Characteristics of Value-Added Wood Products Manufacturers in the U.S. South

Richard P. Vlosky
Assistant Professor
Forest Products Marketing
Louisiana Forest Products Laboratory
Louisiana State University Agricultural Center
Baton Rouge, LA.

Sebin Kim
Associate Professor
Department of Forest Resources
College of Agriculture
Chungnam National University
Taejon, Korea

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Abstract

A number of states and regions are pursuing initiatives to add value to their forest resources by manufacturing products rather than export raw materials. One challenge in these efforts is attracting new industry or to expanding the existing industry base. Beyond the production of primary products such as lumber, plywood, particleboard and medium density fiberboard, and intermediate products such as hardwood dimension and parts, the production of furniture, cabinets and store fixtures is a logical next step in the wood products value chain. This research, based on a comprehensive analysis of the Southern U.S. furniture, cabinet and fixture industries, had two objectives: 1) To understand these industries and; 2) To provide information to development planners that can help to attract or expand manufacturing companies in these sectors.

Respondent companies on average purchased 29 percent of their raw materials needs (by value) from out-of-state suppliers, representing a potential opportunity for adding value to domestic forest resources. The most cited reasons for out-of-state raw material purchases were product availability, better prices and better quality. The study also examined factors that foster or hinder industry development. Highest rated factors that contribute to value-added company success were the ability to supply quality products to customers, development of long-term oriented customer relationships, company reputation and offering a high level of customer service. The foremost impediments to company success were acquiring quality raw material, developing a consistent raw material supply and volatile pricing. With regard to location decision factors that influence corporate expansion or location, manufacturers identified productivity of labor, labor costs, taxes and a skilled labor supply as the most important factors.

Introduction

A number of states and regions in the United States are actively pursuing economic development initiatives to add value to their forest resources. One common challenge in these efforts is the ability to attract new industry or to expand an existing wood products manufacturing industry base. After primary and semi-finished products, a logical next step in the value-added chain is the production of furniture and cabinet products. This study identifies critical success factors and impediments to development of these industry sectors as well as factors that influence industry location decisions.

Methodology

The sample frame for the study consisted of value-added wood products manufacturing firms in the South United States[1]. SIC (Standard Industrial Classifications) 2434, wood kitchen cabinets; SIC 2511, wood household furniture, except upholstered; SIC 2512, wood household furniture, upholstered; SIC 2517, wood television, radio, and etc. cabinets; SIC 2521, wood office furniture and; SIC 2541, wood office and store fixtures, partitions, etc. (USDC 1992). A database census of 2,654 companies in these SIC categories was extracted

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[1] Texas, Arkansas, Mississippi, Alabama, Georgia, Florida, South Carolina, North Carolina and Louisiana.

from the 1994 PhoneDisk PowerFinder CD-ROM directory (Database America Companies 1994). From this database, a sample of 2,000 companies was randomly selected for the study.

In general, survey procedures were conducted in accordance with the Total Design Method (Dillman 1978). This procedure consisted of a pre-notification postcard, an initial survey mailing, a post mailing reminder and a second survey mailing.

Results

Profile of respondents

Of the 2,000 surveys mailed, 208 were undeliverable or out of business, reducing the sample to 1,792. The total study response rate was 20.2 percent (362/1,792). Of the 362 returned surveys, 11 were not completed and 23 were from companies that indicated they were not in the furniture business. The balance of returned surveys were all useable, resulting in an adjusted usable response rate of 18.7 percent (328/1,758) ranging from 10 percent (wood partitions & fixtures) to 30 percent (upholstered furniture).

All respondent companies were from one of the nine states in the Southern United States. Total 1994 respondent corporate sales was $1.099 billion with an average of $3.5 million. Fifty-three percent of respondent companies had less than $1 million in sales in 1994 (Figure 1). Upholstered furniture represented 39 percent of total respondent sales revenue, followed by the household furniture (32 percent), kitchen cabinets (13 percent), office furniture (9 percent), office/store fixtures (6 percent) and wood television and radio cabinets (less than 1 percent). In 1994, respondent companies employed 15,521 people . Upholstered furniture respondents represented 45 percent of total employees, followed by the household furniture (28 percent), kitchen cabinets (14 percent), office furniture (8 percent), office/store fixtures (5 percent) and wood television and radio cabinets (less than 1 percent).

[INSERT FIGURE 1 ABOUT HERE]

Non-response bias

Non-response bias was measured using a two-tailed t-test conducted on percent of companies by state, comparing respondents and companies that fell into the non-response/undeliverable category. No difference in state distribution was detected at $\alpha=.05$. In addition, research has shown that late respondents typically respond similarly to non-respondents. Accordingly, second mailing respondents were compared to first mailing respondents by state of origin. In this case as well, no difference in state distribution was detected at $\alpha=.05$.

Species used as raw materials

Study results indicated that red oak was the dominant species used by study respondents in 1994 with 37 percent (107.19 MMBF) of total respondent raw material volume (Figure 2). The most used species (by volume) by study respondents after red oak in order were pine (17.7 percent), poplar (16.6 percent), maple (13.8 percent), ash (6.5 percent) and cherry (4.1 percent).

[INSERT FIGURE 2 ABOUT HERE]

Figures 3 shows that for the top six species used by study respondents in 1994, the kitchen cabinet sector dominated in usage by total volume for all species while Figure 4 indicates that on an average volume usage per company basis, other respondent groups were important. For example, the upholstered furniture sector used more red oak (2,028 MBF) and poplar (1,757 MBF) while the television/radio cabinet sector used more pine (1,010 MBF), office fixtures respondents used more pine (2,149 MBF) and the kitchen cabinet group used more cherry (525 MBF) and maple (667 MBF) on average.

[INSERT FIGURES 3 & 4 ABOUT HERE]

Wood products raw material inputs

Figure 5 shows the raw material inputs by value for each of the respondent categories. Hardwood lumber had the highest average percent by value across all categories (30.9 percent) and constituted 72.6 percent of the raw material input value for the upholstered furniture industry. Hardwood dimension contributed the least with only 2.8 percent of the total.

[INSERT FIGURE 5 ABOUT HERE]

Markets and marketing

Study respondents reported that they sold 68.8 percent of their 1994 production (by sales revenue dollars) to in-state customers with 28.8 percent going to customers in other U.S. states and 2.5 percent to export customers. Analysis of variance (ANOVA) using respondent SIC categories as treatments resulted in significant differences for in-state, other U.S. states and export markets at α=.05. The kitchen cabinet sector had the highest average percentage of sales to in-state customers (90.5 percent) while upholstered furniture manufacturers had the most sales to other U.S. states (58.6 percent). Office furniture respondents had the highest average sales to export markets (3.6 percent).

Similarly, as seen in Figure 6, nearly fifty percent of respondents market their products within a 100 mile radius of their manufacturing facility. Contrasted one to a narrow market radius in the U.S. hardwood dimension industry (Vlosky 1995) nearly thirty percent of respondents market their products beyond a 500 mile radius.

[INSERT FIGURE 6 ABOUT HERE]

Nearly three-fourths (71.6 percent) of respondent 1994 sales (by revenue) were shipped directly to customers, followed by wholesalers (13.6 percent), stocking distributors (6.3 percent) and the balance to other (mail order, contractors, retailer intermediaries). Analysis of variance (ANOVA) using respondent SIC categories as treatments resulted in significant differences for all distribution channels at α=.05.

The wood fixtures sector had the highest average percentage of direct sales (96.2 percent) while upholstered furniture manufacturers had the most sales to both wholesalers (30.2 percent) and stocking distributors (27.3 percent). By selling direct, the furniture manufacturer is directly involved and has more control in all aspects of the sales transaction (Lawser 1992). The direct method of selling is preferred by most experienced furniture manufacturers because they prefer to be directly involved and have more control over the sales transaction. They also want to develop closer, long-term relationships with their end users (Lawser 1992).

Word-of-mouth was the promotional method most cited by study respondents, followed by, in ranked order, networking, the use of company sales representatives, membership in industry associations and magazine advertising. This is consistent with a studies conducted on the secondary wood products industry in Louisiana and the hardwood dimension industry that found that word-of-mouth was the most cited promotional method (Vlosky et al. 1994; Vlosky 1995).

Raw material supplier selection criteria for value-added manufacturers

In the quest to add value to forest resources, important questions to ask are: "What do raw material suppliers need to do to get value-added manufacturer business?" and "Why do manufacturers purchase raw materials from out-of-state suppliers when in-state suppliers exist?"

These questions were answered by study respondents. Using 5-point scaled questions indicating level of importance (1=very unimportant to 5=very important), respondents evaluated 11 supplier selection factors. Figure 7 shows that product oriented criteria (product quality, product availability and fair pricing) were the most important. The next 5 were relationship and capability oriented and included customer service, supplier reputation, responsiveness to customers and flexibility in delivery. The lowest ranked criteria had to do with credit and payment terms offered by suppliers. Analysis of variance (ANOVA) using respondent SIC categories as treatments did not result in significant differences across supplier selection criteria at $\alpha=.05$.

[INSERT FIGURE 7 ABOUT HERE]

A study of major U.S. furniture and cabinet manufacturers found that price and product quality were identified as the two leading factors for choosing a supplier by wood component buyers. Other factors include: on-time delivery, dependability of supply, required lead time and species availability (Anon. 1994).

In another study, Canadian forest lumber purchasers ranked reliability of supply at the top of the list in ranking the importance of a supplier's ability to provide products and services (Armstrong et al. 1993). This same study asked lumber purchasers to rank the importance of product and service quality with overall product quality, overall service quality and competitive pricing ranking highest.

The second question regarding out-of-state raw material purchases is addressed in Figure 8. Once again, 5-point scaled questions indicating level of importance were used (1=very unimportant to 5=very important). The most frequently cited reason that respondents purchase raw material from out-of-state suppliers is product availability. The other two reasons

of any consequence are that out-of-state suppliers offer better prices and higher product quality. These findings suggest that if in-state suppliers can increase development of the customer base and offer quality products at competitive prices, more raw materials will be processed in-state, thereby increasing the value-added to the resource. Analysis of variance (ANOVA) using respondent SIC categories as treatments did not result in significant differences across out-of-state supplier selection criteria at $\alpha=.05$.

[INSERT FIGURE 8 ABOUT HERE]

Value-added manufacturer success and impediment factors

Using 5-point scaled questions indicating level of importance (1=very unimportant to 5=very important), study respondents were asked to rank factors that contribute to the success of their business as well as those factors that impede success in the marketplace. As seen in Figure 9, the two most important and equally ranked success criteria for respondent companies are product quality and development of long-term customer relationships. The importance of relationship factors to company success is further indicated by the subsequent highest ranked factors, offering high levels of customer service and overall company reputation. An understanding of the customer base and development of a long-term orientation can be a significant factor in building or maintaining market share. Analysis of variance (ANOVA) using respondent SIC categories as treatments did not result in significant differences across company success criteria at $\alpha=.05$.

[INSERT FIGURE 9 ABOUT HERE]

On the other side of the equation, respondents were asked to evaluate factors that are a hindrance to their success (Figure 10). The foremost impediment is acquisition of quality raw material followed closely by development of consistent raw material supply. I suggest that these factors can be mitigated if companies focus on the factors that they themselves identified as contributors to success, particularly those that are relationship oriented. However, in this case, rather than these factors being applied to respondent manufacturer relationships with customers, an upstream perspective needs to be developed with raw material suppliers.

The success and impediment responses can help existing companies improve their core capabilities and market position as well as identify important issues for individuals that are considering manufacturing value-added wood products. Analysis of variance (ANOVA) using respondent SIC categories as treatments did not result in significant differences across company success impediment criteria at $\alpha=.05$.

[INSERT FIGURE 10 ABOUT HERE]

Industry location decision factors

As part of the evaluation process that identifies high potential value-added industries, information about factors that encourage or deter industry location is required. Nineteen factors that influence industry expansion for existing companies or location decision criteria for

companies considering immigration were analyzed. Five-point scaled questions indicating level of importance (1=very unimportant to 5=very important) were used. As seen in figure 11, labor issues (productivity and costs) are deemed most important by study respondents. Subsequent factors, in order of importance are a favorable tax structure, construction costs, room for expansion and an amenable community industrial climate. Analysis of variance (ANOVA) using respondent SIC categories as treatments did not result in significant differences across these criteria at
$\alpha=.05$.

[INSERT FIGURE 11 ABOUT HERE]

These results contrast to results found by Jones et al. (1992) in a study that included an examination of location factors for selected forest manufacturing industries. The 36 forest furniture and flooring manufacturers queried said that the most important location decision factor was securing and adequate wood raw material supply followed by access to markets, personal considerations (attitudes towards industry and personal ties to the area), labor costs and availability (low wages, high productivity, and adequately skilled labor), service utilities and last, taxes and regulations.

Summary
Economic development planners involved in secondary wood products industry development can use this information as one input in the planning process. The data suggest that there are a number of areas that can be addressed if value-added products are to be promoted. For example, more sophisticated market promotion efforts, beyond current word-of-mouth promotion, might be explored.

The information contained in the sections on forest lumber supplier selection criteria and reasons that manufacturers purchase out-of-state raw materials can be used as a guide to keeping more resource in-state to be further processed, thus adding value. Specific factors that manufacturers identified as being critical to success as well as those factors that are impediments can help manufacturers be more competitive in the marketplace. All of these factors can also be inputs to economic planning process with the goal of maximizing value-added industry growth and development potential.

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Figure 1.

Average 1994 Sales By Company
Percent By Sales Category
(n=106 companies)

Sales Ranges are in $1,000

100-499   28%

0-99   12%

500-999   13%

25,000 or more   10%

1,000-2,999   19%

10,000-24,999   5%

5,000-9,999   5%

3,000-4,999   8%
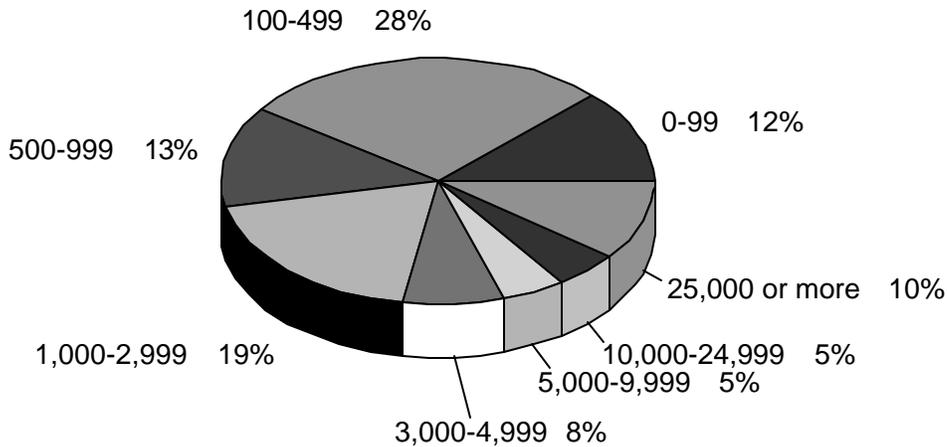
Figure 2.

Species Used as Raw Materials Inputs in 1994

Respondent Volume By Species in Cubic Mete

(Total Volume= 110,160 Cubic Meters (46.65 Million B

Species	Cubic Meters
Poplar	42032
Red Oak	26803
Pine	22552
Maple	9702
White Oak	3809
Ash	2155
Mahogany	1435
Cherry	902
Alder	590
Cypress	76
Birch	71
Walnut	47
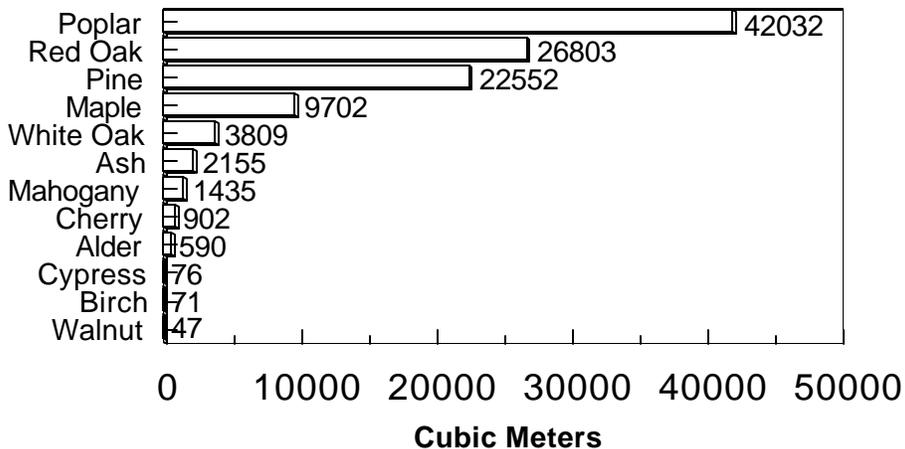
Cubic Meters

Conversion Factor Source: USDA Agriculture Handbook No. 662

Figure 3.
Species Used as Raw Materials Inputs in 1994
Total Volume Reflected By Respondents
(Cubic Meters)
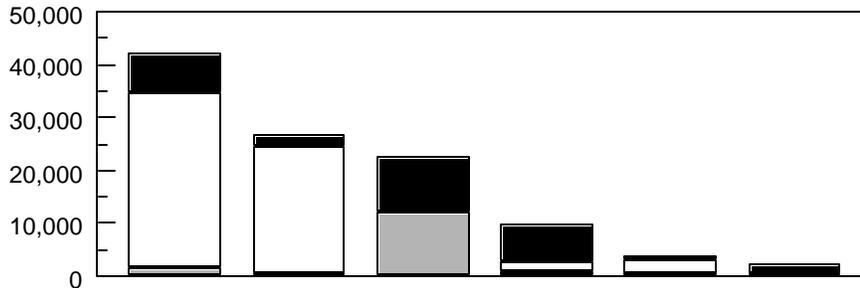
	Poplar	Red Oak	Pine	Maple	White Oak	Ash
Household Furniture ■	7,250	2,379	10,459	7,144	953	1,754
Upholstered Furniture ☐	33,196	23,942	71	1,765	2,377	156
Office Furniture ▨	1,586	481	12,022	793	479	245
Total	42,032	26,802	22,552	9,702	3,809	2,155

Figure 4.
Species Used as Raw Materials Inputs in 1994
Average Volume By Respondent Group
(Cubic Meters)
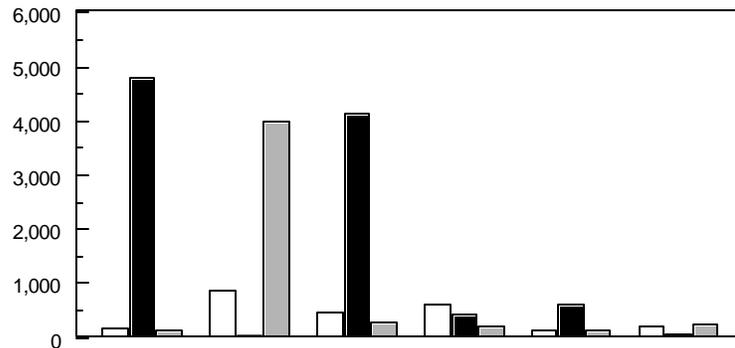
	Red Oak	Pine	Poplar	Maple	White Oak	Ash
Household Furniture ☐	170	871	453	595	137	196
Upholstered Furniture ■	4,786	35	4,147	441	595	78
Office Furniture ▨	120	4,007	264	198	120	245

Figure 5.

Raw Material Inputs in 1994

Percent By Value in 1994

	Hardwood Lumber	Plywood	Particleboard	Softwood Lumber	MDF	Veneer	Hardwood Dimension	Other
Household Furniture	35.4%	19.6%	10.0%	13.5%	5.8%	5.4%	8.7%	1.6%
Upholstered Furniture	72.6%	10.8%	0.7%	6.0%	1.2%	0.7%	2.2%	5.8%
Office Furniture	23.2%	22.2%	31.2%	1.8%	11.0%	5.2%	0.6%	4.9%
Average	**43.7%**	**17.5%**	**14.0%**	**7.1%**	**6.0%**	**3.8%**	**3.8%**	**4.1%**

Figure 6.

Market Radius
Number of Total Responses

51-100 Miles 11.7%

101-250 Miles 4.5%

251-500 Miles 9.0%

0-50 Miles 19.8%

501-1,500 Miles 20.7%

More than 4,000 Mile 10.8%

3,001-4,000 Miles 8.1%

1,501-3,000 Miles 15.3%
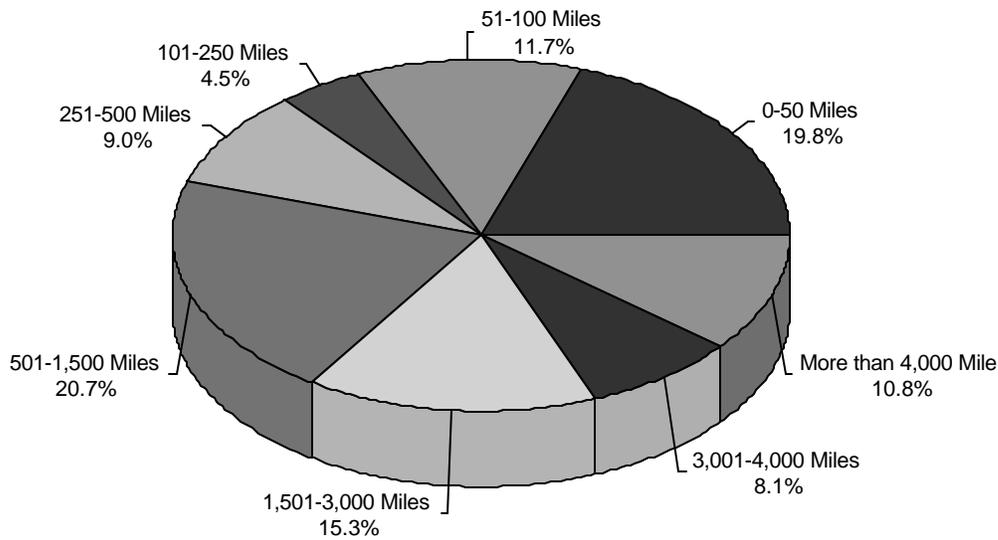
Figure 7.

Raw Material Supplier Selection Criteria

(n=113 companies)

Product Quality — 4.7
Product Availability — 4.5
Fair Prices — 4.5
High Level of Customer Service — 4.2
Flexible Delivery — 4.2
Fast Response to Inquiries — 4.1
Convenience — 4.1
Vendor Reputation — 4.1
Knowledgeable Salespersons — 4.0
Payment Terms — 3.5
Credit Terms — 3.5

0 1 2 3 4 5

(Level of Importance 1=very unimportant to 5=very important)
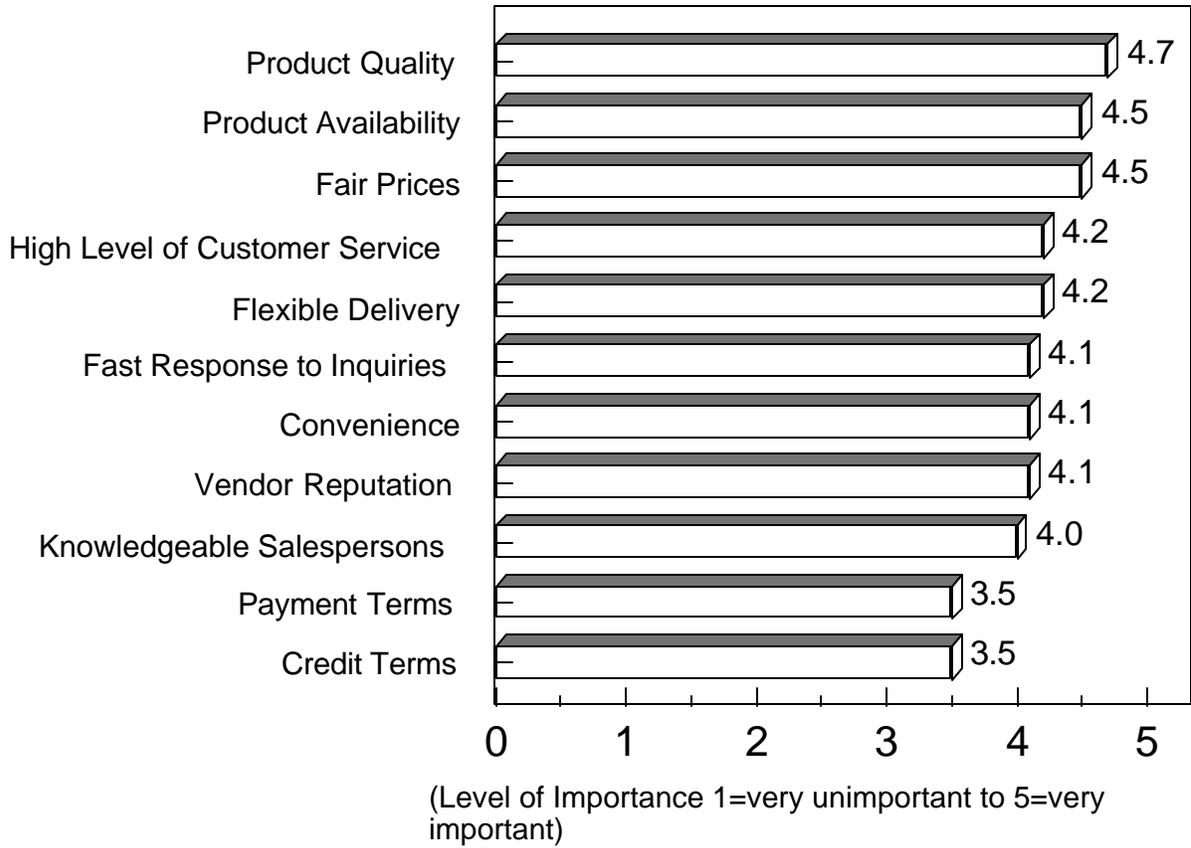
Figure 8.

Company Success Factors
(n=113 companies)

Factor	Value
Product Quality	4.7
Company Reputation	4.7
Long-term Customer Relationships	4.6
High Level of Customer Service	4.6
Product Availability	4.3
Fair Pricing	4.3
Fast Response to Customer Inquiries	4.3
Knowledgeable Salespersons	4.3
Flexible Delivery	3.9
Marketing Skills	3.7
Access to Markets	3.6
Distribution Capabilities	3.4
Computer Capabilities	2.9
Credit Terms	2.8
Payment Terms	2.6

0 1 2 3 4 5

(Level of Importance 1=very unimportant to 5=very important)

Figure 9.

Impediments to Company Success

(n=113 companies)

Impediment	Level of Agreement
Getting consistent raw material supply	4.5
Getting quality raw material	4.4
Volitile pricing	4.2
Promoting company products	4
Not enough capacity	3.5
Competition from suppliers in our region	3.3
Competition from in-state suppliers	3.2
Delivery problems	3.1
Too much capacity	2.6
Competition from overseas suppliers	2.6
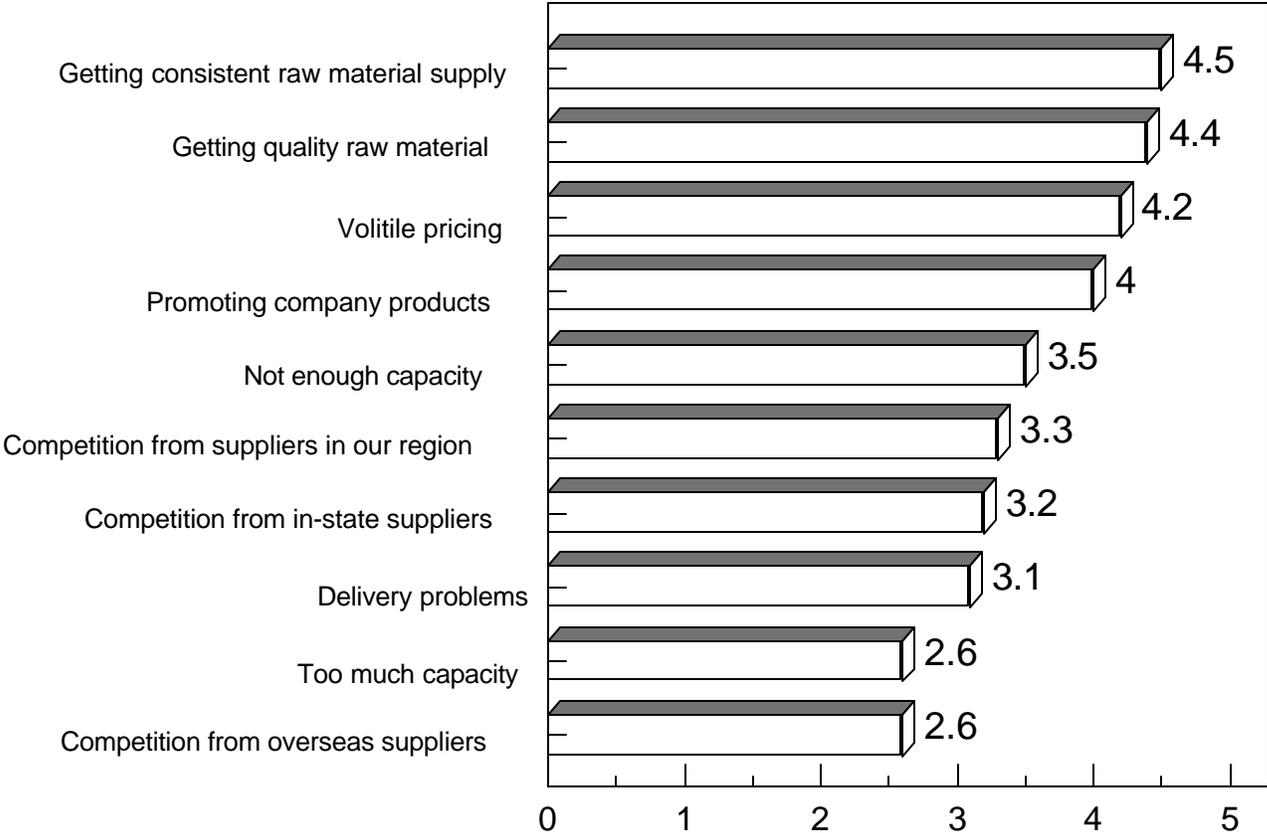
(Level of Agreement 1=strongly disagree to 5=strongly agree)

Figure 10. **Factors Influencing Expansion or Building New Facilities** (n=113 companies)

Factor	Level of Importance
Labor Costs	4.3
Skilled Labor Supply	4.1
Productivity of Labor	4.1
State Taxes	3.9
Local Taxes	3.9
Construction Costs	3.7
Room for Expansion	3.7
Community Industrial Climate	3.5
Proximity to Raw Materials	3.5
Access to Regional Markets	3.5
Unskilled Labor Supply	3.2
Access to Local Markets	3.1
Unionization	3.1
Highway Facilities	3.0
Water Supply	2.8
Public Training Assistance Programs	2.7
Access to National Markets	2.3
Natural Gas Supply	2.3
Railroad Facilities	2.0

(Level of Importance: 1=very unimportant to 5=very important