

# Relational Embeddedness and Learning: The Case of Bank Loan Managers and Their Clients

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As a complement to the literature on learning in firms, we investigate learning in markets, a nascent area of study that focuses on how learning occurs between, rather than within, firms. The core idea behind our framework is that networks shape knowledge transfer and learning processes by creating channels for knowledge trade and reducing the risk of learning. In developing our framework, we elaborate on the knowledge transfer capabilities of different types of social ties, the informational properties of public and private knowledge, and how types of knowledge transfer and forms of learning follow from the networks within which firms embed their exchanges. We conducted fieldwork at Chicago-area banks to examine our framework's plausibility and application to learning in financial lending markets, a setting relevant to most firms. Findings indicate that learning is located not only in actors' cognitions or past experiences, but also in relations among actors, and that viewing learning as a social process helps solve problems regarding knowledge transfer and learning in markets.

*(Embeddedness; Networks; Social Capital; Learning and Knowledge)*

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## Introduction

What types of informal interfirm arrangements promote knowledge transfer and learning benefits for firms transacting across their boundaries? This question has received increasing notice in the organizational learning literature (Darr et al. 1995, Powell et al. 1996, cf. Baum and Ingram 1998), no doubt due in part to the dramatic swell in the frequency of informal interfirm relationships and the rise of new industries that, by nature, depend on informal ties for prosperity. For example, Powell et al. (1996) point out that, for the hundreds of formal ties among firms that act as information conduits, thousands of informal relationships exist among scientists, engineers, developers, managers, and other personnel through which infor-

mation flows. Other research shows that informal ties are precursors to formal ties or reduced learning costs (Gulati 1995, Lazerson 1995).

In this paper, we examine how informal interfirm relationships affect knowledge transfer and learning benefits across firm boundaries. Specifically, we develop a framework that links different types of knowledge transfer and learning to different types of informal ties. To organize our analysis we use a social embeddedness framework, which treats the quality of informal ties as varying in the degree to which commercial ties are embedded in social attachments (Granovetter 1985; Uzzi 1996, 1997). While the degree of embeddedness in an exchange relationship is variable, it can be characterized as either embedded or arm's length (Dacin et al. 1999). Arm's-length

ties reflect the conventional view of interfirm ties and market learning described by Hirschman (1970) and Macneil (1980). In these ties, relationships are cool, impersonal, atomistic, and actors are motivated by instrumental profit seeking. In contrast, embedded ties embed their commercial transactions in social attachments. These relationships create behavioral expectations that are considered irrelevant in the atomistic view of transacting and market learning because they shift the logic of opportunism to a logic of trustful cooperative behavior in a way that creates a new basis for knowledge transfer and learning across firm boundaries (Uzzi 1997, Arrow 1998).

Building on previous work on knowledge transfer in markets (Kogut and Zander 1996, Uzzi 1999, Zuckerman 1999, Haunschild and Beckman 1998), we examine the transfer properties of two key types of market knowledge: public and private information. Public knowledge is reported through standard instruments such as company reports, audited financial statements, regulatory filings, advertised bid and ask prices, price quotes, contractual stipulations, warranties, and other forms of prepared information accessible in the public domain. It is "hard" information for the asking, verifiable through third parties that standardize the collection and reporting of the information to the market.

In contrast, private knowledge is *not* publicly available or third-party guaranteed. Rather, it is "soft" information that references idiosyncratic and nonstandard information about the firm, such as unpublished aspects of the firm's strategy, distinctive competencies, undocumented product capabilities, inside management conflicts or succession plans, critical supplier or customer dependencies, special contractual provisions, as-yet-unpublished innovations, and underlying motives. These data are valuable to the learning process because their uniqueness furnishes prospects for innovations or cost savings that go unreported in public information sources. However, because private knowledge is not verified by third parties and is idiosyncratic across exchange partners, it lacks objective benchmarks. Consequently, actors typically share private knowledge with others they trust to accept it at face value and guard it from misuse.

Organizing our analysis around types of learning, we employ the distinction between exploitative and explorative learning. March (1991, p. 85) defined exploitative learning as "the refinement and extension of existing competences, technologies, and paradigms [that produce] returns [that] are positive, proximate, and predictable," and explorative learning as the "experimentation with new alternatives [that produce] returns [that] are uncertain, distant, and often negative."

We aim to develop a framework that will explain how different types of ties map onto types of public and private knowledge transfer and types of exploitative and exploitative learning. Our context is the ties that exist between firms and banks, a nearly universal interfirm relationship in capital market economies. In this market, learning takes place in the credit eligibility process and in the writing of loan contracts (Calomiris and Ramirez 1996, Bradley et al. 1983). In the credit eligibility process, learning occurs when banks gather information on the borrower's creditworthiness and the borrower gathers information on the bank's financial management competencies. In contracts, learning occurs through the construction of agreements that add or replace cost-saving features (Macaulay 1963, Macneil 1980) through the exploitation or exploration of knowledge. For example, the *boilerplate contract*, the contractual standard that is common across many banks, can be enhanced or refined by assimilating knowledge into its structure without significantly modifying the basic elements of the contractual model. Conversely, exploration can occur when the basic elements are replaced by new elements that promise returns that are more uncertain or distant, emerging only after trials are carried out.

Before beginning our analysis it is worth noting our research design. Responding to the appeals of Pettigrew (1992) and Elsbach et al. (1999) for the use of novel methods to develop organization theory, we apply qualitative analysis techniques to establish a plausible basis for a theoretical framework that explains how knowledge transfer, learning, and social structure are related. Specifically, we rely on field methods, which furnish rich and plausible data for new theories about how different types of learning and knowledge transfer occur via different types of

ties (Petersen and Rajan 1994, 2002). Our original fieldwork is comprised of in-depth interviews with 26 "relationship managers" at 11 Chicago banks (Uzzi 1999). These high-level bank officers interface with client firms, make credit decisions, and disclose financial advice, thereby providing direct insight into how firms and banks learn through ties. In previous work, some of these similar data have been used to analyze the determinants of lending and efficient trade credit behavior and have been shown to comport well with large  $N$  statistical analyses (Uzzi 1999, Uzzi and Gillespie 2002). Thus, while the 26 cases can claim but moderate representativeness, they build on previous work in related areas and contribute a plausible basis for new theory.

### **The Problem of Knowledge Transfer in Markets**

While we know much about how organizations are designed to organize the collection and transfer of data within their boundaries, we know comparatively little about how information is organized and accessed in markets (Kogut 2000). Organization and financial theorists have speculated on how arm's-length ties, which are low in embeddedness, increase an actor's ability to access and transfer public information circulating in the market (Peterson and Rajan 1994, 2002; Uzzi 1999). Because arm's-length ties require little investment in time or mutual obligation, they enable actors to economically maintain many ties to other actors who may be scattered throughout a market. Consequently, when public information is scattered unevenly among actors in a market, arm's-length ties should provide an effective means for acquiring it. In addition, research has shown that even if public information is available through newspapers, job listings, or other freely available sources, people typically gather public information from their arm's-length ties. Specifically, they initiate searches through networks, which often have lower transaction costs than other means of search (Granovetter 1974, Geertz 1978). For example, Granovetter (1974) found that job seekers typically discover novel public information about employment through acquaintances rather than close ties: While the job seeker and the job seeker's close ties typically share comparable information, acquaintances tend to possess different

information. Uzzi (1999) showed that arm's-length ties between firms and banks promoted the flow of public information. Firms were better able to acquire knowledge about the range of standard loan terms of banks in a market through arm's-length ties than they were through sources in the public domain. Similarly, Hansen (1999) found that managers in a large consulting firm were best able to search for information available in the company's public records through weak ties.

In contrast, embedded ties have been argued to promote private knowledge transfer because expectations of trust and reciprocity provide assurances that the transfer will be used to the mutual benefit of both parties (Uzzi 1999). For example, Ingram and Roberts (2000) showed that hotel managers with close ties to one another transferred unpublicized client preference data that enabled them to learn how to better model the price of their rooms, giving them an advantage over hotel managers not linked to the network by embedded ties.

Both embedded ties and arm's-length ties entail learning costs. While arm's-length ties promote wide access to public information, this information can be of only limited novelty because it is not specific to an exchange partner and is not restricted to certain actors in the market. In contrast, when time and other resources are limited, the capital dedicated to creating an embedded tie constrains an actor's ability to invest in other ties, thereby restricting the actor's ability to access knowledge not possessed by the dyadic tie. This constraint poses a potentially serious obstacle to learning in markets, where it is infeasible for any single actor to know the full scope of information circulating in the market (Eccles and Crane 1988). The complementary advantages and disadvantages of embedded and arm's-length ties lead us to two conclusions. First, arm's-length ties can act as conduits for gathering and transferring public information from a wide range of actors. Second, though embedded ties draw from a limited pool of knowledge, they are well suited for the transfer of novel and private information.

These arguments suggest that types of exchange ties influence knowledge transfer and learning in markets, particularly in markets where knowledge is

distributed widely and unevenly among actors, or where no central authority such as a firm is in place to organize the collection and distribution of knowledge (Udell 1999, Kogut 2000, Keister 2002). Nevertheless, these arguments are nascent. Below, we report results from a field study designed to elaborate on the mechanisms by which relationships affect interfirm knowledge transfer and learning.

### Field Methods

Our field research consisted of interviews and ethnographic observations at 11 Chicago-area banks. A large, diverse, and competitive market, the Chicago banking sector is an ideal setting for the study of interfirm networks and market learning. In this market, there are two primary actors: banks that lend capital and firms that seek capital. The efficiency of the market and decisions made by banks and firms depend upon the processes of knowledge transfer and learning. Within the market, a bank's strategic objective is to learn about a firm's credit eligibility and opportunities for growth by gaining access to the firm's public and private information. At the same time, the firm attempts to learn about the bank's capabilities and commitment level. As in many complex markets, while trading partners have incentives to share information, the uncertainty surrounding most lending deals inhibits information transfer and learning. Research conducted by *The Economist* (November 13, 1993, p. 84) illustrates the effects of this dilemma:

[B]anks remain unable to charge prices that reflect the high risks of lending to small companies . . . So banks are looking for other ways to boost returns from borrowers that succeed. Some, such as Midland, would like to take small equity stakes. Others talk of introducing a clause into loan agreements that would give the bank a one-off fee if a borrower wanted to refinance its debt. Customers are understandably unkeen.

Banking markets are made up of three sectors that vary in size, organizational characteristics, and learning and knowledge transfer dynamics (Berger et al. 2001, Mizruchi and Stearns 2001): new corporate, midmarket, and entry level. We focus on the midmarket and entry level segments, often dubbed the "midcap market." These sectors have similar knowledge transfer and learning dynamics and account

for slightly more than 50% of the GDP. Firms in these sectors are typically composed of privately-held medium- (\$10 to \$500 million in annual sales) and small-size firms (less than \$10 million in annual sales). Banks catering to this market are regional or community based. Due to the privately held nature of most of the firms in the midcap market, information transfer and learning between banks and firms is unregulated. Firms are rarely debt rated and often have unreliable or no certified financial statements. Therefore, a bank in this market faces a high level of uncertainty regarding a firm's debt eligibility and a strong need to access private information about the firm. Firms are also in an uncertain position relative to banks. Because midcap firms lack treasury departments and are rarely large enough to have deep financial expertise (e.g., few firms have CFOs), they must rely on banks for reliable financial advice. This dependence is exacerbated by the fact that midcap firms lack the retained earnings that large firms can use to avoid borrowing at unfavorable rates. In this market, Petersen and Rajan (1995) found that banks varied widely in how they priced their loans and shared information with firms, suggesting that financial market knowledge and learning dynamics are both critical and variable in performance in the midmarket sector.<sup>1</sup>

For our study, we selected a field sample of 11 banks in the midmarket segment. Each bank was a board member of the Banking Resource Center, a research institute dedicated to the study of banking. We contacted the CEO of each bank, apprised them of the nature of the research, and requested interviews with several personnel who interface and exchange

<sup>1</sup> The sector with the largest banks and firms (sales > \$500 million) is referred to as the "new corporate level" and accounts for little less than half of the GDP. This sector is made up of large, publicly traded, multiproduct firms and national and large regional banks. The extensive legal regulations of large publicly traded firms greatly facilitates a bank's ability to access a large and diverse amount of public information on firms through certified financial statements, analysts' reports, SEC filings, debt raters, etc., which greatly reduces the bank's uncertainty in evaluating a firm's credit eligibility (Mizruchi and Stearns 2001). Similarly, large firms use their sizable finance departments to assess the loan pricing and deal structure offered to them by banks, as well as the ability to borrow directly from debt markets to gain bargaining power vis-à-vis banks (Mizruchi and Stearns 2001).

strategic information with bank customers and make lending decisions regarding these customers. Every CEO we contacted agreed to our request. Shortly thereafter, we set up in-depth interviews with 24 "relationship managers" at the 11 banks. As high-level bank officers who work directly with clients, relationship managers are responsible for gathering information from clients about their firm's performance, transferring financial information and presenting fiscal recommendations to clients, and making efficient credit-eligibility decisions. As such, these managers play a critical role in all of the knowledge exchanges and learning between clients and the bank. We also interviewed two bad-debt collectors and three CEOs (who were also relationship managers) who were actively involved in client and business development, for a total of 26 interviews. We interviewed bad-debt collectors and CEOs for the purposes of triangulating the views of dedicated relationship managers. Bad-debt collectors focus their attention on unambiguous failure cases: clients who have defaulted on their bank commitments or misrepresented their financial standing to the bank. The CEOs offered an overall view of the bank and its market opportunities.

Interview time ranged from 30 to 120 minutes; the average interview lasted 60 minutes (standard deviation of 15) and the total interview time was 26 hours. The mean industry tenure of interviewees was 13 years (standard deviation of 9.8) with a range of 2 to over 40 years of experience. The number of firms managed by each interviewee ranged from 9 to 50; the average was 25.30 firms (standard deviation of 15.2). Our sample was predominately white and male, a demographic profile that reflects the composition of the larger banking market. Table 1 provides an overview of the organizational and interviewee characteristics of our sample.

We used Miles and Huberman's (1994) data collection and analysis methods. Data collection consisted of taped interviews and participant observation. The first author conducted the interviews, which were taped and transcribed to create a case record for each interviewee.<sup>2</sup> Because there was no research base on

which to formulate close-ended items, we used open-ended interview questions (and observation) to discover pertinent relationships. Questions focused on how social and network relationships affect information exchange and learning in lending decisions. To probe deeper into sensitive issues while avoiding directiveness, the interviewer followed up on responses with phrases such as: I am interested in those kinds of details. Can you tell me more about that? Is there anything else? Would you consider this typical or atypical?

Data analysis proceeded as follows. First, we organized the responses into categories or variables relevant to the study of knowledge and learning by embedded and arm's-length ties. We used theory and pilot interviews to categorize embedded and arm's-length ties in this setting (Uzzi 1997, 1999; Montgomery 1998; Ingram and Roberts 2000). Consistent with prior research, interviewees referred to embedded ties as relationships in which they had a social closeness to, and familiarity with, the client. Arm's-length ties were categorized as relationships that lacked social closeness to, and familiarity with, the client. To organize our data into categories of learning and knowledge transfer, we decomposed each interviewee's entire response record into categories reflecting specific knowledge and learning variables, such as the volume and motives for knowledge transfer, types of information transfer,

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credit eligibility of the borrower? How does the bank assess the creditworthiness of a corporate borrower? What do you discuss with a client in order to assess their creditworthiness? What kind of public information do you review on clients and why? How do you use public information on firms in your business? What are the norms of information disclosure? What kind of information do you share with clients? What kind of information would you share with cold-callers? and What kind of information would you share with long-term ties? Typical question on relationships and learning were: How do relationships promote the transfer of information? What kinds of things increase your access to the firm's private information? What is the basis of a good relationship with a client? How do relationships between you and the client develop? What do you typically do and discuss when you meet clients for the first time? What do you typically do and discuss when you have a relationship? How do you learn to make better banking decisions? and What information is pertinent to learning about a firm's credit eligibility?

<sup>2</sup>Typical questions on relationships and information transfer included: What information permits the bank to learn about the

**Table 1** Field Sample

Relationship manager (RM) characteristics						Bank characteristics			
Length of interview (minutes)	Industry experience (years)	# of firms in portfolio	Demographics		Position	Bank name	Deposits (millions)	Assets (millions)	Market niche
<b>60</b>	<b>17</b>	<b>21</b>	<b>White</b>	<b>Male</b>	<b>VP</b>	<b>First Bank of Evansation</b>	<b>104</b>	<b>94</b>	<b>Small midmarket</b>
<b>30</b>	<b>2</b>	<b>9</b>	<b>White</b>	<b>Female</b>	<b>Officer</b>				
120	40+	50	White	Male	CEO	1st National Bank of La Grange	125	445	Small midmarket
120	8	17	White	Male	VP	<b>1st Midwest Bank</b>	<b>178</b>	<b>15</b>	<b>Small midmarket</b>
120	3	6	White	Male	VP				
<b>60</b>	<b>35</b>	<b>N/A</b>	<b>White</b>	<b>Male</b>	<b>CEO</b>	Bank One—Chicago	1,156	101,848	Midmarket
<b>45</b>	<b>4</b>	<b>17</b>	<b>White</b>	<b>Male</b>	<b>Officer</b>				
45	15	50	White	Male	VP	Cole Taylor	1,327	1,813	Midmarket
50	3	12	Black	Male	Officer				
30	6	26	White	Female	Officer				
<b>45</b>	<b>20</b>	<b>54</b>	<b>White</b>	<b>Male</b>	<b>CEO</b>	BankAmerica	3,887	225v801	Midmarket
<b>50</b>	<b>5</b>	<b>13</b>	<b>White</b>	<b>Male</b>	<b>VP</b>				
60	19	Bad debt	White	Female	Bad debt	<b>American National</b>	<b>4,357</b>	<b>101,223</b>	<b>Midmarket</b>
45	7	15	White	Male	VP				
30	9	35	White	Male	VP				
75	19	50	White	Male	VP				
<b>50</b>	<b>9</b>	<b>25</b>	<b>White</b>						
120	25	27	White	Male	VP	Northern Trust	6,301	910	Midmarket
60	7	Bad debt	White	Male	VP	<b>Harris Bank</b>	<b>8,653</b>	<b>990</b>	<b>Large midmarket</b>
30	5	8	White	Male	VP				
70	15	19	White	Male	VP				
<b>60</b>	<b>7</b>	<b>21</b>	<b>White</b>	<b>Male</b>	<b>VP</b>				
<b>55</b>	<b>9</b>	<b>18</b>	<b>White</b>	<b>Female</b>	<b>VP</b>				
<b>45</b>	<b>12</b>	<b>14</b>	<b>White</b>	<b>Male</b>	<b>VP</b>	LaSalle National	9,761	65,600	Large midmarket
50	12	25	White	Male	VP				
<b>35</b>	<b>25</b>	<b>50</b>	<b>White</b>	<b>Male</b>	<b>VP</b>	<b>1st National Bank of Chicago</b>	<b>17,961</b>	<b>24,739</b>	<b>Large midmarket</b>

and forms of explorative and exploitative learning. At times, long and discursive responses addressed both the specific question asked as well as other questions relevant to the general discussion of ties, knowledge, and learning; we separated these passages into separate stanzas that reflected common categories (e.g., exploitative learning, public information sharing, etc.). Passages that reflected the nonfluency typical of spoken English were edited for the sake of comprehension. In addition, we coded the source or

form of learning by looking for certain key concepts that arose during the interviews. For example, if a banker observed that a type of tie promoted *learning from other's private experiences* or *searching for privately held knowledge*, her response was coded as promoting the transfer of private knowledge.

We used the methodology above to construct Table 2, which is a cross-site display of the observed number of times an interviewee discussed the relationship between the type of tie and information

**Table 2** Cross Site Display Table Relating Type of Tie to Type of Knowledge Transfer and Learning

Form of knowledge transfer and learning	Embedded ties	Arm's-length ties	Illustrative cases of knowledge transfer and learning
	Number of relationship manager responses	Number of relationship manager responses	
<i>Private knowledge transfer</i>			
Learning from others' private experiences	16	-3	Discovery of lending problems
Searching for new privately held knowledge	15	-6	Probing for nonstandard performance data
Utilizing other's privately held knowledge	13	1	Trouble shooting, customization
<i>Public knowledge transfer</i>			
Learning from others' public experiences	2	10	Acquiring financial records
Searching for new publicly held knowledge	1	9	Finding competitive quotes
Utilizing other's publicly available knowledge		11	Using financial records and price quotes for bargaining
<i>Exploratory learning</i>			
Generating novel knowledge	5	6	New loan structures, new firm capabilities
Prompting innovative/risky behavioral change	12	-4	Contingent contracts, no securitization
Exploration	13, -1		Cross-selling products; advising; custom loans
<i>Exploitative learning</i>			
Exploitation	3	15	Aggressive lending, shopping the market
Performance increases	7	7	Lower interest rates on loans
Myopia	3	2, -2	Focus on one bank's capabilities Focus on just financial records

transfer or learning. Specifically, Table 2 presents a frequency count of the number of interviewees who mentioned a relationship between a type of tie and our four "outcome variables": (a) private knowledge transfer, (b) public knowledge transfer, (c) exploration, and (d) exploitation. In these cases, the relationship between a type of tie and knowledge transfer and learning reflects the interviewee's expert knowledge of how that type of tie affects knowledge transfer and learning on average across all of his or her clients; it does not reflect how the type of tie affects knowledge transfer with a particular client in order to get a mean effect for tie type and our outcome variables.

For each outcome variable, we presented a finer-grained breakdown of the indicators of each concept.

Private knowledge transfer, for example, was divided into three related indicators taken from the literature: (a) learning from others' private experiences, (b) searching for new privately held knowledge, and (c) utilizing others' privately held knowledge. The first row in Table 2 shows that 16 interviewees cited a positive relationship between having an embedded relationship with a client and "learning from others' private experiences"; three relationship managers cited a negative relationship between having an arm's-length relationship with a client and "learning from others' private experiences."

To test the hypothesis that the relationship between types of ties and the different knowledge transfer and learning processes were independent, we analyzed the cell frequencies of Table 2 using chi-square tests.

Zeroes represent no mention of any relationship between the type of tie and the source or form of learning. Also presented are the expected frequencies for each cell, which provides an indication of the deviation of the observed values in each cell.

## Findings

### Public and Private Knowledge and Capabilities for Learning

Interviewees revealed that information transfer and learning are closely related. A key finding was that relationship managers noted how public information about a firm provides objective and comparative standards for measuring and learning about the firm's creditworthiness; however, they also stated that the inferences drawn from public information are deficient without possession of private information on the firm. Because of this interdependence, they said the transfer of private and public information was critical to learning about a client firm's creditworthiness. For example, one relationship manager made the generic observation, "Take a company and based on different accounting treatments you have different-looking balance sheets. If all you did was look at the numbers, you would make different decisions on the same company!" Other relationships managers tied the relationship between private and public knowledge transfer directly to their learning routines. One interviewee observed:

You're trying to get some idea of the right price for the risk. You put in all this stuff [public financial information] into the computer model, then boom! You summarize the whole thing with literally one number. But you have to interpret that number. . . . For example, credits can have a 9/9 rating system, but most of the credits in middle market are in the gray areas of fours, fives, sixes, sevens, and eights. As the thing goes from a four to a seven it's higher credit costs, but cost is not a linear function. So, all [the public information] goes into some measurement model but how we get at gray differences is through information learned through relationships.

Building on the general observation that public and private knowledge transfer play complementary roles in the learning process, other bankers described how the content of private information was critical

to increasing the bank's ability to learn from public information and vice versa. A lead relationship manager described this interplay:

It's something you wouldn't think . . . has to do with major business but . . . every social issue is played out in economic form. [CEOs] have children of unequal talents; the CEO is less talented than the children. Somebody doesn't want to give up stock. Somebody does . . . [You] can't see that on a balance sheet or P&L [profit and loss statement] . . . I'll ask questions about financial statements or projections but an answer is not enough . . . You couldn't just say, "Oh, the truth is in the financial statements." . . . So, we need this interactive process . . . which is this digging in [for private information] and recreating of something . . . that's a relationship . . . a market being made.

Thus, the field research revealed that distinctive forms of knowledge are transferred in markets and that these forms complement each other in the organizational learning process. This finding is significant in light of previous work that has focused on the differences between codified and tacit information (Winter 1987, Hansen 1999). Our work suggests that while the tacit/codified distinction is fundamentally important, it does not account for the full range of differences in knowledge transfer and learning in markets. Conceptual differences between public/private information and codified/tacit information are evident in the fact that public as well as private information can contain information that is both codified and tacit. For example, while public information can be codified, as in the case of a profit-and-loss statement or an analyst's report, it can also be tacit, as in the case of competitors attempting to learn from each other through the observation of organizational practices, customer services, or competitive reactions (see Menon and Pfeffer 2003). Similarly, while private information can be codified (the release date of a new product, contractual relations among board or family members, etc.), it can also be tacit (observing how the management team interacts, drawing inferences about the critical dependencies or trustworthiness of a trading partner, etc.).

Moreover, unlike tacit and codified knowledge, public and private information are complementary in the learning process. Our results show that while each type of information provides distinctive learning benefits, the combination of both types of information



**Table 3** Analysis of Type of Tie with Transfer of Private Knowledge

	Embedded ties	Arm's-length ties	Total
Transfer private knowledge	44 (36.7)	1 (8.3)	45
Don't transfer private knowledge	0 (7.3)	9 (1.7)	9
Total	44	10	54

*Note.*  $\chi^2 = 47.52, p < 0.001$ . Expected frequencies in parentheses.

enhances the overall learning process by accessing forms of information that complement one another, rather than acting independently of one another. Consequently, while codified and tacit information are critical to understanding the characteristics of information, they fail to capture the entire range of vital sources of information; nor do they explain how these different sources of information can function in the learning process.

#### Types of Ties and Knowledge Transfer

If market learning requires interplay between public and private information, how do firms transfer these forms of knowledge? Table 3 indicates that respondents observed that embedded ties were frequently the source of private knowledge transfer. In contrast, a positive relationship between an arm's-length ties and private knowledge transfer was observed rarely, while a negative relationship was observed nine times. This finding suggests the presence of a strong positive relationship between embedded ties and private knowledge transfer and a strong negative relationship between arm's-length ties and private knowledge transfer (chi-square  $p < 0.001$ ).<sup>3</sup> Furthermore, in each cell, the observed frequencies are clearly

<sup>3</sup> Strauss and Corbin (1990) argue that the quantitative presentation of qualitative fieldwork should be at the level of the underlying construct. Consequently, we summed the indicators related to the same construct when performing the cross-tabs presented in Tables 3 through 6. Although this is an accepted method of qualitative research given the ethnographic method's objectives and limits, a concern is that the cells might count the same respondent twice—e.g., once for one indicator and once for another indicator of the same underlying construct. To control for this bias we did two things, both of which confirmed the reported results. First, we ran separate cross-tabs on the individual indicators. These results confirmed those reported above. Second, we divided all of the summed counts by three to create a conservative adjustment for double counting. This produced the same pattern of results, except for exploratory learning, which was significant at  $p < 0.07$ . Thus,

**Table 4** Analysis of Type of Tie with Transfer of Public Knowledge

	Embedded ties	Arm's-length ties	Total
Transfer public knowledge	3	30	33
Don't transfer public knowledge	0	0	0
Total	3	30	33

*Note.* Chi-square could not be calculated because of the lack of cell frequencies for "don't transfer public knowledge."

quite different from the expected frequencies. Specifically, embedded ties are more frequently associated with the transfer of private knowledge than would be expected by the marginals, and arm's-length ties are much more frequently associated with inhibiting the transfer of private knowledge. This indicates that embedded ties strongly promote the transfer of private knowledge, while arm's-length ties strongly inhibit the transfer of private knowledge.

Further evidence for the association between the type of tie and knowledge transfer was observed in the public knowledge transfer process, as shown in Table 4.<sup>4</sup> We found that arm's-length ties promoted public information flow to a greater degree than did embedded ties. Arm's-length ties were cited 30 times across our interviews as mechanisms for public knowledge transfer, whereas embedded ties were mentioned only three times, or one-tenth as often. Furthermore, neither type of tie was negatively related to the transfer of public knowledge. This is to be expected, since information that is widely available should not be inhibited by the nature of the relationship. Instead, we find that arm's-length ties are much more frequently associated with the transfer of public knowledge than are embedded ties. These findings suggest that embedded ties reliably and frequently promote the flow of private information, whereas arm's-length ties frequently promote the transfer of

the method of summing common indicators of an underlying construct furnished the most informative and methodologically valid presentation of the data.

<sup>4</sup> The chi-square statistic was not calculated for the transfer of public knowledge, since no respondents mentioned that there was a negative relationship between the type of tie and the transfer of public knowledge. The chi-square cannot be calculated for a  $1 \times 2$  table as we have for the relationship between type of tie and the transfer of public knowledge.

public information, which also flows sporadically via embedded ties.

How and why do types of ties transfer knowledge differently? The mechanism by which this occurs was revealed by the interview data. Consistent with the embeddedness framework, we found that the embedding of commercial exchanges in social attachments created cooperative expectations of trust and ongoing reciprocal exchanges. These expectations enabled banks and borrowers to transfer private information with the conviction that it was being shared to their mutual benefit. "A relationship on a social basis," explained one relationship manager of embedded ties, "tends to break a lot of ice and develop a multi-dimensional relationship that's more than cold fact, interest rates, and products. It's an emotion-based bond...that's so important...because the customer will let us know problems early, so we can correct them." Forming expectations of trust and reciprocity enabled exchange partners to actively acquire and transfer private information that would otherwise be withheld. A relationship manager observed, "The more comfortable the client is with me, the more willing he is to share with me whether his long-range goal is in jeopardy, he's getting divorced in the next year, he wants to bring his kids into the business or buy out his partner, he really wants to grow the thing or is he comfortable with the status quo. For midsize companies the future of the company is tied up in the owner, and you've really got to get into his head..."

By the same mechanisms, embedded ties prompted relationship managers to reciprocally share private information with a firm. One banker noted, "[Borrowers] start gaining a trust in their lending officer... On the other side of [the relationship], I tend to gain an understanding of the customer, how they approach things, how they like to be approached. [So] relationships get them to know you and what you're capable of doing, how you work with them, and how responsive you are. And they find that, that it's a learning curve."

In contrast, interviewees remarked that arm's-length ties furnished access to public information but were weak conduits of private information because they lacked trust, a finding first observed by Hansen

(1999) and Uzzi (1999).<sup>5</sup> In the following quote, an interviewee describes the typical social distance that characterizes arm's-length ties as well as the ability of arm's-length ties to promote the transfer of only publicly available knowledge: "I have a customer [with whom]... It's just not a very close relationship, it's very transactionally oriented... They are giving us the information and talking to us when they need us. Otherwise, they keep us in the dark."

In addition to identifying how types of ties create motives for sharing types of knowledge, we found that the type of tie can increase the specificity of the knowledge transferred. Exchange partners in embedded ties screened each other's needs to optimally match the knowledge transferred to the knowledge needed. This screening and matching process reduced the effort and costs the receiving firm incurred in adapting the acquired information to its particular requirements, ultimately laying groundwork for learning. For example, one relationship manager explained how screening and matching bank knowledge transferred to the firm helped to decrease the firm's costs of experimenting with new knowledge. "You happen to find out that a firm is having problems sourcing a certain raw material," he said, "and the banker happens to know someone that provides that material... They are in a real estate deal and they've got a problem [and] the banker happens to know someone that they can trust that can help out. On and on, that's a network. That's also a relationship." Another relationship manager observed

<sup>5</sup>The consistency between previous work and our findings adds credence to the results on the key association between type of tie and type of knowledge transfer benefits. It is also worth noting, however, how our findings and Hansen's findings differ but complement one another. First, Hansen conceptualizes ties and information differently. He measures ties by the frequency of interaction of units, not persons (i.e., weak ties have few interunit interactions, strong ties have many) (1999, p. 94). Second, knowledge is conceptualized as simple and complex (simple is codified and stand alone and complex is noncodified and integrated). In contrast, we look at public and private knowledge. Second, we directly measure knowledge transfer and learning whereas Hansen directly measures project completion time, rather than knowledge transfer. Thus, the studies complement one another in reinforcing similar ideas through empirical analysis and in providing empirical support to related but different concepts.

how the matching and screening benefits of embedded ties can also lessen the learning costs of identifying new business opportunities: “There are costs to the entrepreneur to gather [select] information. A relationship can set me apart if I deliver the information. That’s the concept of value-added provider.”

Thus, the relationship between type of tie and type of information transferred appears to be organized around the differences in embedded and arm’s-length ties. Arm’s-length ties prompt the transfer of comparative, objective, and unrestricted information, while embedded ties prompt the transfer of idiosyncratic, interpretative, and restricted information. The relational property that creates these differences appears to be the governance mechanism associated with a type of tie. The expectations of trust and reciprocity associated with embedded ties lower the risk that exchange partners face in sharing valuable private information by ensuring that it is used to the parties’ mutual benefit. In contrast, the unrestricted nature of public information makes trust superfluous to the transfer process.

The way in which ties appear to influence the value of knowledge by screening and matching suggests that ties may offer some functional substitution for past experience in learning, a critical predictor of a firm’s ability to recognize and assimilate valuable information—what Cohen and Levinthal (1990) call absorptive capacity. Our findings suggest that learning can be affected not only by the firm’s capabilities but by the capabilities of the firm’s ties to transfer knowledge that is prescreened and matched to the receiving firm’s needs. We found that embedded ties increase the matching and screening of knowledge that is well suited for the receiving company. Thus, while there are limits on a firm’s ability to capture the value of transferred knowledge (Miner et al. 2001), embedded ties can increase the value of this knowledge by attending to critical information. This finding is consistent with that of Ocasio (1997), who showed that in the absence of past experience firms learn by attending to appropriate knowledge.

**Types of Ties and Learning**

Tables 5 and 6 suggest that a regular pattern exists between type of tie and learning, one more complex

**Table 5 Analysis of Type of Tie with Learning by Exploration**

	Embedded ties	Arm’s-length ties	Total
Explore	30 (27.2)	6 (8.8)	36
Don’t explore	1 (3.8)	4 (1.2)	5
Total	31	10	41

Note.  $\chi^2 = 9.549, p < 0.01$ . Expected frequencies in parentheses.

than the relationship between type of tie and type of knowledge transfer. The relationship between type of tie and exploratory learning was significant, with a chi-square of  $p < 0.01$ , suggesting that there is a strong general propensity for embedded ties to be associated with explorative learning and for arm’s-length ties to be associated with exploitative learning. A positive association between embedded ties and exploratory learning was observed 30 times; there was just one negative association. Conversely, arm’s-length ties inhibited exploratory learning, although the pattern was less restrictive. A negative relationship between arm’s-length ties and exploratory learning was cited four times, while a positive relationship between arm’s-length ties and exploration was mentioned six times, or one-fifth as often as embedded ties. In addition, embedded ties were more frequently associated with exploration than would be expected by chance, and arm’s-length ties were more frequently associated with a lack of exploration than would be expected by chance. These findings suggest that explorative learning is more likely through embedded ties than arm’s-length ties and that arm’s-length ties may also inhibit explorative learning.

In the case of exploitative learning, 24 positive associations were made between arm’s-length ties and exploitative learning. A positive association between embedded ties and exploitative learning was observed only about half as frequently. However, our Chi-square test was not significant, which does not

**Table 6 Analysis of Type of Tie with Learning by Exploitation**

	Embedded ties	Arm’s-length ties	Total
Exploit	13 (12.3)	24 (24.7)	37
Don’t exploit	0	2 (1.3)	2
Total	13	26	39

Note.  $\chi^2 = 1.054, p = 0.305$ . Expected frequencies in parentheses.

allow us to reject the null hypothesis that the type of tie and exploitative learning are independent. Furthermore, the expected and observed frequencies are very similar in all cells. Thus, consistent with our earlier discussion, both embedded and arm's-length ties can promote exploitation, while embedded ties also uniquely promote exploration. This indicates that learning is more complexly related to type of tie than is knowledge transfer, probably because learning is a more elaborate process than knowledge transfer and may in fact include knowledge transfer as an input into the learning process (Argote 1999).

By what mechanisms do types of ties influence different types of learning? A closer examination of the field data suggests that variation in tie type and type of learning arises when a mixture of arm's-length and embedded ties are used in the learning process. In contrast, when one type of tie is used, consistent agreement occurs between tie type and type of learning.

We consider first how exploitative learning and explorative learning are independently influenced by tie type. We found that exploitative learning is the least complex form of learning and typically involves the use of arm's-length ties. In loan contracts, arm's-length ties provide wide and varied access to public information on prices, loan covenants, debt structures, organizational financial practices, tax arrangements, and other financial instruments that can be assimilated into standard contractual arrangements or organizational practices with foreseeable results. In this way, arm's-length ties promote learning through exploitation, providing knowledge that enables organizations to enhance their current competencies and systems rather than restructure them. Numerous interviewees noted that their broad contact with many different firms, many of which possessed different financial structures and financial instruments, enabled them to frequently acquire public information about the market and exploit it in transactions with clients. Notably, this learning occurred without the need for significant change in current practices. A banker described how this learning process occurs. She explains how her arm's-length attachments provide access to public information that can in turn be quickly assimilated into their current practices with client firms with immediate results.

[W]e have to see a lot different companies, so we see a good idea that's done over here and then bring that to this company. I use the word, "you-should-know" idea—you should know that another company's tried this and that as a successful salesperson I set myself apart from other lenders when I come across with those kinds of ideas. . . . You need to be out in front. . . talking to them about their business and having your ears open, being a good listener, so that when they say this is the problem or they are just being natural and curious and say, "Well, how do you do this?" you can identify those opportunities that improve their business.

Exploratory learning is more complex than exploitative learning and appears to follow from two processes. On the one hand, we found that embedded ties alone can promote exploratory learning through the flow of novel, private information and through governance mechanisms that reduce the risk associated with exploratory learning. On the other hand, we found that exploratory learning can result from a mixed use of embedded and arm's-length ties.

When exploratory learning resulted from embedded ties alone, these ties helped to transfer private knowledge on capabilities and created expectations of trust and reciprocity that reduced the risks of experimenting with fundamental changes in loan contracts. For example, a general form of exploratory learning relates to loan-contract structuring. Loan contracts are meant to reflect the bank's cumulative learning about the client's creditworthiness. Typical contracts have the same basic structure: Covenants are stipulated at the loan's outset and remain stable over the debt's life. Bankers remarked that exploratory learning in loan contracts occurred when this basic structure was altered, for example, by varying the structure of the contract over time, contingent on the borrower's behavior. Although such contracts are desirable to the borrower because they offer the potential of reduced borrowing costs, they require banks to experiment with outcomes that depend on the unpredictable future behavior of the firm.

Thus, exploratory learning takes two forms in contingent contracts. First, the standard loan structure is replaced with a new structure that differs fundamentally from the standard structure; second, the structure is updated in real time with knowledge

transferred over the life of the debt. In the following quote, a banker explains how an embedded tie between him and a firm's CEO promoted the transfer of private information and provided the trust needed to lower the cost of experimenting with a new loan structure. He explained it this way:

[B]ecause we knew this guy [I said]... "Tell you what we'll do: We'll give you a price of X today. We'll base our pricing as if those expenses were not in your financial statements... But after twelve months... if it's all flushed through you will continue on in this price level. If you don't, boom, your pricing will go up." So, because of the relationship, because we knew the guy and we really believed in him and trusted him, we gave him the benefit of the doubt on the pricing for the first year. He has to continue to perform or it goes up. So, that's a way we would sort of marry the two, the objective and the subjective, if you will.

The banker also noted how learning by exploration extended beyond learning by exploitation. Specifically, the structure of the loan contract did not just assimilate information into the bank's current model, but presented an alternative to it. He continued: "And those are the types of things [experimenting with new covenants] that really make a difference when you're talking to that owner [using private information]. It means you're not just plugging it into some model and saying the model says or the financial statements say..."

The second form of exploratory learning we observed combined features of both exploratory and exploitative learning, as well as the use of both embedded and arm's-length ties. This suggests that the line between exploration and exploitation can be blurred when both arm's-length and embedded ties are operating simultaneously, a finding consistent with Baker's (1990) and Uzzi's (1997) arguments that network behavior is conditioned on the portfolio of ties in a firm's network, not just on specific ties.

The process we observed had two stages. First, arm's-length ties were used to access and bundle independent pieces of public information into an original innovation. Second, embedded ties were used to transfer the new innovation to an exchange partner who was motivated to risk experimenting with the new innovation. Thus, exploratory learning was a product of both types of ties and both types of

learning. Arm's-length ties accessed separate pieces of public information that could be bundled into a new financial routine; motivation to engage in exploratory learning depended on an embedded tie to reduce the risk of experimenting with an untried innovation. One relationship manager recounted a recent deal in which his bank was one of the arm's-length ties in a firm's network. The manager described how the firm's CEO used arm's-length ties to access and exploit public market information, bundled the separate pieces of knowledge into an original configuration, and then transferred that information through an embedded tie to his close lender, which in turn experimented with ways to customize a loan structure for the firm. He summarized the deal this way:

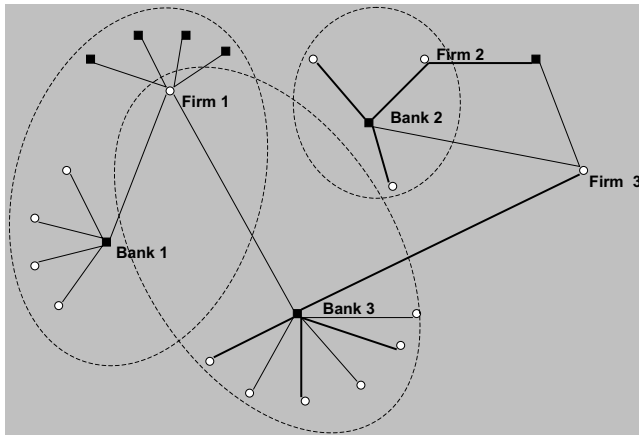
Three banks were pitching on the same deal and the company said "give us a creative idea on how you would structure this." [W]e provided a very creative idea with term loans and revolving credit [factors affecting price and structure]. They said, "We really like this structure but X has been our bank for 50 years and we don't want to pull the agency from them." When the term sheet came back from X bank, X bank had basically our term sheet with their name on it. The CEO laughed and said to me, "Look, your bank came up with the idea. So, we'd like to give you the first shot at our trust business or the private banking of the owners' [business worth less than the original deal]." So, we gave the banking insight on the marketplace to the firm [but the firm made the deal with its close bank].

Thus, learning, like knowledge transfer, is a function of the type of relationship that links actors. However, the relationship between type of tie and learning is more complex. On the one hand, in our findings, tie type predicts type of knowledge transfer, which predicts type of learning. On the other hand, we find that tie types can combine to create forms of learning that build on one another, such that exploitative learning becomes an input to exploratory learning rather than a separate type of learning. This suggests that the distinction between types of learning can blur when the capabilities of ties are combined within a single firm's network, expanding its ability to learn.

### **Generalizations**

Figure 1 summarizes three propositions that follow logically from our findings. The figure repre-

Figure 1 Hypothetical Networks Relationships and Learning



sents a hypothetical network of three banks (boxes) and eleven firms (circles). All actors possess both public and private knowledge. In markets such as banking, knowledge about competences and capabilities is likely to be dispersed widely and unevenly among firms. Ties among firms can be embedded or arm's length, where the darker lines represent embedded ties.

Our first proposition is suggested by the network surrounding Bank One (Bank One and its direct connections) and Firm One. We argue that this type of network displays a high capacity for exploitation and a low capacity for exploration; Bank One's many arm's-length ties enable it to search widely for public information in the market and, predictably, to assimilate select aspects of public information into current practices. We hypothesize that organizations with networks composed of predominately arm's-length ties learn primarily through exploitation. These firms should display frequent incremental improvements in their routines but few radical improvements. We also hypothesize that arm's-length networks will predominate in industries with stable and mature knowledge bases rather than in industries with rapidly emerging or contentious knowledge bases, because adaptation depends on refining or extending competences and paradigms for incremental, predictable returns.

Our second proposition is suggested by the network surrounding Bank Two and Firm Two. We argue that this network configuration has a high capacity for

exploratory learning and a low capacity for exploitative learning, due to the finding that embedded ties prompt private information transfer, which in turn provides both the raw material for original practices and a governance structure to reduce the risks of experimenting with new practices. We hypothesize that organizations with networks composed predominately of embedded ties learn primarily through exploration. These firms should display infrequent but risky improvements in their routines rather than consistent incremental improvements. We also hypothesize that these types of networks will predominate in industries with emerging or contentious knowledge bases rather than in industries with stable and mature knowledge bases because adaptation requires experimentation with uncertain alternatives.

Our third proposition is illustrated by the network surrounding Bank Three and Firm Three. We argue that these networks have a high capacity for both exploitative and explorative learning. In this system, arm's-length ties provide capacity for exploitation and embedded ties provide capacity for exploration. We hypothesize that organizations with networks composed of a mixture of arm's-length and embedded ties learn through both exploitation and exploration. These firms should display both frequent incremental improvements as well as infrequent but risky advances in their routines. We also hypothesize that these networks will predominate in industries where there is a mixture of both emerging knowledge and a base of stable and mature knowledge because adaptation requires both the extension of current knowledge and experimentation with new alternatives.

Although tests of these propositions are beyond the scope of this paper, several studies offer supportive circumstantial evidence. Uzzi (1999) found that firms seeking capital in the late 1990s, when the stable knowledge base of the banking market began to change, were more likely to receive needed loans and lower interest rates on loans (presumably because the deals involved innovative loan structures) when they possessed a mixture of embedded and arm's-length ties, a finding consistent with the third hypothesis. In a study of the effect of information access on the price acquirers pay for target firms, Haunschild and Beckman (1998) showed that firms

with many interlocking connections to firms that had previously acquired targets received wide access to public information on prices and pricing strategies that reduced the price they paid for their targets, a finding consistent with the second hypothesis. Similarly, Hargadon and Sutton (1997) found that design firms with many weak ties to other organizations were better at creating a new synthesis of existing knowledge by bundling separate pieces of information into a new innovation. Finally, consistent with the first hypothesis, Reagans and McEvily (2002) showed that managers with bridging ties embedded in social attachments are more effective in synthesizing diverse and novel information.

## Discussion

In this paper, we attempted to develop a framework that explains how types of social relationships influence types of knowledge transfer and types of learning. To organize our analysis, we drew on embeddedness theory, which has shown that informal interfirm exchange ties vary in the degree to which they are embedded in social attachments, ranging from a low level of embeddedness (arm's-length ties) to a high level of embeddedness (embedded ties). To classify types of knowledge, we developed the distinction between public and private knowledge (Uzzi 1999). As compared to the popular categorization of codified versus tacit knowledge, our distinction appears better suited for understanding knowledge transfer between firms because it deals with characteristics of information that reflect market problems of knowledge access, verification, and misappropriation—problems that are comparatively less of an issue in firms.

Our main findings show that different types of ties promote different forms of knowledge transfer and different forms of learning. We found that types of relationships differentially facilitate the flow of public versus private knowledge and create incentives to learn through exploitation or exploration. When arm's-length ties connect firms, they tend to transfer public knowledge and stimulate exploitative learning. In contrast, when firms are linked via embedded ties, they tend to transfer private knowledge and engage in exploratory learning. Moreover, we found

that learning has a complex relationship to ties and knowledge transfer; by using both arm's-length and embedded ties in their exchanges, actors can combine exploratory and exploitative learning and thereby expand their range of learning capabilities. In this way, learning is a social process, with new benefits and liabilities that are underappreciated in a framework that views learning solely from the perspective of cognition or past organizational experiences (cf. Argote 1999, Cohen and Levinthal 1990).

These results extend work on knowledge transfer and learning in several ways. First, we found that the public versus private distinction is more critical for understanding interfirm knowledge transfer than is the codified versus tacit distinction, at least in the financial market. In this market, the qualities of public and private information are fundamental to learning; both types of knowledge are necessary for valid inferences to occur. On its own, each type of knowledge provides only a partial basis for learning. Consequently, unlike codified and tacit information, public and private information perform complementary roles in the learning process. We also found that a correct matching of type of tie to type of knowledge transfer can increase not only the flow of information but the optimal matching of knowledge needs to knowledge accessed. This suggests that while absorptive capacity, which figures prominently in a firm's ability to learn, can be enhanced through ties that match and prescreen information to best meet the needs of the exchanging firms. There are liabilities attached to these forms of knowledge as well. We found that the costs of transferring public and private information varies with the type of relationship, suggesting that a mismatch between type of relationship and type of knowledge needed can lead to inefficiencies in the costs and rates of transfer. This suggests that future work should focus not only on the form of knowledge but also on the relational nature of knowledge: How relations between and among actors affect capabilities for transferring, matching, and screening knowledge used in learning.

Second, if learning is crucial to organizational adaptation and competitiveness, our results suggest that future research should focus on how firms strategically develop relationships to increase their learning capabilities. Currently, we know relatively little

about the types of protocols used to establish arm's-length and embedded ties, how these protocols potentially influence different levels of knowledge transfer and learning, how these relationships decay or adapt as the market or capabilities of exchange partners change, and how these informal ties interact with formal ties to potentially enhance or hinder the levels of knowledge transfer and learning.

Third, the finding that embeddedness provides one of possibly multiple explanations of how firms, through their networks, can gain the benefits of both exploration and exploitation simultaneously is potentially vital to the learning literature. Specifically, this finding suggests a resolution to the oft-noted tension between the strategies of exploration and exploitation. In the learning literature, the balance between exploration and exploitation is critical. While exploration provides firms with the adaptive capacity for change, it rarely offers the immediate returns needed to survive in the short run; the opposite is true of exploitation. Thus, network ties can theoretically increase a firm's ability to both prosper in the short run and adapt in the long run. While these conjectures go beyond our findings and await formal tests, they are consistent with current research (Rowley et al. 2000, Beckman and Haunschild 2002, Reagens and McEvily 2002).

Finally, like all methods, the qualitative methods used in this study supply unique insights while leaving some key questions open to further analysis. In particular, while the interview and observational data offer a rich basis for studying and developing hypotheses and provide a plausibility proof of key learning dynamics, they cannot subject the emerging framework to statistical tests. Another limitation was the decision to focus on relationship managers and not clients. Although we detected no indications of bias in this design during our research and achieved results that explain patterns unanswered in prior banking studies (Petersen and Rajan 1994, Uzzi 1999, Uzzi and Gillespie 2002, Keister 2002), it is possible that client firms might view learning from banks in ways that diverge from how relationship managers view a firm's capabilities for learning. Nevertheless, new work (Reagens and McEvily 2002) is beginning to address this problem directly.

In conclusion, we emphasize that the literature on learning has underappreciated the substantive effects that informal, self-organizing social structures have on learning, the distinction between public and private information, and how an understanding of learning as a social process—a process located in the relations among actors rather than in actors' cognitions or past experiences—can help solve learning dilemmas.

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