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Social Structure and Competition in Interfirm Networks: The Paradox of Embeddedness

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The purpose of this work is to develop a systematic understanding of embeddedness and organization networks. Drawing on ethnographic fieldwork conducted at 23 entrepreneurial firms, I identify the components of embedded relationships and explicate the devices by which embeddedness shapes organizational and economic outcomes. The findings suggest that embeddedness is a logic of exchange that promotes economies of time, integrative agreements, Pareto improvements in allocative efficiency, and complex adaptation. These positive effects rise up to a threshold, however, after which embeddedness can derail economic performance by making firms vulnerable to exogenous shocks or insulating them from information that exists beyond their network. A framework is proposed that explains how these properties vary with the quality of social ties, the structure of the organization network, and an organization's structural position in the network.[•]

Research on embeddedness is an exciting area in sociology and economics because it advances our understanding of how social structure affects economic life. Polanyi (1957) used the concept of embeddedness to describe the social structure of modern markets, while Schumpeter (1950) and Granovetter (1985) revealed its robust effect on economic action, particularly in the context of interfirm networks, stimulating research on industrial districts (Leung, 1993; Lazerson, 1995), marketing channels (Moorman, Zaltman, and Deshpande, 1992), immigrant enterprise (Portes and Sensenbrenner, 1993), entrepreneurship (Larson, 1992), lending relationships (Podolny, 1994; Sterns and Mizruchi, 1993; Abolafia, 1996), location decisions (Romo and Schwartz, 1995), acquisitions (Palmer et al., 1995), and organizational adaptation (Baum and Oliver, 1992; Uzzi, 1996).

The notion that economic action is embedded in social structure has revived debates about the positive and negative effects of social relations on economic behavior. While most organization theorists hold that social structure plays a significant role in economic behavior, many economic theorists maintain that social relations minimally affect economic transacting or create inefficiencies by shielding the transaction from the market (Peterson and Rajan, 1994). These conflicting views indicate a need for more research on how social structure facilitates or derails economic action. In this regard, Granovetter's (1985) embeddedness argument has emerged as a potential theory for joining economic and sociological approaches to organization theory. As presently developed, however, Granovetter's argument usefully explicates the differences between economic and sociological schemes of economic behavior but lacks its own concrete account of how social relations affect economic exchange. The fundamental statement that economic action is embedded in ongoing social ties that at times facilitate and at times derail exchange suffers from a theoretical indefiniteness. Thus, although embeddedness purports to explain some forms of economic action better than do pure economic accounts, its implications are indeterminate because of the imbalance between the relatively specific propositions of economic theories and the broad statements

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about how social ties shape economic and collective action.

This work aims to develop one of perhaps multiple specifications of embeddedness, a concept that has been used to refer broadly to the contingent nature of economic action with respect to cognition, social structure, institutions, and culture. Zukin and DiMaggio (1990) classified embeddedness into four forms: structural, cognitive, political, and cultural. The last three domains of embeddedness primarily reflect social constructionist perspectives on embeddedness, whereas structural embeddedness is principally concerned with how the quality and network architecture of material exchange relationships influence economic activity. In this paper, I limit my analysis to the concept of structural embeddedness.

THE PROBLEM OF EMBEDDEDNESS AND ECONOMIC ACTION

Powell's (1990) analysis of the sociological and economic literatures on exchange suggests that transactions can take place through loose collections of individuals who maintain impersonal and constantly shifting exchange ties, as in markets, or through stable networks of exchange partners who maintain close social relationships. The key distinction between these systems is the structure and quality of exchange ties, because these factors shape expectations and opportunities.

The neoclassical formulation is often taken as the baseline theory for the study of interfirm relationships because it embodies the core principles of most economic approaches (Wilson, 1989). In the ideal-type atomistic market, exchange partners are linked by arm's-length ties. Self-interest motivates action, and actors regularly switch to new buyers and sellers to take advantage of new entrants or avoid dependence. The exchange itself is limited to price data, which supposedly distill all the information needed to make efficient decisions, especially when there are many buyers and sellers or transactions are nonspecific. Personal relationships are cool and atomistic; if ongoing ties or implicit contracts exist between parties, it is believed to be more a matter of self-interested, profit-seeking behavior than willful commitment or altruistic attachment (Macneil, 1978). Accordingly, arm's-length ties facilitate performance because firms disperse their business among many competitors, widely sampling prices and avoiding small-numbers bargaining situations that can entrap them in inefficient relationships (Hirschman, 1970). Although some economists have recognized that the conclusion that markets are efficient becomes suspect when the idealization of theoretical cases is abandoned, they nonetheless have tended to regard the idealized model as giving a basically correct view and have paid scant attention to instances that diverge from the ideal (Krugman, 1986).

At the other end of the exchange continuum are embedded relationships, and here a well-defined theory of embeddedness and interfirm networks has yet to emerge. Instead, findings from numerous empirical studies suggest that embedded exchanges have several distinctive features. Research has shown that network relationships in the

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Japanese auto and Italian knitwear industries are characterized by trust and personal ties, rather than explicit contracts, and that these features make expectations more predictable and reduce monitoring costs (Dore, 1983; Asanuma, 1985; Smitka, 1991; Gerlach, 1992). Helper (1990) found that close supplier-manufacturer relationships in the auto industry are distinctive for their "thick" information exchange of tacit and proprietary know-how, while Larson (1992) and Lazerson (1995) found that successful entrepreneurial business networks are typified by coordination devices that promote knowledge transfer and learning. Romo and Schwartz's (1995) and Dore's (1983) findings concerning the embeddedness of firms in regional production networks suggest that embedded actors satisfice rather than maximize on price and shift their focus from the narrow economically rational goal of winning immediate gain and exploiting dependency to cultivating long-term, cooperative ties. The basic conjecture of this literature is that embeddedness creates economic opportunities that are difficult to replicate via markets, contracts, or vertical integration.

To a limited degree, revisionist economic frameworks have attempted to explain the above outcomes by redefining embeddedness in terms of transaction cost, agency, or game theory concepts. Like their neoclassical parent, however, these schemes do not explicitly recognize or model social structure but, rather, apply conventional economic constructs to organizational behavior, bypassing the issues central to organization theorists.¹ Transaction cost economics, for example, has usefully revised our understanding of when nonmarket transactions will arise, yet because its focus is on dyadic relations, network dynamics "are given short shrift" (Williamson, 1994: 85). Transaction cost economics also displays a bias toward describing opportunistic rather than cooperative relations in its assumption that, irrespective of the social relationship between a buyer and seller, if the transaction degenerates into a small-numbers bargaining situation, then the buyer or seller will opportunistically squeeze above-market rents or shirk, whichever is in his or her self-interest (Ghoshal and Moran, 1996).

Agency theory also focuses mainly on self-interested human nature, dyadic principal-agent ties, and the use of formal controls to explain exchange, rather than on an account of embeddedness. For example, Larson's (1992) study of interfirm exchange relationships revealed agency theory's limited ability to explain network forms of organization when she showed that there is a lack of control and monitoring devices between firms, that the roles of principal and agent blur and shift, and that incentives are jointly set. Similarly, team theory is pressed to explain interfirm exchange relations because of its assumption that group members have identical interests, an unrealistic assumption when formal rule structures (a hierarchy) do not exist or group members both cooperate and compete for resources, as in the case of manufacturer-supplier networks (Cyert and March, 1992).

Game theory can accommodate *N*-person, network-like structures, yet the core argument—that selfish players will

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My intent is not to critique revisionist economic approaches or contrast all their similarities and differences with network perspectives (see Burt, 1992; Zajac and Olsen, 1993; Ghoshal and Moran, 1996). Rather, I review the main points of existing critiques to show that the features of embeddedness cannot be adequately explained by these approaches.

defect from cooperation when the endgame ensues even if they have had on-going social ties and like each other well (Jackson and Wolinsky, 1996)—fits poorly with the empirical regularities of networks. Padgett and Ansell (1993: 1308) found in their network analysis of fifteenth-century Medici trading companies that “clear goals of self-interest . . . are not really features of people; they are . . . varying structures of games.” In cases in which game theory concedes outcomes to social structure, it tends to do so after the fact, to align predictions and empirical results, but continues to ignore sociological questions on the origin of expectations, why people interpret rules similarly, or why actors cooperate when it contradicts self-interest (Kreps, 1990).

Thus, while revisionist economic schemes advance our understanding of the economic details of transacting, they faintly recognize the influence of social structure on economic life. Similarly, theory about the properties and process by which embeddedness affects economic action remains nascent in the organizations literature. Below, I report results and formulate arguments that attempt to flesh out the concept of embeddedness and its implications for the competitive advantage of network organizations.

RESEARCH METHODOLOGY

I conducted field and ethnographic analysis at 23 women’s better-dress firms in the New York City apparel industry, a model competitive market with intense international competition, thousands of local shops, and low barriers to entry, start-up costs, and search costs. In this type of industrial setting economic theory makes strong predictions that social ties should play a minimal role in economic performance (Hirschman, 1970), and this is thus a conservative setting in which to examine conjectures about embeddedness. Field methods are advantageous here because they provided rich data for theorizing and conducting a detailed analysis of the dynamics of interfirm ties, even though the 23 cases examined here can have but moderate generalizability.

I interviewed the chief executive officers (CEOs) and selected staff of 23 apparel organizations with sales ranging from \$500,000 to \$1,000,000,000. An advantage of studying firms of this type is that the senior managers are involved in all key aspects of the business and consequently have firsthand knowledge of the firm’s strategy and administrative activities. I selected firms that varied in age, sales, employment, location, type, and the CEO’s gender and ethnicity to insure proper industry representation and to minimize the likelihood that interfirm cooperation could be attributed to ethnic homogeneity or size (Portes and Sensenbrenner, 1993). The sample was drawn from a register that listed all the firms operating in the better-dress sector of the New York apparel industry. Table 1 provides a descriptive summary of the sample. This register and other data on firm attributes came from the International Ladies’ Garment Workers’ Union (ILGWU, now called UNITE), which organizes 87 percent of the industry (Waldinger, 1989) and which helped me identify representative firms from their data base. Union records indicate that there were 89 unionized manufacturers and 484 unionized contractors in the better-dress

Table 1

Summary of Ethnographic Interviews and Organizational Characteristics of the Sample*

Type of firm	Firm's birth year	Size	Number of employees	HQ or factory location	CEO demographics	Number of interviews	Number of interview hours
Converter	1962	Medium	22	Midtown	Jewish female	1	2
Designer	1986	Small	3	Midtown	Jewish female	2	4
Designer	1980	Small	3	Midtown	Swedish male	2	6
Manufacturer	1951	Large	182	Midtown	Jewish male	1	2
Manufacturer	1950	Large	30	Midtown	Jewish male	1	2
Manufacturer	1986	Large	6	Midtown	Anglo male	1	3
Manufacturer	1974	Large	153	Brooklyn	Anglo male	2	2
Manufacturer	1985	Large	16	Midtown	Jewish male	3	15
Manufacturer (Pilot study)	1954	Large	7	Denver	Jewish male	1	2
Manufacturer	1941	Medium	51	Midtown	Arab male	1	2
Manufacturer	1939	Medium	75	Midtown	Jewish female	1	3
Manufacturer	1977	Medium	10	Midtown	Jewish female	7	35
Manufacturer (Pilot study)	1970	Small	2	Midtown	Jewish male	1	3
Manufacturer	1930	Small	7	Midtown	Jewish male	1	2
Manufacturer	1989	Small	3	Midtown	Jewish male	1	2
Manufacturer	1973	Small	4	Midtown	Anglo female	2	2
Contractor-Cutting	1962	Large	40	Midtown	Jewish male	1	2
Contractor-Sewing	1976	Large	72	Chinatown	Chinese female	1	4
Contractor-Sewing	1982	Large	150	Chinatown	Chinese male	1	6
Contractor-Sewing	1989	Medium	85	Chinatown	Chinese female	2	2
Contractor-Pleating	1972	Small	31	Midtown	Hispanic male	2	2
Contractor-Sewing	1986	Small	46	Chinatown	Chinese female	4	8
Trucking company	1956	Small	45	Brooklyn	Italian male	3	2
Total						42	113

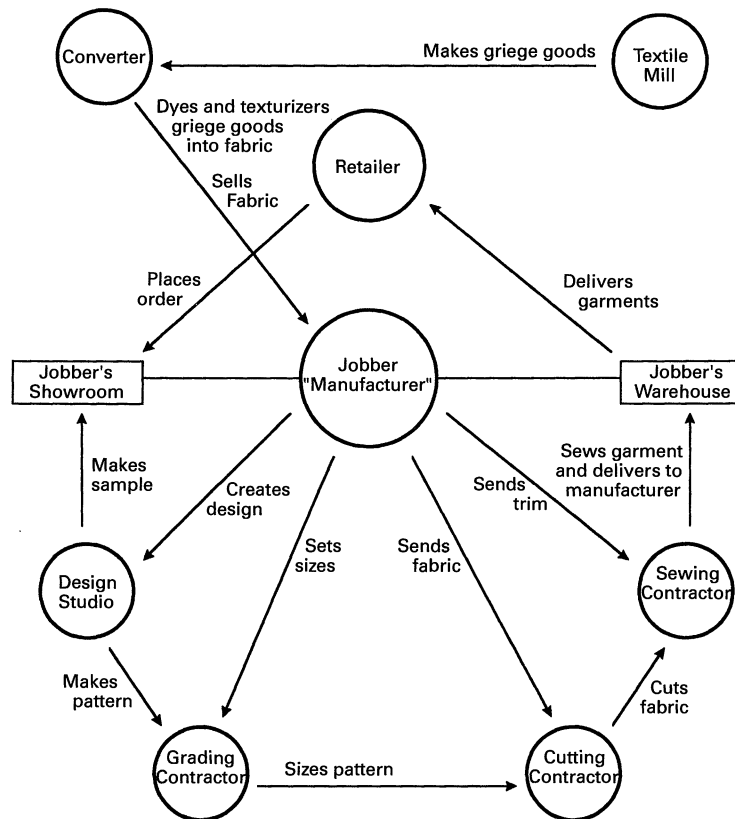
* Size in sales: small = \$500,000–\$3 million; medium = \$3–10 million; large = \$10–35 million. (One large firm had sales of \$1 billion.) Mean number of ties/contractor = 4.33; embedded ties = 1–2, or 61–76% of total business. Mean number of ties/manufacturer = 12; embedded ties = 2, or 42% of total business. Source is ILGWU records. Sample and population means do not significantly differ.

sector at the time of the study. The unit of analysis was the interfirm relationship.

My analysis focused on the women's better-dress sector to control for the differences that exist across industry sectors (other sectors include menswear, fantasywear, etc.). Better dresswear is a midscale market (retails for \$80–\$180), comprises off-the-rack dresses, skirts, and jackets, typically sells in department stores and chains, and tends to be price, quality, and fashion sensitive.

Figure 1 depicts a typical organizational network in this sector. Production revolves around manufacturers (called "jobbers") that normally fabricate no part of the garment; instead, they design and market it. The first step in the production process of a garment entails a manufacturer making a "collection" of sample garment designs in-house or with freelance designers and then showing its collection to retail buyers, who place orders. The jobber then "manufactures" the designs selected by the retail buyers by managing a network of grading, cutting, and sewing contracting firms that produce in volume the selected designs in their respective shops. Jobbers also link to textile mills that take raw materials such as cottons and plant linens and make them into grieger goods—cloth that has no texture, color, or patterns. Converters buy grieger goods from textile mills and transform them into fabrics (cloth that has color and patterns). The fabric is then sold to jobbers who use it in their clothing designs.

Figure 1. Typical interfirm network in the apparel industry's better-dress sector.



Data collection and analysis followed grounded theory building techniques (Glaser and Strauss, 1967; Miles and Huberman, 1984). I contacted each CEO by phone and introduced myself as a student doing a doctoral dissertation on the management practices of garment firms. In-depth interviews were open-ended, lasted two to six hours, and were carried out over a five-month period. In eight cases I was invited to tour the firm and interview and observe employees freely, and in fourteen cases I was invited for a follow-up visit. At three firms I passed several days interviewing and observing personnel. In these cases and others, I accompanied production managers when they visited their network contacts. These trips enabled me to gather first-hand ethnographic data on exchange dynamics and to compare actors' declared motives and accounts with direct observations. I recorded interviews and field observations in a hand-size spiral notebook, creating a record for each firm. I augmented these data with company and ILGWU data on the characteristics of the sampled firms.

I conducted the study in four phases. A pre-study phase consisted of two pilot interviews that I used to learn how the interview materials, my self-presentation, and the frequency or salience of an event such as price negotiation, tie formation, or problem solving affected the accuracy of reporting. Phase one involved open-ended, moderately directive interviews, and direct field observations. I con-

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ducted interviews carefully so that economic explanations were adequately examined during discussions. If an interviewee spoke only of the relationship between trust and opportunism, I asked how she or he differentiated trust and risk or why hostage taking or information asymmetry could not explain an action he or she attributed to social ties. I stressed accuracy in reporting and used nondirective items to probe sensitive issues, for example, "Can you tell me more about that," "Is there anything else," or "I am interested in details like that." The Appendix lists the interview items. In phase two, I formed an organized interpretation of the data. I first developed a working framework based on extant theory and then traveled back and forth between the data and my working framework. As evidence amassed, expectations from the literature were retained, revised, removed, or added to my framework. In this stage, I also did a formal analysis of the data using a "cross-site display," shown in Table 2 below, that indicates the frequency and weighting of data across cases and how well my framework was rooted in each data source (Miles and Huberman, 1984). Like all data reduction methods, however, it cannot display the full richness of the data, just as statistical routines don't explain all the variance. Phase three focused on gaining construct validity by conferring with over a half-dozen industry experts at the ILGWU, the Fashion Institute of New York, and the Garment Industry Development Corporation. These discussions revealed few demand characteristics or recording errors in my data. Thus I believe the chance of response bias is low, given the sample's breadth, the cross-checking of interview and archival data, and the formalization of the analysis.

FEATURES AND FUNCTIONS OF EMBEDDED TIES

Table 2 summarizes the evidence for the features and functions of embedded ties. One important initial finding is that the different accounts of transacting can be accurately summarized by two forms of exchange: arm's-length ties, referred to by interviewees as "market relationships," and embedded ties, which they called "close or special relationships." These data and the literature on organization networks form the basis for my analysis and the framework developed in this paper.

I found that market ties conformed closely to the concept of an arm's-length relationship as commonly specified in the economic literature. These relationships were described in the sharp, detached language that reflected the nature of the transaction. Typical characterizations focused on the lack of reciprocity between exchange partners, the non-repeated nature of the interaction, and narrow economic matters: "It's the opposite [of a close tie], one hand doesn't wash the other." "They're the one-shot deals." "A deal in which costs are everything." Other interviews also focused on the lack of social content in these relationships: "They're relationships that are like far away. They don't consider the feeling for the human being." "You discuss only money."

An examination of close relationships suggested that they reflected the concept of embeddedness (Granovetter, 1985). These relationships were distinguished by the personal

Table 2

Summary of Cross-Site Ethnographic Evidence for Features and Functions of Embeddedness in 21 Firms*

Features and Functions of Exchange	Source of Evidence					
	CEO	Arm's-length Ties		CEO	Embedded Ties	
		Product manager	Direct observation		Product manager	Direct observation
Uses written contracts	2	5	2			
Personal relationship with partner matters	2	2		18	7	11
Trust is major aspect of relationship				14	7	5
Reputation of a potential partner matters	1	2		2	2	2
Reciprocity and favors are important	4	2		10	4	3
Small-numbers bargaining is risky	11	5	4	2	1	
Monitor partner for opportunism	13	7	4	3	1	
Thick information sharing				17	7	4
Use exit to solve problems	13	5				
Joint problem solving				15	5	3
Concentrated exchange with partner matters	1	1		10	7	
Push for lowest price possible	7	4	2	2		
Promotes shared investment				9	4	
Shortens response time to market	3	1		8	5	2
Promotes innovation	2			4	5	2
Strong incentives for quality	2			10	5	1
Increases fit with market demand	4	1		7	4	
Source of novel ideas	5	3	1	1	2	

* Numbers in cells represent frequency of responses by interviewees aggregated across person-cases. Empty cells indicate that no responses were made by interviewees in that category. Multiple and unambiguous examples across cases and sources constitute strong evidence for an element of the framework. An unambiguous example across a single case constitutes modest evidence.

nature of the business relationship and their effect on economic process. One CEO distinguished close ties from arm's-length ties by their socially constructed character: "It is hard to see for an outsider that you become friends with these people—business friends. You trust them and their work. You have an interest in what they're doing outside of business." Another interviewee said, "They know that they're like part of the company. They're part of the family."

All interviewees described dealings with arm's-length ties and reported using them regularly. Most of their interfirm relationships were arm's-length ties, but "special relations," which were fewer in number, characterized critical exchanges (Uzzi, 1996). This suggested that (a) arm's-length ties may be greater in frequency but of lesser significance than close ties in terms of company success and overall business volume and that (b) stringent assumptions about individuals being either innately self-interested or cooperative are too simplistic, because the same individuals simultaneously acted "selfishly" and cooperatively with different actors in their network—an orientation that was shown to be an emergent property of the quality of the social tie and the structure of the network in which the actors were embedded. Finer analyses showed that embedded relationships have three main components that regulate the expectations and behaviors of exchange partners: trust, fine-grained information transfer, and joint problem-solving arrangements. The components are conceptually independent, though related because they are all elements of social structure.

Trust

Respondents viewed trust as an explicit and primary feature of their embedded ties. It was expressed as the belief that an exchange partner would not act in self-interest at another's expense and appeared to operate not like calculated risk but like a heuristic—a predilection to assume the best when interpreting another's motives and actions. This heuristic quality is important because it speeds up decision making and conserves cognitive resources, a point I return to below. Typical statements about trust were, "Trust is the distinguishing characteristic of a personal relationship"; "It's a personal feeling"; and "Trust means he's not going to find a way to take advantage of me. You are not selfish for your own self. The partnership [between firms] comes first."

Trust developed when extra effort was voluntarily given and reciprocated. These efforts, often called "favors," might entail giving an exchange partner preferred treatment in a job queue, offering overtime on a last-minute rush job, or placing an order before it was needed to help a network partner through a slow period. These exchanges are noteworthy because no formal devices were used to enforce reciprocation (e.g., contracts, fines, overt sanctions), and there was no clear metric of conversion to the measuring rod of money. The primary outcome of governance by trust was that it promoted access to privileged and difficult-to-price resources that enhance competitiveness but that are difficult to exchange in arm's-length ties. One contractor explained it this way, "With people you trust, you know that if they have a problem with a fabric they're just not going to say, 'I won't pay' or 'take it back'. If they did then we would have to pay for the loss. This way maybe the manufacturer will say, 'OK so I'll make a dress out of it or I can cut it and make a short jacket instead of a long jacket'." In contrast, these types of voluntary and mutually beneficial exchanges were unlikely in arm's-length relationships. A production manager said, "They [arm's-length ties] go only by the letter and don't recognize my extra effort. I may come down to their factory on Saturday or Sunday if there is a problem . . . I don't mean recognize with money. I mean with working things out to both our satisfaction." Trust promoted the exchange of a range of assets that were difficult to put a price on but that enriched the organization's ability to compete and overcome problems, especially when firms cooperatively traded resources that produced integrative agreements.

An analysis of the distinction between trust and risk is useful in explicating the nature of trust in embedded ties (Williamson, 1994). I found that trust in embedded ties is unlike the calculated risk of arm's-length transacting in two ways. First, the distributional information needed to compute the risk (i.e., the expected value) of an action was not culled by trusting parties. Rather, in embedded ties, there was an absence of monitoring devices designed to catch a thief. Second, the decision-making psychology of trust appeared to conform more closely to heuristic-based processing than to the calculativeness that underlies risk-based decision making (Williamson, 1994). Interviewees reported that among embedded ties the information needed to make risk-based

decisions was not systematically compiled, nor were base rates closely attended to, underscoring the heuristic processing associated with trust. Moreover, the calculative stance of risk-based judgments, denoted by the skeptical interpretation of another's motives when credible data are absent, was replaced by favorable interpretations of another's unmonitored activities. One CEO said, "You may ship fabric for 500 garments and get only 480 back. So what happened to the other 20? Twenty may not seem like a lot, but 20 from me and 20 from another manufacturer and so on and the contractor has a nice little business on the side. Of course you can say to the contractor, 'What happened to the 20?' But he can get out of it if he wants. 'Was it the trucker that stole the fabric?' he might ask. He can also say he was shorted in the original shipment from us. So, there's no way of knowing who's to blame for sure. That's why trust is so important." This interviewee's statement that he trusts his exchange partner is also not equivalent to his saying that the probability of my exchange partner skimming off 20 garments is very small, because that interpretation cannot explain interviewees' investments in trust if calculations using base-rate data on shrinkage could supply sufficient motives for action.

These observations are also consistent with the psychology of heuristics in several other ways. Although my intention here is not to explain social structural outcomes via psychological reductionism, I mention these links because they help distinguish the psychology of embeddedness from that of atomistic transacting. By the term "heuristic," I refer to the decision-making processes that economize on cognitive resources, time, and attention processes but do not necessarily jeopardize the quality of decisions (Aumann and Sorin, 1989). In making this argument, I draw on the literature that shows that heuristics can help people make quick decisions and process more complex information than would be possible without heuristics, especially when uncertainty is high and decision cues are socially defined. In such contexts, heuristics have been shown to produce quality decisions that have cognitive economy, speed, and accuracy (Messick, 1993). Thus, the research that shows that heuristic processing is most likely when the problem is unique or decision-making speed is beneficial (Kahneman and Tversky, 1982) is consistent with how embedded ties particularize the features of the exchange relationship, how information is attended to, gathered, and processed, and my finding that decision-making speed is advantageous among network partners.

The heuristic character of trust also permits actors to be responsive to stimuli. If it didn't, actors relying on trust would be injured systematically by exchange partners that feign trust and then defect before reciprocating (Burt, Knez, and Powell, 1997). I found that trust can break down after repeated abuses, because its heuristic quality enables actors to continue to recognize nontrivial mistreatments that can change trust to mistrust over time, a finding consonant with research on keiretsu ties (Smitka, 1991). Two CEOs described how repeated abuse of trust can corrode a close tie: "Sometimes they ask a favor for a lower price and I'll do it.

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But if they always do that, they're ripping me off." "If the other firm's busy he'll stay with us and vice versa. If he switches to a new contractor then I won't work with that manufacturer again."

Unlike governance structures in atomistic markets, which are manifested in intense calculativeness, monitoring devices, and impersonal contractual ties, trust is a governance structure that resides in the social relationship between and among individuals and cognitively is based on heuristic rather than calculative processing. In this sense, trust is fundamentally a social process, since these psychological mechanisms and expectations are emergent features of a social structure that creates and reproduces them through time. This component of the exchange relationship is important because it enriches the firm's opportunities, access to resources, and flexibility in ways that are difficult to emulate using arm's-length ties.

Fine-grained Information Transfer

I found that information exchange in embedded relationships was more proprietary and tacit than the price and quantity data that were traded in arm's-length ties. Consistent with Larson's (1992) findings, it includes information on strategy and profit margins, as well as tacit information acquired through learning by doing. The CEO of a pleating firm described how exchange of nonprice and proprietary information is a main feature of his embedded ties: "Constant communication is the difference. It's just something you know. It's like having a friend. The small details really help in a crunch. They know we're thinking about them. And I feel free to ask, 'How are things going on your end, when will you have work for us?'"

Relative to price data, fine-grained information transfer is not only more detailed and tacit but has a holistic rather than a divisible structure that is difficult to communicate through market ties. In the context of the fashion industry, I found that this information structure is manifested as a particular "style," which is the fusion of components from different fashions, materials, nomenclatures, and production techniques. Because a style tends to be forbidding and time consuming even for experts to articulate and separate into discrete component parts, it was difficult to codify into a pattern or to convey via arm's-length ties without the loss of information. For example, a designer showed me a defective pleated skirt and described how only his embedded ties would be likely to catch the problem. His demonstration of how different fabrics are meant to "fall," "run," "catch light," and "forgive stitching" made it clear that information transfer with his close ties is a composite of "chunks" of information that are not only more detailed than price data but more implied than overtly expressed in conversation. It also appeared that the transfer of fine-grained information between embedded ties is consistent with Herbert Simon's notions of chunking and expert rationality, in that even though the information exchanged is more intricate than price data, it is at the same time more fully understood

because it is processed as composite chunks of information (a style) rather than as sequential pieces of dissimilar data.² A designer explained how these factors improve a firm's ability to bring products to market quickly and to reduce errors: "If we have a factory that is used to making our stuff, they know how it's supposed to look. They know a particular style. It is not always easy to make a garment just from the pattern. Especially if we rushed the pattern. But a factory that we have a relationship with will see the problem when the garment starts to go together. They will know how to work the fabric to make it look the way we intended. A factory that is new will just go ahead and make it. They won't know any better."

Fine-grained information transfer benefits networked firms by increasing the breadth and ordering of their behavioral options and the accuracy of their long-run forecasts. A typical example of how this occurs was described by a manufacturer who stated that he passes on critical information about "hot selling items" to his embedded ties before the other firms in the market know about it, giving his close ties an advantage in meeting the future demand: "I get on the phone and say to a buyer, 'this group's on fire' [i.e., many orders are being placed on it by retail buyers]. But she'll buy it only as long as she believes me. Other manufacturers can say, 'It's hot as a pistol,' but she knows me. If she wants it she can come down and get it. The feedback gives her an advantage."

These cases demonstrate that fine-grained information transfer is also more than a matter of asset-specific know-how or reducing information asymmetry between parties, because the social relationship imbues information with veracity and meaning beyond its face value. An illustrative case involved a manufacturer who explained how social ties are critical for evaluating information even when one has access to an exchange partner's confidential data. In such a case, one would imagine that this access would make the quality of the social relationship unimportant because the information asymmetry that existed between the buyer and seller has been overcome. This interviewee argued, however, that while he could demand that the accounting records of a contractor be made available to him so that he might check how the contractor arrived at a price, the records would be difficult to agree upon in the absence of a relationship that takes for granted the integrity of the source. The manufacturer said, "If we don't like the price a contractor gives us, I say, 'So let's sit down and discuss the costing numbers.' But there are all these 'funny numbers' in the contractor's books and so we argue over what they mean. We disagree . . . and in the end the contractor says, 'We don't have a markup,' and then he looks at you like you have three heads for asking . . . because he knows we don't know each other well enough to agree on the numbers in the first place."

Thus, information exchange in embedded ties is more tacit and holistic in nature than the price and quantity data exchanged in arm's-length ties. The valuation of this information has its basis in the social identities of the exchange partners and in the manner in which it is processed, via

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I owe the insightful observation about chunking and expert rationality to an anonymous reviewer, who helped me fine-tune my analysis and who also suggested a more radical implication of my findings—that embeddedness can overcome bounded rationality altogether—an interpretation I am more reluctant to endorse. Although embedded ties appear to reduce bounded rationality by expanding the range of data attended to and the speed of processing, I would argue that this expansion does not constitute full rationality. I am more confident in concluding at this point that embedded ties reflect "expert rationality," a third kind of rationality that exists between pure and bounded rationality (Prietula and Simon, 1989). Many points in Prietula and Simon's (1989) discussion of the organizational implications of expert rationality support and extend the arguments made here.

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chunking, even though it is intricate and detailed. These features help to convey the preferences and range of strategic options available to exchange partners, increasing effective interfirm coordination.

Joint Problem-solving Arrangements

The use of social arrangements to coordinate market transactions is supposedly inefficient because the price system most efficiently coordinates transactions, except under conditions of bilateral monopoly or market imperfection (Hirschman, 1982: 1473). In contrast, I found that embedded ties entail problem-solving mechanisms that enable actors to coordinate functions and work out problems "on the fly." These arrangements typically consist of routines of negotiation and mutual adjustment that flexibly resolve problems (see also Larson, 1992). For example, a contractor showed me a dress that he had to cut to different sizes depending on the dye color used because the dye color affected the fabric's stretching. The manufacturer who put in the order didn't know that the dress sizes had to be cut differently to compensate for the dyeing. If the contractor had not taken the initiative to research the fabric's qualities, he would have cut all the dresses the same way—a costly mistake for the manufacturer and one for which the contractor could not be held responsible. Both the manufacturer and the contractor reported that this type of integration existed only in their embedded ties, because their work routines facilitated troubleshooting and their "business friendship" motivated expectations of doing more than the letter of a "contract." The manufacturer explained: "When you deal with a guy you don't have a close relationship with, it can be a big problem. Things go wrong and there's no telling what will happen. With my guys [his key contractors], if something goes wrong, I know we'll be able to work it out. I know his business and he knows mine."

These arrangements are special, relative to market-based mechanisms of alignment, such as exit (Hirschman, 1970), because learning is explicit rather than extrapolated from another firm's actions. Hirschman (1970) showed that a firm receives no direct feedback if it loses a customer through exit; the reasons must be inferred. In embedded relationships, firms work through problems and get direct feedback, increasing learning and the discovery of new combinations, as Helper (1990) showed in her study of automaker-supplier relationships. In contrast, one informant said about market ties, "They don't want to work with the problem. They just want to say, 'This is how it must be.' Then they switch [to a new firm] again and again." In this way, joint problem-solving arrangements improve organization responses by reducing production errors and the number of development cycles. Joint problem-solving arrangements are mechanisms of voice. They replace the simplistic exit-or-stay response of the market and enrich the network, because working through problems promotes learning and innovation.

A Note on the Formation of Embedded Ties and Networks

Although a full discussion of network formation exceeds this paper's scope, I can summarize my findings on this process

to establish the link between embedded ties and the structure of organization networks (Uzzi, 1996). I found that embedded ties primarily develop out of third-party referral networks and previous personal relations. In these cases, one actor with an embedded tie to two unconnected actors acts as their "go-between." The go-between performs two functions: He or she rolls over expectations of behavior from the existing embedded relationship to the newly matched firms and "calls on" the reciprocity owed him or her by one exchange partner and transfers it to the other. In essence, the go-between transfers the expectations and opportunities of an existing embedded social structure to a newly formed one, furnishing a basis for trust and subsequent commitments to be offered and discharged. As exchange is reciprocated, trust forms, and a basis for fine-grained information transfer and joint problem solving is set in place (Larson, 1992). This formation process exposes network partners to aspects of their social and economic lives that are outside the narrow economic concerns of the exchange but that provide adaptive resources, embedding the economic exchange in a multiplex relationship made up of economic investments, friendship, and altruistic attachments.

The significant structural consequence of the formation of dyadic embedded ties is that the original market of impersonal transactions becomes concentrated and exclusive in partner dyads. Since an exchange between dyads has repercussions for the other network members through transitivity, the embedded ties assemble into extended networks of such relations. The ties of each firm, as well as the ties of their ties, generate a network of organizations that becomes a repository for the accumulated benefits of embedded exchanges. Thus the level of embeddedness in a network increases with the density of embedded ties. Conversely, networks with a high density of arm's-length ties have low embeddedness and resemble an atomistic market. The extended network of ties has a profound effect on a firm's performance, even though the extended network may be unknown or beyond the firm's control (Uzzi, 1996).

EMBEDDEDNESS, INTERFIRM NETWORKS, AND PERFORMANCE

Embeddedness is of slight theoretical and practical value if more parsimonious accounts of exchange can explain as much. As Friedman (1953) argued, it doesn't matter if reality is not as the economic model purports so long as the model's forecasts agree with empirical observation. In response to this argument and the need to specify the mechanisms of embeddedness, I show in this section how embeddedness advances our understanding of key economic and social outcomes. For each outcome, I specify propositions about the operation and outcomes of interfirm networks that are guided implicitly by *ceteris paribus* assumptions. My goal is not to model a specific outcome, such as profitability, but to show how social structure governs the intervening processes that regulate key performance outcomes, both positive and negative.

Economies of Time and Allocative Efficiency

Economists have argued that people's time is the scarcest resource in the economy and that how it is allocated has a

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profound economic effect (Juster and Stafford, 1991). I found that embeddedness promotes economies of time (the ability to capitalize quickly on market opportunities), because the transactional details normally worked out to protect against opportunism (contracts, price negotiations, scheduling) in arm's-length relationships prior to production are negotiated on the fly or after production is completed. Contracting costs are avoided, because firms trust that payoffs will be divided equitably, even when comparative market transactions do not exist. In addition, fine-grained information transfer speeds data exchange and helps firms understand each other's production methods so that decision making can be quickened. Joint problem-solving arrangements also increase the speed at which products are brought to market by resolving problems in real time during production. "Bud," the CEO of a large dress firm, explained how embeddedness economizes on time in a way that is unachievable using arm's-length contacts: "We have to go to market fast. Bids take too long. He [the contractor] knows he can trust us because he's part of the 'family.' Sometimes we get hurt [referring to a contractor that takes too long to do a job] and we pay more than we want to. Sometimes we think the contractor could have done it quicker and he takes less than he wants. But everything is negotiated and it saves us both from being killed from a poor estimate. We do first and fix price after."

While economies of time due to embeddedness have obvious benefits for the individual firm, they also have important implications for allocative efficiency and the determination of prices. This is because embeddedness helps solve the allocation problem by enabling firms to match product designs and production levels more closely to consumer preferences than is possible in an atomized market governed by the price system. When the price system operates, there is a lag between the market's response and producers' adjustments to it. The longer the lag, the longer the market is in disequilibrium, and the longer resources are suboptimally allocated. Underproduced items cause shortages and a rise in prices, while overproduced items are sold at a discount. This is especially true when goods are fashion-sensitive or when long lead times exist between design and production, because producers are more likely to guess inaccurately the future demands of the market. They may devote excess resources to goods that do not sell as expected and too few resources to goods that are in higher demand than expected. Consumers can also gain increased access to goods that best meet their needs, while the production of low-demand goods is minimized before prices react.

Consequently, the allocative efficiency of the market improves as waste is reduced (fewer products are discounted), and fast-selling items do not run out of stock. In this way, embedded ties offer an alternative to the price system for allocating resources, especially under conditions of rapid product innovation and mercurial consumer preferences. While these findings are not meant to imply that prices offer no valuable information for making adjustments, they do suggest that they are a limited device when adjust-

ment must be timely and coordinated. Under these conditions, as Hirschman (1970) conjectured, both organizational and interfirm adaptation appears less effectively coordinated by prices than by embeddedness. These observations can be summarized in the following propositions:

Proposition 1a: The weaker the ability of prices to distill information, the more organizations will form embedded ties.

Proposition 1b: The greater the level of embeddedness in an organization's network, the greater its economies of time.

Proposition 1c: The greater the competitive advantage of achieving real-time change to environmental shifts or fashion-sensitive markets, the more network forms of organization will dominate competitive processes and produce allocative efficiencies relative to other forms of organization.

Search and Integrative Agreements

In the neoclassical model, efficiency and profit maximization depend on individual search behavior. Search is needed to identify a set of alternatives that are then ranked according to a preference function. If there is no search behavior, there can be no ranking of alternatives and therefore no maximization. This suggests that search procedures are a primary building block of economic effectiveness and therefore are of great theoretical and practical importance to the study of the competitiveness of organizations.

In the neoclassical model, search ends when the marginal cost of search and the expected marginal gain of a set of alternatives is equal to zero. "In a satisficing model search terminates when the best offer exceeds an aspiration level that itself adjusts gradually to the value of the offers received so far" (Simon, 1978: 10). The above statements by "Bud" that "everything is negotiated" and that "Sometimes . . . we pay more than we want to," or "Sometimes we think the contractor could have done it quicker and he takes less than he wants," suggest that each firm satisfices rather than maximizes on price in embedded relationships. Moreover, Bud's statements that "we need to go to market fast" and "We do first and fix price after" demonstrate that in contrast to arm's-length market exchange, firms linked through embedded ties routinely do not search for competitive prices first but, rather, negotiate key agreements afterwards.

To Simon's (1978) model of search I add the following qualification: *search procedures depend on the types of social ties maintained by the actor, not just the cognitive limits of the decision maker.* I found that embedded ties shape expectations of fairness and aspiration levels, such that actors search "deeply" for solutions within a relationship rather than "widely" for solutions across relationships. A reasonable first conjecture of how this network phenomenon operates is that multiplex links among actors enable assets and interests that are not easily communicated across market ties to enter negotiations, increasing the likelihood of integrative agreements that pool resources and promote mutually beneficial solutions, rather than distributive agreements that aim for zero-sum solutions. Solutions are resolved within the relationship, on integrative rather than distributed grounds, where integrative agreements are

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themselves made possible because multiplex ties among network partners (e.g., supplier, friend, community member) reveal interests and enlarge the pie of negotiable outcomes (Bazerman and Neale, 1992). For example, when the above-described contractor incorrectly cut a jobber's garment, the jobber searched for a solution within the relationship (i.e., making a short jacket instead of the planned long jacket) based on the expectation that the contractor would voluntarily reciprocate in the future and prefer to solve the problem within the relationship rather than through exit. An interviewee explained this logic: "I'd rather business go to a friend, not an enemy. My theory is it is not competition. Problems are always happening in production. I always tell the manufacturer that 'it's not my problem, it's not his.' I call to always solve the problem, not to get out of fixing the problem. We are all in the same boat." Another said succinctly, "Win-win situations definitely help firms survive. The contractors know that they will not lose."

My findings also suggest that embeddedness operates under microbehavioral decision processes that promote a qualitative analysis of discrete categories (high vs. low quality), rather than continuous amounts (quantities and prices), as in the neoclassical approach. This point is illustrated by a CEO's ranking of embedded ties as more effective enablers of quality production than arm's-length ties: "Any firm, any good firm that's been around, whether it's Italian, Japanese, or German, and I've been there because we've been around for four generations, does business like we do. I have a guy who has been with me 22 years. We all keep long-term relationships with our contractors. That's the only way you become important to them. And if you're not important, you won't get quality." Embedded ties promote each party's commitment to exceed willingly the letter of a contract, to contribute more to the relationship than is specified, and solve problems such that categorical limits are sufficient to motivate a high level of quality in production. In arm's-length ties, by contrast, target outcomes must be contractually detailed at the outset because there are no incentives to motivate positive contributions afterwards, a condition that also limits the search for and recognition of potential problems.

These findings suggest that it is of theoretical and practical import to assess the economic development potential of different search procedures. Hence, I offer the following propositions:

Proposition 2a: Search procedures depend on the type of exchange tie. The width of search across relationships increases with the number of arm's-length ties in the network and decreases with the number of embedded ties in the network. The depth of search within a relationship increases with the strength of the embedded tie.

Proposition 2b: The greater the level of embeddedness in a network, the more likely it is that integrative rather than distributive agreements will be reached.

Proposition 2c: The more competitive advantage depends on reaching positive-sum solutions to interfirm coordination problems, the more organization networks, rather than other forms of organization, will dominate competitive processes.

Risk Taking and Investment

The level of investment in an economy promotes positive changes in productivity, standards of living, mobility, and wealth generation. Economic theory credits investment activity primarily to tax and interest-rate policies that influence the level, pattern, and timing of investments. I found that in the apparel industry embeddedness enables investments beyond the level that would be generated alone by the modern capital and factor markets. Embeddedness creates economic opportunities because it exists prior to the individuals who occupy competitive positions in a network of exchange and defines how traits that signal reliability and competence are interpreted by potential exchange partners, for three reasons. First, it increases expectations that noncontractual, nonbinding exchanges will be reciprocated (Portes and Sensenbrenner, 1993). Second, social networks reduce the complexity of risk taking by providing a structure that matches known investors. Third, network ties link actors in multiple ways (as business partners, friends, agents, mentors), providing a means by which resources from one relationship can be engaged for another. In risky investment situations, these factors increase an actor's capacity to access resources, adjust to unforeseen events, and take risks.

Interviewees argued that the unique expectations of reciprocity and cooperative resource sharing of embedded ties generate investments that cannot be achieved through arm's-length ties that are based on immediate gain. The importance of these consequences of embeddedness seemed particularly meaningful for investments in intellectual property or cultural products (i.e., an original style), which are difficult to value by conventional means but important for economic development in information economies. On the nature of this process of valuation through embedded ties, a characteristic response was, "If someone needs advertising money, or returns, or a special style for windows—it will be like any relationship. You'll do things for friends. You'll go to the bank on their orders. The idea that 'they buy and we sell' is no good. Friends will be there with you through the bad times and good."

The role of embeddedness in matching investors and investment opportunities was exemplified by the CEO of a trucking and manufacturing firm who explained the conditions under which his firm helps contractors who need capital to expand. Consistent with Macaulay's (1963) findings, both parties independently said that they signed no contracts because of their expectations of long-term fair play. The CEO stated, "We never make gifts [i.e., sewing machines, hangers, racks, new lighting] to potential startups unless there is a history of personal contact. Never for a stranger. Only for people we have a rapport with. So, if Elaine [CEO of a contracting firm] wanted to start her own shop I would make her a gift. But for some stranger—never. Why should I invest my money on a guy I may never see again?" In contrast, interviewees believed that few firms use arm's-length ties to find investment partners. On this point, a CEO said, "I will give a firm a chance based on Dun and Bradstreet data. I call the bank and get a financial report on

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the firm's size. I know this is 'marketing' but most contractors don't do marketing [they mainly use firms they know]."

I observed a similar pattern for investment in special-purpose technology. The added risk of special-purpose technology, however, meant that firms wanted assurances that usually consisted of a joint-equity stake in the technology. Interestingly, the demand for shared equity was not viewed as distrust but as a deepening of trust and a symbol of risk sharing. This was demonstrated by the fact that CEOs most often approached another firm about joint investments when a close tie existed prior to the planned investment. The president of a dress company described how prior social relations shape investment behavior in specialized technology, in this case a \$20,000 stitching machine: "Say we want to do a special stitch. So we go to the contractor and ask him to buy the machine to do the job. But he says that he wants us to buy it. But, he has money for this machine like you have money for bubble gum. He's been with us for 25 years. You see, we might not like the way the dress looks with the special stitch. Then we won't use the machine, so he's stuck. The reason he wants us to buy it is that he wants to know that we're not committed to bullshit—we're committed to using it."

This kind of joint equity sharing is only partly consistent with the transaction cost economic notion of credible commitments, since the equity ties symbolize trust, not protection against perfidy—a finding consistent with the Japanese supplier model (Smitka, 1991; Gerlach, 1992). Since both parties had money for the machine, the co-equity stake was not a significant enough sum to be a reliable hostage for either firm. Moreover, since both firms had the money to buy the machine unilaterally and auction it to the lowest-bidding shop if they wanted, the transaction costs of monitoring a joint investment and haggling with a known individual could have been avoided altogether.

My analysis suggests that in these situations, the equity investment acted primarily as a backup—a redundant structural tie that reinforced the firms' attachments to each other. Just as engineers overbuild structures such as bridges to withstand supernormal stress when the cost of a failure is high but the chance of failure is low, these actors appear to overbuild the structures of important exchanges even though the risk of failure due to opportunism may be low, perhaps because the cost of random mishaps is high. The mechanism guiding this process, like that of integrative bargaining, appears to be multiplexity. In risky situations, multiplexity enables resource pooling and adaptation to random events. This implies that multiplex ties may develop because of the riskiness of exchanges. The action of taking risks, however, is a consequence of having multiplex ties at one's disposal. Cyert and March (1992: 228) discussed a similar association between risk taking and physical assets in the form of slack. The contribution here is that a portfolio of social ties can perform the same function slack does in boosting risk taking, especially when actors are in resource-scarce, competitive environments. The key implication is that firms would be less likely to make investments and take risks in the ab-

sence of embeddedness. These observations suggest the following propositions:

Proposition 3a: The greater the level of embeddedness in an organization's network, the greater an organization's investment activity and risk taking and the lower its level of resource commitment to hostage taking.

Proposition 3b: The more competitive advantage depends on the ability to reduce product development risk or investment uncertainty, the more organizational networks, rather than other forms of organizations, will dominate competitive processes.

Complex Adaptation and Pareto Improvements

Neoclassicists argue that social arrangements of coordination among firms are unnecessary because the price system directs self-interested maximizers to choose optimally adaptive responses. A related approach held in game theory, agency theory, and evolutionary economics predicts that actors will coordinate only as long as the expected payoffs of cooperation exceed those of selfish behavior (Simon, 1991).

Contrary to these arguments, I found that embeddedness assists adaptation because actors can better identify and execute coordinated solutions to organizational problems. Similar to mechanisms identified by Dore (1983) and Lincoln, Gerlach, and Ahmadjian (1996) on the duration of Japanese interfirm ties, these solutions stem from the willingness of firms to forego immediate economic gain and the ability to pool resources across firms. In embedded relationships, it was typical for exchange partners to inform one another in advance of future work slowdowns or to contract early for services to help out an exchange partner whose business was slow. These actions improve forecasts and adaptation to market changes in ways that cannot be achieved through prices or the narrow pursuit of self-interest. A production manager explained to me how her firm foregoes immediate self-gain in embedded relationships to benefit the adaptation of her exchange partners. In this case, she could not predict if the aided contractor would regain profitability or how long a recovery might take, but she knew that another contractor could offer high volume discounts and a better immediate payoff. She said, "I tell them [key contractors] that in two weeks I won't have much work. You better start to find other work. [At other times] when we are not so busy, we try to find work for that time for our key contractors. We will put a dress into work to keep the contractor going. We'll then store the dress in the warehouse. Where we put work all depends on the factory. If it's very busy I'll go to another factory that needs the work to get by in the short run."

In contrast, these behaviors were virtually nonexistent in arm's-length ties because information about the need for work was used opportunistically to drive price down, a finding consistent with traditional U.S. automaker-supplier relationships (Helper, 1990). Moreover, price is too unresponsive and noisy a signal of organizational effectiveness to foster interfirm coordination or adaptation (Hirschman, 1970). A contractor illustrated why price is a poor signal for organizational adaptation and how it can be used opportunistically to mask problems: "In close relationships we work together.

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I handle their last-minute garment changes and ship fast and jobbers help me expand and solve production problems. . . . [Other] jobbers push the price down when the contractor tells his production problems. Eventually the contractor wants to leave the manufacturer because he doesn't pay enough next time [to make up for earlier price concessions]. But in the time a good contractor needs to find a new jobber to replace their business they lose their best workers and then they go out of business."

The implications of these findings are revealing when contrasted with game theoretic predictions that rely on self-interested motives to explain cooperation. A core prediction of game theory is that players will switch from cooperative to self-interested behavior when the end game is revealed—when players know the end of the game is near and therefore should end cooperative play because it yields lower payoffs than unilateral self-interest (Murnighan, 1994). Contrary to this prediction, I found that embedded firms continue to cooperate even after the end of the game is apparent. An illustrative case concerned a manufacturer that was permanently moving all its production to Asia and thus had begun its end game with its New York contractors. As a result, this manufacturer had strong incentives not to tell its contractors that it intended to leave. Doing so put it at risk of receiving low-quality goods from contractors who now saw the account as temporary and had to redirect their efforts to new manufacturers who could replace the lost business. Yet the CEO of this manufacturer personally notified his embedded ties, because his relationships with them obliged him to help them adapt to the closing of his business, and his trust in them led him to believe that they would not shirk on quality. Consistent with his account, one of his contractors said that the jobber's personal visit to his shop reaffirmed their relationship, which he repaid with quality goods. The same manufacturer, however, did not inform those contractors with which it had arm's-length ties.

These findings thus suggest another important outcome of embedded networks: They generate Pareto improvements, promoting a reallocation of resources that makes at least one person better off without making anyone worse off. In the above case, the jobber's embedded ties were made better off by receiving information that enabled them to adapt to the loss of his business. By contrast, in the baseline system of market exchange, the jobber's arm's-length ties were denied access to critical information and thus found the manufacturer's departure debilitating.

This behavior is difficult to explain as rational reputation maintenance. The manufacturer's New York reputation was irrelevant to its future success in Asia. Likewise, it would not have hurt the contractors' reputations to shirk, since the manufacturer was "deserting" them, not the reverse. As a rule, I found that in a large market like New York's, generalized reputations are surprisingly weak control devices because firms can easily escape their bad reputations, while positive information is often hoarded in the open "market." One contractor said, "Manufacturers can play hit and run for years before their reputation catches up with them." Another added, "I hear 'This one is very picky' or 'This guy

is really bad trouble.' But firms I do all the business for, I don't tell a word about to others. I don't want the competition."

Such acts of nondefection raise an interesting question: Why don't actors defect when it serves their self-interest to do so? One possibility is that embedded social structures entail expectations that either change more slowly than or remain resistant to changes in the purely economic features of the exchange. This enables the logic of embedded ties to extend to subsequent transactions, even those subject to different incentive structures, at least in the near term. In the above case, the manufacturer's visit to the contractor's factory continued their reciprocal indebtedness even though the incentive systems for both firms were radically transformed at the instant the manufacturer revealed his preference to migrate offshore.

Although a conclusive account of such non-self-interested behavior calls for more than ethnographic analysis, one explanation is that, with the blending of the social and economic lives of actors, relationships take on an existence of their own that remains after the economic transaction ends (Granovetter, 1993). Collective successes ("We had a hit season"), common experiences ("I went to her daughter's wedding"), and shared symbols (plaques of appreciation from exchange partners) vividly and enduringly influence actions to furnish resources for which no future gain can be expected. These causal mechanisms are buttressed by ample psychological research that shows that close personal ties heighten empathy, which increases altruistic behavior (Batson, 1990). One manufacturer explicitly displayed this reasoning in discussing the main issues affecting his decision not to move to Taiwan, "You have a heart and a soul here with the people you work with. I don't want to pick up my family either. So, I'll try to make it work here. Not everything in business works by the economic model. You act like a schmuck sometimes." This suggests that the motivation to cooperate when it is not in an individual's self-interest occurs because the expectations of embedded ties lag changes in economic incentives or persist against them, an outcome that is itself sustained by psychological processes that are set in motion by embedded ties.

This altruistic behavior appears irrational only in the narrow economic sense, in that actors forego purely self-seeking behavior (Simon, 1978). These actors are conscious nonetheless of the fact that they are in business to make a return and that big returns are better than small ones. What distinguishes this rationality from formal economic rationality is not just satisficing and heuristics, but the fact that self-interest gives way to altruism: Actors strategically cooperate and equitably distribute both positive and negative outcomes. Thus, contrary to Adam Smith's quip that individuals do best for others by doing selfishly for themselves, the above evidence suggests that firms that act in the interest of others (and against their short-term interests) may do more for the collective economy and society than if they had followed purely selfish pursuits. Hence, I offer the following propositions:

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Proposition 4a: The weaker the ability of generalized reputation or prices to provide reliable information about products or exchange partners' characteristics, the more organizations will form embedded rather than arm's-length ties.

Proposition 4b: The greater the level of embeddedness in an organization's network, the more likely are Pareto-improved solutions to coordination problems.

Proposition 4c: The more competitive advantage depends on complex adaptation, the more network forms of organization, rather than other forms, will dominate competition.

PARADOXES OF EMBEDDEDNESS

If a firm becomes too embedded, does adaptation become more difficult as network relationships are tuned to specific trading partners, isomorphism within the network decreases diversity, and a concentrated level of exchange with only a few network partners reduces nonredundant information and access to new opportunities (Burt, 1992)? This question suggests a paradox of theoretical significance: The same processes by which embeddedness creates a requisite fit with the current environment can paradoxically reduce an organization's ability to adapt. In this section I explicate three conditions that turn embeddedness into a liability: (1) there is an unforeseeable exit of a core network player, (2) institutional forces rationalize markets, or (3) overembeddedness characterizes the network.

The unexpected loss of a network's core organization, or more generally, a deep and sudden structural change in resource flows can cause embeddedness to shift from an asset to a liability. Under these conditions, social processes that increase integration combine with resource dependency problems to increase the vulnerability of networked organizations. For example, a contractor may become highly skilled at working with a manufacturer's fabric, production schedule, and design specifications. If that manufacturer closes shop or migrates offshore, then the embedded relationship that had originally benefited the contractor may now put it at a higher risk of failure than if it had diversified its ties, because it is likely to lack the resources needed to transition to a replacement partner (Romo and Schwartz, 1995).

The problem is the opposite of the free-rider problem: diligent commitment, backed by expectations of reciprocity and social pressure to perform, intensifies an organization's involvement with certain network partners while raising the concomitant costs of keeping ties to extra-network partners that can provide a safety net for unexpected or random fluctuations. Portes and Sensenbrenner (1993: 1340) drew attention to this phenomenon in their study of entrepreneurs, whose socially embedded relationships gave them access to resources but restricted their actions outside their network. In the apparel industry, the unexpected failure of Leslie Fay, Inc., a manufacturer at the center of a large network, was most debilitating for the primary contractors that had benefited from their close tie to Leslie Fay, Inc. which, before falling victim to a few unscrupulous top executives, had sheltered them from a glut of low-cost competitors and downturns in the economy (Uzzi, 1997). The above arguments suggest the following propositions:

Proposition 5a: The loss of a core organization in a network will have a large negative effect on the viability of the network as a whole.

Proposition 5b: The intensity of the effects of the loss of a core organization increases with its size and the level of embeddedness in the network such that, at the limit, an "extinction effect" will occur, as the deleterious effect of destabilized economic transactions ripples through the network and causes widespread failure of even healthy firms in the network.

Institutional arrangements that "rationalize" markets or fracture social ties can also cause instability. If changes to the system rupture social ties, then the benefits of embeddedness generated by the ties can be lost. Ironically, this can place firms that invested heavily in networks at a higher risk of failure than market-oriented firms because the social relationships that created and supported competitive advantages no longer exist, and the distinctive competencies of managing network relationships may not translate well to other modes of exchange. An example of this type of breakdown occurred in the apparel retail trade in the 1980s. Prior to that time, retail buyers maintained embedded relationships with clothing manufacturers. During the '80s these longstanding ties were broken when many of the giant retailers (e.g., Macy's, Bullocks, A&S) were bought by corporate conglomerates (e.g., Federated, Inc.) that imposed a shift from "relationship buying" to "numbers buying" among their retail buyers. Numbers buying emphasizes short-term profits, one-shot relationships, and whipsaw-like competitive bidding. A manufacturer with 30 years of experience explained how a shift toward impersonal market exchange destabilized embedded ties and permanently affected organizational outcomes:

A symbolic relationship developed into a one-sided relationship. The big stores got accounting running the store. You didn't have fashion-sensitive people running the store any longer. The fashion-sensitive people had great fashion sense. They couldn't read a balance sheet [but] they developed merchants and buyers in the stores. If there was a problem you knew you'd work it out and they'd help you. There was a personal rapport with buyers. We'd say to one another "Let's work it out." It happened in lots of situations—promotions, joint advertising, in seeing what's in for next year. Then everyone became cautious [post buyout]. There was no longer a good dialogue. Ultimately we walked away from the department stores. The relationship became very impersonal and the manufacturers got squeezed. The corpses [of failed manufacturers] littered 7th Avenue.

These observations suggest another proposition:

Proposition 6: Organizations that build their competitive advantage on the use of embedded ties will be at a high risk of failure if institutional changes fundamentally rationalize the basis of, or preclude the formation of, new embedded ties.

The third instability results from overembeddedness, when all firms in a network are connected through embedded ties. This can reduce the flow of new or novel information into the network because redundant ties to the same network partners mean that there are few or no links to outside members who can potentially contribute innovative ideas (Burt, 1992). Under these conditions, the network becomes

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ossified and out of step with the demands of its environment, ultimately leading to decline.

Overembeddedness can also stifle effective economic action if the social aspects of exchange supersede the economic imperatives. Feelings of obligation and friendship may be so great between transactors that a firm becomes a “relief organization” for the other firms in its network. The stronger firms in the network may dedicate resources to weaker members at a rate that outpaces their capacity to rejuvenate their own resources, an argument that is consistent with Portes and Sensenbrenner’s (1993: 1339) finding that networks of exclusive ties “turn promising enterprises into welfare hotels, checking economic expansion.”

Overembedded networks can sometimes release intense negative emotions of spite and revenge that trap firms in self-defeating cycles of behavior. For example, Axelrod (1984) found that defection, even in simple tit-for-tat games, can cause feuding when it is perceived as illicit or violates an implicit understanding between players to cooperate. I found that if the strong assumptions of trust and cooperation are exploited in embedded ties, vendettas and endless feuds can arise. Over time these actions can prevail against rational action and reduce the firm’s ability to meet the economic demands of the market place. A CEO put it simply, “If you screw a guy like that [a close tie] he’ll stay in business just long enough to get even.”

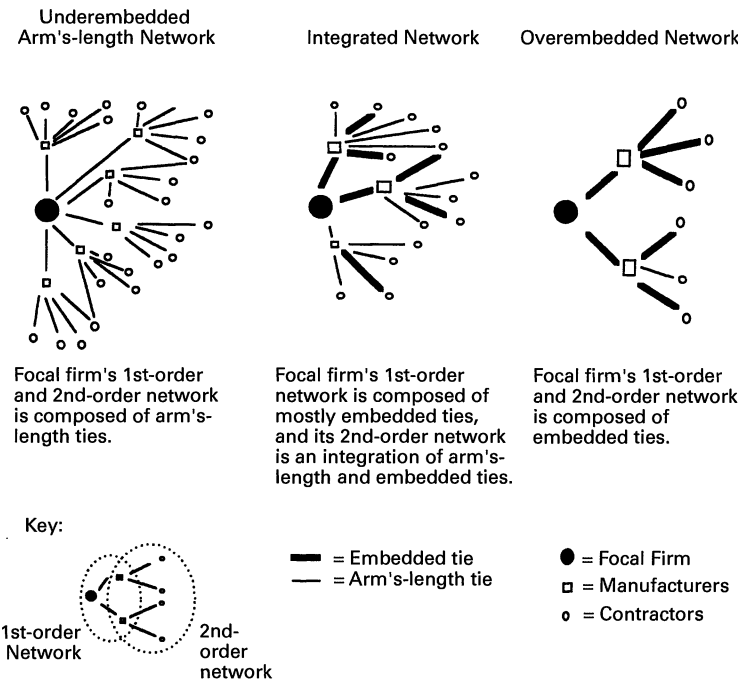
How can these results be reconciled with the finding that embeddedness is an enabling feature of organizational efficacy? My argument has been that organizations gain access to special opportunities when connected to their exchange partners through embedded ties, such that the opportunity level is positively related to the degree to which a firm’s network partners use embedded ties—at least up to some threshold. These relationships suggest that the effect of embeddedness and network structure on economic action depends on two variables: (1) how a firm links to its network and (2) the composition of the network that a firm is linked to. The best way for an organization to link to its network is by means of embedded ties, which provide better access to the benefits circulating in the network than arm’s-length ties. The optimal network structure to link to is a mix of arm’s-length and embedded ties, because each type of tie performs different functions: Embedded ties enrich the network, while arm’s-length ties prevent the complete insulation of the network from market demands and new possibilities. This suggests two propositions:

Proposition 7a: Organizational performance increases with the use of embedded ties to link to network partners.

Proposition 7b: Network structures that integrate arm’s-length and embedded ties optimize an organization’s performance potential; network structures comprising only arm’s-length ties or embedded ties decrease organizational performance potential.

In a study of the New York apparel industry, I found plausible evidence for propositions 7a and 7b using data on the network ties among contractors and manufacturers in the better-dress sector of the New York apparel industry over an 18-month period (Uzzi, 1996). I found that contractors had a

Figure 2. Network structure and embeddedness from a focal firm's perspective.



significantly lower failure rate when linked by embedded ties to their network partners and that being connected to a network comprising an integration of embedded ties and arm's-length ties, rather than a network comprising either embedded ties or arm's-length ties, significantly decreased the failure rate even further. Figure 2 summarizes this theoretical argument and the types of network structures a firm could be linked to. For illustrative purposes, each network is composed of contractors (circles) and manufacturers (squares) and has a first-order network made up of an actor's ties to its exchange partners and a second-order network made up of an actor's exchange partners' ties to their trading partners. Exchange relationships also vary in quality—thick lines and thin lines represent embedded ties and arm's-length ties, respectively. The underembedded network structure has first- and second-order networks that both comprise arm's-length ties. In this type of network, all ties are arm's-length: A contractor uses arm's-length ties to link to its manufacturers, who also use arm's-length ties to transact with their contractors. This network has low embeddedness and approximates an atomistic market (Baker, 1990). The overembedded network structure has first- and second-order networks that comprise embedded ties: The contractor uses embedded ties to transact with its manufacturers, who also use embedded ties to transact with their contractors. The integrated network structure exemplifies the hypothesized optimal, integrated structure. The focal firm's first-order network comprises embedded ties, and its second-order network is an integration of embedded and arm's-length ties. The conjecture drawn from these patterns is that the degree to which embeddedness facilitates economic action depends on the quality of interfirm ties, network position, and network architecture.

DISCUSSION

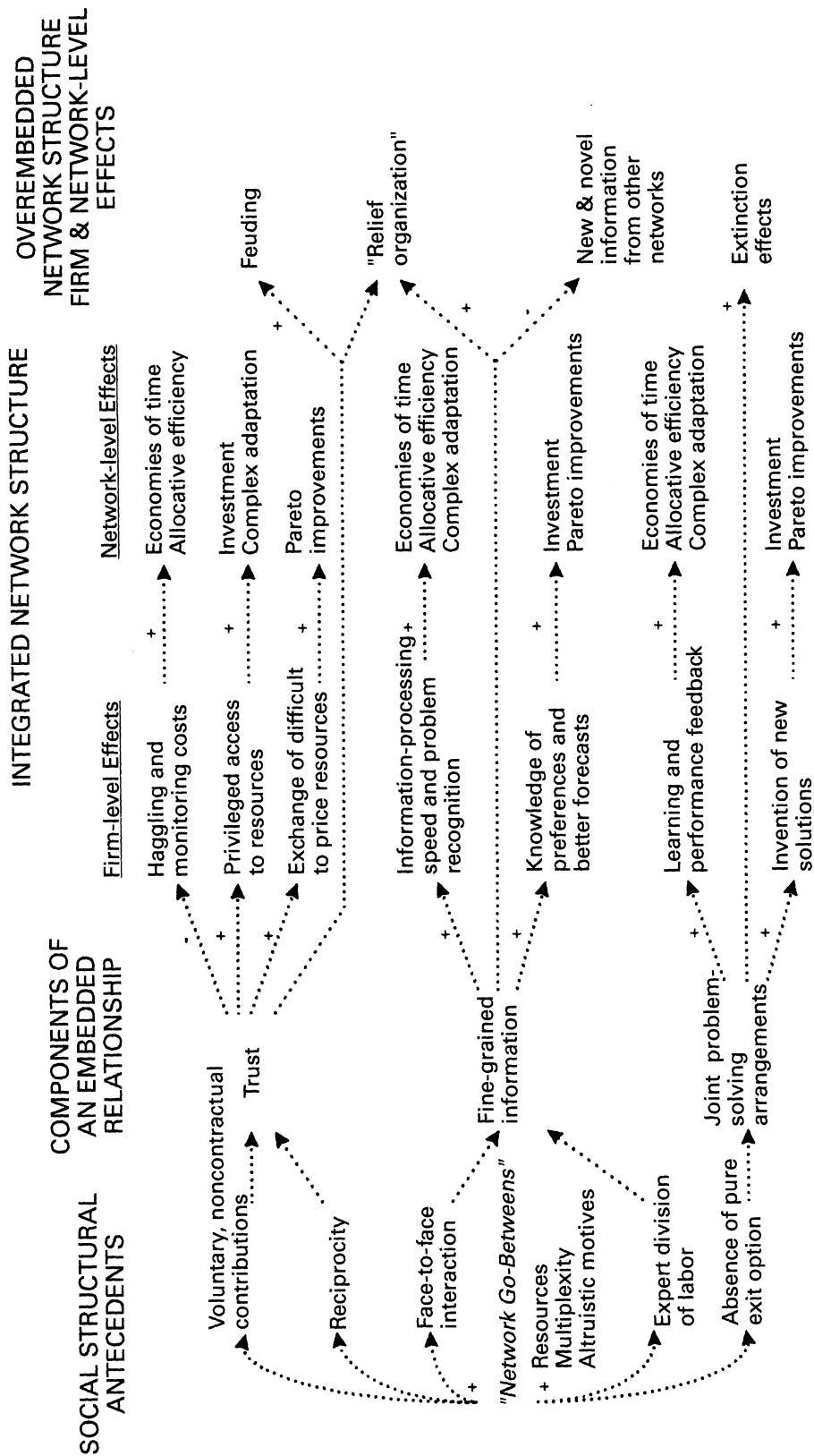
If economic action is embedded in networks of relations (Granovetter, 1985), then a logical first step is to specify the dimensions of embedded relationships and the mechanisms by which they influence economic action. This undertaking builds on the work of others who have launched the important enterprise of reintroducing social structure into the analysis of economic phenomena. In trying to demonstrate the unique organizational and market processes that follow from an understanding of social structure and economic performance, I analyzed the properties of embedded relations and how they create competitive advantages for firms and networks of firms.

While these processes and outcomes are not quickly summarized, Figure 3 diagrams the propositions and logic presented in the preceding sections into their antecedents and consequences. The figure lays out, from left to right, the social structural antecedents of embedded ties, the components of embedded ties, the positive outcomes of an integrated network structure, and the negative outcomes of overembedded networks. The plausibility of these propositions has been partly established in the empirical research analyzed here. Testing and refinement await future research.

The programmatic implication of this work is that embeddedness is a unique logic of exchange that results from the distinct social structure of organization networks and the microbehavioral decision-making processes they promote. In an embedded logic of exchange, trust acts as the primary governance structure. Calculative risk and monitoring systems play a secondary role. Information transfer is more fine-grained, tacit, and holistic than the typical price data of pure market exchanges, and joint problem-solving arrangements promote voice rather than exit. On a microbehavioral level, actors follow heuristic and qualitative decision rules, rather than intensely calculative ones, and they cultivate long-term cooperative ties rather than narrowly pursue self-interest. These factors furnish an alternative mechanism for coordinating adaptation, speeding products to market, and matching consumer demand to production.

This paper offers an explanation of the links between social structure, microbehavioral decision-making processes, and economic outcomes within the context of organizational networks. At the same time, it adds complexity to models of exchange such as game theory, agency theory, and transaction costs economics. Typical classification schemes differentiate these theories according to an actor's motivation (selfish or cooperative) and rationality (pure or bounded) (Williamson, 1985: 50). But I found that in embedded ties, an actor's motivation and rationality resist characterization within these distinctions, thereby demonstrating the unique logic of embeddedness. My findings suggest that in networks of close ties, motivation is neither purely selfish or cooperative but an emergent property of the social structure within which actors are embedded and that rationality is neither purely rational or boundedly rational, but expert. Thus embeddedness broadens the typical typology of exchange theories to include a new categorization for motives (emer-

Figure 3. Antecedents and consequences of embeddedness and interfirm network structure.



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gent rationality) and for rationality (expert rationality). Together, the emergent character of motives and the expanded nature of information processing sets embeddedness apart from other logics of exchange and situates social structure as a precondition to these psychological processes.

While structural embeddedness rests on different behavioral assumptions than revisionary economic accounts, it also shares commonalities and differences with these frameworks that have implications for future research. A key difference is that the unit of analysis is the relationship between and among actors. This unit of analysis shifts the focus of inquiry from the qualities of the transaction to the qualities of the relationship. Another difference is how structuration influences economic action. The cooperative behaviors that follow from an organization network are significant because networks are the sociological analogue of the type of small-numbers bargaining situations that in transaction cost, game, and agency theories are a fundamental source of opportunism and inefficiency (Harrison, 1994). In contrast, I have shown that firms in networks cooperate under ostensible small-numbers bargaining situations and end-game conditions. These differences suggest that future research might examine how different interfirm relationships affect the development of different types of transactions, inverting the logic of transaction costs economics. If embeddedness encourages firms to *increase* their asset specificity or to engage in repeated transactions that have uncertain future states, then there are significant implications for how learning and technology transfer are promoted in alliances. Future research might also examine when embeddedness can solve coordination problems without the need to integrate vertically or erect costly monitoring systems.

My finding that actors acknowledge differences between arm's-length and embedded ties and designedly use them has implications for research in network analysis, where it is often proposed that network structure alone virtually determines action (Emirbayer and Goodwin, 1994). Burt's (1992) foundational work takes this structural approach to its most natural conclusion: A network structure rich in structural holes is virtually all that is needed to induce information and resources to flow through the network like electric current through a circuit board. Understanding the difference between embedded and arm's-length ties can add to these theories by specifying how an actor's ability to access the opportunities of a contact or network strategically depends on the quality of the relationship that connects them and how it is managed.

This research extends classic statements of embeddedness. Polanyi (1957: 43–68) argued that the embeddedness of economic action in preindustrial societies was for all intents and purposes supplanted in modern life by the logic of efficient markets. Elaborating on this view, Granovetter (1985) argued that virtually all economic behavior in modern life is embedded in networks of social relations that condition economic processes in ways that Polanyi and neoclassicists only faintly recognized. My work adds complexity to both of these views. Like Polanyi, I found that in the apparel industry at least, atomistic relations govern some transac-

tions. Yet, consistent with Granovetter, I found that atomistic relations occupy a confined area of economic life and that the critical transactions on which firms depend most are embedded in networks of social relationships that produce positive and unique outcomes that are difficult to imitate via other means.

Granovetter (1985) also argued that institutional economics overly emphasizes the selection mechanism of efficiency in explaining the existence of organizational forms. I found that the functioning of organization networks depends in part on historical and institutional factors, as well as their ability to satisfy non-efficiency-based selection mechanisms. Like Schumpeter (1950), I found that organization performance can depend on the ability to service niche markets, which requires that the firm bring products to market quickly and adapt rapidly, rather than to optimize cost efficiency. Embedded networks offer competitive advantages of precisely the type Schumpeter conjectured: entrepreneurial firms adept at innovating and organizing a shifting network of talent, products, and resources. This implies that future research might examine how markets function and competitive dynamics unfold when organizations compete on the basis of their ability to access and reconfigure an external pool of resources and partners rather than firm-based competencies.

Finally, some caveats may be in order, given that my argument is grounded in observations from one industry. First, because I focused on fleshing out the concept of structural embeddedness, I necessarily neglected other types of embeddedness that affect organizations, including cognitive, institutional, and political embeddedness (Zukin and DiMaggio, 1990; Oliver, 1996). Second, the small employment size of these firms and the personal nature of interfirm ties in this industry may provide an especially fertile ground for embeddedness that might not exist for larger firms. As firms grow, ties among individuals may become insufficient sources of embeddedness, and other social mechanisms such as interlocks or shared equity may then be needed. Studies of large Japanese firms show, however, that the critical factor may be organizational form rather than size (Dore, 1983; Gerlach, 1992). If this is true, and the trend toward smaller, flatter, more connected organizations continues, networks could become an important mode of organizing. Third, the fashion- and quality-sensitive nature of better-dress firms may make economies of time, allocative efficiency, and complex adaptation more competitive advantages in this industry than in others.

Embeddedness is a puzzle that, once understood, can furnish tools for explicating not only organizational puzzles but market processes such as allocative efficiency, economies of time, Pareto-improvements, investment, and complex adaptation. While these processes are sociological, they have needlessly been the subject of only economics, both because of a historical division of labor between the disciplines and because organization theorists have been reluctant to study problems that are not within the boundary of the firm (Swedberg, 1994). As economists pay greater attention to organizational issues and the field of organization

theory matures, this division of labor appears outmoded. The interconnected and institutional character of the world economy denotes an opportune time for economic sociology to contribute to the theory of markets in a way that connects organization theory with an understanding of the social mechanisms that underlie market allocation processes.

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APPENDIX: Open-ended Interview Items

Because many of the data were collected ethnographically, these items summarize the questions but only partly convey the nuances and details of the lengthy, interactive, and face-to-face discussions reported in the text.

Internal organization:

Is this a proprietorship, partnership, or corporation?
How many years of industry experience do the principals have?
Do you produce any products in-house?
Why do you contract instead of produce in-house?
Do you outsource work that was done in-house?
Is the decision to produce in-house primarily financial, organizational, or historic?
How many firms work for you per year?
How many retailers do you typically sell to in a year?

Market and product characteristics:

What are the characteristics of your product?
How is your production organized?
How sensitive is your product's demand to quality, price, and fashion trends?
How has your market changed in the last 5 years?
How has the firm adapted to these changes?
What does it take to succeed in this business?

Forming interfirm contacts:

How do you contact new contractors?
When will you use new contractors?
What role does reputation play?
How does the typical relationship begin and develop over time?
Are written contracts used and when?

Interfirm interaction:

What kinds of relationships do you form with contractors?
Is opportunism a problem?
How do you protect yourself?
How are disagreements resolved?
How do you manage the tradeoffs?
In what ways is power gained in a relationship?
When are you most vulnerable in a relationship?
How do you respond to poor performance?
How do you react to a contractor that passes on his price increases?
What happens when a new contractor offers you a lower price than your present contractor(s)? Do you visit your contractor's shop?
In what way do you reward good performance?

Network outcomes:

What benefits do you get from each type of relationship?
What are the downsides?
How do you set prices for goods and services?
What kind of information is shared in different relationships?
Please describe your contractual agreements with regard to setting performance and price.
How are new products created and test marketed?
How are investments in new equipment made?
How do firms borrow money or get loans?
How do you increase your ability to respond to the market?
What promotes innovation?
What events or conditions lead to close business relationships?
What mechanisms are effective in reducing costs?
Do you attempt to attain a specific mix of relationships?
What prevents you from attaining the mix you want?