

ABSTRACT. A policy innovation that has achieved widespread diffusion across national and sub-national governments in industrialized countries is the promotion of networks among small manufacturers as a means of promoting competitiveness. However, research and evaluations of formal networks formed in response to policy initiatives tend not account for the informal networks that small manufacturers routinely use in gathering information and business resources. This study examines the use of informal networks by 50 small manufacturing firms in rural and urban regions of northern Florida. The analysis is inductive and designed to provide a point of comparison to the growing literature on formal small manufacturing networks. Unlike formal networks, the links that comprise informal networks tend to be geographically and socially mixed. Small firms use informal networks to gather information on a mix of issues. Urban and rural firms have similar patterns of network use on issues affecting product development and competitiveness. But they have different patterns of network usage for issues associated with exporting and labor problems. Informal networks draw upon local and non-local information resources that do not require significant amounts of interpersonal contact across actors. Proximity is not a factor in the effective use of informal networks for information purposes. Rather the emphasis is upon locating "tried-and-true" solutions that solve the business needs. There is little evidence suggesting that the informal networks that these small manufacturers use are gravitating towards or seeking the development of formal networks. Thus, policy prescriptions identifying barriers to networking among small manufacturers are borne out in this study.

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1. Introduction

Networks have become well established during the past decade as a form of industrial organization located between market and hierarchies, but being neither one (Perrow, 1992; Powell, 1990; Thorelli, 1986). The importance of networks to small firms, in particular, is well-documented (Julien, 1995; Malecki and Tootle, 1996). The evidence has been sufficiently compelling to convince governments across the globe at the national and sub-national levels to expend resources towards the creation, support and maintenance of networks amongst small firms with an emphasis on the competitiveness of small manufacturers (Pyke, 1994).

While policy and praxis have rushed to use this new tool of economic development, our methods of evaluation confront limitations. There have been remarkable advances in the study of networks over the past several years. Social network analysis has provided an array of methods and measures for describing the structure of a network through a language of relational variables (Wasserman and Faust, 1994). Similarly, economics and management studies have used game theory, transactions cost analysis and cultural analysis to reveal the nature of exchanges within a network (Osborn and Hagedoorn, 1997). But all of this work begins with *a priori* specification of a network by a researcher or policy maker.

This starting point may be problematic for assessing policies designed to stimulate networks. What we would like to know are (1) factors that lead to the creation and evolution of a network, and (2) whether these networks are achieving good results for an acceptable number of participants. When evaluators or public officials define the existence and boundaries of a network *a priori* we may obfuscate important social relationships that underlie the network and threaten the validity of research findings (Laumann et al., 1989).

In this paper, we explore the nature of this



specification problem by drawing a distinction between the formal and informal networks used by small manufacturers in rural and urban counties of northern Florida. Researchers have employed an astonishing number of definitions of networks (Nohria and Eccles, 1992; Scott, 1991). We define formal networks as intentionally formed groups of small to medium sized profit-oriented companies in which firms are geographically proximate, potentially share inputs and outputs, and undertake direct interactions with each other for specific business outcomes. This definition is drawn directly from evaluations of public policies promoting networks among small manufacturers (Bosworth and Rosenfeld, 1992; Human and Provan, 1997, Shapira, 1998). Informal networks have not received the same sort of attention in the evaluation literature. We define informal networks as a group of organizations, including public, private and not-for-profit entities, who are sufficiently interested in the economic viability of a specific small manufacturing firm, and whose knowledge and opinions the firm sufficiently values that the firm will seek out and enter into regular information exchanges about issues relevant to the firms competitiveness. The distinction between formal and informal networks is rarely made in research and evaluations.¹ A formal network is one where the participating organizations have explicitly agreed to a shared objective requiring some level of coordination of actions and resources. An informal network is not bound by an explicit agreement that links all participants but rather is bound entirely by mutually reinforcing self-interests.

In this study we seek to make two contributions to the growing literature on networks. First, we ask in what ways do small manufacturing firms use informal networks for gathering information and business resources for competitive purposes. Second, we seek to broaden our understanding of firm behavior by studying informal networks in both urban and rural regions where there are fewer firms and services (Dubini, 1988 and Davidsson, 1995 study this contrast referring to dense and sparse regions). The focus upon informal networks offers an interesting vantage for examining the assumptions underlying public and private sector policies promoting formal networks among small manufacturers. We review the literature con-

cerning formal networks and provide a comparison with our empirical findings on firm behavior in informal networks. Most studies focus upon formal networks located within "industrial districts" where there are dense clusters of firms and services (Malecki, 1997). Through this data we present an empirical contrast of the behavior of firms as they use informal networks in urban and rural regions.

The literature regarding small manufacturing networks is not extensive, and that which exists rarely is designed to build or test theory. The literature regarding the use of informal networks by firms is, if anything, even less extensive. Consequently, this study is not grounded in, nor does it test, a particular theory. Instead, our research questions are explored inductively by examining data from 50 firms distributed across rural and urban regions of northern Florida. We use the data as a means of informing theory development and to examine the policy assumptions currently in use to promote networking activity. Our reasoning for using an inductive approach is similar to that found in other recent studies of small manufacturing networks (see Human and Provan, 1997).

2. Formal network policies and practices

Efforts to promote formal networking, by both the public and private sector, have reached a sufficient stage of maturity that practitioners now have distinctive models from which they can choose. Indergaard (1996) argues that formal networks are being established around either a resource mobilization strategy or a social mobilization strategy. The resource mobilization model brings together small grants, small firms and professionals trained at facilitating networks (usually drawn from the private sector). The goal is to create a business opportunity. The social mobilization model uses grants to trade associations and regional service organizations targeted at specific industries to stimulate collaborative activity by providing an array of modernization services. Rosenfeld (1996b, p. 249) points out that the first model is inspired by Danish approaches to networking while the second has its origins in the Emilia-Romagna region of Italy. "This, in essence, is the dichotomy that is occurring in the U.S.; encour-

aging a practice hoping to change the culture (the Danish approach) or establishing the culture hoping that it will lead to the common practice of collaboration (the Italian approach)."

Both models share the fundamental assumption that cooperation among small manufacturers needs to be stimulated in some fashion. They argue that in most instances small firms do not have the capital (human or otherwise) to be able to forge a network without assistance. Both models also agree on the catalysts for change: small incentive grants, expert advice on modernization, expert assistance on the social and business dimensions of networking, and trust among firms. Recent evaluations tend to indicate that both approaches to formal networking have produced successes within industrial districts (Indergaard, 1996; Pyke, 1994; Rosenfeld, 1996a, b; Shapira et al., 1997; Sommers, 1998).

In the U.S., major public agencies have become advocates for formal networking, particularly of small manufacturers. The Manufacturing Extension Partnership (MEP) of the National Institute of Standards and Technology (NIST) has encouraged networking as an effective economic development tool among state extension agents. Oregon has made extensive use of small firm networks through the Key Industries Program. Some state economic development organizations, such as those in New Mexico and Oklahoma, have adopted the networking philosophy to such a degree that they have even organized industrial modernization service providers into extension networks.

Perhaps the largest effort at promoting formal networking in the U.S. over the past few years has been through USNet. This project was a pilot initiative, from 1994 to 1997, for building the capacity of its partners to promote inter-firm collaboration, with the ultimate aim of enhancing the competitiveness of small and mid-sized manufacturing enterprises (SMEs). Partners consisted of state manufacturing assistance organizations and the MEP. Federal funding for USNet was granted through the Technology Reinvestment Project, under the administration of NIST. The federal funds were matched by state and local funds and in-kind contributions provided by each partner.

Under USNet, a network was defined to be a

group of three or more companies who have joined together – mutually or through an association or other hub organization – for common business purposes, such as production, marketing, technology development, or learning. While USNet trained people to act as network "brokers" they were not committed to promoting one model of inter-firm collaboration. In fact, they freely borrowed from both the Danish and Italian models in the design of networks.

Through USNet, 695 participants were sponsored by the states to receive training in the creation and support of networks. An evaluation of the USNet project (Shapira, 1998) found that small firms did benefit from participation in formal networks but that states were reluctant to change their existing policies, organizations, and programs to become more forceful advocates. However, federal support proved to be a strong catalyst for promoting inter-firm collaboration at the state level and aided shared learning. While this project has now come to an end there are vestiges of the program scattered across the participating states and within the MEP program.

3. Glimpses of informal networks

Evaluations of USNet and other studies of formal SME networks have found indications that effective networks may be predicated upon previous informal relationships among participating firms (Kingsley, 1996; Lichtenstein, 1992). In other words, small firms may operate within networks of informal relationships that may prove important when more formal relationships and objectives are introduced. There has been some research into the types of informal relationships that small firms maintain. For example, Easton and Araujo (1992) found a rather large number of non-economic exchanges taking place between firms or, more accurately, between the people in different firms. However, such studies tend to focus on dyadic or triadic relationships and stop short of identifying the network of these informal relationships. We review this literature, as well as the SME networking literature, as a means of identifying how small firms might use informal networks. Consistent with an inductive approach, we use these glimpses as a focus for analysis of the data.

Perhaps the single most important business function that small firms turn to informal networks for assistance is to secure information about their operating environment. Friendships provide regular, inexpensive, and swift routes both to customers via referrals and to reliable marketing information, as ideas are "bounced off" friendly contacts (Shaw, 1997). The most productive ties are those which remain informal; formalization appears to inhibit collaboration (Dickson, 1996). However, small firms tend to be fairly conservative in their use of information from informal networks. Information is far more likely to come from traditional, familiar or "tried and true" sources that have been used previously, rather than from new or nontraditional sources, such as universities or federal programs (Glasmeier et al., 1998). Many firms deal with information acquisition only in a time of "crisis" that forces firms to seek information from these nontraditional sources (Freel, 1998). Thus, under normal circumstances, firms will learn little, change little, and innovate in an incremental fashion (Glasmeier et al., 1998; Lütz, 1997).

There are several factors that seem to be important to a small firm's willingness to use informal relationships for information: trust in the information source, proximity, and whether or not the firm has multiple relationships engaged in the information exchange. The first of these, trust, makes the rather obvious and popular point – small firms must place some level of trust in the relationship in order for it to serve as an information source. However, there are a number of forms that trust can take. Ring (1997) proposes two kinds: fragile and resilient. Fragile trust comprises norms that substitute for formal control to simplify economic relationships. Resilient trust, by contrast, is an enabling condition that facilitates formation of networks through increasing the predictability of the goodwill of others. In general, a common culture facilitates resilient trust. It is worth noting that experts and authorities are not necessarily the ones trusted in an informal network. Within small firms, as other types of organizations, trust often develops outside the roles and limits of formal relationships and hierarchies (Krackhardt and Hanson, 1993).

Lorenz (1988) shows how trust is developed only over time among subcontractors, who rely on

each other for work. Many of the easiest bonds to build are based on geographical proximity, but the relationship remains one intermediate between friend and stranger. The importance of local relationships has led to the observation that some regions are able to show evidence of collective learning over time, utilizing the close bonds among firms, as well as with and among local institutions, leading to a small number of learning regions (Asheim, 1996). Institutions, such as trade associations, provide an institution-based trust that allows and reinforces personal trust (Lane and Bachmann, 1996). This occurs in part because connections can be formed between local sources of expertise and the system of codified knowledge associated with science and technology. The Italian experience suggests that these institutions must be local rather than national (Brusco, 1996). In general, industrial districts are the regions most associated with such territorial learning (OECD, 1996). The related concept of regional innovation systems evokes the same idea (Braczyk et al., 1998).

The importance of local sources of expertise points to the second factor that may prove important to the willingness of small firms to use informal networks as a source of information: proximity. For small firms and new firms, it is generally believed that contacts are especially likely to be local. Small firms tend to become involved in informal arrangements with other small firms, as a natural consequence of familiarity among individuals (Julien, 1995). Indeed, it is the frequent face-to-face interaction that means most to small firms (Sweeney, 1987). This is in part because of what von Hippel (1994) calls "sticky" information, the exchange of non-routine or tacit knowledge that typically must be exchanged face-to-face. The importance of proximity to small firms is also seen in the network of linkages between a firm's internal resources and the resources in its surroundings (Malmberg and Maskell, 1997). When such networks are particularly dense, the relationships reciprocal, and well grounded in the local political economy the resulting agglomerations have been identified as learning regions (Flora et al., 1997).

The willingness of small firms to draw upon informal networks is also influenced by whether or not the firm is pursuing multiple relationships

in the information exchange. For example, at different times relationships in an informal network might exhibit elements of being a friendship, a mentoring relationship, or a cooperative relationship for engaging in community support or philanthropy. For small firms, multiple relationships in an informal network may reinforce the value placed on this source of information. Multiple relationships may also mix informal relationships with formal relationships. The sequence from personal networks to business networks to strategic networks suggests that friendships are a common starting point for the networks of businesses (Butler and Hansen, 1991; Dubini and Aldrich, 1991). Dodgson (1993) also demonstrates how personal links can grow into strategic collaborations. Firms may also use the multiple relationships of informal networks to improve their competitive position. There is always a tension, however, between trust and competition within networks (Mønsted, 1995). There are advantages to cooperation among competitors. Herrigel (1993) shows that trust-based, collaborative subcontracting among small firms is a means both of socializing risk and of expanding each firm's capabilities.

Our review of the literature also identified judgment calls that researchers must make in the study of formal networks that may hinder our ability to observe the influence of informal networks. Our approach to the specification of the informal networks is an adaptation to some of the limitations identified in the literature.

The first of these judgment calls is identifying which firms should be included in the network. Most studies of small manufacturing networks rely upon researchers or key informants within a sponsoring agency to provide boundary specifications (Kingsley and Klein, 1998). Thus, this judgment call has two dimensions: (1) what criteria will be used to determine membership in the network?; and (2) who decides? For small networks this may not be a problem as all the members can easily identify one another. But many formal networks have numerous members. For example, Human and Provan (1997) studied two formal networks of Kentucky wood product manufacturers whose membership number 60 and 77 firms. These numbers can be quite daunting for researchers as social network analysis involves both qualitative

and quantitative data collection that seeks complete coverage of the network during fieldwork. Researchers will opt for specifications that are consistent with the theory that is being tested in the study. This focuses the sampling strategy to those firms that are active in the criteria of interest.² There is a tradeoff in this judgment call. By focusing only on the active members, we miss critical relationships that may be based upon weak ties. Similarly, information about various subgroups, such as cliques and clusters, within the formal network can be limited. In the absence of any theoretical or programmatic rationale for studying informal networks, the additional data collection effort will be unwarranted. Given the complexity of the data collection exercise associated with network studies this is a tradeoff that most researchers can be reasonably be expected to make.

A more serious form of this bias is seen in the exclusion of public organizations in the analysis of the formal networks. Virtually all studies of formal SME networks focus solely upon the interactions among small firms (Kingsley, 1996). The policy objectives of research and evaluation sponsors tend to reinforce this exclusion. Because the policy objective is to stimulate the interaction amongst private sector firms the analysis is limited only to the relations between these small firms. Public sector sponsors of evaluations actively encourage this bias because their own performance measures are focused on demonstrating activity within the network. However, Kingsley and Klein (1998) found that in 126 case studies of formal SME networks, over 90% received some form of public monies to initiate or maintain the network. If our objective is to understand what makes formal networks viable it is important to capture this resource base.

In a similar vein, public agencies often have a role in identifying and recruiting brokers for SME networks. Most formal SME networks in the U.S. have been broker-led or coordinated networks, in which a great deal of responsibility and activity was in the hands of a coordinator, who often was the main "glue" holding a network together. Malecki and Tootle (1997) found that the role of the coordinator or broker generally was central to the success of the networks. The most effective coordinators acted as gatekeepers in two dimen-

sions. First, they were externally oriented and brought in information from and about other networks in other places. Second, they coordinated and took advantage of other institutions, programs, and facilities in the local region that could be of benefit to some or all of the firms in the network. Through this gatekeeper role, the network coordinator could provide useful information and services to the member firms. They did this by building trust in the network as an entity in its own right and building trust among the firms through one-to-one pairings which facilitated the information and knowledge exchanges and the learning efficiency characteristic of well-oiled networks in industrial districts and other regions (Sweeney, 1996).

Human and Provan (1997) offer a useful distinction between the "administrative network," which is the central organizing hub of the network, and the "interactive network," which is the interactions among the network membership with each other. Using these concepts, the exclusion of public sector organizations and service providers from the network analysis effectively means that the study is limited to the interactive network. Case studies of formal networks indicate that public organizations and service providers interact with formal networks through both the administrative network and directly with the interactive network (Kingsley and Klein, 1998; Lichtenstein, 1992).

An important question from a policy perspective is whether all of these different types of behaviors are relevant to the policy objective of formal networks. This is particularly troublesome when the network receiving policy support is built upon a pre-existing informal social network. For example, case studies of formal networks have frequently noted that the observed inter-firm collaboration was facilitated by prior friendship relationships among participating executives or through programs sponsored by trade associations (Lichtenstein, 1992; Rosenfeld, 1996b). Researchers, in effect, are faced with deciding whether to attribute the observed exchanges among firms to a short-lived policy or these longer established informal relationships. However, before we can even approach this question we need to have a better understanding of how small firms use informal networks.

4. Data collection

Because one of our goals is to contrast the use of informal networks in both urban and rural regions, we examined firms based upon a geographic selection criterion. Interviews were conducted with 50 small manufacturing firms located in several northern Florida counties. For comparative purposes 39 firms were located in seven rural counties, ranging in population from roughly 95,000 to 6,000, and 11 firms were located in the more industrial locale of Jacksonville, Florida, where the metropolitan area population is over 650,000.

The interviews were anchored by a questionnaire that addresses several areas in which small firms may require external information including issues associated with regulation, competition, exports, quality, and labor. The instrument consists of structured questions inter-laced with open-ended questions (the relevant elements of the interview protocol are provided in the Appendix of this article). The structured questions ask firm owners or managers to identify sources of information and sources of assistance or technology that they use to address these issues.

We imposed no restrictions on the definition of the informal network. Rather, our geographic selection merely established a starting point for identifying the informal networks within which each of the 50 firms interacted. In this sense our network specification method has a snowball quality where we begin with a single firm and build out to identify the nature of other network members. However, we did limit the investigation to the business relationships of the firms. Our objective in doing so was to understand how informal business networks contribute to the information gathering of the individual firm for competitiveness purposes.

Some interesting companies participated in this study including:

- A developer of potato harvesters and debris eliminators for which Frito-Lay is a major customer and conduit to export markets;
- A painted stained glass manufacturer who often names his price for once-in-several-hundred-years church restorations;
- A producer of laboratory countertops made

from state-of-the-art materials that can withstand heat up to 6000 °F;

- A producer of dog cages and other accessories for the booming law enforcement market;
- A manufacturer of diving equipment developed especially for cave-diving.

Other firms produced less exotic products such as pork sausage, composted cow manure, roof trusses, farm gates, sheet metal ductwork, and fiberglass boats.

The research design for this study was developed shortly after the collection of data from the small firms of northern Florida. Consequently, the match between the data and our goal of theory building is not exact. Recall that in our review of the literature we identified several targets for further study regarding how small firms might use informal networks. Chief of these is understanding how small firms use such networks to gather information. Critical factors identified in the literature affecting a firm's willingness to use informal networks for information purposes are trust, proximity, and the pursuit of multiple objectives through an information exchange. This data set is most useful in addressing the later two of these factors. Trust is a topic that was discussed in the

semi-structured interviews but not explored in the structured items. Accordingly, the evidence concerning trust as a factor is limited. We have also restricted our focus in this study to information gathering for competitive purposes. This leads us to limit discussion of the use for informal networks by small firms for regulatory issues.

5. A discussion of the empirical evidence

Tables I and II provide a break down of the sources of information for the 50 small firms and the types of issues that inspired these firms to seek out information. Tables Ia and IIa break this data down by firms working in urban and rural regions. Below we discuss some of the major differences in the use of informal networks for information between urban and rural firms.

Overall the firms are small, with urban firms having a slightly larger mean size of 25.3 employees v. 23.2 for rural firms and a median of 15 employees in both types of regions. Urban firms were slightly older than rural firms (24 years v. 20 years), but firm age was uncorrelated with size at 0.00815. The firms cover a range of industrial sectors, with the largest number involved in metal fabrication (SIC 34). However, the SIC

TABLE I
Demand or need for external information and most frequent sources of information across all firms

Area of information need	Demand (number of firms using external sources)	Most frequently used external sources (of those firms using an external source)		
		Most frequently used source	Second most frequently used	Third most frequently used
Product development	45 (90%)	Customers (60%)	Other firms (40%)	Suppliers (38%)
Customer mandates	45 (90%)	Customers (44%)	Suppliers (44%)	Other firms (41%)
Occupational safety and health	38 (76%)	Federal agency (54%)	Other firms (41%)	State/local agencies (27%)
Local and state regulations	33 (64%)	Local or state agency (84%)	Other firms (9%)	5 sources (3% each)
Labor	32 (64%)	Other firms (32%)	State agency (26%)	Community college (15%)
Environmental issues	32 (66%)	Federal agency (38%)	State agency (34%)	Consultants (22%)
Exporting	29 (58%)	Customers (59%)	Other firms (38%)	Trade shows (34%)

Note: Firms may have used more than one source for an area of need.

TABLE IA
Demand or need for external information and most frequent sources of information, by urban and rural location

Area of information need	Demand (number of firms using external sources)		Most frequently used external sources (of those firms using an external source)		
	Rural firms	Urban firms	Most frequently used source	Second most frequently used	Third most frequently used
Product development	34 (87%)	11 (100%)	Rural: Customers Urban: Suppliers	Rural: Other firms Urban: Customers	Rural: Suppliers Urban: Other firms
Customer mandates	34 (87%)	11 (100%)	Rural: Customers Urban: Suppliers	Rural: Other firms Urban: Other firms	Rural: Suppliers Urban: 3 sources tied
Occupational safety & health	32 (82%)	6 (55%)	Rural: Federal Urban: Federal	Rural: Other firms Urban: 3 sources tied: state or local agency, natl trade assoc, other firms	R: State or local agency Urban:
Local & state regulations	25 (64%)	8 (73%)	Rural: State or local agency Urban: State or local agency	Rural: Other firms Urban: Other firms and consultants (tie)	
Labor	27 (69%)	5 (45%)	Rural: State agency Urban: Other firms	Rural: Other firms Urban: 3 sources tied	Rural: 2 sources tied
Environmental issues	26 (67%)	6 (55%)	Rural: Federal agency Urban: Federal agency	Rural: State or local agency Urban: State or local agency	Rural: Consultant
Exporting	20 (51%)	9 (82%)	Rural: Customers Urban: Customers	Rural: Other firms Urban: 4 sources tied	Rural: Tradeshow

categories mask the significance of the market niches in which many of the firms operate. Several of the firms have carved out niches in which they experience little competition. In some cases, this is the result of serving local market demand. In other cases, the firm serves a narrow market world-wide.

Export-oriented firms were quite distinctive among the firms interviewed. They were much more likely to be an urban firm (82% of urban firms are exporters v. 44% of rural firms). Urban exporters were more likely to be among the largest firms interviewed in this study. Urban exporters were more likely use trade shows as an information resource (2.3 shows per year v. 1.7 shows for rural firms). In contrast, rural firms are more likely to use national trade associations to pursue information about exporting as well as more general information about the firms competitive position (41% v. 18% for urban firms).

Urban firms were more likely to view themselves as operating at the state-of-the-art in technology (67% of urban firms v. 36% for rural firms). Urban firms were also more likely to have customers who were demanding and setting standards for product quality (91% v. 61% for rural firms). For purposes of product development both urban and rural firms rely upon information from their customers. However, urban firms were much more likely to turn to suppliers for information and also seek out written sources of information for product development. Rural firms did not always seek technical assistance. An interesting insight from the open-ended questions is that even when facing a troublesome issue, many of these small rural firms consulted various sources of information and then resolved the issue internally.

Urban firms were much less likely to experience labor problems related to production and technical workers (9% v. 49% for rural firms).

TABLE II
Sources of information used by all firms interviewed

Information source	Number of firms using source at least once per month	Number of firms using source at least five times per month	Number of firms not using source
Customers	44 (88%)	34 (68%)	6
Written material	39 (78%)	10 (20%)	11
Suppliers	38 (76%)	16 (32%)	12
Other firms	28 (56%)	6 (12%)	22
National trade association	18 (36%)	0	32
Consultants	10 (20%)	1 (2%)	40
Internet sites	10 (20%)	3 (6%)	40
State/regional trade association	9 (18%)	0	41
Federal agency	8 (16%)	1 (2%)	42
Other	7 (14%)	4 (8%)	43
Local Chamber of Commerce	6 (12%)	0	44
University	5 (10%)	0	45
Network	4 (8%)	2 (4%)	46
Community College	3 (6%)	0	47
Local trade association	3 (6%)	0	47
State Industrial Extension	2 (4%)	0	48
US Chamber of Commerce	1 (2%)	0	49
State Chamber of Commerce	1 (2%)	0	40

TABLE IIA
Sources of information used by firms interviewed, by rural and urban location

Information source	Number of firms using source at least once per month		Number of firms using source at least five times per month		Number of firms not using source	
	Rural firms	Urban firms	Rural firms	Urban firms	Rural firms	Urban firms
Customers	34 (87%)	10 (91%)	26 (67%)	8 (73%)	5 (13%)	1 (9%)
Written material	29 (74%)	10 (91%)	5 (13%)	5 (45%)	10 (26%)	1 (9%)
Suppliers	27 (69%)	11 (100%)	10 (26%)	6 (55%)	12 (31%)	0
Other firms	23 (59%)	5 (45%)	6 (15%)	0	16 (41%)	6 (55%)
National trade association	16 (41%)	2 (18%)	0	0	23 (59%)	9 (82%)
Consultants	7 (18%)	3 (27%)	1 (3%)	0	32 (82%)	8 (73%)
Internet sites	7 (18%)	3 (27%)	2 (5%)	1 (9%)	32 (82%)	8 (73%)
State/regional trade association	8 (21%)	1 (9%)	0	0	31 (79%)	10 (91%)
Federal agency	6 (15%)	2 (18%)	1 (3%)	0	33 (85%)	9 (82%)
Other	6 (15%)	1 (9%)	3 (8%)	1 (9%)	33 (85%)	10 (91%)
Local chamber of commerce	6 (15%)	0	0	0	33 (85%)	11 (100%)
University	4 (10%)	1 (9%)	0	0	35 (90%)	10 (91%)
Network	4 (10%)	0	0	0	35 (90%)	11 (100%)
Community college	3 (8%)	0	0	0	36 (92%)	11 (100%)
Local trade association	1 (3%)	2 (18%)	0	0	38 (97%)	9 (82%)
State industrial extension	1 (3%)	1 (9%)	0	0	38 (97%)	10 (91%)
US chamber of commerce	1 (3%)	0	0	0	38 (97%)	11 (100%)
State chamber of commerce	1 (3%)	0	0	0	38 (97%)	11 (100%)

When urban firms did experience labor difficulties they were more likely to turn to other firms for information. In contrast, rural firms were more likely to turn to a state agency and community colleges for information associated with labor issues.

Rural firms tended to not be as aggressive in their pursuit of information as their urban counterparts. Executives in urban settings were much more likely to characterize their firm as actively seeking information about improvements to their product lines and their competitive position in the marketplace (64%). In contrast only 41% of the executives in rural firms felt their firm was pursuing an active and aggressive strategy for securing external information. Younger firms were the most likely to actively seek information (regardless of their location). Urban firms used a slightly larger number of information sources on a regular basis (a mean of 21.4 per month v. 17.9 per month for rural firms). Urban firms were also more likely to use the Internet as a means for gathering information (73% v. 49% for rural firms). Interestingly, the active pursuit of information does not include the use of manufacturing networks. None of the urban firms participated in an SME network and only 15% of the rural firms were associated with this form of formal network.

The least aggressive firms in seeking information were the very small firms (5 to 9 employees). This was true regardless of whether they are located in an urban or rural area. Among the larger firms interviewed issues of competitiveness nearly always prompted discussions with customers. However the very small firms were even unlikely to reach out to customers for information.

Collectively, these findings indicate that in rural regions, the nature and use of the informal networks by firms can often stand in sharp contrast to those found amongst urban firms. Perhaps the starkest contrast is offered by the active, even aggressive use of informal networks, particularly by young, relatively large, urban exporters which are markedly different from older, smaller, rural firms serving regional markets.

The findings of this study are consistent with the research literature in that customers are the leading information source (Glasmeier et al., 1998; Karakaya and Kobu, 1994). However, this study

also supports some of the surprising findings of Malecki and Veldhoen (1993) that information sources expected to be important, such as competitors and contacts made at local business meetings and at social gatherings, were among the least important external sources of information. Malecki and Veldhoen also found that impersonal and non-local sources such as trade shows and trade publications were especially prominent to these firms. In our study trade associations and trade shows also appear to be an important source of information. Also, impersonal forms of communication via written documents and the Internet were important sources of information. Not surprisingly, the sources of information for export oriented firms (58% of the firms interviewed) were not local in nature. However, the non-local nature of information sources was also found among firms serving domestic and even local markets.

These firms seem to have adapted to the thin local sources of information by developing strong informal networks outside the region for the identification of customers, suppliers, and inputs. These external sources of information – especially trade shows – provide them with the knowledge needed to compete in increasingly small, flexible, and custom market niches. This is consistent with Sharland and Balogh's (1996) finding that trade shows play an important role as a particularly useful and relatively low-cost way to obtain information about competitors, new technology, and potential partners. The high density of opportunities for information exchange at such shows lower search costs for new information (Florio, 1994).

It appears, then, that informal networks can take on non-local as well as local dimensions. This tends to belie the importance of proximity as a determining factor in the structure of informal networks or as to whether the small firm will use an information source. The resulting informal network can be a geographical mix of local and non-local links. Similarly, small firms appear to be comfortable with a mix of different types of information sources. Some are relatively impersonal, such as written communications, or the Internet. Others can be highly personal such as social relations with long-time business relationships.

The firms also exhibited multiple relationships being pursued in the information exchanges. For

example, in the open-ended questions there was evidence of informal linkages that build upon social ties of friends and business acquaintances. There are also informal linkages that might be used for information concerning product development, exporting, and other issues such as labor. Most importantly, informal linkages often reflected the input-output connections of the firm. Suppliers and customers provided information to small firms that went beyond the bounds of what is contractually required in their business relationship. Having forged a successful pattern of business, there was evidence in this study that small firms could and would turn to both suppliers and customers in both an informal and formal capacity. In some ways, this might be seen as a natural outgrowth of a long-term working relationship. However, the more active the small firm in cultivating and using informal networks for information, the more likely they were to have both informal and formal patterns of communication with suppliers and customers.

One consequence of the mixed nature of these informal networks is that it makes building a local network more difficult for owner/managers. These respondents were stretched in their time commitments. Having fashioned an informal network that "works", small firms are either reluctant to make an investment in a local equivalent focused only on neighboring firms or they are willing to allow the network they have in hand to supplant consideration of local relationships. Even if the firms are complementary, each will already have an established set of suppliers, subcontractors and customers. There is little motivation to change or add even one more firm to their list of contacts.

This reluctance was most evident among rural firms. Malecki and Poehling (1999) make a distinction between extroverted, as measured by the number of linkages to other organizations that firms actively pursue, and introverted firms. Our discussion of network structure is consistent with many of the attributes of the extroverted and introverted firm. As was noted earlier, urban firms are more active in seeking out information sources. Rural firms did not have the same number of links in their networks nor were they likely to be as active in developing the informal network structure or using information available through the network. A question for future research is whether

the costs associated with information gathering in a rural region are the source of networks structures that are more sparse or, to use Malecki and Poehling's term, causing rural firms to be more introverted.

In the unstructured responses, executives and managers of small firms would on occasion mention the importance of trust in their efforts to secure information and in their willingness to build informal networks. However, effectiveness criteria also seemed to be equally important, if not more important, in these linkages. The reliance upon trade shows offers a glimpse of this motivation. This research found that exporting was the most common purpose for which firms used trade shows to obtain information. For many firms, such shows are their only contact with foreign customers, export agents, government agencies, and others with expertise in exporting. Trade shows also are used in gathering information for product development. The infrequency of these contacts and their utilitarian purpose raises questions about the nature of trust associated with this linkage. A question for further study is whether firms use institutional substitutes, such as the trade show itself, for determining the trustworthiness of those in which they interact.

The mixed and utilitarian nature of informal networks indicates a pattern of adaptation to compensate for the absence of local resources. However, there are indications of behavior that are consistent with networking, both informal and formal, in industrial districts. This is evident in the reliance upon other firms as a very important source of information. Overall, they represent the second-largest source of external information, following customers, traditionally the most frequently consulted source. We found that customers are the primary information source only for competitive issues, such as product development, meeting customer mandates (such as improving quality, delivery and price), and exporting, and that they rank only fifth for informing regulatory issues.

It is also striking that other firms are the leading source of information for labor issues. Hiring reliable and qualified workers for production workers as well as technical and skilled jobs, was a persistent problem for the 50 firms interviewed during 1997 (particularly for firms in rural

regions). Most of the owners and managers of firms we talked with had few tried-and-true solutions to this problem. Consequently, they turned most frequently to their colleagues in other businesses in their area, both for information and for assistance in solving the problem, which might involve temporary use of expertise in another nearby firm.

Who are these other firms? In addition to the owners and managers of other small businesses in the vicinity, "other firms" more often were accountants and family members also in business (nearby or elsewhere). When we probed this category, sales representatives ("reps") were frequently mentioned. While little is known about how "reps" fit into firms' informal networks, we can hypothesize that they comprise a formal link that, in the best case, grows to be a trusted source of knowledge about customer demand in the marketplace.

Other sources, such as consultants, universities, trade associations, and Internet sites, were commonly used in times of "crisis" rather than as tried-and-true sources. Other firms rank along with customers, suppliers, and written material (including, prominently, trade journals) as the central sources of information within the informal network of the small firm.

Interestingly, only 15% of the rural firms participated in a formal SME network. None of the urban firms reported this type of affiliation. However, these firms used the formal network extensively and benefited from participation. In one case, the firm was closely associated with the Florida MEP sponsored by the State of Florida and NIST. The MEP extension agent was a de facto member of the firm's board. In the other case, a firm paid to be a member of a construction-information network run by F.W. Dodge, a subsidiary of McGraw-Hill. Dodge has developed and maintains these regional networks nationwide. Amongst the small firms in this study, the impetus for creating and participating came from outside the firm. In fact, those small firms that did participate in a formal network were at times surprised at the information sources available locally. There was no evidence of an informal network evolving into a formal network. To this extent, the policy assumption seems to be correct, that collaborative networks must be

cultivated and created by a larger firm, agency or association.

6. Conclusion

By examining informal networks in urban and rural regions we have found a distinctive structural patterns in the linkages. Far from needing dense social ties, small firms use informal networks that are cast widely in a quest for useful information. Proximity does not seem to be an important factor shaping the structure of informal networks or the use of information. However, informal networks do exhibit a structural pattern of multiple relationships in the linkages. In other words, small firms use the informal networks for different types of advice, whether it be product development, competitive concerns, or labor issues. They also seem quite comfortable having a mix of informal and formal relationships with suppliers and customers. But above all, their focus is upon fashioning an informal network that "works."

For small, rural firms this search for information can be very cautious resulting in a few links. If they do manage to find such a working combination of information sources they are slow to change. Firms in urban areas, where conditions are more akin to those in industrial districts, do not appear to be so hesitant in trying new and diverse sources of information. As a consequence they are more likely to exhibit a greater number of links that are used more frequently.

We also found no evidence of informal networks evolving into formal networks. Indeed in a rural regions this may prove exceptionally difficult. Informal networks in such a setting are used to adapt to the paucity of information resources in the district. They begin with the assumption, and in some cases knowledge, that there is no information resource base to draw upon. Thus, the policy prescription appears correct. To institute a formal network in such a setting requires an infusion of resources from outside the firm.

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Notes

¹ An exception to this trend is Shaw (1993). However, even in this study, the terms informal and formal are used to signal the expansive array of social interactions being studied in the network. No analytic distinction or definition is offered as to how formal and informal networks might differ.

² The study of Human and Provan (1997) is distinctive in that it casts a wide net to include a variety of social relationships as potential network interactions, including business, friendship, information and competency exchanges over a time period of one year. The vast majority of studies will focus upon one type of social relationship.

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