in distant locations, then concentration should encourage non-local tie formation in smaller markets more than larger markets. Inferences as such imply potent research opportunities.

In only other study of exploration interlocking, Beckman et al. 2004's tested for non-local industry search. Results underscored no effect of firm-specific uncertainty. Here, we unveiled it to be a cause of search along industry. In our empirical context, we also found a positive effect of industrial lending on non-local industry search but not spatial search. Taken together, the disposition to invite an outsider from a new industry has antecedents different from non-local spatial selection. Results from our study should though be evaluated in caution in making generalizations. Other industry contexts might produce different outcomes. Future research should investigate this critical question in other industries.

This study has one major limitation, which is common to most analyses of the determinants of interlocks. It does not investigate tie formation at the transactional level. There are two solutions to this problem. The first and also the most robust one is to harness data on flows of exchange. In the banking industry, this is difficult and subject to regulatory hurdles. The second solution is to adopt an industry focus and make inferences by examining aggregate flows. This was what Burt (1980) and Burt et al. 1983 did in their seminal co-optation work by using 2-digit IO tables within manufacturing industries. In addition to its inherent weaknesses (see Zajac, 1988) and reliance upon comparative statics, this approach proves less feasible in our context because value chain of commercial banks differs from those of manufacturing industries. Nonetheless, in this study, the share of banks' industrial and commercial loans in their loan portfolio was found to be a significant positive determinant of non-local interlocking along industry networks. This variable can be a crude proxy of flows of exchange. In line with the resource dependence and corporate control logics, if the bank does not engage in lending of this type at all, then there is no need to forge

interlock ties for the purpose of managing transaction uncertainties. From this base, if the bank commences industrial and commercial lending, then it begins to create dependencies and more so when it channels more of its loan resources. These perspectives suggest that it is only when the magnitude of transactional relations with a given industry reaches a certain threshold that the bank invites a director from that industry. As commercial lending increases, more and more industries will move towards and beyond this threshold, resulting in creation of ties that did not exist in recent years. This scenario does not hold if the bank puts all its resources to use in one industry. Yet, this is very unlikely given that the benefits of loan diversification outweigh the risks of specialization.

Undeniably, firm level controls for transactional flows would allow us to better isolate the alternative arguments from learning arguments. Perhaps, future research can tackle this debate with creative methodologies. I make no pretense that resource relations could not have affected the choices made. However if we envision choices drawn from a pool of potential candidates and accept the possibility that some of the choices may have comparably similar resource relations with the focal firms, we should explain why a non-local selection was made over a local choice.

What if social relationships underlie the choices made? It is true that many directors serve on more than one board. Prior studies have identified the importance of indirect ties for corporate behavior. Again, I do not deny the possibility that one or more board members might have known the invited non-local director through social relationships. Yet why that particular choice took precedence over a local director who had similar social distance to the board requires additional considerations. This though represents another research opportunity.

In this paper, I set out to examine the causes of exploration interlocks and thus left their implications for strategic actions out of scope. The literature provides evidence that presence of interlock ties between organizations makes the creation of hybrid arrangements

between them more likely (Gulati and Westphal, 1999). There is also evidence that firms imitate the acquisition activities (Haunschild, 1993) or plant location choices (Bastos and Greve, 2003) of other firms to which they are tied through directorships. In our setting, queries as such present ample avenues for future research. In fact, while coding the branch networks, I came across a learning-based pattern of geographical diversification. One to three years subsequent to appointing a non-local spatial director, some banks made de novo entry or acquired banks situated in that area (i.e. Commonwealth National of PA into Franklin County, First Capital Corp. of MS into Forrest County, Mellon Bank of PA into Lehigh County). This pattern was not limited to state borders. Southeast Banking Corp. (FL)'s acquisition of Atlanta's Churchill Mortgage Co. came two years after having appointed an Atlanta-based director. These speculations should be tested. Since banks are multi-unit chains, such attempts will also advance our understanding of chain expansions and their learning dynamics.

This study makes a contribution to the research on inter-organizational arrangements by investigating factors steering interlock networks into new territories and industries. By incorporating the role of market dynamics and institutional constraints into the debate its contributions also stretch to corporate governance and regional development literatures. There is some evidence that shows that banks in states with strict regulatory restrictions were less profitable and more inefficient than banks in states without such constraints (Jayaratne and Strahan, 1998). Moreover both the turnover and the sensitivity of pay to performance for bank executives seemed to improve under more liberal banking regimes (Hubbard and Palia, 1995). For corporate governance scholars, issues at the nexus of performance, pay, efficiency and director networks pose new research challenges. For regional economists, an interesting subject would be to examine to what degree interlock structures resulting from regulatory limitations on banks fostered new entrepreneurial opportunities, sustained the development of local industries and affected the composition of industrial structure within the state.

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TABLE 1: Sample Characteristics

	Min	Max	Mean	St. Dev.
New Geo. – New Ind.	0	2	0.09	0.32
New Geography	0	4	0.14	0.40
New Industry	0	6	0.54	0.86
P>A	0	2	0.85	0.85
Concentration	-4.81	-1.05	0.52	0.50
Market Growth	-2.99	2.73	0.21	1.40
Regulation	0	6	3.86	1.67
Board Size	7	37	18.90	5.50
Board Openings	0	8	0.96	1.19
Insider Ratio	0.02	3	0.37	0.32
Dual Leadership	0	1	0.73	0.44
Firm Uncertainty	0.01	0.32	0.09	0.04
Loan Ratio – I & C.	-2.56	-0.44	-1.19	0.30
Loan Ratio – Cons.	-5.10	-0.34	-1.49	0.58
Assets (\$000)	283770	129997000	5705724	1.34e07
Employees	486	85266	4192.25	7790.96
Market Size	14.33	20.07	17.35	1.16
Market Density	14	1598	324.03	317.25
Most Concentrated Markets (C6) & Density in 1977 & 1982				
	C6-1977	Density-1977	C6-1982	Density-1982
Rhode Island	0.34	14	0.35	14
Utah	0.31	71	0.32	66
Oregon	0.28	53	0.30	84
Arizona	0.28	17	0.26	26
Washington DC	0.28	16	0.25	17
Idaho	0.26	24	0.22	27
Least Concentrated Markets (C6) & Density in 1977 & 1982				
	C6-1977	Density-1977	C6-1982	Density-1982
Arkansas	0.01	259	0.01	262
Iowa	0.01	649	0.01	649
Texas	0.03	1377	0.03	1523
Florida	0.03	675	0.04	495
New Jersey	0.03	188	0.04	161
Ohio	0.03	486	0.03	379

TABLE 2: Correlation Matrix

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1	NGNI	1																		
2	New Geo	0.84**	1																	
3	New Industry	0.41**	0.37**	1																
4	P > A	0.07	0.04	0.03	1															
5	Market Growth	-0.02	0.00	-0.00	0.11*	1														
6	Market Concentratio	-0.09	-0.09	-0.01	0.05	-0.10*	1													
7	Regulation	0.02	0.01	0.02	0.05	-0.10 [†]	0.16**	1												
8	Firm Size ¹	0.03	0.04	0.10*	-0.30**	-0.15**	0.10 [†]	0.16**	1											
9	Insider Ratio	-0.06	-0.06	-0.06	0.12**	0.07	-0.22**	-0.02	-0.15**	1										
10	Board Size ¹	0.04	0.06	0.05	-0.13**	-0.06	0.13**	0.05	0.30**	-0.34**	1									
11	Change	0.01	-0.00	0.03	-0.06	-0.04	0.04	0.01	0.07	-0.01	0.02	1								
12	Outsiders Appointed	0.37*	0.43*	0.79*	-0.02	0.02	0.00	-0.00	0.15**	-0.09	0.14**	0.03	1							
13	Dual Leadership	0.02	0.04	0.01	-0.05	0.06	-0.03	-0.00	0.14**	0.07	0.21**	0.02	0.03	1						
14	Firm Uncertainty	-0.06	-0.07	-0.07	0.01	-0.13	0.03	0.00	0.01	0.02	-0.10	-0.02	-0.02	-0.07	1					
15	Industrial Loan Ratio ¹	0.04	0.04	0.05	-0.02	-0.06	-0.04	-0.36	-0.02	-0.10 [†]	0.07	-0.01	0.05	-0.02	0.04	1				
16	Consumer Loan Ratio ¹	-0.01	-0.01	-0.00	0.26**	0.20**	-0.07	0.12*	-0.45**	0.13**	-0.20**	-0.01	-0.05	-0.18**	-0.02	-0.24**	1			
17	Market Size ¹	0.03	0.03	0.06	-0.17**	-0.23**	-0.36**	0.06	0.50**	-0.05	0.01	-0.02	0.06	0.03	0.08	0.00	-0.41**	1		
18	Firm Dummies	0.03	-0.01	0.02	0.02	0.02	0.08	0.11*	0.00	-0.03	-0.00	0.04	0.01	-0.03	-0.02	0.01	0.04	-0.05	1	
19	PA * Market Growth	0.03	0.03	-0.01	0.18**	0.70**	-0.07	-0.05	-0.10	0.01	-0.07	-0.04	0.00	0.02	-0.11*	-0.08	0.14**	-0.11*	-0.01	1

¹ Logarithm [†]P < 0,10 *P < 0,05 **P < 0,01 1238 firm years

**TABLE 3: Results of Neg. Bin. Reg. Analysis for
Non-Local Spatial Search (*), Non-Local Industry Search (**), and Non-Local Spatial-Industry Search (***)**

Variables	Model 1*	Model 2*	Model 3*	Model 4**	Model 5**	Model 6**	Model 7***	Model 8***	Model 9***
Constant	13.67 (1740.89)	13.54 (196.77)	16.13** (2.33)	13.52 (126.54)	13.11 (81.01)	12.58 (136.95)	12.58** (573.58)	12.67 (486.13)	10.49 (56.53)
P > A		0.20 [†] (0.10)	0.18 [†] (0.11)		0.06 (0.05)	0.06 (0.05)		0.36** (0.12)	0.35** (0.12)
Market Growth		-0.13* (0.06)	-0.21* (0.09)		-0.06* (0.03)	-0.03 (0.04)		-0.19* (0.08)	-0.38** (0.12)
Market Concentration ¹		-0.62** (0.16)	-0.63** (0.16)		0.03 (0.07)	0.03 (0.07)		-0.73** (0.18)	-0.77** (0.18)
Regulation Index		0.08 (0.06)	0.08 (0.06)		0.02 (0.03)	0.02 (0.03)		0.11 [†] (0.07)	0.11 [†] (0.06)
Firm Size ¹	-0.05 (0.14)	0.12 (0.15)	0.12 (0.15)	0.03 (0.06)	0.04 (0.07)	0.03 (0.07)	-0.14 (0.16)	0.06 (0.17)	0.07 (0.17)
Insider Ratio	-0.58 (0.42)	-0.90* (0.44)	-0.89* (0.44)	-0.02 (0.16)	-0.01 (0.16)	-0.01 (0.16)	-0.80 (0.52)	-1.16* (0.54)	-1.14* (0.53)
Board Size ¹	-0.07 (0.33)	-0.13 (0.32)	-0.13 (0.32)	-0.19 (0.15)	-0.18 (0.15)	-0.18 (0.15)	-0.16 (0.38)	-0.17 (0.36)	-0.12 (0.35)
Change	-0.14 (0.24)	-0.08 (0.24)	-0.09 (0.24)	0.08 (0.11)	0.08 (0.11)	0.08 (0.11)	0.04 (0.27)	0.10 (0.27)	0.09 (0.27)
Outsiders Appointed	0.59** (0.05)	0.58** (0.05)	0.58** (0.05)	0.58** (0.03)	0.58** (0.03)	0.58** (0.03)	0.58** (0.05)	0.56** (0.05)	0.56** (0.05)
Dual Leadership	0.08 (0.21)	0.00 (0.20)	0.01 (0.20)	-0.11 (0.10)	-0.10 (0.10)	-0.10 (0.10)	0.02 (0.24)	-0.11 (0.23)	-0.10 (0.23)
Firm Uncertainty	-4.88* (2.16)	-4.96* (2.16)	-4.95* (2.16)	-2.71** (1.02)	-3.06** (1.02)	-3.06** (1.02)	-5.36* (2.61)	-6.22* (2.62)	-6.26* (2.63)
Industrial Loan Ratio ¹	0.47 (0.34)	0.35 (0.35)	0.37 (0.35)	0.45** (0.16)	0.45** (0.16)	0.45** (0.16)	0.58 (0.39)	0.39 (0.40)	0.43 (0.40)
Commercial Loan Ratio ¹	0.06 (0.21)	-0.15 (0.21)	-0.12 (0.21)	0.13 (0.10)	0.12 (0.10)	0.11 (0.10)	0.06 (0.24)	-0.20 (0.23)	-0.15 (0.24)
Market Size ¹	0.05 (0.09)	-0.23 [†] (0.12)	-0.25* (0.12)	0.06 (0.04)	0.05 (0.05)	0.06 (0.05)	0.10 (0.10)	-0.23 [†] (0.14)	-0.26 [†] (0.14)
Firm Dummies	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
PA*Market Growth			0.09 (0.07)			-0.03 (0.03)			0.17* (0.08)
Wald Chi-Square	191.54	202.55	202.37	517.67	530.97	534.71	145.27	174.80	195.88
Log-Likelihood	-424.57	-414.41	-413.60	-911.61	-908.07	-907.57	-333.53	-319.11	-317.10

¹Logarithm [†]P < 0.10 *P < 0.05 **P < 0.01 1238 firm years

ⁱ Only in 1980, there were 14,434 FDIC-insured commercial banks in the US

ⁱⁱ In 1977, multi-BHCs (multiple locations under common ownership) were allowed in 24 states (states excluded from this study are given in italics): Alabama, Colorado, Florida, Georgia, Idaho, Iowa, *Maine*, Massachusetts, Michigan, Minnesota, Missouri, *Montana*, New Jersey, New Mexico, New York, *North Dakota*, Ohio, *South Dakota*, Tennessee, Texas, Utah, Virginia, Wisconsin, and *Wyoming*.

ⁱⁱⁱ These “legacy” multi-state BHCs were patched together before the 1956 Bank Holding Company Act blocked further interstate tie-ups.

^{iv} This is also consistent with how banks themselves defined their markets. See for instance Moody’s Manuals 1977-1982 for American Fletcher of Indiana or the “competition” sections on 10Ks for Merchants National Corp. of Indiana. In these markets, definitions of statistical metropolitan areas involve exactly the very same boundaries i.e. Orleans county (New Orleans) plus contiguous counties form an SMA.