SMALL ENTERPRISES AS IMPORTANT HARDWOOD LUMBER CONSUMERS: EVIDENCE FROM THE CURRENT HOUSING DOWNTURN

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Abstract.—Housing fixtures (such as cabinets, flooring, moldings, and stairways) have become a major market for secondary wood products manufacturers in the United States and a major user of U.S. hardwood lumber. Thus, downturns in housing markets, with associated declines in the demand and price for fixtures, can pose significant challenges to the profitability of these manufacturers and have implications through the supply chain down to raw material suppliers (e.g., hardwood lumber suppliers). The current downturn in the U.S. housing construction industry segment, which began in 2006, provided an opportunity to investigate the attributes associated with successful secondary wood products companies. In particular, it was thought that smaller firms and those producing customized (semi-customized and fully made-to-order) products would be the most likely to have realized increased sales volume during the period in question. It was found that small firms do indeed seem to do better during turbulent times, due in part to the production of fully made-to-order products. Implications for hardwood lumber distribution are discussed.

INTRODUCTION

Seventy percent of dimensional softwood lumber (for example, 2x4's made from spruce, pine, or fir) and structural panels (for example, plywood or oriented strand board) consumed in the United States goes into housing, whether new construction or remodeling of existing homes (Buehlmann and others 2008). Hardwood lumber, although not frequently used for framing, is a raw material widely used to fabricate fixtures such as cabinets, floors, and moldings; therefore, the hardwood lumber industry is sensitive to the housing economy's fortunes. In 1982, hardwood lumber use by the construction and remodeling sector (defined as kitchen cabinets, flooring, millwork, and other miscellaneous building products) accounted for 1.4 billion board feet (bbf) or 28 percent of domestic consumption in appearance-based hardwood lumber products (excluding pallets and containers). This volume had increased to 4.2 bbf by 2002, accounting for more than 52 percent of domestic consumption in appearance-based products (Luppold and Bumgardner 2008). Thus, construction-related markets have grown in volume and relative importance for the domestic secondary wood products industry and for U.S. hardwood lumber producers, especially as the domestic furniture manufacturing industry has moved offshore (Schuler and Buehlmann 2003, Buehlmann and Schuler 2009).

The U.S. housing economy currently is undergoing its worst recession in decades (Buehlmann and others 2008, Dicks 2008). Robust growth earlier in the decade—driven largely by readily available credit, favorable

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demographics, lax lending standards, record low interest rates, a belief by many homebuyers that housing prices would continue to rapidly increase, and speculation by home buyers, builders, and lenders—has turned into a bust, with single-family housing starts at 0.53 million annualized (from a more typical 1.5 to 2.0 million annualized prior to the start of the recession[2]). Between 2006 and 2007, the value of U.S. single-family housing put in place shrank by 27 percent or $113 billion (U.S. Census Bureau 2009).

It is often said that smaller firms manufacturing customized products are the most competitive in the current economic environment for secondary wood products. However, much of the evidence is anecdotal. While previous studies have investigated the roles of competitive strategy (Barth 2003) and owner-manager demographic factors (Kangasharju 2000) on firm performance in mature markets, less is known about whether small firms perform better than large firms under such market conditions. This study sought to confirm these suppositions and to determine the product characteristics of successful secondary wood products firms in the current downturn in single-family residential construction (SFRC).

Two hypotheses (or predictions) were tested in this study: 1) Firms having increased sales volume in the declining SFRC market will be smaller as measured by number of employees or by total sales; and 2) Firms having increased sales volume in the declining SFRC market will score higher on customization as measured by proportion of semi-custom products produced and by proportion of made-to-order products produced.

MATERIALS AND METHODS

An email was sent by *Modern Woodworking* magazine in February 2008 to all subscribers with an email address available (approximately 17,000), inviting them to participate in the study. The email included a cover letter explaining the study and a link to the questionnaire posted on the Internet. A reminder notice was sent via email 2 weeks after the initial email. The questionnaire contained 24 questions and was completed by respondents online. As an incentive for participation, respondents were entered in a sweepstakes to win a prize. After 4 weeks, 496 responses had been received. The usable sample of manufacturers was 430 after nonmanufacturing responders such as distributors, service providers, and educational organizations were removed. (The apparently low response rate, as traditionally defined, was partially a result of the heavy presence of nonmanufacturers in the list of email addresses on file). Respondents were active in markets across the United States; 44 percent of firms did regular business in the Midwest, and 21 percent of respondents did regular business in California. More than 69 percent of the respondents held positions in corporate or operating management or were owners, while another 16 percent were in production management.

It was possible to check for nonresponse bias by comparing the sample to known parameters for *Modern Woodworking* subscribers. The proportion of the sample with less than 50 employees was 82 percent, while this proportion was 72 percent for the subscriber population. Also, the sample consisted of 71 percent cabinet and household furniture manufacturing firms while firms associated with these products were 62 percent of the population. Despite some minor differences, the sample seemed to be a reasonable representation of the *Modern Woodworking* population. Given that differences might exist between subscribers and nonsubscribers, however, some caution is warranted in generalizing beyond companies subscribing to the magazine, although the subscriber base is large and likely representative of the broader secondary wood products industry. Another

[2]Sources: U.S. Bureau of Census – www.census.gov/const/newresales.pdf, and National Association of Realtors - http://www.realtor.org/research/index.html.

point to note was that the number of responders facing a declining market was only 15 percent greater than the number realizing increased demand between 2006 and 2007. Thus, there might have been a subset of respondents "motivated" to respond based on their success.

To test the hypotheses, respondents were placed into one of four market/performance groups based on: 1) The proportion of their production volume that was directly associated with the SFRC market in 2007 (that is, used in the building or trimming of new homes, excluding furniture or furnishings); and 2) Whether their sales volume increased or decreased from 2006 to 2007. Primary interest was with those firms who had more than 60 percent of their production volume associated with the declining SFRC market, and whose sales volume increased from 2006 to 2007. Sales growth has been used in other small business studies as the performance measure of choice (Barth 2003). Data were analyzed using Chi-square tests of independence.

RESULTS

The breakdown of the sample along the market and performance dimensions (percentage of business from the SFRC market and sales volume performance) is shown in Table 1. There was a fairly even distribution across the categories representing changes in sales volume from 2006 to 2007. Production volume directly associated with the SFRC market in 2007 was also fairly evenly distributed, but with a small spike in the category where sales volume was 81- to 100-percent associated with the SFRC market. Using Table 1, we classified the firms as follows:

- SFRC ≤ 60 percent of production; sales volume off; Group 1 (n = 118)
- SFRC ≤ 60 percent of production; sales volume up; Group 2 (n = 127)
- SFRC > 60 percent of production; sales volume off; Group 3 (n = 112)
- SFRC > 60 percent of production; sales volume up; Group 4 (n = 73)

A group breakdown by main product manufactured is shown in Table 2. As might be expected, the proportion of companies whose main product was kitchen/bath cabinets was substantially higher for those firms primarily in the SFRC market (Groups 3 and 4), while architectural fixtures and contract furniture as a main product were proportionally higher for those firms operating primarily in non-SFRC markets (Groups 1 and 2). The categories were very similar in terms of respondents' job titles; 64 to 73 percent were corporate/operations managers or were the firm owner. Most of the remainder in each category worked in production management.

Table 1.—Summary results for variables used to categorize firms.

Change in sales volume, 2007 vs. 2006	Percent of respondents	Production volume directly associated with the SFRC market, 2007	Percent of respondents
Sales volume off		—— ≤ 60 percent of production ——	
Much worse (off by 20% or more)	15.6	0%	18.1
Somewhat worse (off by 10%)	11.4	1-20%	16.0
Slightly worse (off by 5%)	10.0	21-40%	10.0
Unchanged	16.5	41-60%	12.8
Sales volume up		—— > 60 percent of production ——	
Slightly better (up by 5%)	13.0	61-80%	16.5
Somewhat better (up by 10%)	19.1	81-100%	26.5
Much better (up by 20% or more)	14.4		

Table 2.—Profile of companies in each group.

Demographic variables	SFRC ≤ 60 percent of production; sales volume off (Group 1)	SFRC ≤ 60 percent of production; sales volume up (Group 2)	SFRC > 60 percent of production; sales volume off (Group 3)	SFRC > 60 percent of production; sales volume up (Group 4)
Main product				
Cabinets	27.1%	32.3%	57.1%	63.0%
Arch. fixtures	12.7%	15.0%	4.5%	4.1%
Molding/millwork	11.9%	11.8%	17.0%	11.0%
Contract furniture	10.2%	12.6%	1.8%	0.0%
Household furniture	31.4%	18.1%	11.6%	17.8%
Other	6.7%	10.2%	8.0%	4.1%
Average number of business regions per firm[a]	2.6	2.6	2.1	1.6

[a] Respondents were asked to indicate all regions of the United States where they did regular business: Northeast, Mid-Atlantic, Southeast, South, Southwest, Midwest, Northwest, and California.

Another difference was that firms in Group 3 and especially Group 4 did regular business in fewer geographic regions on average than did firms in Groups 1 and 2 (significant at the $\alpha = .05$ level), which is not surprising given the local nature of housing construction.

Hypothesis 1 stated that firms having increased sales volume in the declining SFRC market would be smaller as measured by number of employees and total sales. As shown in Table 3, Hypothesis 1 was supported. The overall test for number of employees was significant ($p < 0.01$). Group 4 (SFRC > 60 percent of production; sales volume up) had proportionally fewer firms with 20 or more employees than did the other groups. Group 2 (SFRC ≤ 60 percent of production; sales volume up) seemed to be geared the most toward larger firms, with 39 percent of the firms having 20 or more employees.

Similar results were obtained for total sales in 2007, with an overall significant test ($p < 0.01$), though the strength of association was lower than for number of employees (Cramer's V = 0.16). Group 4 again had the largest proportion of firms in the lowest sales category (less than $1 million) and the smallest proportion of firms in the highest sales category (more than $10 million). Also following a pattern similar to number of employees, Group 2 had proportionally fewer firms in the lowest sales category and proportionally more in

Table 3.—Firm size by SFRC and sales volume group.

Size category	SFRC ≤ 60 percent of production; sales volume off (Group 1)	SFRC ≤ 60 percent of production; sales volume up (Group 2)	SFRC > 60 percent of production; sales volume off (Group 3)	SFRC > 60 percent of production; sales volume up (Group 4)
Number of employees[a]				
1-19	74.6%	61.4%	72.3%	86.3%
20 or more	25.4%	38.6%	27.7%	13.7%
Total sales[b]				
less than $1 million	61.0%	48.8%	66.1%	78.1%
$1 - $10 million	24.6%	34.6%	16.1%	13.7%
more than $10 million	14.4%	16.5%	17.9%	8.2%

[a] Overall χ^2 statistic = 14.9; $p < 0.01$; Cramer's $V = 0.19$.
[b] Overall χ^2 statistic = 22.4; $p < 0.01$; Cramer's $V = 0.16$.

the middle sales category ($1 to $10 million). There is thus some indication that firms with increased sales volume in 2007 tended to be smaller firms when operating within the declining SFRC market, and larger firms when operating outside of SFRC markets, which tended to be stronger.

Hypothesis 2 stated that firms having increased sales volume in the declining SFRC market will score higher on customization as measured by proportion of semi-custom and made-to-order products. As shown in Table 4, hypothesis 2 was partially supported. There was little evidence of group differences across the "semi-custom" product categories ($p = 0.15$), with a definition that for a given design, customers have a choice of wood species, finish, and hardware. However, there was a significant relationship for "made-to-order" products ($p = 0.04$), which were defined as products for which customers can specify all aspects of the product, including design. Here, Group 4 had proportionally fewer firms in the 0- to 20-percent made-to-order production category and proportionally more in the 61- to 100-percent category, as predicted. Nearly four out of five firms in Group 4 produced made-to-order products on the order of at least 61 percent of their overall product mix.

DISCUSSION

This study found support for the hypotheses that successful secondary wood products firms operating in the declining SFRC housing market were smaller and manufactured more fully customized products than their counterparts. Semi-customization nevertheless was not enough to warrant success as no statistical difference could be established for performance differences between firms manufacturing semi-customized products and firms who did not produce such products. Smaller firms with the capability to manufacture products to order seem especially well positioned to weather the current and future downturns in the housing market and possibly also to compete with larger offshore competitors that have inherent advantages in terms of economies of scale and price. Similar to our findings, other researchers also have found that smaller firms, by working closely with customers (e.g., to produce made-to-order products), seemingly have an important competitive advantage; as stated by Gilmore and others (1999, p. 33), "[our] findings suggest that the SME [small and medium-sized enterprise], by staying close to its customers, will have a keen understanding of their needs."

With the relative success of smaller businesses and the demise of larger ones (at least in terms of domestic

Table 4.—Characteristics of the overall product type mix by group.

Product type mix	SFRC ≤ 60 percent of production; sales volume off (Group 1)	SFRC ≤ 60 percent of production; sales volume up (Group 2)	SFRC > 60 percent of production; sales volume off (Group 3)	SFRC > 60 percent of production; sales volume up (Group 4)
Semi-custom products[a]				
0 – 20%	14.4%	21.3%	17.0%	26.0%
21 – 60%	28.8%	25.2%	21.4%	13.7%
61 – 100%	56.8%	53.5%	61.6%	60.3%
Made-to-order products[b]				
0 – 20%	18.6%	14.3%	16.1%	4.1%
21 – 60%	23.7%	19.0%	15.2%	16.4%
61 – 100%	57.6%	66.7%	68.8%	79.4%

[a] Overall χ^2 statistic = 9.4; $p = 0.15$.
[b] Overall χ^2 statistic = 13.0; $p = 0.04$; Cramer's $V = 0.12$.

production) due to more global competition, smaller firms likely will become increasingly important to understanding consumption patterns for hardwood lumber and other raw materials, even though the availability of data to measure consumption by small firms is limited. It also could pose challenges related to distributional efficiency for lumber manufacturers and wholesalers, as they may need to reach proportionally more small customers in the future.

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