

# PERCEPTIONS OF FIRMS WITHIN A CLUSTER REGARDING THE CLUSTER'S FUNCTION AND SUCCESS: AMISH FURNITURE MANUFACTURING IN OHIO

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**Abstract.**—The Amish-based furniture manufacturing cluster in and around Holmes County, OH, is home to some 400 shops and has become an important regional driver of demand for hardwood products. The cluster has expanded even as the broader domestic furniture industry has declined. Clustering dynamics are seen as important to the success, but little information has been available to assess the perceptions of firms operating within the cluster. The present study asked manufacturers to rate the importance of several factors to making the Holmes County region a good place to be in business. Common actions taken by these firms, and the information sources most commonly used, also were evaluated. A reputation for high-quality products was rated as critical to the cluster's success, followed by access to suppliers and manufacturing services. It was somewhat common to outsource components from other local shops, to use other vendors for computer numeric control work, and to refer potential customers to other local shops when better equipped for an order. Firms within the cluster were close to their customers, as conversations with customers was rated the most common source of information to learn about furniture industry trends. Word of mouth from other local shops also was somewhat important. These results demonstrated the importance of repeated interaction among the numerous shops, and also showed the importance individual firms placed on maintaining the reputation for high-quality products coming from the cluster. The unique mix of cooperation and competition has resulted in a model of competitiveness in wood furniture manufacturing.

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## INTRODUCTION

Over the past decade, the United States has declined steeply in the manufacture of wood household furniture. From 1999 to 2008, production employment in the U.S. nonupholstered wood household furniture industry (NAICS 337122) declined by more than 62 percent, or nearly 70,000 employees (Bureau of Labor Statistics n.d.). Hardwood lumber consumption by the U.S. furniture industry has declined from 34 percent of total domestic appearance-grade production (excluding material used to produce pallets and rail ties) in 1999 to just 15 percent in 2008 (Hardwood Market Report 2009). This downturn in U.S. furniture manufacturing has been precipitated largely by increasing imports from low-cost sources such as China, Vietnam, and other locations in southeast Asia (Quesada and Gazo 2006). In 2007, approximately 60 percent of the nonupholstered wood household furniture sold in the United States was imported (Cochran 2008). In the absence of a viable domestic furniture industry, U.S. hardwood lumber demand becomes increasingly reliant

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on housing and remodeling markets (e.g., cabinets, flooring, millwork), particularly for the middle and higher grades (Luppold and Bumgardner 2008, Buehlmann and others 2009).

## **THE FURNITURE CLUSTER IN HOLMES COUNTY, OHIO**

Despite these overall trends, one sector of the domestic furniture industry that has performed well during this period of globalization is the Amish-based manufacturing clusters located in northeastern Ohio and elsewhere. Clusters are defined as geographic concentrations of interconnected companies in a given field (Porter 1998). The Ohio cluster, located in Holmes County and portions of five surrounding counties, has grown as the broader domestic furniture manufacturing industry has contracted (Bumgardner and others 2007). Firms within this cluster seem to be employing many practices associated with a new “paradigm” for the industry (Schuler and Buehlmann 2003). For example, in many retail stores dedicated to Amish-made products, consumers are given options related to wood species, finish, and hardware for their furniture pieces. Specialized supply chains have been developed to facilitate this customization. Stains have been standardized across manufacturers to help enable production of semi-customized products to meet consumer specifications among the numerous small shops operating within the cluster.

Interdependence within a manufacturing cluster arises when few of the resident firms can produce the final product in isolation (Mottiar and Ingle 2007). Within the Holmes County cluster, this notion seems evident with the existence of smaller groupings of firms within the broader cluster. For example, very small shops may reach a point where they do not wish to grow beyond a customer base that can be served by the family members already employed. These shops might choose to work with a larger firm to manufacture specific products for the larger firm’s product line. In this way, they rely on the larger firm for marketing and distribution (Terreri 2008). This situation seems similar to findings by Mottiar and Ingle (2007), who found that two important motivations for small firms operating in a furniture cluster in Ireland were to 1) remain viable, and 2) continue living in the area. Unique linkages among firms are the result. According to Porter (1998), repeated market exchanges are common among proximal companies in clusters.

Economic clusters have been characterized as “critical masses – in one place – of unusual competitive success in particular fields” (Porter 1998, p. 78). The success of the Holmes County cluster can be measured in part by its importance to regional demand for hardwood lumber. A preliminary assessment of this sector in Ohio (Bumgardner and others 2007) found that this cluster, comprising roughly a two-county area, consumed 11 percent of the volume of hardwood lumber produced in Ohio, or 19 percent of the lumber used in appearance-based applications (i.e., excluding pallets and rail ties). The corresponding volume was approximately 43 million board feet, aggregated across more than 400 shops. Thus, the cluster has become an important regional source of hardwood lumber demand.

## **PROBLEM STATEMENT**

Aguilar and others (2009) found that area-specific drivers often were important to the formation of successful forest products-based clusters. While clustering dynamics seemingly have been important to the growth in Amish-based furniture manufacturing, little information has been available concerning firm managers’ actual perceptions of the importance of operating within the cluster. This paper examines these perceptions to help explain what firms have done to be successful.

The present study asked manufacturers to rate the importance of several factors to making the Holmes County region a good place to be in business. In addition, the frequency with which several manufacturing-related actions were taken within the cluster was measured, as were the information sources used to learn of trends in the furniture industry. In addition, smaller firms (one to five employees) were compared to larger firms (six or more employees) on their answers to these questions.<sup>2</sup> There are possible perceptual differences by firm size based on the fact that, as noted previously, many smaller shops work with larger shops for marketing and distribution of products. Size of firm also could affect the information sources used and the actions commonly undertaken.

## METHODS

### DATA COLLECTION

A questionnaire was developed with input from several manufacturers and suppliers working in the cluster. While not formally pre-tested, the questionnaire was discussed line-by-line in two separate group meetings with these representatives. The final questionnaire was seven pages long and contained 40 questions. For the present study, the “Holmes County Region” was defined as Holmes County and portions of five surrounding counties in northeastern Ohio, representing an area of approximately 1,500 square miles. A map was provided on the questionnaire to make clear to respondents the geographic definition of the cluster for the purposes of the study.

A packet containing the questionnaire, a cover letter, and postage-paid return envelope was sent in May 2008 to 569 firms. The sampling frame was *The Furniture Book: A Complete Guide to the Furniture Manufacturers and Wholesalers in Ohio's Amish Country* (Anonymous 2005). A reminder postcard was sent to nonrespondents approximately 1 month after the initial mailing. Last, a second packet (containing a duplicate questionnaire, postage-paid return envelope, and updated cover letter) was sent to all nonrespondents approximately 2 weeks after the postcard. All mailings originated from (and were returned to) the Ohio Agricultural Research and Development Center in Wooster, OH.

Of the 196 usable questionnaires returned, 168 were primarily furniture manufacturers while 28 were primarily producers of components or dimension products. Forty packets were undeliverable due to incorrect addresses, and an additional 77 questionnaires were returned from respondents who were no longer in business or were not manufacturers (e.g., suppliers, finishers, distributors, outdoor furniture makers). The result was an adjusted response rate of 43.4 percent. More than 96 percent of respondents indicated that they were the shop owner or co-owner; thus respondents were very familiar with the specifics of their respective operations.

Potential nonresponse bias in the survey was assessed by comparing sample statistics to known population parameters developed from *The Furniture Book*, as discussed by Bumgardner and others (2007). The mean employment and establishment year in the sample was 7.6 and 1994, respectively, which compared favorably with mean values of 7.2 for employees and 1994 for establishment year for the population. Furthermore,

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<sup>2</sup>While formation of a third category (i.e., “mid-sized” firms) might have yielded additional insights, the prevalence of small firms made further division among the larger firms difficult (i.e., only 15 percent of the firms in the sample had 10 or more employees).

Bumgardner and others (2007) reported 2,723 manufacturing employees in the Holmes County cluster; the sample included 1,433 employees or 52.6 percent of that total, which compares favorably with the survey response rate of 43.4 percent. Thus nonresponse bias was assumed not to be a factor when interpreting results.

## DATA ANALYSIS

After noting the background characteristics of the sample, aggregated results (means) are presented graphically for each question of interest. For comparisons by firm size, multivariate analysis of variance (MANOVA) was used as a test of differences between small and large firms across multiple dependent variables. For example, when respondents were asked to rate the aspects that make the Holmes County region a good place to be in business, MANOVA was used to determine whether there was an overall difference in ratings between the two groups. When the MANOVA test was significant ( $\alpha = 0.10$ ), one-way analysis of variance (ANOVA) was used to determine the significance of the individual dependent variables, i.e., to determine the variable(s) driving the overall difference.

## RESULTS

### BACKGROUND CHARACTERISTICS

The distribution of respondents by sales category for 2007 showed that respondents were fairly evenly distributed across categories, at least up to the \$500,000 mark (Table 1). Sixty-seven percent had gross sales of \$500,000 or less and about a quarter had sales of less than \$100,000, suggesting the small nature of most firms. Only slightly more than 5 percent of the sample had sales of \$3 million or more. The average shop operated 42.7 hours per week. For 66 percent of respondents, wood products manufacturing was their sole occupation. More than 80 percent of respondents indicated that they produced household furniture. Additionally, 36 percent produced office furniture and 6 percent produced institutional/contract furniture. Nearly 21 percent produced components (defined as ready to assemble) or dimension (defined as squares, blocks, and edge-glued products) to support manufacturing both within and outside the cluster. Last, 29 percent produced cabinets and 7 percent were manufacturers of millwork products (total sums to more than 100 percent because many firms produced multiple product types). Thus, while often referred to as a furniture manufacturing cluster, the region supports a variety of related wood products production, although furniture is clearly the primary final product. Red oak (*Quercus* spp., mostly *rubra* L.) was the dominant species used, accounting for nearly half of total consumption. To make comparisons based on firm size, 109 of the furniture firms were classified as “small” (1 to 5 employees) and 52 furniture firms were classified as “large” (6 or more employees).<sup>3</sup>

**Table 1.—Breakdown of the sample by sales category for 2007.**

Sales category	% of respondents
Less than \$100,000	23.4
\$101,000 - \$250,000	21.4
\$251,000 - \$500,000	22.4
\$501,000 - \$1,000,000	14.6
\$1,000,000 - \$3,000,000	12.5
\$3,000,000 or more	5.7

<sup>3</sup>Given the specific nature of some of the questions asked (e.g., importance of visiting retail furniture stores as an information source), results are presented for furniture firms only (excluding dimension and components firms).

## WHAT MAKES THE HOLMES COUNTY REGION A GOOD PLACE TO MANUFACTURE FURNITURE?

Respondents were asked about the aspects of wood manufacturing in the Holmes County region that made it a good place to be in business (Fig. 1). A reputation for high-quality products stood out clearly as the highest-scoring attribute. Access to suppliers, manufacturing services, and skilled employees also were important, illustrating the importance of the clustering concept.

Some differences were noted based on firm size, as the MANOVA test was significant (Wilks' lambda = 0.844,  $p = 0.07$ ). Based on subsequent ANOVA analyses, perceptions by small and large firms differed for three attributes: reputation for high-quality products, availability of skilled employees, and opportunities to manufacture products jointly with other shops (Table 2). While the last two differences seem reasonable (i.e., larger firms, which are more likely to be hiring outside the family, are more concerned with employee availability, and are in a position to develop products jointly with other shops), it was interesting that there was a difference in perceptions of the importance of quality by firm size. Still, quality was the most important overall attribute for both small and large firms.

## HOW OFTEN DO YOU TAKE THE FOLLOWING BUSINESS AND MANUFACTURING ACTIONS?

Respondents were asked to indicate the extent to which they undertook several manufacturing-related actions within the cluster. As shown in Figure 2, the investigated actions were not frequently undertaken, and some

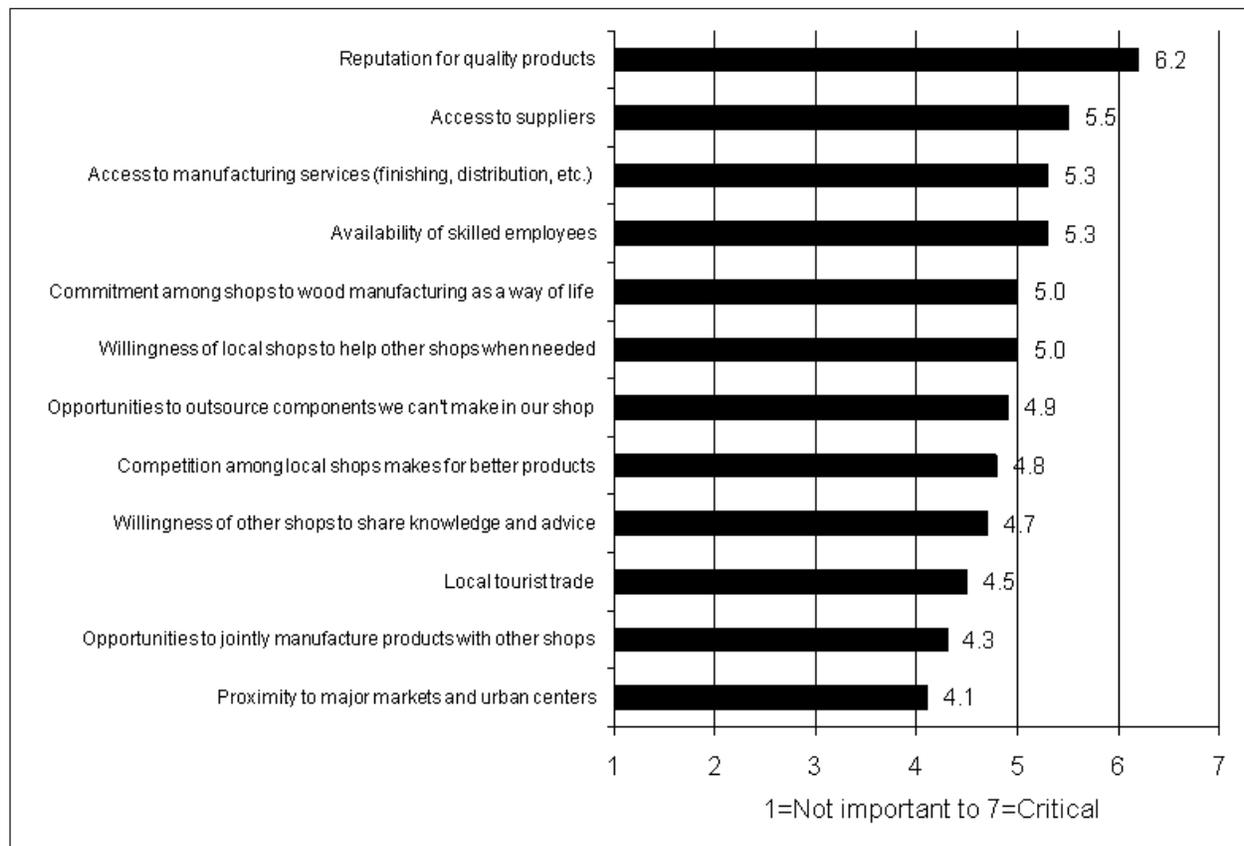


Figure 1.—Responses (means) to the question, “What aspects of wood manufacturing in the Holmes County region make it a good place to be in business?”

**Table 2.—Differences in perceptions by small firms (one to five employees) and large firms (six employees or more) regarding the aspects of wood manufacturing in the Holmes County region that make it a good place to be in business.**

Attribute	Small firms (mean) <sup>a,c</sup>	Large firms (mean) <sup>b,c</sup>	F	Sig.
Reputation for quality products	6.0	6.4	3.38	0.07
Availability of skilled employees	4.9	5.8	8.26	<0.01
Opportunities to jointly manufacture products with other shops	4.0	4.9	4.67	0.03

<sup>a</sup> n=82.

<sup>b</sup> n=42.

<sup>c</sup> Scale anchored by: 1 = Not important to 7 = Critical.

were almost never undertaken. The three most common actions were outsourcing components from other shops, using other vendors for computer numeric control (CNC) work, and referring potential customers to other local shops better equipped for an order. The remaining actions were rated quite low, in particular borrowing and/or lending equipment. Thus, while there are numerous examples of cooperation among shops in the cluster, such cooperation does not generally extend to sharing equipment or shop resources. No statistical differences were detected between small firms and large firms among the actions investigated (Wilks' lambda = 0.932,  $p = 0.36$ ).

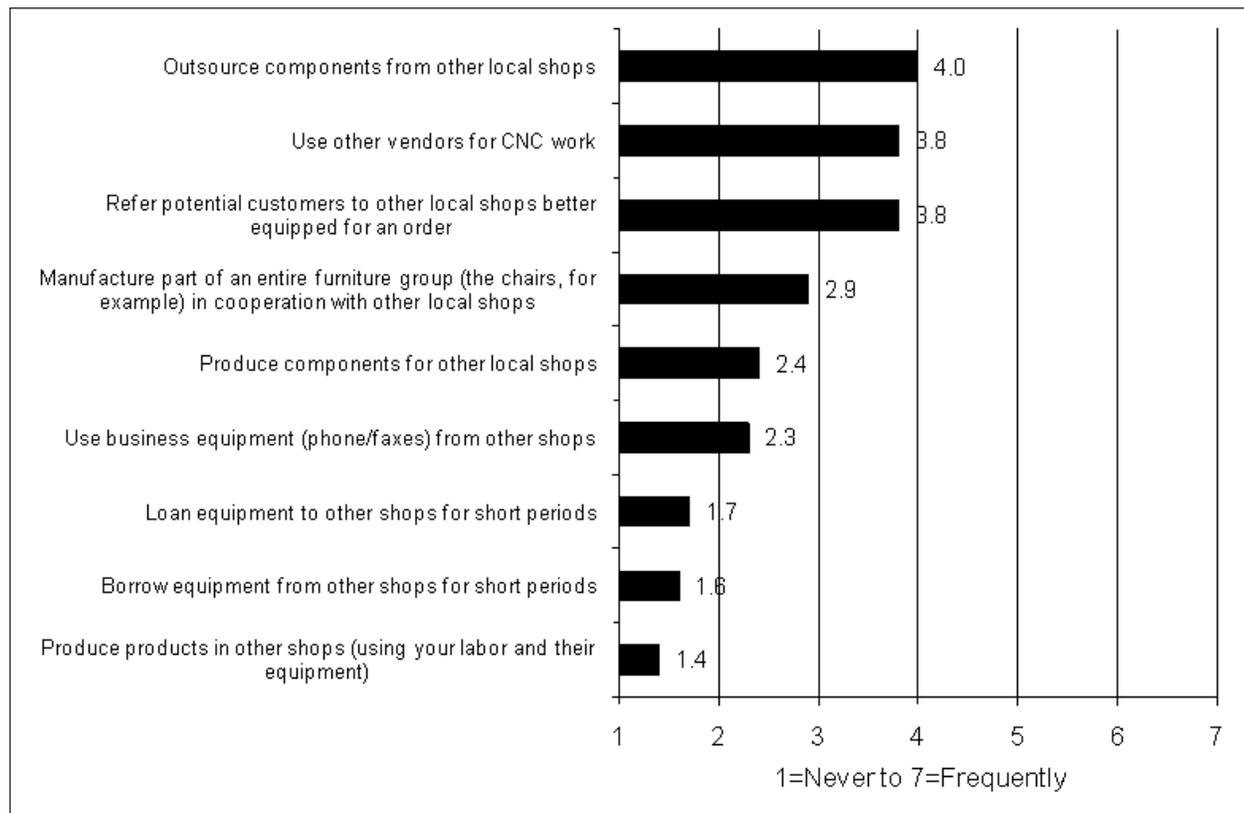


Figure 2.—Responses (means) to the question, “How often do you take the following business and manufacturing actions?”

## HOW OFTEN DO YOU USE THE FOLLOWING INFORMATION SOURCES TO LEARN ABOUT TRENDS IN THE FURNITURE INDUSTRY?

Last, respondents were asked about the information sources used to learn about trends in the furniture industry. As shown in Figure 3, conversations with customers and word of mouth from other local shops were the most commonly used information sources. Visits to retail furniture stores and trade magazines also were used to a moderate extent, while workshop attendance, consultants/designers, and newspapers were more seldom used. These results suggest that closeness to customers is a key component of manufacturing within the Holmes County cluster, as is closeness to, and communication with, other local shops. Other studies have also suggested that closeness to customers is a key competitive advantage associated with smaller firms (Gilmore and others 1999). Such close communication allows for development of customized solutions to specific customer needs.

Several statistical differences were detected between small firms and large firms concerning their use of information sources (Wilks' lambda = 0.903,  $p = 0.05$ ), as shown in Table 3. In general, larger firms utilized the information sources to a greater extent than did smaller firms. Specifically, attendance at workshops and use of designers/consultants exhibited the greatest disparities; larger firms also more commonly used trade magazines as information sources.

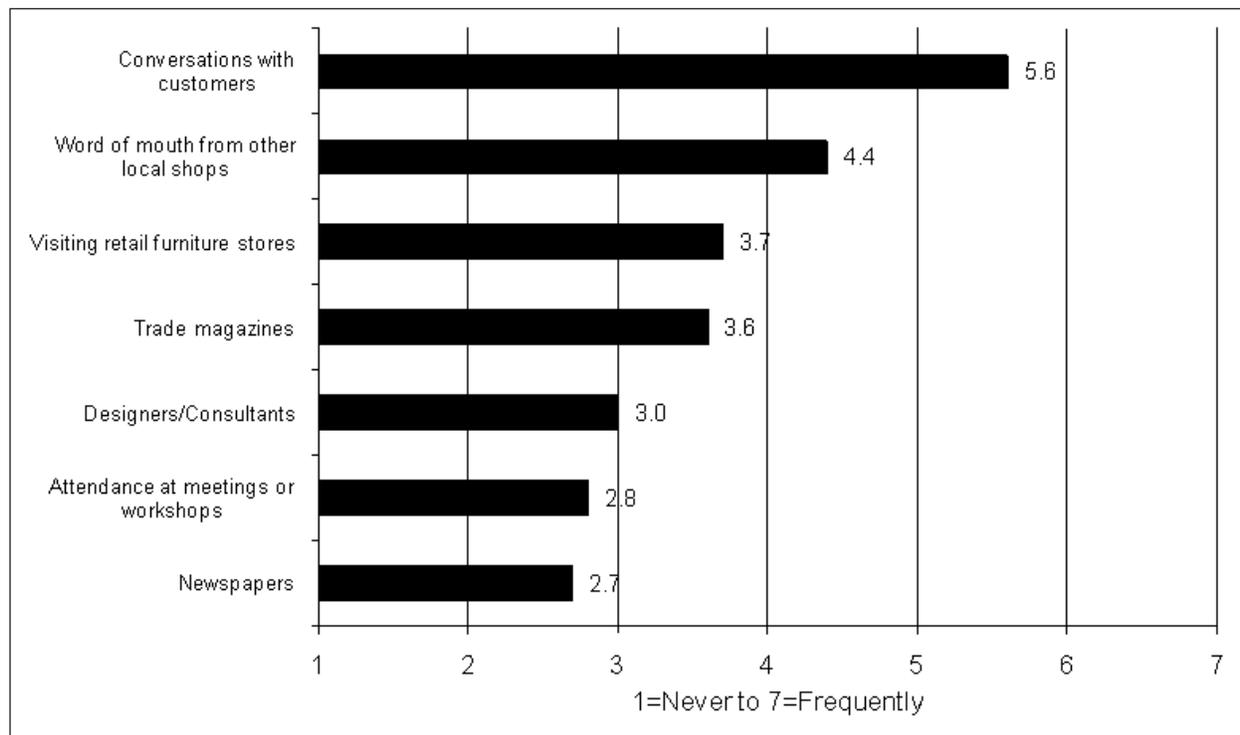


Figure 3.—Responses (means) to the question, “How often do you use the following information sources to learn about trends in the furniture industry?”

**Table 3.—Differences in the use of information sources to learn of trends in the furniture industry by small firms (one to five employees) and large firms (six or more employees).**

Attribute	Small firms (mean) <sup>a,c</sup>	Large firms (mean) <sup>b,c</sup>	F	Sig.
Trade magazines	3.3	4.0	4.47	0.04
Designers/Consultants	2.6	3.5	5.64	0.02
Attendance at meetings or workshops	2.6	3.2	5.22	0.02

<sup>a</sup> n=94.

<sup>b</sup> n=48.

<sup>c</sup> Scale anchored by: 1 = Never to 7 = Frequently.

## DISCUSSION

The responding firms perceived a reputation for high-quality products as especially critical to the cluster's success. Porter (1998) posits that “peer pressure” is a critical element of the competitive nature of clusters—in the case of Amish furniture manufacturing, firms appear to be especially focused on this aspect and try to maintain a quality level consistent with their peers. It also likely is a function of “embeddedness,” which Mottiar and Ingle (2007) found to be an important characteristic of a furniture district in Ireland comprising many small companies; the relationships among firms are not purely economic. In the case of Holmes County, a commitment to quality might be part of the social fabric of the Amish community. Perhaps this characteristic explains why, in Figure 1, *competition among shops makes for better products* is rated somewhat lower than *reputation for quality products*; quality is about more than the effects of peer pressure.

Quality was followed somewhat closely by access to suppliers and manufacturing services, critical elements of the supply chains that are common to clusters. This response likely reflects, in part, the small size and specialized nature of most of the furniture firms. As stated by Porter (1998, p. 80), “A cluster allows each member to benefit as if it had greater scale or as if it had joined with others without sacrificing its flexibility.” Availability of skilled employees also was rated highly, especially by the larger firms. The findings also confirmed the notion that larger firms take advantage of opportunities within the cluster to manufacture and market products jointly with other shops (Terrerri 2008), a practice found in other forest products-based clusters (Braden and others 1998). Unlike the findings from Braden and others (1998), however, proximity to major markets was rated relatively low, perhaps suggesting that the Holmes County cluster is less dependent on local markets than are many other forest-based clusters. Many firms reported distant states (e.g., California, Alaska, and Washington) when asked the farthest state in which they had sold their products.

It was somewhat common to outsource components from other local shops, to use other vendors for CNC work, and to refer potential customers to other local shops that would be better equipped for an order. However, most of the investigated actions were not common. Thus, in spite of the unique supply chains resulting from so many firms in close proximity, there appeared to be a degree of independence at the individual firm level when it came to such actions as borrowing or lending business and manufacturing equipment.

Firms within the cluster were close to their customers, as conversations with customers was rated the most common source of information to learn about furniture industry trends. This relationship could be an inherent advantage of the small nature of most Amish-based firms, as Gilmore and others (1999) claim an

advantage of small firms is their ability to stay close to their customers and thus better understand their needs. Word of mouth from other local shops also was somewhat important, demonstrating the importance of repeated interaction among the numerous proximal shops (Porter 1998). This finding also seems consistent with the notion of an “industrial district,” defined by Mottiar and Ingle (2007, p. 668) as “areas dominated by small firms that are geographically concentrated and exhibit strong inter-firm relations.”

While contact with customers and contact with other local shops were important information sources to all firms, larger firms also were more likely than small firms to seek information from sources outside the cluster. These sources included designers and consultants, as well as subscriptions to trade magazines. They also were more likely to travel to workshops, although workshops were not frequently utilized (Fig. 3).

The unique mix of cooperation and competition has resulted in a model of competitiveness in wood furniture manufacturing. The presence of this manufacturing cluster provides evidence that viable furniture production is possible in the United States, which helps sustain regional forest-based economies and provides diversification for hardwood lumber markets beyond those directly related to housing.

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